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SURVEY ARTICLE



THE IMPOSSIBILITY OF A GENERALIZED DARWINISM: COMMENTS ON *DARWIN'S CONJECTURE**

Paul FUDULU**

WHAT SOCIAL SCIENCES, ESPECIALLY ECONOMIC THEORY, COULD EXPECT FROM OTHER SCIENCES?

Human scientific endeavor can have a reason to exist if components of the universe are causally related. If so, then whatever of its components has to be guided by comprehensive principles also valid for its subcomponents. It follows that each subcomponent can have its own specific principles which although different cannot contradict the comprehensive principles of the universe component to which it is a subcomponent.

There is a basic methodological principle that follows: economists should look for comprehensive principles of social life and other components of the living world and the consistency of their own theories with these principles can be even taken as a criterion of truth. Correspondingly, the sciences we should look for assistance are those studying these larger reality components the economic or social life is a subcomponent. Furthermore, we should carefully avoid to look for general models or principles in sciences which themselves study same rank subcomponents of the same larger reality.

If these ideas are correct, then it seems that *Darwin's Conjecture* is doing what exactly should not be done. By trying to generalize the Darwinian principles to social evolution it is forced upon a component of the living world – the human society – principles tentatively valid to another component – the subhuman component – of the same living reality. If so, the book should prove of little assistance in solving some of the serious problems of economic theory. In addition to that, there must be other sciences studying fields with a comprehensive perspective on the living reality offering comprehensive principles valid even for social life with which economic theories must be consistent that should be illuminating in finding solutions to those serious problems. What follows consists in checking these preliminary ideas.

* Geoffrey Hodgson and Thorbjorn Knudsen - *Darwin's Conjecture. The Search for General Principles of Social and Economic Evolution* - The University of Chicago Press, Chicago and London, 2010

** Paul FUDULU, University of Bucharest

THE DARWINIST PERSPECTIVE AND THE MAXIMIZATION HYPOTHESIS OF ECONOMIC THEORY

If the standard economic theory is in a plight, and for sure it is, its weaknesses should be looked for in its fundamental hypotheses: the maximizing nature of the human beings and especially the comprehensive nature of the human megagoal of absolute wealth (assumed explicitly and implicitly).

If the Darwinist theory is the proper metatheoretical model of all social sciences including economic science, as the authors of this book claim, what does it tell us economists about the maximization hypothesis? In regard with the consumption of matter and energy of the living entities the authors of *Darwin's Conjecture* asserts that they "have limited capacities to absorb" (p.33). However, there is a magnitude which is maximized by replicators - the number of offspring. But enough disappointing, human reality seems to be depicted by an upside down situation: it is rather the number of offspring which humans strive to limit and it is each individual's consumption of matter and energy that is maximized. The authors do not seem aware of this serious contradiction and are not at all concerned to account for by a more comprehensive principle that reconcile these two principles of limitation and maximization, which apply differently to human and non-human living worlds.

As one moves from lower to higher biological ranks and ultimately to human species, the regularity seems to be that the maximization is done lesser through the number of copies produced in filogenesis and more through the resources trapped and consumed by each living entities during its ontogenesis. That maximization and limitation principles should be studied simultaneously in ontogenesis and filogenesis and that they might be consistent with maximization of a more comprehensive magnitude never come to the minds of the authors because their perspective it is not able to suggest such a thing. Such a perspective can be offered only by physics (I shall come back to this point) and this is able to suggest solution to even other problems the authors should have not avoided.

THE DARWINIST PERSPECTIVE AND THE NATURE OF THE MEGAMAXIMAND

The root cause of the serious logical inconsistencies of standard economic theories (which, as my own experience proves, the orthodox economists have not been ready to accept) consists in their assumed nature of the megamaximand or their assumed type of man. The orthodox economists are all culture-blind assuming that only the megagoal of absolute wealth, which goes very close to their type of culture, is descriptive of the invariable type of man which populates this planet. They cannot understand that by this assumption they annul the incontestable reality of world cultural diversity. This is in perfect harmony with the perception that the concept of culture is one of the least understood concepts by economists and, as I will show later, the authors of the book are not at all different.

When forced to recognize otherwise by, for instance, anthropologists, the orthodox economists claim, as Frank Knight did, a mathematical-like nature of economic science, thus giving up its descriptive capacity. But taking this route they embark on an even more serious faultiness: the assumption that economic theory is maximand neutral. The truth is that any change in the megamaximand – for instance, from absolute wealth to relative power – entails a fundamental change in economic theory. Surprising to the orthodox economist, his theory is not primarily derived from the maximization principle but from the nature of the assumed megamaximand and cannot but change fundamentally when the megamaximand changes. Consequently, the idea that it could be an economic science which is valid for whatever megamaximand or able to generally assist efficient human action is flat wrong. An economic theory has an implicit cultural content or, in other words, is unavoidably descriptive for a specific cultural reality.

To this most fundamental problem Hodgson and Knudsen pay no attention or, when they have an opportunity to, they rather circumvent it looking overwhelmed by moral concerns. Although they acknowledge the cruel aspect of selection – some living entities devouring others or, as with Dawkins, a gene devouring its own alleles – it is downgraded to only a special case which does not deserve the effort to look for a more comprehensive principle. As such the solution they present consists of a “technical definition of selection” (p. 90) and in this way they fail to address this fundamental problem.

MORALLY BY HYPOTHESES OR RESULTS?

I have pointed out authors' rush to go away from a cruel perspective on natural selection and to suggest, apparently mainly for this reason, a “technical definition” of it, which proves to be remarkably flawed at least for human species. The main cause of this turn in their economic metamodel was due to moral concerns. Instead of a descriptive theory based on “cruel” hypothesis, they could have got a flawed theory based on “moral” hypotheses.

So, why rush for “moral” hypotheses, which, because could generate flawed theories, help not at all human species in its efforts to become more moral? Should we rush to be moral by our hypotheses or look for moral results in the end? How could a flawed theory support efforts to make humanity more moral? In a change of realms, would it be moral to a medical doctor not to assess diagnoses that are undesirable to humans? In search for a right answer we have to accept that it would be impossible to find a cure without a precise assessment of the disease. And if an effective cure cannot but be grounded on a true assessment of the cause, a moral result cannot but be based on a correct hypothesis and theory, irrespective of how cruel or immoral that might seem. Consequently, we should not rush to be moral by hypothesis or theories but look for moral results in the end.

To the end of this review I shall suggest a perspective on social evolution which is based on a very cruel perspective on life. Only this perspective will prove to reconcile the

revealed contradictions in authors' model and only this perspective can generate a descriptive model on social evolution. With a correct perspective on social evolution one can generate descriptive economic theories and, possibly, these theories can be employed to better human condition. With flawed theories even this possibility is ruled out.

THE PUZZLE OF SELECTION CRITERION

The project of extending Darwinian principles to social evolution assumes the possibility of a clear and general definition of the basic terms and then their adaptability to particular realms of the living reality. The authors candidly acknowledge these requirements. Unfortunately, their definitions are far from being clear and with general applicability, but rather seem to cumulate confusions both from biology and economic science.

The nature of selection process and its criterion are of primary importance for such a scientific project. Disappointing enough both definitions of the terms are tautological or do not have enough generality. Selection is the process that eliminates those unfit and fitness stays, despite authors' effort to the contrary, "that quality that is selected" (p.90). Their efforts to identify a general criterion of selection fail because "the propensity of a genotype to produce offspring" is not a general criterion, as previously shown, but only a particular application of an unidentified general criterion to a particular realm of the living reality.

The authors' implicit contention that there are "multiple interdependent criteria" (p. 91) is unwarranted (they do not mention more than one or two different criteria) and produces even more confusion. Selection or sorting out is like a classification and in a classification cannot be but only one criterion. This might have different expressions in different particular fields, but essentially it remains just one criterion and that one has to be clearly asserted. Speaking of multiple criteria emphasizes the confusion of the whole intellectual enterprise.

The talk about the fact that fit and optimal or efficient diverge might have been for the reader an opportunity to learn more about the criterion of selection but was not so. If one takes into account the causes for divergence suggested by authors (path dependence or errors) it seems that there are no differences between fit and efficient. Although this is not at all helpful; in fact we can have efficiency on many coordinates. As such it could be the case that something is not "efficient" in an orthodox sense, but is still efficient in the sense assumed by the quality of fitness, without any errors or path dependence phenomena.

This way we came to the fundamental confusion of the orthodox economic theory with which the authors of the book are fully contaminated. As long as for moral, ideological or cultural prejudices the only human megagoal assumed is power over nonhuman (living and inert) reality, statements as the previous ones make no sense and cannot be descriptive for the reality we face. Consequently, the metatheoretical model

suggested by this book rests on fundamental concepts that have no clear comprehensive definitions.

ARE THERE ANY SOCIAL REPLICATORS?

Within the theoretical model suggested by the book the possibility of generalizing Darwinist principles to social evolutions depends crucially on the existence of social replicators and the authors are doing their best to prove this. Had they tried to learn something about social evolution starting from the nature of the living entities or the nature of life itself, which I find far more normal, their endeavor would have looked much less hopeful from the very beginning. Who could venture to take a habit or an organization as a full freestanding living entity?

Taking the former route the authors proceed with characterizing in much detail the nature and the differences between replicators and interactors. In what I consider their ultimate definition of a genuine or generative replicator the reader can learn that it is "a material entity embodying mechanisms that can be energized by input signals" (p. 127). And because these "conditional generative" mechanisms are like programs, I would choose a little bit different wording and say that a generative replicator is a unity between a material structure and a program.

While I can agree that nests and burrows are not generative replicators, why, as the authors opine, ideas are not replicators but habits are? Habits and dispositions are subconscious or inborn pattern of behavior or rules and a pattern or a rule is a program. Of course they do not include by themselves any material structure and as such both cannot qualify as replicators. Only together with the human bodies they could form generative replicators which are the human beings. To find a difference between habits and ideas the authors in a subtle way changes the criterion and we learn that ideas cannot be freestanding entities but rests on habits or dispositions. But do habits and dispositions can be replicators on the ground that they might be located at a much deeper layer of human decisional mechanism? Based on authors' own definition, of course, not: They do not change their nature of a program.

SAME DEEP CONFUSION IN DEFINING FUNDAMENTAL TERMS

If there are principles or metamodels offered to economic science by other sciences their beneficial impact should first of all be on ending confusions affecting fundamental terms. Two interrelated terms are crucial in most of judgments or logical elaborations of the book. They are "culture" and "rules" and regarding both the authors of the book are staying in the same deep confusion which is characteristic to the orthodox economic theory.

In respect with the term culture there are at least three different meanings. Of all these the authors are ignoring that meaning which is of utmost importance to social sciences including economics - culture as a set o fundamental values and rules which are characteristic to some given community. It is of utmost importance because social

sciences should explain human behavior and there cannot be any such explanation without a right identification of human megaobjectives. The concept of culture, as it is employed especially by sociologist and anthropologist, is exactly about the longstanding ranking of human megaobjectives by various human communities and this is exactly what fundamental values and rules are doing.

What the orthodox economists stubbornly refuse to accept, despite many sociologists, anthropologists and political scientists' filed research, is that the megaobjective of (absolute) wealth is itself ranked or has a substitute. In the orthodox economists' minds there is only the megaobjective of absolute wealth and this contradicts the reality of world cultural diversity and has a disastrous effect on the descriptive capacity of economic theory. Had economic theory stayed on a normative stance the situation should not have been so troubling. However, when orthodox economists claim descriptive capacity for their theories the situation becomes an impossible to solve problem. It is impossible to conceive descriptive economic theories based on the false assumption of the unique human megaobjective of absolute wealth when humans of this world have also a proved preference for relative power in and of itself.

A proof of this situation consists in the embarrassing logical inconsistencies of some famous orthodox theories. One of this is the path dependence theory which is invoked by the authors at some crucial points of their argumentation. For instance, Arthur's model (1989), at some point, accepts the ranking of efficiency in terms of absolute wealth (through accepting preferences for technologies which have already been ranked in terms of efficiency) and this equals to blowing up all the logic of the theory including its reason of being. With absolute wealth itself ranked the paradox of inefficient technologies cornering the markets (or inefficient institutional settings dominating whole countries) simply ceases to exist. Various preferences for absolute wealth entail in a natural or desirable way differences in economic performances.

Some could conceive a line of defense in authors' favor by saying that they chose a different meaning of culture – that of a kind of non-genetic transmission of information - based on the topic of their research. But it is not at all like this. Although in an explicit manner they employ this latter meaning of the term culture, at the back of their mind and, as such, in an implicit manner, there is an extreme culture by the former meaning. In other words, it is the assumption of an invariable cultural reality or a world populated only with individuals minded by the unique megagoal of absolute wealth. And based on this false assumption there are some important flawed logical elaborations and insufficiencies in the book.

FLAWED LOGICAL ELABORATIONS AND INSUFFICIENCIES

Let me pick two of these. First, the idea that cultural transmission of information reduces diversity within groups and, consequently, the sizeable differences across cultures are caused by path-dependent processes which follow accidental factors or minor differences. That cultural differences among communities or groups should,

without path-dependent processes, be small is an idea that goes against the very nature of culture and primarily cannot be but based on a lack of understanding of the nature of rules and values which in a fundamental way are contained by the concept of culture.

Culture is determined by the independent factor climate which in fact shapes human inequalities. Indeed, the strong correlation between human relative power inequalities and climate is well documented. Climate is the root cause of a causal chain that goes up to the impressive cultural differences and the impressive gaps in economic performance. Rules and values are functions of relative power among interacting individuals and as such culture cannot but be different across various climates and groups living in those various climates.

In a fundamental way rules and values are patterned rankings of human megagoals or of alternative human actions in terms of opportunity costs and, respectively, satisfaction. The sociological concept of culture is about variation in importance of human megagoals and not about means in relation with the invariable megagoal of absolute wealth as it is wrongly assumed by the orthodox economists. Without some other megagoal besides absolute wealth it cannot be alternatives and without alternatives there are possible no rankings either in terms of satisfaction or opportunity costs. It is for this very reason that orthodox economic theory has remained so unable to define rules and understand the concept of culture.

The authors' idea that religion as an expression of culture is about reducing cheating and free-riding within groups is another flawed orthodox idea. Most of the religions, except Judaism and Protestantism, are about huge human inequalities. The antique Buddhism, Islam and to a sizeable extent even Christian Orthodoxy justify as large inequalities as almost the institution of slavery. Gods, heaven and hell are primarily symbolic sources of rewards and punishments for enforcing impressive earthly human inequalities. Religion can accommodate to whatever level of human inequality or power structure and the idea that by its very nature it has had the effect of reducing human inequalities is simply flawed.

The second logical elaboration I chose is derived from an embarrassing permanent inability of the orthodox economic theory to define rules. Sadly enough, in fact, it cannot go further than tautologies or gimmicks meant to circumvent the problem. Authors' treatment of this issue is no different at all. The first component of what they call "social structure" consists of "significant social rules", but all we are told about social structures, implicitly rules, is that they have properties that "are additional to the sum of the properties of individuals" (p.163). Instead of describing the nature of the components or decoding of rules in facts and, respectively, concepts that are meaningful to economists, the reader is let to guess about some unnamed properties. And instead of suggesting the crucial process of the emergence of rules the authors circumvent the problem by invoking again path-dependent processes which originate in an unknown past.

The perspective I have suggested leads to a different and more meaningful explanation: Rules are based on patterned opportunity costs of the alternative actions or

goals and the past is not at all relevant for the present rules unless the present conditions are similar to the past ones. As ultimately all individuals are players and there is no independent third-party enforcement mechanism, the patterned opportunity costs and the patterned or ruled interdependent behavior that follows are shaped by the relative powers of the interacting individuals or their ability to impose costs or constrain others' actions. Ultimately, rules are enforced by players themselves. Consequently, there are as many kinds of rules as many kinds of interacting individuals. If there is something to be said when rules are related to individuals it is not that they have different properties but that the nature of rules depends on the cultural nature of interacting individuals. The authors' critique of Marshall who asserted the dependence of human institutions on human nature is unjustified.

BACK TO PHYSICS: THE ANTI-ENTROPIC NATURE OF LIFE

The book's internal logical inconsistencies and ideas which are contradicted by facts confirm a preliminary idea with which I started this review: The Darwinist theory cannot become a metatheoretical model which covers also social life. A model requires already some detailed description of some reality and social and subhuman lives seem to be well-apart fields. What we should look for in other sciences is some comprehensive principles which social reality cannot contradict but submit to. Then whatever causality some social scholar suggests it has to be compatible with these more comprehensive principles. The room for speculative thinking and falsification – and there are strong factors conducive to do so in social sciences -would be dramatically reduced.

For some time, Newtonian physics inspired economists and encouraged them to look for causalities and mechanisms of economic equilibrium. Has physics ceased to be a source of more comprehensive paradigms? Or orthodox economists have not been able to keep up with its new theories? Before answering these questions let me consider authors explanation for why we should not rely on physics. To them, while physics has clear-cut general principles, biology and social sciences deal with more complex realities which - the authors suggest - lacks these clear-cut general principles and scholars have to recourse to "auxiliary and particular explanations" (p. 23).

If one takes causality as a basic feature of the universe, authors' logic is troubling. They accept that there is a distinct component of the universe – biological and social life – but, at the same time, this lacks specific general principles or general causalities. The inevitable question is: What then keep this reality as distinct and apart field? How could a distinct reality exist without some unifying force or principle? One of the two statements has to be false. As it is hard to deny the existence of biological and social life, the false statement has to be that there are no general unifying principles governing this reality.

Then which is the general principle of the living reality which covers both biological and social life and to which all biological and social theories should submit? Is physics helpful in identifying this principle? Physics is the only science I am aware

of to give a definition of life starting from one of the most fundamental principle of the universe - its ever growing entropy. The living reality is a component of the universe which takes an inverse direction; we do not know and need not know why and how. It consists of organisms that fight for decreasing their entropy by trapping low entropy from their external reality. It is in this way that the living world speeds up the entropic degradation of the universe as a whole. It is also in this way that the living reality submits itself to the comprehensive principle of increasing entropy.

Because in reversing at least temporarily their entropic degradation living organisms rests on the low entropy from their external reality, trapping, exploiting, devouring its components is a fundamental aspect of life. The cruelty of biological world the authors try to circumvent is implacable. The more trapping, the lower the level of organisms' entropic degradation and the higher consistency with the more comprehensive principle of entropic degradation of the whole universe. It is at the level of organisms that the magnitude and efficiency of trapping low entropy primarily produce results and are judged. The logical conclusion of this fact is that each organism tends to trap all the components of his external reality including members of its own species.

Trapping, exploiting, and even devouring the other members of the human species are some more brutal forms of what social scholar calls (relative) power and for this very reason relative power should be acknowledged as the other human megaobjective, besides absolute wealth. There is no *a priori* difference between trapping the external reality component we call nature and the reality component of the other members of the human species. The weights for the two fundamental kinds of trapping are evolutionary determined or, in other words, depend on evolution of the conditions of trapping: the degree of identity overlapping and the opportunity costs of trapping. In a most fundamental way, those weights make up the content of the sociological concept of culture which, not surprising at all, the orthodox economists find so difficult to grasp.

THE INCONSISTENCIES AND INSUFFICIENCIES OF THE BOOK SOLVED

There are some troubling inconsistencies and insufficiencies in the book. They consists in ideas which are descriptive of some real facts but lack causalities that could make them compatible and as such possible. What follows is a proof that all these can be explained if one takes on board the anti-entropic perspective on life.

Let me start with a missing link in authors' logic which can be accounted for by the anti-entropic nature of life but not at all based on the Darwinist principles. In refining their fundamental concept of replicator they reach a point which "complements" Darwin by going beyond "limited heredity" in the sense that the generative replicators have the capacity to ever increase their complexity. Because these are *conditional* generative replicators, in the sense that they are energized by external stimuli, there should be an external condition to explain why they increase their complexity. This is the more necessary the authors react to Lamarckians'

contention that the growth of giraffe's neck might be related to its willpower do so by considering that this disposition to act purposefully in that manner should be itself inherited and should have an evolutionary origin (p. 71).

The entropic perspective prevents the need for such explanations both the authors and Lamarckians cannot provide. Both the "unbounded" increase in complexity of replicators and the giraffe's willpower to become more efficient in trapping food are derived from the fundamental anti-entropic feature of life. For this very reason, the social scholar needs not any explanation for this feature as the physicist needs not for the fundamental principle of ever increasing entropy of the universe. It is just so and social scholars do not need to know why and how. Besides, the Darwinist evolutionary principles were meant to explain only how organisms evolve and not why and how the living reality came into being.

But the most serious inconsistency of the Darwinist metatheoretical model which the book suggests regards the selection criterion. Without a solid and identifiable selection criteria even selection is questionable as a process, unless there is a criterion identifiable based on a different perspective which makes compatible various "proxies" or melt down in only one criterion the "multiple interdependent criteria" suggested by the authors. So fitness can be measured in some cases by the number of offspring, survival rates, and profitability rates but in some other case theses are not relevant. The most prominent indicator of fitness – the number of offspring - is remarkably contradicted by human species which as it evolves seems to increasingly limit its numbers. Besides, while at a subhuman level maximization of the number of offspring is accompanied by the limitation of individual consumption, at the human level the situation is on its head: While offspring are limited the individual consumption is maximized.

Within an anti-entropic perspective on life the criterion of selection cannot but be the level of anti-entropic control (power) or the amount of low entropy trapped by one organism from the various components of its external reality. This could be expressed in terms of, for instance, energy, highly organized matter, and information. It is based on this success in amassing anti-entropic control or general power that an organism beats the others with or without their extinction. Does this negentropy-based criterion make compatible the abovementioned contradictory fitness indicators and variables? Maximization of the trapped low entropy by an organism with a given identity (genotype) can be done either by maximizing the number of copies living in subsequent lives (while keeping constant the low entropy trapped by one copy) or by maximizing the low entropy trapped by one copy (in a single life) or both. The survival rate and profitability rate in foraging are also perfectly compatible with the criterion of anti-entropic performance.

This anti-entropic criterion solves also the paradox of divergence between fitness and efficiency or optimality. In the standard economic theory efficiency is ultimately in terms of absolute wealth or power over nature (non-human external reality). Fitness in terms of anti-entropic performance is efficiency in terms of absolute

wealth but also, simultaneously, relative power (trapping of the other members of the species). They overlap only when trapping the other members of the species is absent.

CONCLUSIONS

With a fuzzy or even unidentified selection criterion, concepts like replicator for which it is hard to find correspondent social realities, with no illuminating plus in terminating the confusion regarding some fundamental economic and social terms with which economists operate, like rules and culture, a metatheoretical model based on Darwinist principles, which the authors of the book fought to assemble, is neither feasible nor desirable. The social scholars should not look for metatheoretical models which are built based on theories that are tentatively descriptive for components of the same larger reality which includes also the social life. They should look for comprehensive principles of this larger reality – the living world – with which each of the specific principles of its components have to be compatible. It is in this way that we could make available another criterion for judging the descriptive power of economic theories. Consequently, we should not look for more support from biology but get back to physics; it is the only science that defines the living world based on one of the most fundamental principle of the universe with which our theories cannot but be consistent.

RESEARCH ARTICLE



CAUSAL RETURNS TO SCHOOLING AND INDIVIDUAL HETEROGENEITY

Friedhelm PFEIFFER*, Winfried POHLMEIER**

Abstract: *In this paper, human capital investments are evaluated by assuming heterogeneous returns to schooling. We use the potential outcome approach to measure the causal effect of human capital investments on earnings as a continuous treatment effect. Empirical evidence is based on a sample of West German full-time employed males (BIBB/LAB survey on educational and vocational attainment and career 1998/99). Our estimate of the average partial effect (APE) of an additional year of schooling amounts to 8.7%, which is higher than OLS estimates and quite similar to conventional instrumental variable estimates.*

INTRODUCTION

Two major issues concerning the impact of schooling on earnings have been raised in the empirical literature on human capital investments.¹ First, education as the individual's choice parameter is an endogenous choice variable in the standard earnings function. Therefore, coefficients on schooling from conventional Becker-Mincer type of earnings functions can only be interpreted as causal returns to schooling if the schooling level is uncorrelated with unobserved individual factors, i.e. if schooling is more or less assigned to individuals randomly. Therefore, ordinary least squares estimates are only of explorative nature and their usefulness with respect to policy recommendations is limited. Second, as a choice parameter the individual's schooling level is determined by the individual's observed and unobserved marginal benefits and costs of schooling. Thus, the return of an additional year of schooling varies across individuals and is driven by observable factors (e.g. family background, school quality etc.) as well as unobservable factors (e.g. cognitive and noncognitive skills, peer group and network effects).

This paper presents empirical results for the causal returns to schooling in Germany accounting for endogeneity and heterogeneity. In order to assess the causal

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¹ See Card (1999), Flossmann and Pohlmeier (2006), Gebel and Pfeiffer (2010), or Wooldridge (2002), among others.

effect of education on earnings, we adopt the concept of the average partial effect (APE) developed in the econometric evaluation literature for causal effects on continuous treatments. This can be used to quantify the expected earnings difference between two otherwise identical individuals if they had been assigned randomly to S and $S+1$ years of schooling, respectively. Contrary to previous studies on the APE in earnings functions with heterogeneous returns which rest on a control function approach (Garen (1984) and Heckman and Vytlačil (1998) for the US), we apply the conditional moment independence (CMI) approach proposed by Wooldridge (2004) to identify the APE on schooling. The approach applied in this study is easy to implement and reveals several advantages over other popular econometric approaches to estimate causal returns to schooling in the presence of heterogeneity. Aside from the problem that the classical instrumental variable approach to estimate the Local Average Treatment Effect (LATE) only provides estimates of causal returns to schooling for the potentially very small subgroup of compliers, it suffers in real world applications from the drawback of the availability of an appropriate and valid instrument (see Heckman and Urzua (2010)). Moreover, this binary instrument should have a relevant policy interpretation. Alternative valid instruments lead to estimates for different groups of compliers and therefore have a different interpretation. Similar to the standard instrumental variable approach, control function approaches to random coefficient models (Garen (1984), Heckman and Vytlačil (1998), Wooldridge (2008)) require strong assumptions on exclusion restrictions, which are often difficult to justify.

Using cross-sectional data on 7,722 male full-time workers in Germany we present evidence that the causal returns to schooling estimated by the conditional moment approach are well above the figures one obtains by ordinary least squares estimates, but lower than the two-stage least squares estimates for models assuming inessential heterogeneity in the returns to schooling.

Our paper is organized as follows: In Section 2, we develop the idea of random returns to education based on Card's schooling model (Card, 1999). Following Wooldridge (2004), we identify the average treatment effect via CMI assumptions and demonstrate that the APE for the continuous treatment variable schooling can be estimated by means of auxiliary regressions. Section 3 describes the data and provides some information on the institutional settings in Germany. Our empirical findings are presented in Sections 4 and 5, while Section 6 concludes with an outlook on future research.

THE CONDITIONAL MOMENTS APPROACH

For many years the literature on returns to schooling has emphasized that schooling is a choice variable depending on observable and unobservable factors which determine the individual's marginal costs and benefits of schooling. For the econometrician, this implies that the individual return rate itself is a random variable correlated with these observable and unobservable factors and therefore returns to

schooling vary across individuals. These basic features can easily be captured by Card's (1999) simple model of schooling and earnings, which we will use in the following as a specification device. The individual is assumed to choose the optimal amount of schooling, S , and earnings, Y , which maximize his lifetime utility depending on earnings and the disutility of schooling, $\varphi(S)$:

$$\max_{S, Y} U(S, Y) = \ln Y - \varphi(S) \text{ with } \varphi'(S) > 0 \text{ and } \varphi''(S) > 0. \quad (2.1)$$

Let the benefits of schooling (schooling-earnings relationship) be $Y = Y(S)$ with $Y'(S) > 0$. This yields the first order conditions

$$\frac{Y'(S)}{Y(S)} = \varphi'(S) \quad (2.2)$$

The conventional log earnings function linear in schooling arises if marginal benefits are constant:²

$$MB \equiv \frac{Y'(S)}{Y(S)} = \beta \quad (2.3)$$

Note, that in this framework β is a fixed parameter for the optimizing individual. However, from the viewpoint of the econometrician it is assumed to be a correlated random variable depending on observable and unobservable factors. If marginal costs (MC) are linear in schooling, then:

$$MC \equiv \varphi'(S) = \gamma + \kappa S, \quad \kappa > 0 \quad (2.4)$$

Given these functional form assumptions optimal schooling is given by the schooling function of the form

$$S = \frac{\beta - \gamma}{\kappa} \quad (2.5)$$

Integration of the marginal benefit function (2.3) yields a log linear earnings function with random coefficients, an individual specific intercept and an individual specific slope coefficient:

$$\ln Y = \alpha + \beta S \quad (2.6)$$

The intercept α captures the absolute productivity (ability) advantages of the agent. Similar to β , it is also treated as a correlated random coefficient. Observable factors and unobserved heterogeneity in the absolute and marginal benefits of schooling as well as factors driving the marginal costs of schooling enter the earnings function through the coefficients α , β and γ , respectively. Let α be presented by the linear predictor function

$$\alpha = \alpha_0 + X_1' \alpha_1 + \eta_\alpha, \quad (2.7)$$

² Assuming a linear marginal benefit function results in a log earnings function that contains an additional quadratic schooling term.

where X_1 is a vector of observables and the random variable η_α captures unobserved heterogeneity in the absolute productivity term (e.g. individual work experience, regional factors etc.) which serve as additional control variables in the classical Becker-Mincer framework. Likewise, marginal productivity may depend on the same set of factors:

$$\beta = \beta_0 + X_1' \beta_1 + \eta_\beta, \quad (2.8)$$

while marginal cost depends on the X_1 variables as well as on additional cost driving factors X_2 :

$$\gamma = \gamma_0 + X_1' \gamma_1 + X_2' \gamma_2 + \eta_\gamma \quad (2.9)$$

Inserting (2.7) - (2.9) in the schooling equation (2.5) yields a reduced form of the schooling equation:

$$\begin{aligned} S &= \frac{1}{\kappa} [(\beta_0 - \gamma_0) + X_1'(\beta_1 - \gamma_1) - X_2' \gamma_2 + \eta_\beta - \eta_\gamma] \\ &= \pi_0 + X_1' \pi_1 + X_2' \pi_2 + \xi \end{aligned} \quad (2.10)$$

Note that the returns of an additional year of schooling now is a random variable depending on the level of schooling and the marginal costs of schooling, i.e. the returns to schooling vary across the population. The APE of an additional year of schooling is the mean across all individual returns for an additional year of schooling:

$$APE = E[E[\ln Y|S = s + 1, \alpha, \beta] - E[\ln Y|S = s, \alpha, \beta]] = E[\beta]. \quad (2.11)$$

The literature on causal effects in non-experimental settings is largely focused on binary treatments and to some extent to discrete multivalued treatments, while estimation issues of causal effects for continuous treatments has gained comparatively little attention. One can distinguish between three approaches to the treatment evaluation problem for continuous treatments. Garen (1984), Heckman and Vytlacil (1998) and Wooldridge (2008) propose an IV or control function approach that makes use of control functions such as (2.7) and (2.8) to estimate the APE from the reduced forms for earnings and schooling. The major drawback of this approach is the limited availability of a reasonable exclusion restriction (instrument) which identifies the causal treatment effect. Based on the conditional independence assumption the propensity score approach has been generalized to the case of continuous treatments by Imai and van Dyk (2004) and Hirano and Imbens (2005). Contrary to the binary case their generalizations require strong distributional assumptions. Here, we follow a suggestion by Wooldridge (2004, 2008). The APE is estimated in a random coefficient framework by assuming conditional mean independence. Under this assumption, treatments can be ignored conditional on a set of confounding variables. The APE can be identified if the following assumptions hold (ignorability conditions):

Identifying Assumptions for the APE (Wooldridge (2004):

A.1 Equation (2.6) holds.

A.2 For a set of covariates X , the following ignorability assumption holds:

$$E[\ln Y|S, \alpha, \beta, X] = E[\ln Y|S, \alpha, \beta]$$

A.3 Conditional on X , α and β are ignorable in the first two conditional moments of S :

$$E[S|X, \alpha, \beta] = E[S|X] \text{ and } V[S|X, \alpha, \beta] = V[S|X] > 0$$

Identification condition A.2 obviously holds since the control variable X enters the earnings function through α , β and S only. The linear predictor specification used for illustrative purposes in (2.7) and (2.8) is not required to identify the APE. In fact, the conditional mean independence approach uses identification conditions different from the control function approaches in correlated random coefficient models. Identification condition A.3 denotes that conditional on the controls, expected schooling is mean independent of α and β . Thus no new information is gained in projecting schooling if there are sufficient controls. This is the crucial identification condition (ignorability condition) needed to identify the APE.

Proposition 2.1 (APE) (Wooldridge (2004):

Under the identifying assumptions A.1 – A.3, the average treatment effect for all X in the relevant population is given by

$$E[\beta] = E[E[\beta | X]] = E\left[\frac{\text{Cov}[S, \ln Y|X]}{V[S|X]}\right]$$

In the following analysis, we estimate $V[S|X]$ and $\text{Cov}[S, \ln Y|X]$ by means of linear regression. Replacing the population parameters with the regression estimates yields a consistent estimate of the average treatment effect under the assumption of independent, identically distributed observations:

$$\hat{E}[\beta] = \frac{1}{n} \sum_{i=1}^n \frac{\hat{\text{Cov}}[S_i, \ln Y_i | X_i]}{\hat{V}[S_i | X_i]}$$

Contrary to the instrumental variable or control function approach, the CMI approach does not require exclusion restrictions for instrumental variables in such a way that the instruments drive the selection process (choice of the optimal years of schooling) and are uncorrelated with the error term of the earnings function. Since the APE is nothing but the mean of the ratio of second moments and cross-moments of schooling and earnings conditional on X , more insights into the causal effects of schooling can be obtained by analyzing other distributional properties of this ratio in addition to the mean.

DATA

Our empirical study is based on a sample of full-time employed male workers from the so-called BIBB/IAB survey on educational and vocational attainment and

career (BIBB/IAB (1999)), conducted in 1999. The BIBB/IAB³ survey is a 0.1 % representative survey of German workers which has been conducted every five to six years since 1979. The objective of the survey is to produce “differentiated, actual data on workers in Germany, their qualifications and working conditions” (Dostal and Jansen, 2002). The data are processed and documented by the Central Archive for Empirical Social Research (“Zentralarchiv für empirische Sozialforschung”, ZA), Cologne. Neither BIBB, IAB nor ZA take any responsibility for the analysis or the interpretation of the data presented here.

The 1999 survey contains comprehensive information on the number of years spent in the educational and vocational education system in Germany. In particular, our data contain extensive information on the successful completion of schooling levels (basic schooling, vocational and university education) and the actual years spent in the educational system to obtain the degree. Hence, our schooling variable is more closely related to the definition of an input variable compared to the standard measurement using either the minimum years required by the individual to receive his/her highest educational attainment or the average years of schooling necessary to attain a degree.

Table 1 contains selected summary statistics on the number of observations, on the number of years of schooling and on earnings for four different educational groups: workers without any formal occupational degree, workers with an apprenticeship degree (“Geselle”), workers with senior craftsmen qualifications (“Meister”) or a degree from a university of applied sciences (“Fachhochschule”) and workers with at least a university degree (for more details on the German educational system compare Blechinger and Pfeiffer (2000), among others). The overall years of standard schooling for these groups are 10, 13, 15-16 and 18. The actual number of years of schooling spent to capture a university degree is 1.7 years higher than standard years. For the quantitatively important group of workers with an apprenticeship degree, actual and standard years are not that different.

For our empirical analysis, we select a sample of German male full-time workers from the 1989/99 survey. We concentrate on full-time male workers because men by and large have an inelastic labor supply and we can disregard selection into the labor force. Our earnings variable refers to the natural logarithm of gross monthly earnings before taxes. We end up with 7,722 observations. Summary statistics of the covariates are presented in Table 6a in the Appendix.

Table 1 *Summary Statistics of Schooling and Earnings by Skill Group*

Sample	Observations		Earnings [DM]		Schooling [years]	
	Freq.	Percent	mean	std.-dev.	mean	std.-dev.
Overall sample	7,722	100	4,697	1,986.4	14.3	3.5
Unskilled	762	9.9	3,689	1,667.7	10.6	2.4
Vocational training	4,988	64.6	4,302	1,572.0	13.7	2.5

³ BIBB: Federal Institute for Vocational Training (“Bundesinstitut für Berufsbildung”), IAB: Institute for Labour Market and Occupational Research of the Federal Labour Office (Institut für Arbeitsmarkt- und Berufsforschung der Bundesagentur für Arbeit).

Sample	Observations		Earnings [DM]		Schooling [years]	
	Freq.	Percent	mean	std.-dev.	mean	std.-dev.
Foreman, senior craftsman	1,330	17.2	5,627	2,017.5	16.5	3.6
University graduate	642	8.3	7,028	2,628.3	19.7	2.7

Source: BIBB/IAB 1999; own calculation; for definitions and sample selection see text.

EMPIRICAL FINDINGS

As a benchmark for our estimates of the APE, we first present the results of more traditional two-stage least squares estimates of the earnings function assuming homogenous returns to schooling (Table 2 and Table 3). The instruments used are the unemployment rate at graduation and its interaction terms with age and the squared age variable. This gives us three overidentifying restrictions. The reasoning behind the use of these instruments lies in some specific institutional features of the German vocational system. By opting for the elementary vocational year (“Berufsgrundbildungsjahr”), youths, especially those without an apprenticeship training position, have the opportunity to prepare for vocational training by attending a full-time school year (optional as part-time school). The preparation year for vocational training (“Berufsvorbereitungsjahr”) basically serves the same purpose as the elementary vocational year, but in a somewhat broader sense. It prepares youths without an apprenticeship position for vocational training.⁴ If unemployment reflects opportunity costs, an individual is more likely to stay in the educational system if employment prospects are low. This argument seems particularly relevant for the case of Germany where tuition and fees for general schooling and vocational training are rare exceptions or negligible.

Table 2 presents the reduced form estimates for the schooling equation. Given the large value of the F-Test (195.84), we can reject the null of weak instruments in terms of the relative 2SLS bias (> 10%) and the actual size of the 2SLS t-test (> 15%) according to the critical values presented in Stock et al. (2002). The unemployment rate at graduation has a significant impact on the schooling level, and its impact varies across cohorts. Our specification explains 36% of the variation in schooling in the sample. Using the Hausman test (auxiliary regression specification) we can reject the hypothesis that schooling can be treated as an exogenous explanatory variable.

Table 2 *Reduced Form Estimates of the Schooling Equation*

Variable	β	t value
Experience	-.330	-16.65
Experience squared	-.003	-4.96
Age	.267	2.43
Age squared	.003	2.12
Unemployment ratio at graduation	-.331	-1.10
Unemployment ratio at graduation * Age	.028	1.79

⁴ Franz et al. (2000) study the impact of vocational training on youth unemployment duration.

Unemployment ratio at graduation * Age squared	.000	-1.41
Constant	6.685	2.94
N = 7,722; F(22, 7699) = 195.84; R ² = 0.36		

Additional controls: sectoral dummies, regional dummies, firm size and a dummy variable for handicapped workers.

Dependent variable: Years of schooling.

Source: BIBB/IAB 1999; own estimates.

The 2SLS estimates of the fixed coefficient earnings function are given in Table 3. In addition to the typical covariates schooling, experience and experience squared, sector dummies, regional dummies, firm size and a dummy variable for handicapped workers are used as additional controls. The return to an additional school year is 8.3%, which is in line with previous estimates for Germany (see Flossmann and Pohlmeier, 2006). Ignoring the endogeneity of schooling by estimating the equation using ordinary least squares results in a lower estimate of 4.2 % (Maier et al., 2003). These differences confirm the international evidence that the return rates obtained from instrumental variable estimators often are above the ones from ordinary least squares estimates (see Card, 1999).

Table 3 2SLS Estimates of the Earnings Equation

Variable	β	t value
Schooling	.083	33.57
Experience	.030	18.09
Experience squared	.000	-9.48
Handicapped	-.039	-1.88
Constant	6.920	159.9
N = 7,722; F(18, 7703) = 132.19; R ² = 0.236		
Hausman test (N(0,1)) = 20.76		

Additional controls: sector dummies, regional dummies, firm size dummies. Dependent variable: Logarithm of wage,

Source: BIBB/IAB 1999, own estimates

The estimates of the expected rate of return to an additional year of schooling based on the CMI approach are reported in Table 4. In the first row of Table 4, we report the APE using all observations. Outliers turn out to have a significant effect on the reported APE values. Therefore, the second line presents estimates based on a trimmed sample, where observations below the 1% and above the 99% APE quantiles were dropped. Trimming obviously leads to more plausible estimation results.

Table 4 Estimates of the APE

$\hat{E}[\beta]$	t-value	Quantiles					
		10 %	25%	50%	75%	90%	
1.060	1.22	-.103	.005	.076	.158	.294	without trimming
0.087	29.94	-.091	.007	.076	.156	.283	trimmed

Source: BIBB/IAB 1999; own estimates.

The CMI approach reveals an average treatment effect of an additional year of schooling (APE) at 8.7%, which is significantly different from zero. This estimate does

not differ much from the 2SLS results reported above. Angrist and Imbens (1995) show that for models with variable treatment intensity, the 2SLS estimator identifies a weighted average of the treatment effect in the population whose educational attainment was changed by the instrument. Hence, there is no reason to expect ex ante quantitatively similar estimates. Using a control function approach, Gebel and Pfeiffer (2010) obtained a value of 7.2% for APE based on SOEP data 1999, which lies slightly above their OLS estimates (5.8%).

The quantiles of the individual return rates reported in Table 4 reveal that the impact of educational attainment on earnings is far from being homogeneous. For a quarter of the individuals, the causal return rate is more than 15.6%, and for the 90% quantile, it is 28.3%. On the other hand, for a quarter of the individuals, there are very low or even negative causal return rates. For example, negative return rates may result from a restricted entry into the labour market, in which case education serves as means of bridging over waiting queues in times of unemployment. They can be the result of a suboptimal matching between heterogeneous students and teaching institutions as well.

More descriptive evidence on the distribution of the heterogeneous returns is given by the kernel density estimates of the conditional average partial effect $E[\beta | X]$ depicted in Figure 1.

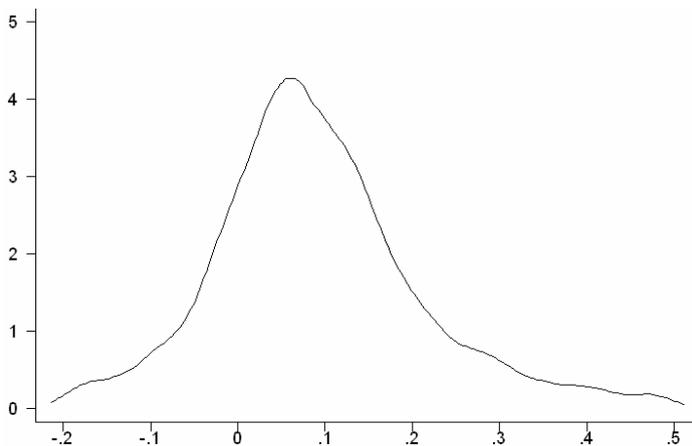


Figure 1 Kernel density estimates of the conditional average partial effect $E[\beta | X]$

The kernel density plot of the conditional average partial effect produces some insights on the heterogeneity of the returns to schooling, although it should not be mixed up with variance of the partial effect or variance of the causal effect of the returns to schooling, $V[\beta]$, which cannot be identified given the assumptions on conditional moment independence. The distribution of the conditional average partial effect reveals fat tails indicating that for certain socio-economic background factors the returns to schooling can even be negative or very large. Moreover, the conditional APE turns out to be skewed to the right.

For economic policy reasons it is important to know who benefits from education. To get some empirical insights into this question, the sample has been divided into workers with a APE-value above the median, and workers below the median APE-value. Table 5 presents descriptive statistics on some relevant socio-economic characteristics in the two sub-samples.

Table 5 *Socio-economic characteristics of two groups of workers*

Variables	Estimated conditional ATE		t-value of difference
	below median	above median	
Schooling	13.92	14.76	-10.65
Earnings	4576.17	4817.15	-5.34
Age	37.53	37.40	.68
Qualification:			
Unskilled	.11	.09	3.97
Vocational Training	.68	.61	7.16
Foremen etc.	.16	.18	-2.53
University graduates	.04	.12	-13.34

Source: BIBB/IAB 1999; own calculations.

The differences in the two samples suggests that on average the group with higher returns to education workers have acquired more years of schooling, are better qualified (the share of university graduates for example is 12% in the high returns group compared to only 4% in the low returns group) and do have higher earnings. These statistics seem to suggest that the law of diminishing returns to investments in human capital does not necessarily hold for all persons and all educational institutions at the chosen levels of schooling. If this interpretation is valid, then a variety of hitherto not fully exploited investment opportunities in schooling might exist for significant groups of individuals in Germany.

CONCLUDING REMARKS

In this paper, the returns on educational investments are assessed based on the potential outcome for continuous treatments. The estimate of the causal effect of schooling on earnings presented in this study is based on the CMI approach, taking into account heterogeneity of costs and benefits among individuals. Our estimate of the average causal effect of an additional year of schooling is 8.7%, which is close to the two stages least square estimate of the rate of return in a traditional fixed coefficient earnings function. Heterogeneity in the returns does matter and the monetary benefits of an additional year of schooling vary largely across the population. For 20 to 30% of the male workers in our sample, an additional year of schooling yields negative returns. For more than 25%, the returns are above 15%. Negative return rates may result from restricted entry into the labor market in which case education is a mean of bridging over waiting queues in times of unemployment, for example. The large positive returns may result from individual differences in learning abilities, educational costs and educational quality, among other reasons.

Since practical experience with the CMI approach to correlated random coefficient models is limited, our results, although plausible, should be treated with caution. More evidence is needed to assess the estimator. In particular, the estimation procedure applied is very sensitive to outliers. Trimming, for instance, can be used to reduce the impact of outliers. Another alternative would be the use of a shrinkage estimator, especially when a large number of confounding variables is available. For policy analysis, other treatment effects such as the effect of treatment on the treated, the treatment on the non-treated and the local average treatment effect should also be evaluated. Clearly, more research is needed to disentangle individual heterogeneity and institutional diversification for the economic returns of education.

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Appendix

Table 6a *Summary Statistics of the Covariates*

Variable	mean	std. dev.
Age	37.47	8.352
Age squared	1474	629.5
Experience	18.68	9.46
Experience squared	438.4	374.0
Handicapped	.038	.191
Sector		
Manufacturing	.318	.466
Craft	.213	.409
Trade	.103	.303
Public Service	.232	.422
Agriculture	.009	.094
Others	.120	.325
Firm size		
small	.414	.493
medium	.341	.474

Variable	mean	std. dev.
big	.229	.420
City size		
small	.360	.480
medium	.276	.447
big	.365	.481
Federal state		
Schleswig Holstein and Lower Saxony	.160	.367
Hamburg and Bremen	.033	.180
North-Rhine Westphalia	.286	.452
Rhineland-Palatinate, Hessen and Saarland	.166	.372
Baden Wuerttemberg and Bavaria	.320	.467
West Berlin	.034	.182
Unemployment ratio	4.16	2.83
Number of observations		7,722



EVOLUTIONS IN THE ACCOUNTING – TAXATION (DIS)CONNECTION IN ROMANIA, AFTER 1990

Costel ISTRATE*

Abstract: *Trying to credibly describe the Romanian relationship between accounting and taxation, we applied the method proposed in 1998 by Lamb et al. and developed by Nobes et Schwenke (2006). Six cases are available: from disconnection (case I) to identity (case II), through the various cases of influence on accounting over taxation or vice-versa. Despite the short period considered (20 years), our results confirm a de jure disconnection between Romanian financial accounting and tax accounting, as suggested by Petre and Lazăr (2006). But, one should not to much rely on appearances: in many cases, the accounting practice in Romania (especially SMEs) is marked by a close relationship with taxation.*

Keywords: *Accounting, Taxation, (Dis)connection, Romania*

JEL Codes: *M41, H22*

1. INTRODUCTION

The starting point in calculating taxable income is the accounting income. Nobes (2004) states that this initial link between the two incomes is valid in all countries that he is familiar with. Goncharov and Werner (2009) notice, in their turn, that there is a link between accounting and taxation in most countries in continental Europe. However, it is well known that the objectives of accounting and taxation are different (Raby and Richter, 1975; Viandier et de Lauzainghein, 1993; d’Ascenzo et England, 2003; Nobes, 2004; Whitaker, 2005, Formigioni et al., 2009...). This divergence of objectives explains why there are more or less significant adjustments when passing from accounting income to tax income. The more or less close connection between accounting and taxation depends on a range of multiple factors.

Certain developments can be seen in both senses: countries with a reputation for close relations between accounting and taxation go towards a more or less important disconnection¹ (the more frequent case) and vice-versa (the less frequent case). Which

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¹ Alexander et Nobes [2004: 268] noted that several European continental countries (in which the fiscal influence on accounting was strong) started, towards the end of the 1980s, a process of disconnecting accounting from taxation. Gallego (2004) identifies a similar phenomenon for the countries characterized by a strong influence of taxation on accounting: their situation changes towards a certain autonomy and independence of accounting and fiscal rules (in Spain, the starting point of such a

is the best system? It is hard to tell... The main argument for a total alignment of fiscal rules to accounting norms is the administrative efficiency (Nobes, 2004) both on the side of the tax-payer and on the side of the tax administration². By contrast, the separation between accounting and taxation can be justified by (Nobes, 2004): the different purposes of the two sets of rules; the protection of the financial reporting from tax pollution; the possibility to apply different accounting norms to different entities; the more rapid and easier evolution of accounting and fiscal norms; the possibility to head easier towards an international harmonization of the measure of the taxable income³.

The influence of taxation on accounting (and vice-versa) represents one of the factors included in the classification of accounting systems. Flower [2002: 30] makes a summary by comparing three works on international accounting (Nobes and Parker; Choi, Frost and Meek; Roberts, Weetman and Gordon). Taxation is invoked in all classifications quoted by Flower. Nobes (2008) notes that even after the application of the IAS/IFRS in Europe and in other areas of the world, there are still differences between accounting systems and that the variety of national responses to IAS/IFRS (in individual accounts) is due to reasons connected to company law and fiscal law. In this context, when tackling the issue of taxation, profit tax is mainly taken into account. The rules that govern this tax can be very different from one country to another. The European Union has not managed yet to harmonize the norms of the member states concerning the taxation of company profits despite its efforts to create a single consolidated taxation base (CCCTB – Common Consolidated Corporate Tax Base). The progress of EU efforts on CCCTB was, initially, facilitated by the application of IAS/IFRS in Europe beginning with 2005, even though the reference to international norms is no longer a topical issue (Schantz and Schantz, 2010).

Aisbitt (2002) notices that one of the main reasons that justifies a more or less clear separation between accounting and taxation consists precisely in the improvement of the international accounting of financial statements. It is hard to believe in the complete independence of accounting from taxation. Aisbitt (2001) believes that this will never happen.

In Romania, in 1990, due to its recent history of total centralization of enterprise activity, to a way of doing accounting that would leave little room to principles and interpretations and to the new challenges of an economy that was beginning to move in a different direction, accounting habits were turned upside down. For Feleagă and

separation is 1990). In France, Rossignol (1999) quotes Emmanuel de Pontavice who believes that the dependence link was broken by the 1983 law pertaining to the harmonization of accounting rules with the European directives.

² After interviewing a few Swedish practitioners, Blake et al. (1997) listed (for the case of Sweden) six arguments in favor of a strong connection between accounting and taxation and five arguments against this connection.

³ The reasons that justify the separation between accounting and taxation in what concerns the size of the income are broadly debated by Whitaker (32), in a plea for bridging of the gap between tax and accounting.

Ionaşcu (1993) the intervention of taxation in the life of enterprises represents one of the coordinates of an accounting system adjusted to the market economy. Before 1990, it was customary to receive ready-made (accounting and fiscal) solutions from the norm-granting body. Even after 1990, this body continued to take its role seriously and, in addition to the accounting law and its implementation rules (see Table 8), it issued a large number of interpretations. King and al. (2001) consider that these amendments make reference to fiscal issues rather, which seems to confirm the close link between accounting and taxation.

A HYPOTHESIS : *DE FACTO* CONNECTION VS. *DE JURE* DISCONNECTION

Petre and Lazăr (2006) argue that Romanian accounting and taxation are not connected (mention should be made of the fact that the two authors have an inside knowledge of this problem: they represented, at the time, the Romanian accounting regulating body – the Department of Public Finance). Fekete and al. (2009) agree to Petre and Lazăr's ideas, and they highlight the fact that accounting and fiscal practices must, in this context, be clearly distinguished from accounting and fiscal norms: the *de jure* disconnection and the *de facto* disconnection are treated differently. King and al. [19] aim to highlight the differences (if there are any) between the accounting practice in Romania and what Romanian accounting norms stipulate. They used questionnaires and conducted interviews (between November 1997 and March 1998) and their concluding findings were that the fiscal law has a large impact on the implementation of Romanian accounting norms. King and al. also found that the pro-forma nature of financial states is ideal for fiscal and statistical needs. In their study on the relation between accounting and taxation in Romania, for the 2006 – 2008 interval, Fekete and al. (2009) suggest a model to measure fiscal influence on accounting, by analysing a representative sample of Romanian enterprises. They found that in practice, taxation influences accounting, and the influence level decreased from 2006 to 2008. What we can grasp from these opinions is that the Romanian taxation is not supposed to influence accounting too much at the level of accounting and fiscal norms, yet practices are always impregnated by a *de facto* connection between accounting and taxation, even though this connection is diminishing and its level is different depending on the size of the enterprise⁴. Consequently, we aim to measure the *de jure* relation between accounting and taxation by analysing the texts of accounting and fiscal laws and regulations in Romania, in their post-1990 evolution.

⁴ For France, Rossignol (2002) conducts a survey whose results suggest that “size does emerge as an explanatory factor for a fiscal and accounting policy; the latter seems to justify itself more eagerly through an organization of accounting and fiscal services that are particularly close to each other as well as through an essentially fiscal perception of the usefulness of individual accounts.

**A METHOD FOR ASSESSING THE DEGREE OF CONNECTION BETWEEN
TAX FINANCIAL REPORTING: LAMB AD AL.'S SYSTEMATIC
EVALUATION APPROACH (1998)**

Lamb and al. (1998) suggest a framework to assess international variations in the connection between accounting and taxation. They dwell on five cases when there are links between accounting and fiscal rules; they admit, however, that the third case can be divided into two, so that, finally, six cases can be identified. Nobes and Schwenke (2006) pursue the research done by Lamb and al. (1998), by applying the principles to the situation of Norway, and they present the six distinct cases (Table 7). In addition, Nobes and Schwenke introduce a new dimension in the research of accounting - taxation relations: the longitudinal development of this link, by identifying the successive stages of this evolution.

We shall attempt to follow the approach suggested by the latter authors and to apply it to the case of Romania⁵. Thus, we aim to establish the degree of (dis)connection between accounting and taxation and the development, in time, of this relation. Nobes and Schwenke suggest that their model can be applied to Western developed countries that have a sufficiently long history of presentation of financial statements (since the first half of the 20th century). This condition is met by the country that they made their study on (namely Norway) and, in general, by Western countries⁶.

In the case of Romania, due to its political and social evolution, this model of evaluation of the accounting – taxation relation can only be applied beginning with the early 1990s. The length of successive intervals that mark changes in the accounting – taxation relations is equally very short: from one year to seven years. This could seem insufficient in comparison with the time intervals covered by previous studies but the history of modern taxation and accounting in Romania (and, maybe, in other countries of the ex-Communist block) is itself very short...

In the East, we have been trying to design and implement accounting and fiscal systems at a much higher speed than in the Western developed countries. The experience of these countries (especially of the EU countries) serves as a model and we hope to reach the fiscal stability that would make the Romanian economic environment predictable enough for Romanian and foreign investors.

Table 7 *The cases of links between taxation and accounting*

<i>Case</i>	<i>Description</i>
Cas I – Disconnection	The different tax and financial reporting rules (or different options) are followed for their different purposes*
Cas II – Identity	Identity between specific (or singular) tax and financial reporting rules.

⁵ As far as we know, the analytical framework designed by Lamb et al. [20] has not been applied to Romania yet. There are, however, two articles authored by Romanian scholars and that quote Lamb et al.: Fekete et al. and Cuzdriorean (2010).

⁶ Rossignol (1999) identifies, for France, the moment of the official creation of the link between accounting and taxation: World War I.

Cas III – Accounting leads	A financial reporting rule or option is followed for financial reporting purposes, and also for tax purposes. This is possible because of the absence of a sufficiently specific (or singular) tax rule**.
Cas III' – Accounting Leads (but with reverse effect)	Financial reporting rules contain options or allow interpretations, some of which lead to lower or to later profit than others do. This is a motivation for choosing these options so that they will then also be used for tax purposes, in the absence of a specific or singular tax rule.
Cas IV – Tax leads	A tax rule or option is followed for tax purposes, and also for financial reporting purposes. This is possible because of the absence of a sufficiently specific (or singular) financial reporting rule.
Cas V – Tax dominates	A tax rule or option is followed for tax and financial reporting purposes, instead of a conflicting financial reporting rule.
* Such disconnection will be recognized when distinct, independent and detailed tax and financial operational rules exist. Even if measurement outcomes are essentially the same, the particular arena may still be characterized as Case 1; the independence and completeness of the sets of rules “disconnect” tax and accounting in an operational sense.	
**This case may be either <i>de facto</i> identity or an instance where financial reporting is the “leader”. It may be difficult to distinguish between the two circumstances. However, both indicate a <i>prima facie</i> financial reporting influence on tax.	

Source: Nobes and Schwenke (2006) who adapt Lamb and al. (1998)

In their approach, Lamb and al. draw a list of 15 elements for which they aim to identify the differences between accounting and fiscal treatments, by comparing the situations in 4 countries: the United Kingdom, the United States, France and Germany. Suzuki (2005) analyses the same 15 elements for the case of Japan; Oliveras and Puig (2007) extend the analysis to Spain⁷ and they include financial assets, while Nobes and Schwenke (2006) include 17 items (for the case of Norway) by tackling, in addition, asset depreciations. The evolution of accounting norms fully justifies this passage from 15 to 17 items. Finally, Azmi (2008) - for Malaysia, - and Gavana and al. 2010 - for Italy – preserve this latest 17-item list.

It is noteworthy to mention that in fact, the elements that are preserved are more numerous: for certain authors, there are subdivisions that make the final number of items more important: in Lamb and al. (1998), the divided elements are amortization (divided into normal and excessive), the stock evaluation (flow assumption and in other situations), how interests are treated (capitalization and other options). All the authors quoted above observe this manner of detailing items. There is, however, an exception: Amzi (2008) identifies three significant elements in what concerns inventories evaluation: flow assumption, cost measurement and in other situations. As far as we are concerned, in order to have a better grasp of the situation in Romania, we shall add another item (the 18th): *other elements*, which comprise 4 items: advertising costs, installment sales, travel costs (transportation and accommodation) and exchange of assets. At the same time, we add further items: subsequent costs for property, plant and equipment; for leasing contracts, in addition to the classification of contracts, we

⁷ For the case of Spain, the elements considered by Lamb et al. are partially retaken, in a different context, by Gallego [13], who analyses the temporary and permanent differences in the case of quoted Spanish enterprises.

include how lease-back is treated; we divide the exchange differences into commercial and financial transactions; for financial assets, we distinguish long-term from short-term; we keep compulsory and optional social contributions to pension (see Table 10).

A BRIEF OVERVIEW OF THE EVOLUTION OF ACCOUNTING AND FISCAL RULES IN ROMANIA

There are several successive periods for the analysis of the evolution of accounting and fiscal rules in Romania. To describe the relation between accounting and taxation in a country like Romania means, first of all, to draw a comparison between the two sets of norms. The period before 1990 is not really eligible for our approach because at the time there was no market economy and the State had a strong hand over the economy, according to the centralist ideology that was characteristic of societies modeled after the soviet type...

During this pre-1990 period, we cannot establish a certain relation between accounting and taxation, in the sense of Lamb and al. (1998), mainly because the State owned almost all enterprises and all activities were, in principle, subjected to a centralized plan. Accounting and fiscal rules were thus very close, almost identical. The inertia of the centralized economic system can be felt well after the fall of Communism, even though developments in accounting and fiscal law went separate ways (see also King at al., 2001). The deadlines of the stages in the regulatory evolution of accounting and taxation are no longer the same. In Table 10, we combined the stages of the accounting and fiscal evolutions by preserving as milestones either the significant changes in accounting rules, or in fiscal rules.

Evolution of accounting regulation

Before 1990, Romania was strongly influenced by soviet accounting, with very few influences from the rest of the world. Calu (2005: 40] uses the word “hermetic” to describe the little openness towards the free world during this stage in the evolution of Romanian accounting. The accounting regulation was radically reformed after 1990, yet the implementation of this reform became effective only beginning with 1994. We could mark this date as a starting point in the identification of the stages of the evolution of Romanian accounting. However, we prefer to start from 1990, so as to mention a few features of accounting as it was practiced before 1990 and immediately after that date.

In Table 8, we provide the main models that influenced accounting norms in Romania. The European directives are in poll-position; nevertheless the impact of the IAS/IFRS and of Romanian accounting practices must not be neglected. Thus, several stages take shape in retracing the evolution of accounting norms applicable to entities in their individual accounts. The demarcation lines between intervals are given by the main successive Romanian legal acts that regulate accounting and that, generally, rule out the immediately preceding act. There are several previous works that retrace the evolution of Romanian accounting after 1990 and which served as inspiration or our

own research: Ionașcu (2003: 122], Calu (2005: 213-218), Ionașcu and al. (2007); Barbu and al. (2010), Albu and al. (2010).

Table 8 *Main stages in the evolution of Romanian accounting norms after 1990*

<i>Phase</i>	<i>Limits</i>	<i>Models</i>
1	1990-1993	Soviet origins
2	1994-1999	Fourth European Directive
3	2000-2005	IAS/IFRS for certain entities
3'	2003-2005	European Directives, for entities that escape IAS/IFRS.
4	2006-2009	Accounting standards in line with European Directives
5	2010-	Accounting standards in line with European Directives

Evolution of the Romanian income tax regulation

After 1990, the evolution of fiscal norms concerning profit taxation was very fast: changes succeeded each other at a pace that poses many problems to tax-payers and especially to accounting professionals. In order to identify the phases in the evolution of the regulation of profit taxation (Table 9), the main criteria that we used were the range of differences between the accounting income and the fiscal income, and the moments of important changes in these differences, which were imposed by laws or equivalent acts.

Table 9 *Main stages in the evolution of Romanian fiscal norms after 1990*

<i>Phase</i>	<i>Limits</i>	<i>Main feature of the book-tax relationship</i>
1	1990	No difference.
2	1991-1994	Tax rules appear and try timidly to separate themselves from the accounting rules
3	1994-1996	Attempt to completely separate tax and accounting rules for some entities; more distinct tax rules for the others.
4	1997-2003	Returning to only one category of entities, with timid steps towards book-tax disconnection.
5	2004-2007	One class of taxpayers, more distinct tax rules: a Tax Code created for the EU membership of Romania, more differences between tax and accounting rules.
6	2008-	Continuation of the previous stage, with significant changes in both tax and accounting rules

A few words on the situation before 1990: there was no profit tax – or at least it was not called so. Practically all enterprises belonged to the State. Consequently, the same authority simultaneously played the role of owner (investor) and tax collector. Under the circumstances, the State was entitled to a part of the profits made by enterprises (also called *State economic units*); this amount was not labeled tax but *payments of benefits to the State budget*. There was no proper tax rate: one had to give the State whatever was left after distributing the planned benefits to the other destinations. By contrast, the benefits that were higher than the planned values were taxed by 35%. The strictly centralized and controlled character of the Romanian economy at the time contributed to a situation of almost total identity between the

accounting norms and fiscal norms, even though the definitions of charges and products were far from their current acceptations.

The first stage that we consider in our analysis (the year 1990) is characterized by the continuation of previous rules, with certain attempts to update them. There are no differences between the accounting income and the fiscal income: the new fiscal rule mentions only that the taxable benefit represents the difference between the products of the total activity and the corresponding charges, minus the elements deducted directly from the incomes. Thus, the fiscal norm is aligned to the accounting norm which did not undergo significant changes in comparison with the period before 1990. This period lasts for only one year; yet, we take it into account precisely because it is the very faithful continuation of the previous situation.

In 1991 (the beginning of the second phase), a special law established slightly more precise rules for profit taxation. From a fiscal point of view, the accounting rules are always followed, except when considering the fees for representation, reception, sponsoring and the constitution of certain reserves, limited by the yearly law of the State budget. In this stage there emerge the first differences between the accounting and the fiscal treatment of certain elements. For the first time, the fiscal law makes reference to fiscal loss: it will be deductible from the profits of the following fiscal year. This phase goes until 1994, which means that it extends over two periods of the evolution of accounting: 1994 marks the transition from monist accounting to the dualist system, with charges classified according to their nature.

The third period (from 1995 to 1996) has as a starting point a more comprehensive law, that was better adjusted to profit taxation. This new law introduces significant differences between the accounting and the fiscal income. In fact, the strong inflation that hit the country at the time⁸ led the fiscal authority to try to bring accounting data up to date by considering inflation, so as to establish profit taxation. A fiscal separation was introduced between the *big contributors* and other contributors.

For the former category, accounting is always in historical costs, while the fiscal income is obtained after adjusting the accounting data to inflation. This creates an almost total separation between the two incomes – the first case, in the classification by Lamb and al. This is why we preserve this category of contributors in the analyses that follow. For the *small contributors*, the starting point in calculating the fiscal taxable benefit is the accounting income, with certain adjustments that, in theory, should be quite important: the maintenance costs for fixed assets, the fees for representation, reception, sponsoring and the constitution of certain reserves, interests and differences of charges for bank credits, representation, reception, and the constitution de reserves costs, interests and differences of changes on bank credits.

⁸ The data published by the Romanian authority (INS – National Institute for Statistics), available at <http://www.insse.ro/cms/rw/pages/ipc.ro.do> (we accessed it on the 15th of November 2010) are revelatory for the Romanian hyperinflation of the 1990s. The inflation rates are 170,2% in 1991 ; 210,4% in 1992 ; 256,1% in 1993 ; 136,7 in 1994 ; 32,3% in 1995 ; 38,8% in 1996 ; 154,8% in 1997... It was only in 2005 that inflation rate fell to a one-digit figure (9%, in comparison with 11,9% in the previous year).

Starting with 1997 (the beginning of the fourth stage), there is a return to a single category of taxable persons, with differences between accounting rules and fiscal norms. The gaps between the two norms consist especially in fiscal limits for certain charges. In addition, the yearly budget, in its turn, can introduce certain limitations. With respect to the amortization of certain fixed assets (the ones corresponding to direct investments), beginning with 1998, a fiscal facility is introduced: the possibility either to use an accelerated amortization without restriction, or to deduct 20% off the entry value during the month where the equipment began to operate. It is only the latter that can generate a difference between accounting and taxation, given that the accelerated amortization is accepted in accounting without any problem.

1998 brings a new possible source of differences between accounting and taxation: installment sales (this situation will remain valid until 2005). At the same time, publicity fees become totally recognized from a fiscal point of view. In this stage, fiscal rules are often modified and they become increasingly detailed. For instance, beginning with 1999, the exchange gains/losses relative to the owned foreign currencies is no longer accepted by the fiscal authorities. For certain types of investment (fixed and even liquid assets), the accounting amortization begins to no longer correspond to the fiscal amortization, due to certain temporary fiscal facilities. There is also a limit to the amortization of cars (which was applied for about a year). In 2002, the fiscal limitation of exchange differences disappeared. The interest regime is very variable: there is a transition from a limitation of fiscal deductibility towards a total recognition, and then a return to partial limitation. The situation is rather complicated, given that either all credits are treated in the same way, or they have to be separated depending on their provenance (the creditor is explicitly authorized or not to grant credits). The maintenance fees for fixed assets will not be limited from a fiscal point of view beginning with 2002.

The fifth period (2004-2007) sees the emergence of a taxation code (fiscal code) that brings together several taxes, out of which the most important are the taxes on profit and the value added tax. The rules concerning taxes on profit are quite similar to those they just replaced. There are certain further restrictions on the fiscal recognition of certain charges: the existence of contracts, the need to justify their need, the existence of positive accounting incomes, the total change of the fiscal status of sponsoring costs (which changes nothing in their place in the picture of the accounting – taxation relation), total disconnection (in theory) of the accounting and fiscal amortization, research and development costs become entirely deductible, the explicit introduction of a limitation of the entity's contribution to supplementary (optional) pension regimes for the employees. An important innovation of the tax code has to do with the tax status of fixed asset revaluations: they are no longer fiscally recognized. It is during this period (in 2005) that the fiscal authority gives up the taxation of products sold by installment as their price is being cashed in, which signifies a sort of return towards the identity of the accounting and fiscal treatments.

The sixth stage (which starts in 2008) is mainly characterized by adjustments of fiscal regulation, out of which the most interesting for our study are: the return to a total recognition of travel costs (their tax deductibility is no longer conditioned by the existence of accounting profit); car-related costs become non-deductible (from the 1st of May 2009 to the 31st of December 2011); the revaluation of fix assets becomes fiscally recognized.

DESCRIPTION OF ELEMENTS CONSIDERED IN THE EVALUATION OF THE ACCOUNTING – TAXATION RELATION

We consider the 18 elements featured in Table 10 to be significant in the evaluation of the relationship between accounting and taxation in Romania.

1. For the initial evaluation of **fixed assets**, the accounting rule is, in general, followed by taxation. Case II (identity) is the most frequent one. During the second period (1995-1996), big contributors apply fiscal rules that make adjustment to the inflation rate compulsory: the entry values of assets were the same as in accounting, except that they were adjusted, which allows us to say that this is case I (disconnection). Since 2006, Romanian companies must include in the asset entry value the costs related to dismantling obligations; these costs are not fiscally accepted, which explains why during the last two periods we can identify case II (identity), and sometimes case I (disconnection, when there are estimated dismantlement costs).

The revaluation followed the same rules until 2003 (except for the big contributors in 1995-1996), for fixed assets (the other assets cannot be re-evaluated, neither in accounting, nor taxation) – case II, identity. Beginning with 2004, Romanian entities can re-evaluate in accounting, but these new reevaluations are not recognized in calculating taxable income (case I - disconnection). 2008 marks the return to the fiscal recognition of revaluations - case II (identity). The asset-maintenance costs do not appear in previous studies of the relation between accounting and taxation, undoubtedly due to their lack of signification. We have chosen to keep this item because the Romanian law grants it, during certain periods, a special status. Thus, from 1995 to 2003, the fiscal deduction of this type of charge is limited. In addition, from the 1st of May 2009 to the 31st of December 2011, certain charges for car use and maintenance are no longer deductible.

2. The depreciation (other than amortization) of fixed assets is not accepted by fiscal norms – case I, disconnection. For the period 1991-1994, there was no explicit fiscal rule for this type de charge, whereas the accounting norm mentioned it – case III. In fact, it is unlikely that Romanian enterprises registered, at the time, reversible depreciations, which did not exist in the accounting of Soviet extraction... Beginning with 2003, the fiscal rule explicitly forbids the deduction of asset value loss – this is still case I.

3. Until 1997, there was no specific accounting or fiscal rule for leasing contracts. Their accounting registration was made by applying general rules for simple locations. Therefore, we can suppose the existence of an identity relationship between the two sets of norms, but we do not preserve anything from them in Table 10, due precisely to the absence of explicit reference in the norms. Beginning with 1997, a specific law regulates leasing - accounting and taxation observe this new law, therefore this is a case of identity (case II). Until 1999, all contracts are treated as operating lease, whereas after 1999, a change separates financial leasing from operational leasing; this separation is equally valid in accounting and in taxation : case II is preserved.

By comparison with previous studies that inspired us, we have introduced an extra item: the accounting/fiscal treatment of lease-back contracts (cession bail). Beginning with 2009, the enforcement of the principle of preeminence of the economic reality over legal appearance causes the accounting of this type of contract, materialized in financial leasing, to be done in a way that goes far from the fiscal treatment – we thus come to case I, disconnection.

4. Before 1990, the amortization of assets was strictly regulated at all levels: amortizable value, length of life, amortization method. This situation goes beyond 1990, which makes case II – identity – to be the most frequent until 2003. Beginning with 2004, the fiscal law explicitly mentions that fiscal amortization is independent of accounting amortization. This leads us directly to case I – disconnection. In reality, we can suppose that many enterprises avoid two series of distinct calculations (accounting and fiscal), by trying to preserve in accounting the fiscal elements of amortization, so that quite often, accounting amortization equals fiscal amortization. Accelerated amortization is allowed since 1994, in accounting as well as in taxation, but only for certain categories of assets. There is a long period of identity between the two sets of norms. It is only beginning with 2010 that accounting rules acknowledge that accelerated amortization is less used in accounting; we thus pass to case III', and even case I.
5. Before 1994, there was no accounting or fiscal norm to regulate provisions. It was only in 1994 that accounting regulations introduced provisions, without any fiscal influence: case I – disconnection. In 1995 the Government issued a decree that allows the fiscal acknowledgement of certain provisions, under certain circumstances: case I is preserved, even though we can suppose that the enterprises (especially those that are not quoted) build only provisions that are fiscally recognized, which leads us to case V, tax dominates.
6. Fiscal rules make no reference to subsidies - the fiscal treatment follows the accounting treatment: case III –accounting leads. This means that subsidies become taxable products either immediately (exploitation subsidies), or during the amortization period of the asset that was thus financed.

7. The fiscal law introduces an explicit law on research and development costs beginning with 2004. Before this date, the accounting norm prevails: case III; after this date, case II – identity – dominates.
8. The evaluation of stocks falls, during the first four periods, under case III – accounting leads. There was no explicit fiscal rule for this item, which caused accounting methods to impose themselves in taxation (except for the big contributors, in 1995-1996). Beginning with 2004, the fiscal law explicitly admits accounting methods in cost evaluation. We can identify the same evolution for the flow assumption, except that explicit fiscal acknowledgment begins during the period 1997-2003. Stocks depreciation has the same evolution as asset depreciation.
9. There is no direct fiscal rule for long-term contracts. This is case III – accounting leads. In the fiscal law (after 1995) there is however a reference to warrantee provisions given to clients in building contracts. These provisions are deductible, on condition to have registered the products. This leads us to infer that case III becomes case III': accounting leads, but with a reverse effect.
10. The capitalization of interest is allowed by the accounting rule beginning with 1994, while the fiscal norm makes no reference to it: this is case III. Subsequently, the accounting norm preserves this possibility and, at a given moment, the fiscal norm follows, by mentioning, implicitly, the same thing: this is the passage to case II.

The evolution of the fiscal system of interest charges in other situations except capitalization is much more complicated. Thus, we pass from case III, which was valid until 1994, to case I – disconnection. 1995 limits fiscal deducibility of all interest charges, which remained valid until 1999. In 2000, fiscal norms introduce a distinction between credits from an authorized institution (banks or other institutions) and credits from other persons (especially associates and other connected parties). The interest charges related to the first category of credits are deductible without any limit (except during the period 2002-2004), while interests on other credits are limited from a fiscal point of view. Thus, beginning with 2005, the limitation concerns only interests of the second type of credits.

11. In individual Romanian accounting there had not been any specific norm before 2005 that would cover financial assets differently from other assets. It was only in 2006 that the option (and not the obligation) to separate financial assets and apply alternative evaluation rules to them was introduced, such as the use of the real value for certain categories. Within the category of financial assets, the fiscal norm distinguished, beginning with 2000, between long term financial assets and other financial assets. For the first category, the fiscal rule starts to distance itself from the accounting norm on certain aspects concerning subsequent evaluation: this becomes case I – separation. The other financial assets remain in case III – accounting leads; there is nothing precise in the fiscal norm.
12. We have chosen to separate exchange differences into two categories: those that are relevant for commercial transactions (sale and purchase in foreign currency) and those that are relevant for financing operations (credits in foreign currencies). For the

former, we start with case III, we go through a period of fiscal limitation (case I) and we finally return to case II. The exchange differences on financing operations have the same evolution until 2000, when the fiscal norm introduces a limitation identical to the one concerning interests: total deductibility is acquired for exchange losses on bank and assimilated credits, while for credits from other sources, there is a limitation. We can suppose that resorting to banking and assimilated financing largely overshadows the recourse to other credits, which allows us to consider that in practice, case II is the most frequent.

13. The amortization or the other depreciation of the commercial fund (either resulting from consolidation or not) is not fiscally acknowledged in any of the studied periods: case I - disconnection.
14. For a long time, the retirement system in Romania has been exclusively public: contributions are compulsory and they are collected by a public body – the corresponding costs are deductible, which leads us to case II – identity. By contrast, contributions to optional retirement schemes are limited, from a fiscal point of view – case I (sometimes III')
15. Beginning with 1994 mention is made to a change in the accounting method: it is possible, but with the support of the fiscal authority: case V – taxation prevails. The situation changes a little after 2000, when Romanian accounting became more seriously connected to European directives ; the accounting principle of consistency of methods is applied, without there being a fiscal rule to impose a certain approval from the fiscal authorities. The only aspect where the fiscal norm is applied concerns stocks evaluation: the change of method is explicitly allowed, on condition that it take place when passing from one fiscal year to the next, which is not at all different from the accounting norm.
16. Pre-1990 Romanian accounting did not explicitly mention any consolidation process, in the Western meaning of the term. In fact, the organization of Romanian enterprises at the time was extremely centralized, on several levels, and it involved the compulsory transmission of accounting data to the higher level that was centralizing them. This centralization slightly resembled a sort of consolidation... Since 1990, the initial Romanian accounting norm did not include any rule on account consolidation. It was only in 2000 that the norm was completed with consolidation duties. In any case, account consolidation has no fiscal consequences: case I – disconnection.
17. The fines, costs for representation, reception and sponsoring are fiscally acknowledged within the limits that allow us to identify case I – disconnection. In practice, it often happens that staff in charge with enterprises limits their real costs to fiscal levels.
18. The fiscal acknowledgment of publicity costs was limited during the period 1990-1997: case I. Since this date, there is no more fiscal limitation concerning publicity: case II - identity. The presence of installment sales in our study is justified by their changing fiscal status during the period chosen. Until 1998, the accounting and fiscal system coincide. From 1998 to 2005, the revenues and costs related to certain

installment sales were fiscally acknowledged, not when the sale occurred but when the product was paid for. This could lead us to the identification of case I – disconnection. In fact, it was rather case V because a large majority of accountings keep records in a fiscal way, by ignoring accounting rules. A particular feature of Romanian fiscal regulation is fiscal limitation of travel costs until 2007: case I – disconnection. It is only beginning with 2008 that these costs become completely deductible. Asset changes are not regulated in the Romanian accounting legislation until 2010. Thus, the accounting registration of this type of transactions is made by following fiscal norms: case IV – taxation leads. Beginning with 2010, the accounting norm is explicitly aligned to the fiscal norm, which leads us to case II – identity.

Table 10 *Measure of the relation between accounting and taxation in Romania*

<i>Topic</i>	<i>1991-1994</i>	<i>1995-1996</i>	<i>1997-2003</i>	<i>2004-2007</i>	<i>2008-2009</i>	<i>2010</i>
1. Fixed assets recognition and valuation	II	III	III	II	II, sometimes	II, sometimes
a) cost	II	II	II	I	I	I
b) revaluation	II	I	I	II	II	II
c) subsequent costs					II and I	I and II
2. Impairment of tangible assets	III	I	I	I	I	I
3. Leases :	-	-	II	II	II	II
a) lease classification					III and I	I
b) (lease-back)	-	-	III	III		
4. Depreciation						
(a) normal	II	II	II	I	I	I
(b) excess tax depreciation	-	II	II	II	II	III', I
5. Provisions	-	I, sometimes V	I, sometimes V	I, sometimes V	I, sometimes V	I, sometimes V
6. Grants and subsidies	III	III	III	III	III	III
7. Research and development costs	III	III	III	II	II	II
8. Inventory valuation	III	III	III	II	II	II
(a) cost measurement	III	III	II	II	II	II
(b) flow assumption						
(c) other areas (e.g. impairment)	III	I	I	I	I	I
9. Long-term contracts	III	III'	III'	III'	III'	III'
10. Interest						
(a) capitalization	-	III	II	II	II	II
(b) others						
- bank loans and similar	III	I	II and I	I and II	II	II
- other credits	III	I	I	I	I	I

<i>Topic</i>	<i>1991-1994</i>	<i>1995-1996</i>	<i>1997-2003</i>	<i>2004-2007</i>	<i>2008-2009</i>	<i>2010</i>
11. Financial assets :	III	III	III, then I	I	I	I
- long term financial assets;	III	III	III	III	III	III
- short term financial assets						
12. Foreign currency (a) operating activities	III	I	I, then II	II	II	II
(b) financing activities	III	I	II (and I)	II (and I)	(II and I)	(II and I)
13. Goodwill (non-consolidation)	-	I	I	I	I	I
14. Pensions (a) mandatory contributions	II	II	II	II	II	II
(b) voluntary contributions	-	-	-	I	I	I
15. Policy changes and fundamental errors	-	V	V	III and V	III and V	III and V
16. Scope of the group	-	-	I	I	I	I
17. Fines, charitable donations, entertaining expenses	III	I	I	I	I	I
18. Others	I	I	II	II	II	II
a) advertising costs	II	II	I or V	I and II	II	II
b) installment sales	I	I	I	I	II	II
c) travel costs						
d) goods exchanged	-	IV	IV	IV	IV	II

DATA INTERPRETATION AND A SMALL STEP TOWARDS INTERNATIONAL COMPARABILITY

Nobes and Scwencke (2006) suggest a development of Lamb and al.'s approach (1998), by proposing two indices that measure the degree of the influence of taxation on accounting. They started by establishing that case II and case III describe identical accounting and fiscal practices. Thus, in order to draw comparisons on the influence of accounting on taxation, we have to focus on case I (independence) III', VI and V. The suggested index can have two measures: the minimum (case IV/V minus case I) and the maximum (case III'/IV/V minus case I). Nobes and Scwencke (2006) use these indices to place Norway in an international context, by comparing the situation of this country (four periods) with the results of studies by Lamb and al. (1998). Our ambitions are clearly more limited: in Table 11, we compared different periods in Romania, so as to grasp the evolution of the link between accounting and taxation.

The minimum and maximum indices calculated above allow us to say that in Romania, the relation between accounting and taxation, at the level of taxation on

profit, is characterized by a quite important disconnection, at least as far as written accounting and fiscal rules are concerned. This confirms the ideas put forth by Petre and Lazăr (2006).

Table 11 *Longitudinal comparison of the relation between accounting and taxation in Romania*

<i>Topic</i>	<i>1991-1994</i>	<i>1995-1996</i>	<i>1997-2003</i>	<i>2004-2007</i>	<i>2008-2009</i>	<i>2010</i>
Cas I – Disconnection	2,0	11,5	11,0	13,0	11,5	12,5
Cas II – Identity	6,0	5	9,5	12,5	14,5	14,5
Cas III – Accounting leads	14,0	8	6,5	3,5	3,0	2,5
Cas III' – Accounting leads (but with reverse effect)	0,0	1	1,0	1	1,0	1,5
Cas IV – Tax leads	0,0	1	1,0	1	1,0	0,0
Cas V – Tax dominates	0,0	1,5	2,0	1	1,0	1,0
N/A	10,0	4,0	1,0	0,0	0,0	0,0
<i>Total</i>	<i>32,0</i>	<i>32,0</i>	<i>32,0</i>	<i>32,0</i>	<i>32,0</i>	<i>32,0</i>
Minimum index (Case IV/V – Case I)	-2,0	-9,0	-8,0	-11,0	-9,5	-11,5
Maximum index (Case III'/IV/V – Case I)	-2,0	-8,0	-7	-10,0	-8,5	-10

CONCLUSIONS, CONTRIBUTIONS AND LIMITATIONS

In order to evaluate the link between accounting and taxation in Romania, we have applied the framework of analysis proposed by Lamb and al. (1998) and developed by Nobes and Schwenke (2006). The six cases suggested by these authors go from identity between the two categories of rules to total separation, by passing through various intermediary cases of influence either of accounting on taxation, or of taxation on accounting. For the situation of Romania, previous studies (King and al., 2001 ; Petre and Lazăr, 2006, Fekete and al., 2009) suggest a certain *de jure* disconnection against a certain *de facto* connection. For the period between 1994 and 2010, our results confirmed the *de jure* disconnection : the indices suggested by Nobes and Scwencke (2006) are generally negative, which means that case I – disconnection – is more frequent than the case where taxation has more influence (III', IV and V). This acknowledgement of the *de jure* disconnection does not necessarily correspond to the reality of accounting practices, especially at the level of SMEs. Accounting practitioners perceive accounting and taxation as very linked.

The period for the analysis of the relation between accounting and taxation in Romania is very short, due to the political and social evolution of the country. The comparison with the results of previous studies is difficult, given the level of economic development of the countries in question and, especially, the historical, political, economical factors etc. that have contributed to the creation and development of accountings and fiscal systems of these countries. It would be very interesting to draw a comparison between Romania and the other countries of the ex-Soviet block. The similarities between these countries are more striking than their differences in what concerns the period of analysis, the starting point and subsequent evolutions of accounting and taxation. For the moment, we lack the data to carry out this project...

Nobes (2004) suggests a framework for the analysis of the tax pollution of accounting, by establishing a sort of note for the 16 elements retaken up by Lamb and al. (1998). Thus, we can speak about fiscal pollution when the fiscal norm is completely or almost completely observed in accounting. It would be interesting to apply this new analysis grid to the case of Romania.

Our study tackles only accounting and fiscal norms: we have extracted the main written rules. At the level of accounting and fiscal practices, it is possible to find a different concrete situation, especially at the level of SMEs and non-quoted enterprises. Without an empirical confirmation, we can suppose that a large majority of these entities steer accounting towards a close connection with taxation, so as to avoid especially two series of different calculations: accounting and fiscal⁹. It would seem that it is easier (and especially less expensive) to keep a single register used both for accounting and fiscal purposes. It is in the evaluation of the practical relation between accounting and taxation that new research can be conducted.

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ANALYSIS OF THE TIMELINESS OF FINANCIAL STATEMENTS SUBMITTED BY COMPANIES OF THE SPANISH CONTINUOUS MARKET

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Abstract: *This study examines the timeliness of the financial information of the companies that form part of the Spanish continuous market and the factors that influence this. The sample comprises 105 companies that formed part of the Spanish continuous market at the end of 2004, and the period of study runs from the first half-year of 2002 to the second half-year of 2008, considering only the half-yearly and annual information. The results obtained with the panel data model demonstrate that the company size and the pressure exerted on particular sectors, have a direct effect on the timeliness of the financial information, and a smaller number of days for the information submission is observed. However, the variable audit report seems to be the main cause of delay.*

Keywords: *financial information, timeliness, panel data.*

JEL Codes: *G1, G2*

1. INTRODUCTION

The term "timeliness" refers to a quality of (1) being available at a suitable time, or (2) being well-timed (Gregory and Van Horn, 1963: 576). For information to be relevant for an investor, it must be timely: information that is delayed, out-of-date, or has been superseded, has no value in this context (Benston, 1969: 520).

The first recognition of the importance of promptness was in 1955 by the American Accounting Association (AAA). It was observed that promptness in reporting is an essential element for adequate dissemination (AAA, 1955). Many researchers and professional bodies followed the AAA in recognising the role of promptness in the theory of corporate financial reporting (e.g. Accounting Principles Board, 1970; Curtis, 1976; Givoly and Palmon, 1982; Carslaw and Kaplan, 1991). Further, the *Accounting Principles Board* of the AICPA (American Institute of

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Certified Public Accountants), 1970: 10) considered promptness to be one of the characteristics necessary for financial information to be useful.

The *Accounting Principles Board* argued (AICPA, 1970: 37-38) that timely financial information must be communicated as early as possible, in anticipation of being used by decision-makers, to avoid unnecessary delays in decision-making. It is in the public interest that financial information should be as objective, as true and as timely as possible (Bows and Wyatt, 1973: 552).

If this information is not available promptly, investors may be encouraged to investigate alternative sources of information. Delayed dissemination may give opportunities to unscrupulous investors to acquire preliminary information privately, at some significant cost, and then exploit this private information for their own benefit, and in prejudice of other "less informed" investors (Bamber *et al.*, 1993: 1), although the value judgments implied in this analysis can be debated

However, information that is published too soon, but without being relevant, is no better than erroneous information, since both can cause the consequent investment decisions taken to lack foundation. Promptness must be reconciled with relevance (Burton, 1972: 28).

Relevance is one of the qualitative characteristics that financial information must have. The *International Accounting Standards Board (IASB, 1989)* states that "*information possesses the quality of relevance when it exerts influence on the economic decisions of those who use it, and helps them to evaluate past, present and future events, or else to confirm or correct evaluations previously made*". Relevance in relation to the needs of users has two dimensions - prediction and confirmation (AECA, 1999).

It is also necessary to reconcile timeliness with reliability. "*Reliability refers to the capacity of a piece of information to express with the maximum rigour the basic characteristics and conditions of the facts reflected; together with its relevance, this quality seeks to ensure the usefulness of financial information*" (AECA, 1999). Information is reliable when it is free from material error and bias (IASB, 1989). In this context, one of the principal reasons for the later publication of the annual accounts of public companies is the accepted need for these accounts to be audited before being published. Thus, the interval of time in the publication of financial reports and the time-lag due to auditing are intertwined variables and are used interchangeably in the literature on financial reporting. As a result, in many cases timeliness has been studied together with delays in auditing actually experienced (Hossain and Taylor, 1998).

Thus timeliness can be considered one of the restrictions on the relevance and reliability of information. Delay in the supply of financial information causes the total or partial loss of relevance. Sometimes, however, in order to supply the information on time, it must be presented before all the aspects of particular transactions or other events are known, and this can reduce its reliability. It is necessary to find a suitable balance between relevance and reliability from the disclosure of timely information (IASB, 1989; AECA, 1999).

Timeliness or promptness is related to: (1) the period of time that elapses from the end of the accounting period reported until the date when the users receive the financial statements or accounts; and (2) the efforts made by the directors to shorten this period (Garsombke, 1981: 207). Hence, in this study, timeliness is related to the period of submission - that is, to the time elapsed between the close of the period and the date of publication of the financial information on the website of the CNMV.

In this study, the aim is to identify the factors that can influence the degree of punctuality of companies when submitting information; the context of the study is one that has not been studied previously, Spain. In our country, telematic means are typically employed for the submission of financial information to the CNMV. The utilisation of this method of submission facilitates the availability of the information and users' access to it; therefore it has been possible to study not only the timeliness of the annual information but also that of the half-yearly reporting.

With respect to the explanatory factors that influence timeliness, in the previous literature researchers have reached several important conclusions. The intention in this study is to verify whether the scope of these conclusions is applicable to the case of Spain, and whether any differentiating element can be identified in this new scenario that may represent a contribution of interest for the literature.

To this end, variables have been included in this study whose significance¹ has been tested in a number of previous studies (size, sector and disclosure of bad news.²). In addition, since it was observed during the compilation of the data necessary for testing the above-mentioned hypotheses that the periods of half-yearly submission were systematically fewer than the annual periods³, the need was appreciated of utilising in the model a control variable capable of reflecting this anomaly.

In summary, the object of the study is to verify the validity of the classic hypotheses in the context of the telematic submission used in Spain. It is also the first study of this type to be undertaken in our country.

The structure of this paper is as follows. Part 2 describes the process for the submission of company financial information in Spain, with comments on the case of certain other countries. In Part 3 is a review of prior research on timeliness and audit delay; and Part 4 presents the hypotheses that are tested in the present study. Part 5 presents the methodology and the variables utilized; in Part 6 the results, including descriptive statistics and pool regressions for the sample, are presented; and in Part 7, the conclusions.

¹ See Figure 1.

² There are previous studies in which the significance of the variable "disclosure of bad news" has not been demonstrated.

³ See Figure 2.

2. THE PROCESS OF SUBMISSION OF THE FINANCIAL INFORMATION TO THE CNMV

The regulatory authorities of several countries have developed Internet-accessible public file repositories which users can access to obtain the financial information that listed companies are obliged to provide. An electronic file repository can be defined as any system that provides a mechanism for users to download files for later use (Prichard and Rohaani, 2004).

The common feature of these systems is that companies use a telematic procedure to send the regulatory authorities their financial information; on acceptance, the authority includes this information on its website so that any user may access it. The principal objective of the regulatory authorities in establishing Internet-accessible public file repositories is to increase the transparency and accessibility of the financial markets, and to improve the utility, relevance, reliability, reasonability and promptness of financial and economic information.

Two representative examples of accessible public file repositories are the EDGAR and SEDAR systems in the USA and Canada, respectively. In 1993, the US SEC (Securities and Exchange Commission) adopted the EDGAR (Electronic Data Gathering and Reporting) system, and in 1997 the CSA (Canadian Securities Administrators) in Canada implemented the SEDAR (System for Electronic Document Analysis and Retrieval) system.

Both systems for the telematic submission of information allow company financial reports and accounts to be compiled electronically, thus accelerating the reception, acceptance and dissemination of this information. Thus the user can access the information more easily. The significant point to make here is that the use of telematic means for the disclosure of financial information could modify the factors that explain the observed timeliness of this information.

In Spain, the procedure for telematic submission of accounts to the CNMV commenced in the year 1998. In that year, the Agreement was signed approving the utilisation of the CIFRADOC/CNMV system of electronic signature. Before the emergence of the CIFRADOC system, the financial information was presented on forms prepared by the CNMV, as stipulated in the Order of the Ministry of Economy and Treasury of 1991. Subsequently, through the issue of a Circular in 1994, the CNMV introduced the possibility of presenting this information in electronic format, on a voluntary basis, by those entities who wished to do so. The problem with both these earlier forms of presenting the information was that the information reported was not included in the database of the CNMV; hence it was neither accessible nor immediately available for the interested parties. The introduction of the telematic submission system eliminated this problem.

Thus, in the year 1998, the establishment of the system was agreed, although at first it was only utilised for the exchange of information, of financial and non-financial character, between the CNMV and supervised, administered and public companies in general. It was in the year 2002, and as a result of the Circular 2/2002, of 27

November, when the utilisation of the CIFRADO/CNMV system was established as the only accepted means for submission of the periodic public information regulated by the previously cited Order. The entry into force of the Circular on 1 July 2003 represented the adoption of the telematic means for the presentation of information to the regulatory body, the CNMV, by all the entities that issue securities admitted for dealing on securities exchanges. The utilisation of this system requires the user to register, followed by the exchange of keys for the coding and decoding of the documents, and it is the CNMV that provides the computer software necessary for the transmission.

Further, in order to guarantee that the submission is made correctly, the system is based on a series of principles that are presented below:

- **Authenticity:** the system identifies the sender and the receiver of the documentation, and the dates and times of emission and reception.
- **Confirmation of receipt:** this prevents the rejection of the documentation sent, and ensures that the sender can prove, if necessary, that it has been received.
- **Confidentiality:** no party other than the sender and receiver can access the document.
- **Integrity:** there is an assurance that any modification of the content of the documents during the transmission will be detected by the receiver.
- **Conservation:** the documents sent will be stored on file in the CNMV, preventing any loss or interference.
- **Availability:** there is an assurance that the document will be accessible to the authorised users who have some interest in it.

The submission and filing of accounting information by the companies quoted on the CNMV is carried out in accordance with the terms established by the *Order of the Ministerio de Economía y Hacienda of 18 January 1991*. This Ministerial Order stipulates the content and the terms of the quarterly and half-yearly reports that must be made public by all entities issuing securities admitted to dealing in official secondary markets.

The half-yearly information should refer to the period running from the start of the accounting period to the last day of each natural six month period, and is required to be submitted not later than the 1st of March and the 1st of September of each year, or in the event of either of these days not being a working day, on the immediately following working day. Thus, the information of the second half-year is the annual information, since it covers the period from the beginning of the accounting period up to the completion of the second half-year, which coincides with the end of the accounting year. In turn, the quarterly information refers to the period running from the start of the accounting period and the last day of the first and third natural three month periods, and must be submitted not later than the 16th of May and the 16th of November of each year, or if either day is not a working day, then on the immediately following working day.

The difference in the terms is due to the contents, which include the quarterly and half-yearly information. The CNMV establishes the information of quarterly and half-yearly character that companies should present at the end of each period. The quarterly information is simply a summary of the profit and loss account (net amount of turnover, pre-tax profits, profit for the period from continuing activities, profit for the period, profit for the period attributable to the main operating company, issued capital, ...); while the half-yearly information consists of the individual and consolidated accounts, in addition to other significant data such as the distribution by activity of the net turnover; the issues, repayments or cancellations of loans; operations with associated parties, etc.; this latter information is more complete and detailed.

Non-compliance with this duty to file information stipulated in the Order gives rise to the imposition of sanctions. In those cases in which the failure to file the information referred to in the Order or a general non-compliance with the provisions of the Order may adversely affect the normal course of operations in respect of a particular security, the CNMV will be entitled to seek agreement to suspend dealings in that security.

Subsequently, in 2007, the Royal Decree 1362/2007, of 19 October, was enacted. This develops the Law 24/1988, of 28 July, of the Securities Market, in relation to the requirements of transparency in respect of the information on the issuers whose securities are admitted for dealing on an official secondary market or on some other regulated market of the European Union. This Royal Decree stipulates that the term for publishing and disseminating the annual financial report will be a maximum of four months from the end of the financial year, and a company will not be able to delay publication beyond the date on which the AGM of shareholders is convened. With respect to the half-yearly accounts, relating to the first six months of the financial year, the term for publishing and disseminating this information will be a maximum of two months from the end of the half-year.

As a novelty it is stated that the issuers with shares admitted for dealing on an official secondary market or on another regulated market domiciled in the European Union will make public and disseminated a second half-yearly financial report relating to the twelve months of the financial year. However, this will not be obligatory when the annual financial report has been published in the two months following the end of the accounting period.

In this study, the dispositions referring to the annual financial report enter into force for those annual accounts whose accounting period commences on 1 January 2007 and later. Those relating to half-yearly financial reports enter into force for the periods that commence on 1 January 2008 and later.

3. BACKGROUND

There is an extensive and varied literature on the “timeliness” of obligatory financial information; and the main objective of all these studies is to identify the

factors that cause or explain the delays observed in the supply of this information. In some of the studies, which are cited below, delays in the auditing of accounts are analysed because this factor can affect the timeliness in the disclosure of company accounting information [Ashton, Willingham and Elliott, 1987: 275].

In later studies it has been demonstrated empirically that the time devoted to the procedures of auditing is the factor that has most influence on the timeliness of the financial statements [Owusu-Ansah, 2000]. Leventis, Weetman and Caramanis [2005: 45] state that the timely publication of corporate financial information depends on the time taken by the auditor to carry out the auditing.

Table 12 lists all the variables that have been found significant in a selection of previous studies on timeliness and delay in auditing. Also shown is the sign which specifies the existence of a positive or negative relationship.

Table 12 *Significant variables in previous studies on timeliness and delay in the auditing*

Variable	Author/s
(-) Company size	Dyer and McHugh [1975], Givoly and Palmon [1982], Ashton et al. [1989], Carslaw and Kaplan [1991], Ng and Tai [1994], Abdulla [1996], Owusu-Ansah [2000]
(+) Month when the accounting period closes	Dyer and McHugh [1975], Ng and Tai [1994], Owusu-Ansah [2000]
(-) Month when the accounting period closes	Ahmad and Kamarudin [2003]
(-) Profitability ⁴	Courtis [1976], Abdulla [1996], Owusu-Ansah [2000]
(-) Age of the company	Courtis [1976], Owusu-Ansah [2000]
(-) N° of pages of the annual report	Courtis [1976]
(-) Quality of the internal controls	Ashton et al. [1987]
(-) Complexity of the operations	Ashton et al. [1987]
(+) Income for the accounting period	Ashton et al. [1987]
(+) Sector (non-financial/financial)	Ashton et al. [1987], Ashton et al. [1989], Carslaw and Kaplan [1991], Bamber et al. [1993], Ahmad and Kamarudin [2003], Boritz and Liu [2006].
(-) Whether or not the company is quoted	Ashton et al. [1987]
(-) Date when the auditing commences	Ashton et al. [1987]
(+) Loss ⁵	Ashton et al. [1987], Ashton et al. [1989], Carslaw and Kaplan [1991], Bamber et al. [1993], Ahmad and Kamarudin [2003].
(-) Reservations or caveats	Ashton et al. [1989]
(+) Reservations	Ahmad and Kamarudin [2003]

⁴ In these studies, a fall in the profitability with respect to previous periods has been considered as an indicator of bad news.

⁵ In these studies losses are considered to exist when the sign of the profit is negative. In this study we have also employed this indicator to mean a loss has been reported.

Variable	Author/s
(+) Extraordinary items	Ashton et al. [1989], Carslaw and Kaplan [1991], Ng and Tai [1994], Leventis et al. [2005]
(+) Contingencies	Ashton et al. [1989]
(-) Auditor	Ashton et al. [1989], Ahmad and Kamarudin [2003], Leventis et al. [2005]
(+) Auditor	Ng and Tai [1996]
(-) Ownership of the company	Carslaw and Kaplan [1991]
(+) Proportion of debt	Carslaw and Kaplan [1991], Ahmad and Kamarudin [2003]
(-) Percentage change in profit per share	Ng and Tai [1994]
(+) Degree of diversification	Ng and Tai [1994]
(-) Dividends distributed	Abdulla [1996]
(+) Number of observations in audit report	Leventis et al. [2005]
(-) Fees of the auditor per hour	Leventis et al. [2005]
(+) Uncertainty in the audit report	Leventis et al. [2005]

Source: Authors' own compilation.

Author	Year	Sample	Variables	Conclusions
Dyer and Mc Hugh	1975	Sidney	Company size, Year-end closing date, Relative profitability	The time employed in the auditing caused loss of timeliness.
Courtis	1976	New Zealand	Corporate size Age (number of annual general meetings held by the entity as a public company) Number of shareholders Pagination: length of the annual report.	The time employed in the auditing caused loss of timeliness.
Gilling	1977	New Zealand	Activities and attributes of the auditor	Leading auditing firms do the work more rapidly for companies of greater size Reporting delays were more related to industry patterns and traditions than to the companies attributes studied.
Givoly and Palmon	1982	New York	Company size Quality of internal controls Complexity of its operation	
			Total revenue for current year Industry classification	Total revenues, operational complexity (sign +).

Author	Year	Sample	Variables	Conclusions
Ashton <i>et al.</i>	1987	USA	Public/non-public status of the company Month of financial year end Overall quality of internal controls Complexity of its operation Financial complexity Electronic data processing complexity Reporting complexity Mix of audit work Number of years company has been client Sign of net income Current year net income or loss/total assets Type of audit opinion	Public/non public classification, overall quality of internal control, relative mix of audit work (sign-).
Ashton <i>et al.</i>	1989	Toronto	Company size Industry Month of year-end Sign of net income Type of audit opinion Extraordinary items Contingencies Audit firm	Industry and extraordinary items were significant for 6 of the 8 years studied
Carslaw and Kaplan	1991	New Zealand	Company size, Industry, Income (LOSS), Extraordinary Item, Audit Opinion, Auditor, Company Year - End, Company Ownership Debt Proportion	Audit delay is related: Inversely to the size Directly with the losses
Ng and Tai	1994	Hong Kong	Company size Change in EPS Month of financial year end Industry Extraordinary items Size of incumbent auditor	Audit delay is related: Inversely to the size Directly with the degree of diversification

Author	Year	Sample	Variables	Conclusions
			Type of audit opinion Degree of diversification Change of auditor Principal subsidiaries/joint ventures	
Abdullah	1996	Bahraini	Industry Debt - equity ratio Firm's profitability Company size Distributed dividend	Timeliness is related: Negatively with: firm's profitability, size and distributed dividend.
Owusu-Ansah	2000	Zimbabwe	Extraordinary and/or contingent items Month of financial year end Complexity of a company's operations Company size Profitability Gearing Company age	Timeliness is related: Negatively with: firm's profitability, and size.
Ahmad and Kamarudin	2003	Malaysia	Company size Industry Sign of income Extraordinary item Audit opinion Auditor Company year-end Debt proportion	Audit delay is related: Positively with: sign of income, audit opinion and debt proportion Negatively with: industry, auditor and company year-end.
Leventis <i>et al.</i>	2005	Athens	Type of auditor Number of remarks Audit fee per hour Extraordinary items Company size Ownership concentration Profitability Gearing Number of subsidiaries Industry Uncertainty in the audit report	Audit report delay is related: Positively with: extraordinary items, number of remarks and uncertainty in the audit report. Negatively with: type of auditor, audit fee per hour.

Author	Year	Sample	Variables	Conclusions
			Other auditor Auditor change	

In this study we have tested the classic hypotheses: size, sector (regulatory pressures) and disclosure of bad news, in the Spanish context of telematic submission of accounts. The influence of these variables, whose significance has been demonstrated in previous studies, has been investigated because our objective is to determine if they continue to be explanatory of delays in the context of telematic submission. In addition, since the periods of half-yearly submission observed are shorter than the annual period, a control variable has been included, linked to the principal differentiating characteristic of this information, which is nothing less than the proximity of its publication to the availability of the audit report.

With respect to the relationship between the company size and the timeliness of the financial information, most previous studies have concluded that large companies will submit their accounts sooner than the rest of the companies, although they offer different reasons for this [Dyer and McHugh in Australia, 1975; Davies and Whittred in Australia, 1980; Givoly and Palmon, in the U.S., 1982; Chambers and Penman in the U.S., 1984; Carslaw and Kaplan in New Zealand, 1991; Ng and Tai in Hong Kong, 1994; Abdulla in Bahrain, 1996; Owusu-Ansah in Zimbabwe, 2000; Boonlert-U-Thai, Patz and Saudagaran in Thailand, 2002; and Boritz and Liu in Canada, 2006]. There is only one study, that of Curtis in New Zealand [1976], in which no relationship was found between these two variables.

In relation to the sector, it has been demonstrated in the literature that companies not classified to the financial sector tend to submit their financial information later than the companies of this sector [Ashton, Willingham and Elliott in the U.S., 1987; Ashton, Graul and Newton in Canada, 1989; Carslaw and Kaplan in New Zealand, 1991; and Ahmad and Kamarudin in Malaysia, 2003].

The variable "bad news" has also been found to be significant in some studies on timeliness: a negative relationship has been found between the disclosure of bad news and the timeliness of the financial information [Givoly and Palmon, 1982; Whittred and Zimmer, 1984; Chambers and Penman, 1984; Carslaw and Kaplan, 1991; and Owusu-Ansah, 2000]. In contrast, other authors [Dyer and Mc Hugh, 1975; Curtis 1976; Garsombke 1981; and Boritz and Liu, 2006], did not find any significant relationship.

4. HYPOTHESES

In accordance with what has previously been stated, three hypotheses have been tested.

4.1 Size of the company

The size of the company can have an influence on the timely submission of the financial information in various different ways; for example, size can influence the

agency costs that companies bear, in the time invested in the process of auditing, in the costs of producing and publishing the information, ... However, in this study and its particular context, in which the system of submission has evolved further than the systems applicable in other older studies, the relationship between timeliness and size could have lost the significance reported in the previous literature.

In the voluntary disclosure of information, the agency costs may be less [Pirchegger and Wagenhofer, 1999]; this could also be the case with the more timely information.

Singhvi and Desai (1971: 131) argued that the directors of the larger companies have a greater propensity to take into account the potential benefits of disseminating information more fully and more promptly; such benefits would include greater facility in the issue of shares and in the financing of the company in general. These arguments suggest that there is a direct relationship between the size of a firm and its timeliness in the dissemination of its accounts, giving rise to the testable hypothesis that larger firms disseminate such information more promptly.

Garsombke (1981: 207) also argued that a relationship exists between the size of a company and timeliness in filing accounts. If the factors (size, countries in which it is quoted, ratio of performance and profit margins) that give rise to a high index of dissemination have the same effect on the timeliness, then it would be expected that the larger firms should be more prompt.

Company size is the most significant variable that has been found in the majority of the studies carried out on delays in reporting. Corteau and Zeghal, (1999: 77) made an international comparison of the timeliness of annual reports, and found that the delays diminished with the size of the firm in countries including Australia, United Kingdom and Italy.

The larger companies are also more complex, therefore they have a more pressing need to disseminate complex information to allow current and prospective investors to take more efficient investment decisions (Marston and Polei, 2004: 293).

The precise time when the financial information is submitted and filed depends on the completion of the audit report. Company size is one of the variables that influences the time needed to produce the audit report. Audit delay causes information delay as well as loss of timeliness for the information.

Dyer and McHugh, (1975: 213), argued that the directors of the largest companies have incentives to reduce the delays in both auditing and reporting, since their companies are more closely monitored by investors, trades unions and regulatory bodies. These external pressures oblige them to report more promptly than smaller companies. Thus the studies analysed previously have demonstrated that, in order to reduce uncertainty in respect of the company results (because this can depress its share price), a larger firm tends to complete its auditing work as soon as possible, to be able to issue its annual report as soon as possible. If the audit report is completed on time, then the company can be on time in releasing its accounts.

On the other hand, larger firms have more extensive and complex accounts to be audited; therefore, it could be thought that the auditors of these companies need more time and that this is more likely to cause delay in releasing the accounts. However, the larger auditor firms who serve the large companies employ more staff, which should reduce the time needed for auditing. There are economies of scale in auditing a larger company (Garsombke, 1981: 207). Therefore, the information of large companies may be reported more promptly.

It is thus possible to offer reasons why company size could be either positively or negatively associated with audit delay and with the loss of timeliness of the financial information. Based upon the results of previous studies, however, a negative association between audit delay and company size is expected. Several factors may account for this relationship. For example, larger companies may have stronger internal controls, which in turn should reduce the propensity for errors to occur in the accounts, and should enable auditors to rely more extensively on controls and to perform more interim work. Also, larger companies may be able to exert greater pressures on the auditor to start and complete the audit in a timely fashion (Carslaw and Kaplan, 1991: 23). To summarise these arguments, the larger companies will tend to provide more timely financial information.

With a telematic system of submission, an important object of study in this research, the relationship existing between company size and timeliness of the information may be modified. In telematic submission, size may cease to be a variable of interest, because another series of factors come into play, such as the degree of use made of new information and communication technologies; factors like this may influence the timing of the submission independently of company size.

All these aspects are tested in the following hypothesis:

H1: There is a positive relationship between the size of the company and the timeliness of the information submitted.

The size of the company has been measured by the logarithm of the capitalised value⁶ of each company at the end of each half-year.

4.2 Sector under regulatory pressures

The sector to which a company is classified can be the cause of its submission being more or less timely. In this study the sector variable differentiates between 2 types of sector; on the one hand those that are subject only to accounting regulations imposed by the outside regulatory body and, on the other, those that are subject to internal regulations specific to the sector, as well as external regulations.

Internal regulation to which certain sectors are subjected can have an influence on the timely submission of the financial information. Thus the companies classified to these sectors may submit their information before companies that are classified to sectors in which companies are not regulated internally.

⁶ We employ logarithms for avoid the problems derived from the asymmetry in the distribution of this variable.

Particular theories such as the theory of political costs or the signal theory claim to explain the way in which these pressures may affect how the companies subjected to these regulations act. The theory of political costs suggests that the industrial affiliation of a firm can affect its political vulnerability (Giner, 1997: 52; Craven and Marston, 1999: 323). Signal theory also indicates differences in information dissemination between particular sectors (Oyelere *et al.*, 2003: 43); this may also occur with the timeliness in the publication of company accounts.

In this research the disclosure of obligatory financial information is analyzed; therefore, it would be expected that the political costs may be reduced and the information may be disclosed more promptly. Companies that are under regulatory pressures are likely to present their financial information more promptly than those companies not subject to pressures of this type.

The companies typically under such pressures are those that belong to sectors that are especially supervised or protected. The social and institutional pressures on particular sectors lead companies in these sectors to file their financial information before those in other sectors that are not under pressure. In Spain, the financial and energy sectors are under strong institutional pressures from regulatory authorities such as the Bank of Spain for the financial sector, and the *Comisión Nacional de la Energía Eléctrica* for the energy sector.

The financial sector is regulated by Circular 4/1991 of the Bank of Spain, whereby certain terms are set for the submission of the Balance Sheet and the Profit and Loss Account to the Bank of Spain; these terms are tighter than those stipulated by the CNMV. According to this Circular, the information has monthly or quarterly periodicity depending on the type of information. The Balance Sheet has monthly periodicity and the maximum term for its presentation is the 20th day of the next month. The Profit and Loss Account has quarterly periodicity and the maximum term for its presentation is the 20th day of the next month. Subsequent to this, the Circular 4/2004, of 22 December, for credit entities, on standards for public and reserved financial information and models of financial statements, stipulates the terms for the submission of the financial information, but no alterations were made in the periods fixed for the Balance Sheet and the Profit and Loss Account. However, in Circular 6/2008, of 26 November, from the Bank of Spain, for entities of credit, which modifies the above-mentioned Circular 4/2004, of 22 December, modifications are made to the stipulated terms for submission, depending on the type of credit entity. Thus, the ICO, the banks and the savings banks, including the *Confederación Española de Cajas de Ahorros* and the subsidiaries of foreign-owned credit entities whose parent company is not domiciled in a State that is a member of the European Economic Space, will have to submit their Balance Sheet monthly, the Profit and Loss Account and the statement of income and recognized expenses quarterly, and the consolidated statement of changes in total equity and the cash-flow statement annually; credit cooperatives will have to submit all the financial statements quarterly, except for the consolidated statement of total changes in equity and the cash-flow statement, which they will have

to submit annually; and specialised credit institutions/companies will have to submit all the statements annually. In addition, the statements mentioned in the previous parts must be submitted to the Bank of Spain, by the 20th day of the month following that to which they refer, at the latest.

The *Comisión Nacional de la Energía Eléctrica* supervises the energy sector, in accordance with the Law 54/1997, of 27 November, of the Electricity Sector. In that law it is stipulated that the companies belonging to the energy sector must provide the Administration with the information that may be required of them, and in particular the information related to the company accounts. The *Comisión Nacional de la Energía Eléctrica* does not impose fixed terms although it does establish the obligation that the companies of the sector should have the financial information prepared and ready, should it be required at any time. Similarly Circular 4/1998, of 10 November, of the *Comisión Nacional del Sistema Eléctrico*, on the collection of economic, financial and accounting information (in force up to 17 September 2009) specifies the information that must be submitted to the *Comisión Nacional del Sistema Eléctrico*, the models and the terms for submission. This stipulates that the Balance Sheet, broken down by activities, and the Profit and Loss Account, also broken down by activities, must be submitted quarterly, together with other financial statements that are not the object of study in this thesis. The information previously mentioned must refer to the period running from the first of January to the last day of the quarter ended before the submission of this information. The information corresponding to the first and third quarters must be submitted within 45 natural days following the last day of the quarter to which it refers. The information corresponding to the second and fourth quarters must be submitted within 60 natural days following the last day of the quarter to which it refers.

Therefore, the second hypothesis is formulated as:

H2: There is a positive relationship between the companies that are under more regulatory pressures and the timeliness of the financial information.

The variable 'Regulatory pressures' has been measured as a dummy variable: 1 for the companies classified to sectors that are subject to regulatory pressures; 0 for the companies not subject to such pressures.

4.3 Bad news

The disclosure of bad news has been one of the variables that has normally been included in studies of this type, although sometimes no significant relationship has been found. However, there are studies in the literature in which an inverse relationship has been found between the disclosure of bad news and the timeliness of submission; in some studies authors have presented arguments that may lead one to think the opposite. In this context, Skinner (1994: 39) argued that bad news needs to be disclosed as soon as possible with a view to minimising damage to the reputation of the managers of the company in question.

On the other hand, as demonstrated in some of the previous studies, the discovery of bad news in the accounts may lead to this information being disclosed later, as a tactic to avoid negative reactions on the part of investors. Bad news can also have an influence on the process of auditing, causing it to be prolonged more than necessary and giving rise to the later disclosure of the audited accounts.

Ashton, Willingham and Elliott, [1987: 284] found that those public companies that disclosed a net loss had longer delays in their auditing. In a later study, Ashton, Graul and Newton [1989: 666], the delay in the auditing was greater for the companies that disclosed losses (bad news) than for those companies that disclosed positive net income.

According to Carlsaw and Kaplan, (1991: 24), the companies reporting a loss for the period were expected to have a longer audit delay. The expected role of a reporting loss, i.e. bad news, in audit delay is suggested for several reasons. First, where a loss occurs, companies may wish to delay bad news. A company with a loss may request the auditor to schedule the start of the audit later than usual. Second, an auditor may proceed more cautiously during the audit process in response to a company loss if the auditor believes the company's loss increases the likelihood of financial failure or management fraud. In their study, losses are reported as the negative sign of the current income.

The delay of bad news could be explained in terms of the "stakeholder theory" (Haw, Qi and Wu, 2000). The stakeholder theory suggests that, in the absence of an opportunity to hide bad news because of mandatory disclosure requirements, managers have the incentive to delay its release (Watts and Zimmerman, 1990).

Dye and Sridhar (1995) state that companies with successful results (good news) will report more promptly than those with failing operations, or that have sustained losses (bad news). This behaviour can be explained by the arguments of Haw, Qi and Wu [2000: 113], whose opinion was that good news should be issued earlier because it undergoes less scrutiny and passes through the auditing process quickly.

Gigler and Hemmer (2001) argued that the more or less timely disclosure of the news, whether good or bad, depends on the conservatism of the company and its accounting methods.

In the light of these arguments, the last hypothesis, expressed in a positive form, is as follows:

H3: There is a positive relationship between the absence of "bad news" about the company and the timeliness of the financial information.

To measure the presence of bad news, the sign presented by the profit before taxes has been analyzed; a dummy variable is obtained: 1 if the sign is negative; 0 if the sign is positive.

4.4 Audit report

Although both the annual and first half-yearly accounts are prepared and formally closed before being submitted, there is an important characteristic that differentiates the annual from the half-yearly information. Whereas the accounts for the

first half-year can be sent as soon as they have been prepared, at the end of the second half-year, the information to be provided is sent to the CNMV at almost the same time as the audit report of the company is sent. This close proximity in time between the submission of the annual information and the presentation of the audit report may lead to a delay, for two different reasons: 1) during this period, a company will tend to devote more time and attention to the production of the information, since the managers of the company will be particularly careful to minimize the risk of the auditors attaching any reservation to the audit report; 2) once the accounts have been completed and closed, the company will then want to present them as quickly as possible so that the process of auditing may be almost finished and the information that is disclosed should be as reliable as possible. With this variable, the object is to analyse the impact that the pressure of auditing exerts on the timeliness of submission.

This variable does not depend on characteristics attributable to each company itself of the population under study; rather, it takes one value or another depending on the period in question. Hence, to differentiate from the rest of the variables, the audit report is included as a control variable; according to Tuckman [1978], a control variable can be defined as one that the researcher controls, with the object of eliminating or neutralizing its effects on the dependent variable.

Thus, the time taken for the completion of the audit report causes companies to submit their accounts later, since both the process in itself and the incidents that may occur as a result (reservations, discussions between client and auditor, conflicts, material errors, etc...) mean that submission may be delayed.

In effect, the requirement that the financial statements must be audited by external auditors can prevent the disclosure from being timely. Timeliness in the disclosure of the financial information thus becomes as much a matter for the executive who formulates the accounts, as a question of the time that the auditor takes in the work of auditing them [Ng and Tai, 1994: 44].

5. METHODOLOGY

5.1 Sample and Variables

The population taken for this study comprises a sample of 105 companies that were quoted on the Spanish continuous market at the end of 2004. The study has been carried out from the second half of 2002 to the second half of 2008 (14 periods). The information analyzed consists of the half-yearly accounts - both the first and second half-yearly information (the latter also being the annual information). The quarterly information has not been included in this study because this information is not comparable in respect of contents with the half-yearly or annual information.

The following variables have been included in the empirical study:

Dependent variable:

Period of submission: number of days that elapse between the close of the period and the date of publication on the website of the CNMV. The source from which this information has been extracted is the database of the Commission.

Independent Variables:

Regulatory pressures: a dummy variable that differentiates the companies according to whether or not the company is classified to a sector that is subject to internal regulation. To obtain this information the particular characteristics of each of the sectors have been studied to ascertain if the sector is subject to any specific regulation.

Bad news: a dummy variable that reflects the sign of the Profit before taxes item in the accounts. The source analyzed to obtain this data is the periodical public information available in the database of the CNMV - specifically the profit and loss account of the companies.

Size: a quantitative variable that has been expressed as the logarithm of the value of the stock market capitalisation of each company in each period. The sources from which this information has been extracted are the website of the Bolsa de Madrid for the annual information, and the financial press ⁷ for the half-yearly information.

Audit Report: a dummy-type control variable that takes one value or another depending on the period, differentiating between half-yearly and annual types of information, with the object of ascertaining if the pressure of auditing the annual accounts influences the timeliness.

5.2 Specification of the model

The technique of panel data has been utilised for the analysis of the data. Panel or longitudinal data are sets of data that combine time series with cross-sections. The sets of panel data are more oriented towards cross-section analysis - they are "wide" but, in general, short. The typical panel is one where there are many units of cross-section, and only a few periods, as occurs in this research.

With the technique of panel data, the variations between the different agents in space, and the changes that have occurred over the course of time can be observed. Panel data allow the heterogeneity that is not observable, but that exists between the companies, to be monitored. With this technique all the individuals of the sample are homogeneous, since the differences existing between them are eliminated. In addition, this methodology eliminates the observations that have incomplete data for one or more of the periods under study, which allows more reliable results to be obtained.

In short, the panel data technique has been selected for this study because it is the most appropriate, taking into account the inherent characteristics of the data analysed (most are qualitative, and there are few periods).

The equation of our model is the following:

⁷ The newspapers "Cinco días" and "El País".

$$\text{Period of submission} = \alpha + \beta_1 * \text{Regulatory pressures} + \beta_2 * \\ \text{Audit report} + \beta_3 * \text{Bad news} + \beta_4 * \text{Size} + \varepsilon$$

6. RESULTS AND DISCUSSION

6.1 Descriptive Statistics

Table 13 contains descriptive statistics of the results found for each of the periods analysed.

In the second column is the number of days on average that the companies take to submit their information in each period. The third column gives the percentage of companies that submit their financial information outside the stipulated term, which is 62 days for the information of the first half-year, and 59 days for the annual information. In the fourth column is the mean delay in days; in other words, the mean length of time that elapses from the date when the term for submission ends, until the date of the actual submission. In the last column is the number of companies that have submitted accounts in each period. This last column demonstrates the impact produced by the introduction of telematic submission; the number of companies that have their financial information available in the database of the CNMV increases, from the date when the CIFRADO system was established as the only system for submission.

The mean term ranges from 35 to 44 days for the first half-year accounts, while for the annual accounts the mean term ranges from 54 to 58 days. It can be observed in this column that the mean term for the submission of the annual accounts shows a tendency to diminish from 2002 up to 2005; a similar trend can be seen with the percentage of companies that submit outside the term, and with the mean delay, in days. It is also notable that the mean delay in days has been diminishing for the half-yearly information, from the first half-year of 2003 to the first half-year of 2006, the same as occurs for the annual information from 2002 to 2006. For the following 2 years, 2007 and 2008, longer mean delays are recorded in submission of the information for the first half-year; similarly for the submission of the annual information for the year 2008, the mean delay is 18 days.

Table 13 *Descriptive statistics of the dependent variable by periods*

Period	Mean term	% of companies outside term	Mean delay in days	N ⁸
2002 1st Halfyear	35.2	15.6	2	32
2002	56.3	37.6	5.4	101

⁸ This column does not represent the total population, due to the existence of companies that close their accounts on a date different from 31 December; these have not been included in the statistics. These companies were not included because the terms stipulated by the *Ministerial Order of 18 January 1991* are identical for all the companies based on the assumption that all of them close their accounts on 31 December. Therefore, the inclusion of those companies that close their books on different dates would skew the results, towards appreciably higher values.

Period	Mean term	% of companies outside term	Mean delay in days	N ⁸
2003 1st Halfyear	42.9	19	4.5	105
2003	54.9	26.7	2.5	105
2004 1st Halfyear	38.1	12.5	1	104
2004	54.3	25	1.1	104
2005 1st Halfyear	38.8	16	1	100
2005	54.8	24	1	100
2006 1st Halfyear	39.0	12.2	1	98
2006	55.8	27.8	1	97
2007 1st Halfyear	38.9	16.9	8.7	89
2007	57.9	46.6	4.8	88
2008 1st Halfyear	44.5	17.6	13.1	85
2008	58.3	12.3	18.6	81

Source: Authors' own elaboration

6.2 Pool Regression Results

Table 14 shows the regression of the panel data with the significant variables. For the 14 periods studied, the significant variables are the regulatory pressures, audit report, and company size. The variables regulatory pressures: and size are significant to 1% with the negative sign expected. The audit report variable is also significant to 1% and has a positive sign.

The R^2 is 0.3270, which indicates that the model is capable of explaining 32.7% of the variability in the number of days for the submission (period of submission) of the companies studied. The adjusted R^2 indicates that 32.48% of the variation of the dependent variable of our model is explained by variations in the independent variables.

The R^2 values compare favourably with those reported in the studies of Ashton, Graul and Newton [1989] in which the adjusted R^2 ranged between 8.8% and 12.3%; Carslaw and Kaplan [1991] in which the adjusted R^2 values were 14.3% and 17%; Ng and Tai [1994] with adjusted R^2 values of 13% and 14.4%; Hossain and Taylor [1998] with an adjusted R^2 of 30.6%; Owusu - Ansah [2000] with adjusted R^2 values of 8% and 16.6%; and Leventis, Weetman and Caramanis [2005] with an adjusted R^2 of 24.3%.

Table 14 *The regression of the panel data with the significant variables*

Variable ⁹	Coefficient	Std. Error	t-Statistic	Prob.
C	81.51956	4.726880	17.24596	0.0000
Regulatory pressures	-4.455996	0.950688	-4.687128	0.0000
Bad news	-0.261643	1.084785	-0.241193	0.8094
Audit report	15.98792	0.777434	20.56499	0.0000

⁹ Dependent variable: Period of submission. Method: Panel Data. Sample: 1st Half-year 2002 to 2nd Half-year 2008. Number of cross sections: 105. Total observations, panel data: 1246.

Size	-4.525479	0.521772	-8.673283	0.0000
R-squared	0.327041	Mean dependent var		48.21027
Adjusted R-squared	0.324872	S.D. dependent var		16.62265
S.E. of regression	13.65819	Sum squared resid		231503.9
F-statistic	150.7737	Durbin-Watson stat		1.389936
Prob(F-statistic)	0.000000			

7. CONCLUSIONS

The regulatory pressures and the size are directly associated with the timeliness of the financial information, whereas the auditing pressure to which the annual information is subjected is inversely associated with timeliness.

The results obtained are evidence that companies of larger size are more prompt in their submissions because they are better able to bear the costs involved and can provide incentives to the auditors to reduce the time taken in auditing. The number of days that a company will take to file its accounts will vary inversely to the size of the company.

The companies of the energy and financial sectors are more prompt in their filing than the companies classified to other sectors. The companies in these two sectors are subjected to political, social and institutional pressures, making them more vulnerable; and the controls to which they are subjected oblige them to comply with stricter standards and reporting terms than others.

The proximity in time between the disclosure of the annual information and the presentation of the audit report to the CNMV increases the number of days that companies take to file their financial information, since companies wait until the auditing process is finalized or is close to being finalized, with the object that the information supplied should be as reliable as possible.

The other variable analyzed, bad news, does not significantly affect the punctuality in the submission of the financial information. Thus, this study is consistent with studies previously cited that have not found a significant relationship between timeliness and disclosure of bad news: [Dyer and Mc Hugh [1975]; Courtis [1976]; Garsombke [1981]; Boritz and Liu [2006]].

From the results obtained, it can be concluded that, despite the introduction of the telematic medium as a new channel of communication and submission between companies and the regulatory body, in this case, the CNMV, classic variables like company size and activity sector that have been found significant in previous studies continue to be capable of explaining this phenomenon in the Spanish context of telematic submission of obligatory financial statements. However, the use of the telematic system may possibly have reduced the submission periods, but this result cannot be confirmed, since it is impossible to make a comparison between the situation before and after the introduction of the CIFRADO system, due to the lack of relevant information on the website of the CNMV, for dates preceding the entry into operation of this system.

The conclusions obtained lead us to think that the reduction of time in the submission of financial information tends to be motivated by external pressures from the regulatory authorities that impose shorter terms than the CNMV and can make companies comply.

In this respect, the need arises to study this topic in greater depth since, in a dynamic society like the present in which changes take place in gigantic steps, regulations more in tune with the times are needed, where the terms for submitting financial information are reduced.

In short, companies should keep to the legally stipulated terms for submission; unless they do so, delays may occur in the publication of important information, and this in turn may demonstrate a need to reduce the terms for submission even further and/or shortening the time allowed for auditing processes.

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THE CO-MOVEMENTS OF NATIONAL STOCK MARKETS AND GLOBAL PORTFOLIO DIVERSIFICATION: 2001-2010

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Abstract: *Global portfolio diversification is recommended because of low correlation between national equity markets. However, recent empirical studies find that correlation between national stock markets has been increasing and the benefit of global portfolio diversification has been decreasing. In this paper we test this hypothesis by using the principal components analysis methodology with data from 38 global stock markets for the 2001-2010 period. We divide this 10-year period into two consecutive 5-year periods and we apply principal components analysis to each sub-period separately. We find seven statistically significant principal components for the 2001-2005 period and only three statistically significant principal components for the 2006-2010 period. Our findings indicate that the co-movements of global stock markets have become significantly closer and the global portfolio diversification benefit has decreased considerably during the 2001-2010 period.*

Keywords: *Co-Movements of Global Stock Markets, Global Portfolio Diversification*

JEL Codes: *G10, G15*

1. INTRODUCTION

Studying the co-movements of national stock markets has long been a popular research topic in finance. Low correlation between national stock markets is often presented as evidences in support of the benefit of global portfolio diversification (see: Levy and Sarnat, 1970, Solnik, 1974, Watson, 1978, and Meric and Meric, 1989).

Empirical studies show that correlation between national markets has been increasing and the benefit of global diversification has been decreasing [(ee, e.g., Arshanapalli and Doukas, 1993, Lee and Kim, 1993, Lau and McInish, 1993, Meric *et al.*, 2001a,b, and Meric and Meric, 2004). In this paper, we provide additional

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empirical evidence for this hypothesis with the principal components analysis technique with data for 38 major global stock markets for the 2001-2010 period.

2. THE WORLD ECONOMY DURING THE 2001-2010 PERIOD

The world economy experienced significant growth during the first decade of the twenty-first century continuing the trend from previous decades and reflecting the global benefits of increased specialization and trade. This decade has also been characterized by numerous financial crises, problems experienced by transition economies, the adoption of a single currency by many EU countries, major acts of terrorism and the response to terrorism, the ongoing volatility of commodity prices and the emergence of China and India as new engines of worldwide growth.

Table 15 below shows the growth of the world economy from 2000 to 2010 as measured by World Gross Domestic Product as well as evidence of the increasing importance of international trade and closer global integration.

Table 15 *World Economic Growth^a*

Year	WGDP ^b (trillions)	%ΔWGDP	%ΔWGDP (per capita)	WExports ^b (trillions)	%ΔWExports	WEX/WGDP (%)
1999	39.4			7.2		
2000	42.3	7.36	6.06	8	11.1	18.9
2001	44.3	4.73	3.43	7.8	-2.5	17.6
2002	46.4	4.74	3.54	8.1	3.85	17.5
2003	49	5.6	4.4	9.5	17.28	19.4
2004	52.9	7.96	6.76	11.5	21.05	21.7
2005	57.1	7.94	6.74	13	13.04	22.8
2006	62.5	9.46	8.26	15	15.38	24
2007	67.9	8.64	7.44	17.4	16	25.6
2008	72	6.04	4.84	19.8	13.79	27.5
2009	72.4	0.056	-0.64	15.9	-19.7	22
2010	74.3	2.62	1.52	18.7	17.61	25.17

^a Source: <http://databank.worldbank.org> accesses June 28, 2011.

^b PPP, trillions, International Dollars.

World GDP grew by 75.7% over this period with an average annual growth rate of 5.8%. There was considerable variation in the annual growth rate ranging from a low of .56% in 2009 to a high of 9.46% in 2006. The overall growth in world exports was 133.8% with the export share of world GDP increasing from 18.9% in 2000 to 25.17% in 2010. The export/World GDP ratio grew by 33.1% over this period showing the growing importance of international trade and closer global integration.

The last decade of the twentieth century and the first decade of the twenty-first century have shown that globalization and closer financial integration can lead to greater vulnerabilities as indicated by the financial crises that hit the world economy during this time period, Mexico (1994), East Asia (1997-1998), Russian bond default (1998), Argentina bond default (2001), U.S. financial crisis (2008-2009) and the current financial

problems with some EU countries. With closer financial integration there is an increased risk that a financial crisis in one country will spread quickly to other countries around the world. The collapse of the housing market in the U.S. and subsequent problems in the U.S. financial system caused credit markets to freeze and helped to precipitate in 2009 the first decrease in WGDG per capita since the end of World War II.

With the collapse of the Soviet Union, some countries of the former Soviet Federation, most notably Russia, have struggled in the transition to a more market oriented economy. On the other hand, the European Union has continued on the path toward closer integration with the introduction of the Euro as a common currency in 2001. The adoption of a common currency could help the EU achieve a faster growth rate but as the current debt crises in Greece, Spain, and Portugal show, there are risks involved in the use of a common currency due to the financial, cultural and political differences between member countries.

The 2001 terrorist attacks in the U.S. had a significant effect on the U.S. and were in large part responsible for the 35% reduction in the world economic growth rate in 2001 and 2002. Subsequent to the 2001 attacks, countries around the world have had to divert resources away from activities that promote long-run growth (physical capital formation, investment in human capital and development of technology) to counter-terrorism programs. The ongoing wars in Iraq and Afghanistan have also necessitated a similar diversion of resources.

The 2000–2010 period has been a time of considerable volatility in commodity prices, as shown in Table 16, by the fluctuation in food and oil prices. Commodity price volatility can have a negative impact on the growth rate of developing countries that have high export/GDP ratios. Price volatility can also negatively affect countries that are dependent on commodity imports because higher commodity prices can lead to lower consumption and investment spending.

Table 16 *Commodity Prices^a*

Year	Food Price Index ^b	% Δ Food Price Index	Crude Oil Price Index ^c	% Δ Crude Oil Price Index ^d
2000	90		47.3	
2001	93	3.33	34.7	-26.6
2002	90	-3.23	52.3	50.72
2003	98	8.89	56.1	7.34
2004	112	14.29	73	30.03
2005	117	4.46	105.8	44.93
2006	127	8.55	114.5	8.22
2007	159	25.2	168.1	46.81
2008	200	25.79	77.7	-53.77
2009	157	-21.5	140.9	81.26
2010	185	17.83	169.3	20.21

^a Source: <http://www.fao.org/worldfoodsituations> accessed June 29, 2011 and <http://www.indexmundi.com/commodities> accessed June 29, 2011

^b Base year = 2002-2004

^c Base year = 2005

^d Annual %Δ measured December to December

In the first decade of the twenty-first century there has been a continuation of the trend of the growing relative importance of the Chinese and Indian economies in the world economy. As a result of the rapid growth of the Chinese and Indian economies, their combined share of world GDP has grown from 4.4% to 17.8% in the last thirty years. During the same time period the combined share of the U.S. and Japanese economy has decreased from 31% to 27.2%.

Table 17 *Growth of the Chinese, Indian, Japanese, and U.S. Economies^a*

Year	China + India GDP ^b	China + India % WGDP	U.S. GDP ^b	U.S. GDP % WGDP	Japan GDP ^b	Japan GDP % WGDP
1980	.54	4.4	2.8	23	.98	8
1990	1.7	6.7	5.8	22.8	2.3	9.1
2000	4.6	10.9	9.9	23.4	3.3	7.8
2009	12.9	17.8	14.1	19.5	4.1	5.7

^a <http://databank.worldbank.org> accessed July 1, 2011

^b GDP is measured in terms of PPP, current international dollars, trillions.

3. DATA AND METHODOLOGY

The study covers the following stock markets: Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, Denmark, Finland, France, Germany, Greece, Hong Kong, India, Indonesia, Ireland, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Philippines, Poland, Portuguese, Shanghai, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Kingdom, and United States. The daily stock market indexes used in the analysis were downloaded from the DataStream database. The index returns were computed as the log difference in the indexes, $\ln(I_t/I_{t-1})$.

The study covers the 2001-2010 period. This 10-year period was divided into two consecutive 5-year periods to study the changes in the co-movement patterns of the stock markets over time. Principal components analysis was applied to each sub-period separately to study the portfolio diversification implications of the changes in the co-movement patterns of the markets.

Principal Component Analysis (PCA) is a widely used multivariate statistical technique in finance to study the co-movements of national equity markets (see: Makridakis and Wheelwright, 1974, Philippatos *et al.*, 1983, and Meric and Meric, 1989). A brief description of the PCA methodology is provided in the Appendix.

4. PRINCIPAL COMPONENTS ANALYSIS

The index returns of the 38 stock markets were used as inputs in the SPSS-PCA computer program to determine the clusters of stock markets with similar movement patterns over time. The Varimax rotation was used to maximize the factor loadings of the stock markets in each principal component with similar movement patterns. Using Kaiser's rule, statistically significant principal components with eigen values greater than one were retained for analysis.

Stock markets with high factor loadings in the same principal component are highly correlated. The higher the factor loading of a stock market in a principal component, the higher is its correlation with the other stock markets with high factor loadings in the same principal component. There is less correlation between the stock markets with high factor loadings in different principal components. Therefore, to maximize global diversification benefit, investors should choose the stock markets with high factor loadings in different principal components.

4.1. 2001-2005 Period

There are seven statistically significant principal components for this period. The factor loadings of the principal components are presented in Table 18. The highest factor loadings in each principal component are shown in dark font and, if a stock market also has a high factor loading (greater than 0.3) in another principal component, it is shown in regular font in italics.

The cumulative variance explained by the seven principal components is 61.414%. The first principal component explains 24.159% of the variance. The second principal component explains 10.165% of the variance. The third principal component explains 9.389% of the variance. The fourth principal component explains 5.695% of the variance. The fifth principal component explains 4.239% of the variance. The sixth principal component explains 4.235% of the variance. The last principal component explains 3.532% of the variance.

The first principal component is mainly dominated by the European stock markets. Although they have their highest factor loadings in the third principal component, the U.S., Canadian, and Mexican stock markets also have high factor loadings in the first principal component.

Table 18 *Factor Loadings of the Principal Components: 2001-2005*

Stock Markets	Principal Components						
	#1	#2	#3	#4	#5	#6	#7
France	0.922						
Netherlands	0.902						
Italy	0.863						
Germany	0.852						
Switzerland	0.844						
Spain	0.841						
U.K.	0.831						
Belgium	0.816						
Sweden	0.766						
Finland	0.658						
Ireland	0.594		<i>0.382</i>				
Portugal	0.574		<i>0.481</i>				
Norway	0.480		<i>0.459</i>				
Hong Kong		0.794					
South Korea		0.717					
Singapore		0.670					

Stock Markets	Principal Components						
	#1	#2	#3	#4	#5	#6	#7
Taiwan		0.629					
Shanghai		0.617					
Japan		0.576	<i>0.355</i>				
India		0.478					
Thailand		0.389				0.389	
New Zealand			0.764				
Australia		<i>0.329</i>	0.729				
Austria	<i>0.385</i>		0.627				
Denmark	<i>0.444</i>		0.563				
South Africa			0.522				
Greece	<i>0.404</i>		0.474				
U.S.	<i>0.375</i>			0.745			
Canada	<i>0.383</i>			0.692			
Mexico	<i>0.303</i>			0.640			
Turkey					0.759		
Poland					0.525		
Philippines						0.672	
Malaysia						0.602	
Indonesia						0.571	
Argentina							0.812
Brazil				<i>0.375</i>	<i>0.383</i>		0.524
Chile	<i>0.306</i>				<i>0.402</i>		0.413
%Variance Exp	24.159	10.165	9.389	5.695	4.239	4.235	3.532
%CumVarExpl	24.159	34.324	43.713	49.407	53.646	57.882	61.414

It indicates that these stock markets are also highly correlated with the European stock markets with high factor loadings in the first principal component. The Irish, Portuguese, and Norwegian stock markets have their highest factor loadings in the first principal component. However, they also have high factor loadings in the third principal component. The Austrian, Danish, and Greek stock markets have their highest factor loadings in the third principal component. However, they also have high factor loadings in the first principal component.

Most Asian stock markets have their highest factor loading in the second principal component. Thailand has a equally high factor loading both in the second principal component and in the sixth principal component. It indicates that the Thai stock market is highly correlated with the stock markets with high factor loadings in both of these principal components. Although the Japanese stock market has its highest factor loading in the second principal component, it also has a high factor loading in the third principal component. It indicates that the Japanese stock market is also highly correlated with the stock markets with high factor loadings in the third principal component. Although it has its highest factor loading in the third principal component,

the Australian stock market also has a high factor loading in the second principal component.

The New Zealand, Australian, Austrian, Danish, South African, and Greek stock markets have their highest factor loadings in the third principal component. Of these stock markets, the Australian stock market also has a high factor loading in the second principal component. The Austrian, Danish, and Greek stock markets also have high factor loadings in the first principal component.

The fourth principal component is dominated by the U.S., Canadian, and Mexican stock markets. These countries are NAFTA members and it appears that their stock markets are highly correlated. These stock markets also have high factor loadings in the first principal component (i.e., they are also highly correlated with the European stock markets with high factor loadings in the first principal component). Although it has its highest factor loading with the other South American stock markets in the seventh principal component, the Brazilian stock market also has a high factor loading in the fourth principal component (i.e., the Brazilian stock market is also highly correlated with the U.S., Canadian, and Mexican stock markets).

The Turkish and Polish stock markets have their highest factor loadings in the fifth principal component. It implies that these stock markets are highly correlated. Although they have their highest factor loadings in the seventh principal component, the Brazilian and Chilean stock markets also have high factor loadings in the fifth principal component (i.e., the Brazilian and Chilean stock markets are also highly correlated with the Turkish and Polish stock markets).

It appears that the Philippines, Malaysian, and Indonesian stock markets are highly correlated and they have independent movements from the other Asian stock markets with high factor loadings in the second principal component. They dominate the sixth principal component. The Thai stock market also has a high factor loading in this principal component as well as in the second principal component with the other Asian stock markets.

The Argentine, Brazilian, and Chilean stock markets, the three South American stock markets in the sample, have their highest factor loadings in the last principal component. It implies that these markets are highly correlated. However, the Brazilian stock market also has high factor loadings in the fourth and fifth principal components. The Chilean stock market also has a high factor loading in the fifth principal component.

4.2. 2006-2010 Period

There are only three statistically significant principal components for the 2006-2010 period. The factor loadings of the principal components are presented in Table 19. The first principal component explains 39.153% of the total variance in the original data matrix. The second principal component explains 21.704 percent of the variance. The third principal component explains 11.454% of the variance. The total variance explained by all three principal components is 72.311%.

There are only three statistically significant principal components for the 2006-2010 period compared with seven principal components for the 2001-2005 period. These results show that the co-movements of the 38 stock markets are significantly closer in the 2006-2010 period than in the 2001-2005 period. Seven statistically significant principal components can explain only 61.414% of the variation in the original data matrix for the 2001-2005 period versus 72.311% for the 2006-2010 period. This is an additional factor that indicates that the markets are less independent and more inter-dependent in the 2006-2010 period than they were in the 2001-2005 period. It implies the presence of greater global portfolio diversification opportunities for investors in the 2001-2005 period than in the 2006-2010 period.

The first principal component is mainly dominated by the European stock markets. However, the South African and New Zealand stock markets also have their highest factor loadings in this principal component. The Austrian, Danish, Greek, Polish, and Turkish stock markets that had their highest factor loadings in different principal components in the 2001-2005 period, have their factor loadings with the other European stock markets in the first principal component in the 2006-2010 period. However, the movements of the European stock markets don't appear to be completely independent from the movements of the stock markets in the other parts of the world in the 2006-2010 period. The Austrian, Danish, Norwegian, Polish, Greek, South African, Turkish, and New Zealand stock markets also have high factor loadings with the Asian stock markets in the second principal component (i.e., these stock markets are also closely correlated with the Asian stock markets). The Dutch, U.K., German, and Turkish stock markets also have high factor loadings with the South and North American stock markets in the third principal component (i.e., these stock markets are also closely correlated with the South and North American stock markets).

Table 19 *Factor Loadings of the Principal Components: 2006-2011*

Stock Markets	Principal Components		
	#1	#2	#3
France	0.904		
Italy	0.893		
Spain	0.886		
Netherlands	0.877		<i>0.311</i>
Switzerland	0.858		
Sweden	0.852		
U.K.	0.839		<i>0.327</i>
Finland	0.839		
Portugal	0.838		
Belgium	0.835		
Austria	0.819	<i>0.343</i>	
Denmark	0.813	<i>0.339</i>	
Germany	0.772		<i>0.440</i>
Ireland	0.771		
Norway	0.757	<i>0.326</i>	
Poland	0.739	<i>0.309</i>	

Stock Markets	Principal Components		
	#1	#2	#3
Greece	0.736	<i>0.318</i>	
South Africa	0.684	<i>0.411</i>	
Turkey	0.585	<i>0.350</i>	<i>0.336</i>
New Zealand	0.575	<i>0.512</i>	
Hong Kong		0.845	
Singapore	<i>0.341</i>	0.791	
Shanghai		0.788	
South Korea		0.770	
Taiwan		0.755	
Malaysia		0.724	
Indonesia		0.718	
Australia	<i>0.515</i>	0.701	
Philippines		0.694	
Japan		0.679	
Thailand		0.582	
India		0.570	
U.S.	<i>0.331</i>		0.816
Mexico	<i>0.515</i>		0.701
Brazil	<i>0.524</i>		0.683
Canada	<i>0.547</i>		0.610
Chile	<i>0.525</i>		0.539
Argentina	<i>0.303</i>		0.520
% Var Explained	39.153	21.704	11.454
% Cum Var Expl	39.153	60.857	72.311

The second principal component is mainly dominated by the Asian stock markets. However, the Austrian, Danish, Norwegian, Polish, Greek, South African, Turkish, and New Zealand stock markets also have high factor loadings in this principal component.

The third principal component is dominated by the North American (U.S., Mexican, and Canadian) and South American (Brazilian, Chilean, and Argentine) stock markets. However, all of these stock markets also have high factor loadings with the European stock markets in the first principal component (i.e., the stock markets on the American continent are highly correlated among themselves, however, they are also highly correlated with the European stock markets). The Dutch, U.K., German, and Turkish stock markets also have high factor loadings in the third principal component (i.e., they are highly correlated with the stock markets on the American Continent).

The results indicate that, although there are three statistically significant principal components for the 2001-2010 period, most stock markets with the highest factor loading in one principal component, also have high factor loadings in the other principal components. These results imply that global portfolio diversification benefits are quite limited in the 2006-2010 period compared with the 2001-2005 period.

5. SUMMARY AND CONCLUSION

Studying the co-movements of national stock markets has long been a popular research topic in finance. Low correlation between national stock markets is presented as evidence in support of the benefit of global portfolio diversification. Several previous empirical studies show that correlation between global stock markets has been increasing and the benefit of global portfolio diversification has been decreasing over time. In this paper, we tested this hypothesis by using a sample of 38 global stock markets with daily return data for the 2001-2010 period.

We divided the 2001-2010 period into two consecutive 5-year periods and we applied principal components analysis to each sub-period separately. Our empirical tests yielded seven statistically significant principal components for the 2001-2005 period and only three statistically significant principal components for the 2006-2010 period. Stock markets with high factor loadings in the same principal component are highly correlated. Therefore, investors would maximize the global portfolio diversification benefit by investing in stock markets with high factor loadings in different principal components. The presence of seven statistically significant principal components in the 2001-2005 period versus only three in the 2006-2010 period indicates that there were more global portfolio diversification opportunities for investors in the 2001-2005 period than in the 2006-2010 period. This result confirms the findings of several previous studies that the correlation between global stock markets is increasing and the benefit of global portfolio diversification is decreasing over time.

APPENDIX

A detailed description of the PCA methodology can be found in Mardia et al. (1979), Marascuilo and Levin (1983), and Meric and Meric (1989). Consider a set of variables (e.g., sector index funds) X_1, X_2, \dots, X_p measured on n observational units (e.g., daily returns). Assume that the X variables can be put together to form a linear combination:

$$Y_1 = a_1^{(1)}X_1 + a_2^{(1)}X_2 + \dots + a_p^{(1)}X_p \quad (4)$$

which is referred to as the first principal component of the P variables. The coefficients of $A_1 = [a_1^{(1)}, a_2^{(1)}, \dots, a_p^{(1)}]$ are selected so as to maximize the variance of Y_1 :

$$Var(Y_1) = A_1' \Sigma_{xx} A_1 \quad (5)$$

The A_p can be determined from the sample variance-covariance matrix (Σ_{xx}) by solving the following characteristic equation:

$$|\Sigma_{xx} - \lambda I| = 0 \quad (6)$$

This equation has p ordered roots, the eigenvalues:

$$\lambda_1 \geq \lambda_2 \geq \dots \geq \lambda_p \geq 0 \quad (7)$$

λ_1 is equal to $\text{Var}(Y_1)$, λ_2 is equal to $\text{Var}(Y_2)$, etc. The sum of the eigenvalues is given by

$$\lambda_1 + \lambda_2 + \dots + \lambda_p = P \quad (8)$$

so that the variance explained by the first principal component is given by λ_1/P , the variance explained by the second principal component is given by λ_2/P , etc. With Kaiser's significance rule, n principal components are significant so that

$$\lambda_1 \geq \lambda_2 \geq \dots \geq \lambda_n \geq I. \quad (9)$$

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BANKING DEREGULATION AND FINANCIAL STABILITY IN EMERGING MARKET ECONOMIES

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Abstract: *Since the 80's, an increasing number of emergent countries have begun in the process of banking deregulation. This policy of liberalization of the financial systems was stimulated by the increase of the national debts and the inconsistency of the restrictions with the new economic and financial world. However, these last decades were marked by great financial crises which became world extensive. From there arose the question whether the process of deregulation, started by the developed countries since the sixties and accentuated in the eighties by the emergent and developing countries, contributed to the recent crises. Several theoretical and empirical studies investigated this question to show that these crises concern various fields: macroeconomic imbalances, structural weakness of the financial systems, instability of international flows of capital, etc.*

Keywords: *deregulation - financial stability - financial crises.*

JEL Codes: *G18, G28, G01*

INTRODUCTION

Regulation and supervision aimed at assuring the stability of the financial system, and therefore the economic stability. However, the protection of banks made them not very competitive. So, these financial services had only one specialised and local activity, they dominated the national market but could not confront foreign markets.

This structure of markets was upset by the deregulation process adopted by almost all the developed and emergent countries. Financial liberalization began with the collapse of the international monetary system based on a generalised regime of adjustable fixed exchange rates, at the beginning of the seventies. The dismantling of the national controls of the flow of capital, during the eighties, in developed countries, increased the liquidity of financial markets. This evolution was even more stressed with the opening of the emergent countries to foreign capitals at the beginning of the

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nineties. The financial globalisation was marked by the advent of new markets and new significant actors in the international financial game.

The financial globalisation creates a new order for the economic agents and for the States as well. It means for States a drastic reduction of their room for manoeuvre in political, monetary and exchange rate matters. The masses of capitals exchanged every day on financial markets are, from now on, widely superior to interference capacities of the States. The economic theory teaches that the internationalisation of financial services augments the effectiveness of the national financial systems. Indeed, deregulation allows a better allocation of financial resources, a reduction of the cost of financings and an extension of the range of the offered products. It also enables to reinforce the free game play of competition by eliminating protectionist and Malthusians devices, and private income situations.

This new opportunity can be advantageous especially for the emergent countries, allowing the installation of a more efficient and more solid financial system. This ultimate objective can be accomplished only by adopting international practices and norms, and by improving financial services under the angle of quality, of output and of diversity.

The emergent countries, which constitute a more and more heterogeneous group, through their productive capacity, their human resources and their competitiveness, are not all ready to challenge financial and economic worldwide integration. Some of them, in South-east Asia, in Latin America, have started finding their place in the worldwide trends of financial exchange. Others have a potential which would allow them a more active part in these global movements. But, to reach that, they have to persist in their increasing efforts to reinforce their economic systems. Most emergent countries advanced well in the implementation of structural adjustment plans and economic reforms intended to stimulate market mechanisms and to fit progressively to liberalization and deregulation measures. But are these reforms sufficient to win the bet of deregulation? In other words, will the financial deregulation of banks contribute to the growth of the emergent countries, without risks of crises?

To answer this question it is necessary to do a close study some cases of emergent countries, while taking into account the worldwide context in which they are included. Indeed, financial markets are strongly interconnected now and financial markets are characterised by behaviours of contagion. This manifests itself especially during financial crises, for example the stock exchange crash of October, 1987, Europe in 1992-93, Mexico in 1995, Thailand, Indonesia, Malaysia and Korea in 1997, Russia and Brazil in 1998. These financial crises often reveal deep weaknesses in the economic structures and the financial systems of these countries.

But isn't it possible to assure a financial deregulation, and more particularly a bank deregulation, in serene conditions, that is to say without risks of crises? Alas, economic history shows a strong correlation between financial deregulation and crises. The recent studies suggest the risks for a country to have a financial crisis increased

with globalisation, probably because technological innovations allow the funds to move more easily.

Financial deregulation increases risks of crises, especially for the emergent countries, unprovided with powerful prudent mechanisms. Spread effects are persistent with opening and globalisation. But this fragility of the international financial system confers it at the same time a solidity element, by making the worldwide economic integration, the quick mobilisation of resources easier. For better settling this question we are first going to introduce empirical studies which studied the effect of banking deregulation on financial stability then to introduce an econometric model which estimates the effect of liberalization on banking crisis likelihood.

1. DEREGULATION AND FINANCIAL STABILITY: A REVIEW OF THE LITERATURE

The impact of deregulation on financial stability was the object of many contributions. Studies of Barth, Caprio and Levine (2000), Demirgüç-Kunt and Detragiache (2000), Miskin (2001), Dekle and Kletzer (2001a, 2001b), Huang and Wajid (2002) and Feldstein (2002), had highlighted a relation between deregulation conditions, prudent structures and financial stability. Feldstein (2002) examined lessons which can be learnt from financial and exchange rate crises in the end of the 1990's. His study gives the modalities for preventing the crisis. This author examined the policies of the emergent savings which affect the likelihood of crises, including the exchange rate regimes, convertibility of the capital account, debts and exchange rate reserves, the structure of domestic credit and financial supervision. He then studies the policies of the industrial countries which affect the risk of crises in emergent savings, including instability of exchange rates, rates of interest, banking supervision, trade policy and the supply of a last resort lender.

The literature on banking crises is much less rich, since it is much more delicate. Indeed, given the numerous aspects of banking fragility, it is difficult to find a numerical indicator corresponding to the banking crisis. Demirgüç-Kunt and Detragiache (1997, 1998a, 1998b, 1999) are the first authors to apply this type of models to banking crises. Their study (1998a) deals with 53 countries between 1980 and 1995 and shows that financial liberalization increases the risk of banking crisis, especially in a fragile environment. Besides, for repressed countries financial liberalization improves financial development, even if they are affected by crisis. Barth, Caprio and Levine (2001), use a Probit model and annual data of 45 countries. Their study suggests that countries with relatively weak governments and bureaucratic systems tend to impose more rigid restrictions on banking business. Besides, the impact of restrictions of regulation on the smooth running of the banking business is mitigated. Finally, the authors note that in the countries where the activities of banks on the stock market are restrained, the likelihood of a crisis is bigger, *ceteris paribus*.

Eichengreen and Arteta (2000), having performed a factual study of variables that can explain banking crises, estimated a probit model with these same variables. These authors note that the stability of the banks of emerging markets is threatened when macroeconomic and financial policies, combined with financial deregulation create an explosion of loans (lending boom).

Like Demirgüç-Kunt and Detragiache (on 1998a), Eichengreen and Arteta (2000) find that banking crises are very probable if financial liberalization is combined with an unstable macroeconomic and financial environment. On the contrary results both the role of institutional environment and that of exchange rate regime are not robust.

Mehrez and Kaufmann (2000) studied the effect of financial liberalization on the likelihood of banking crises in an environment which is not very transparent. They built up a sample of 56 countries between 1977 and 1997. Empirical results show that the likelihood of crisis increases in the periods following liberalization, especially in the countries which are not very transparent.

Eichengreen and Rose (1998) studied the likelihood of banking crises in 105 developing countries over the period 1975-1992, thanks to the multivariate probit model and graphic method. Their results especially stress the influence exerted by the interest rate of the countries of the COED on banking crisis likelihood. On the contrary the study of Eichengreen and Arteta (2000) questions again the role of the interest rates in developed countries on banking crisis likelihood in developing countries. Hardy and Pazarbasioglu (1998) estimated the probability of the banking crisis between 1980 et 1997 in 38 developed and developing countries. They draw out a group of variables which explain the likelihood of banking crises.

Hutchison and McDill (1999), showed the positive effect of financial liberalization, deposits insurance, price-cutting of assets, the weak growth and independence of the central bank on the likelihood of banking crises. Their study concerns a wide sample of 97 developed and developing countries, over the period 1975-1997. On the contrary Rossi (1999) found that barriers at the exit of capitals increase the likelihood of banking crises. Indeed, the controls of capitals increase the risk taking of banks, which produce banking crises. But it is necessary to point out that these results are obtained on a reduced sample composed of 15 developing countries and 8 years of study (from 1990 to 1997).

In a study performed on sixty countries, Barth, Caprio and Levine (2000), found that market expansion values, particularly the liquidity of equity capitals on the market, the programme of equity capitals (on the primary market) as part of the GDP, and the programme of long-term obligation (on the primary market) as part of the GDP, bring down the likelihood of a banking crisis.

2. BUILDING OF THE VARIABLE OF FINANCIAL LIBERALIZATION

To prove the effect of liberalization on banking crises, different liberalization indexes were built up through the method of discriminating factorial analysis (DFA).

This method helps predict a qualitative variable using several quantitative variables, called explicative variables. It therefore gets closer to multiple regression in the case where the endogenous variable is a qualitative variable describing groups.

2.1. DFA methodology

The discriminating factorial analysis (DFA) is a descriptive and explanatory method. It makes it possible to predict a qualitative variable using several quantitative variables, called explanatory variables. This method thus approaches the multiple regressions if the endogenous variable is a qualitative variable that describes the groups.

The DFA makes it possible, moreover, to model the membership of individuals (liberalization or not) according to the values taken by several variables. It allows to describe the connections between the character to be explained and the explanatory characters, while distinguishing between the various groups (or classes). Its objective is to create new variables which are particularly effective to separate the groups. These new variables, known as "discriminating Axes", or "discriminating Factors", are obtained as linear combinations of the initial variables.

The discriminating analysis covers two aspects: a descriptive aspect and an estimated aspect. Indeed, the DFA makes it possible to describe data observed on individuals by, as well as possible, classifying them in various groups. It also makes it possible to exploit the built discriminating axes starting from these data to envisage the classification of new individuals. In other words, it makes it possible to determine the most probable group for an individual, knowing only the values of the variables which characterize it. This second inferential aspect helps much make the decision and show a significant characteristic of this method. However, we will not present this aspect since we are interested only in the descriptive aspect of the DFA.

Presentation of the model

For a variable x , we have: $y_{ij}(x) = \mu(x) + \alpha_i(x) + \varepsilon_{ij}(x)$, with
 $y_{ij}(x)$: the dependent variable i.e. the index of liberalization

$\mu(x)$: a fixed parameter which measures the average effect of variable x

$\alpha_i(x)$: a fixed parameter which measures a variation of group i for variable x

$\varepsilon_{ij}(x)$: are random variables of null hope and constant variance. These random variables are independent two by two and their distribution is normal.

$$\varepsilon_{ij}(x) \approx N(0, \sigma_x^2)$$

We admit the following assumptions for this model.

For each variable x (or observation), we have:

$$T_x (\text{Total}) = B_x (\text{Between or inter}) + W_x (\text{Within or intra})$$

Equivalent to:

$$\sum_{ij} [y_{ij}(x) - y_{..}(x)]^2 = \sum_{i.} n_i [y_{i.}(x) - y_{..}(x)]^2 + \sum_{ij} [y_{ij}(x) - y_{i.}(x)]^2$$

with

$i = 1, \dots, g$: index of group;

$j = 1, \dots, n_i$: index of the observation in group i ;

$x = 1, \dots, p$ with p the index of variable x ;

n_i : a number of observations in each group (0 or 1), it is the number of group i ;

$y_{ij}(x)$: element of R^p , is the individual j of group i , it is the endogenous variable to classify in group 0 (no liberalization) or in group 1 (if there is liberalization);

$y_i(x)$: element of R^p , is the centre of gravity of group i ;

$y_{..}(x)$: element of R^p , is the centre of gravity of the data set;

T_x : represents the sum of the variations squares of all the observations to the noted general average $y_{..}(x)$.

B_x : represents the sum of the variations squares of each average of g groups, noted $y_i(x)$, to the average $y_{..}(x)$; and

W_x : represents the sum of the variations squares inside each group.

With $T_x = B_x + W_x$

The summary of the analysis is represented in the following table:

Table 20 *The summary of the analysis*

	Sum of Variations Squares (SVS)	Degree Of Freedom (DOF)	Average Squares	Test F
TOTAL VAR.	T_x	$n-1$		
GROUPS VAR.	B_x	$g-1$	$B_x/(g-1)$	F_x
RESIDUAL VAR.	W_x	$n-g$	$W_x/(n-g)$	

$W_x/(n-g)$ is an estimate of the variance of the terms $\varepsilon_{ij}(x)$ of the preceding statistical model. The expression of the F test (Fisher-Snedecor), is as follows:

$$F_x = [B_x/W_x] \times [(n-g)/(g-1)]$$

This test allows to be ensured for variable x if there are differences between g groups ensuring discrimination. This statistical test is defined as follows:

H_0 : $\alpha_i(x) = 0$, for all the groups, against

H_1 : $\alpha_i(x)$ is different from 0.

We compare the value of F_x with a threshold $F\{\alpha; g-1, n-g\}$ where F is the value of Fisher-Snedecor with $g-1$ and $n-g$ degrees of freedom for a fixed level of significance α . In this case, it is advisable to remove the variables having a significance (for the F-test) higher than 5%.

2.2. Index of liberalization of capitals

This indicator is constructed by using the balance of payment data in Chelem base. The choice method of variables is based on the availability of data. Indeed, after collecting all data on capital flows, all fluxes where there was not a lot of information were eliminated. Details on used data are in an appendix.

Our study includes 24 emergent countries over the period 1970-2002, the endogenous variable being an indicating variable (0,1). From the first year of

liberalization of capitals there is 1, on the contrary if the account of the capital is still controlled, there is 0. The used method is the method of step by step, by replacing missing data with averages.

Besides, we kept the results of the second estimate which consists in replacing the original classifications with classifications got from the first specification, to get a better classification of data. Results are introduced in what follows and show that 93 % of original data are classified well and 92,1 of crossed validated observations are correctly classified (Table 21).

Table 21 *Coefficients of standardised canonical differential functions*

	Function
	1
FDI_KS_E	0,810
IP_E	0,763
RSV_DEV	-0,867

So the increase of the liberalization of capitals can be noticed through an increase of the foreigners' investments, and more precisely an increase of FDI kept by the foreigners within the economy (increase of the authorised capital of FDI). The increase of obligations and of other assimilated bonds kept by the non residents also reflects the abolition of the financial barriers between countries. Besides, the fall of reserve kept by the central bank and the commercial banks in foreign exchanges reflects a more massive appeal to get financed at the level of the financial market.

The signs expected from this liberalization indication are positive, that is to say the increase of external liberalization augments the risk of banking crisis, in our econometric estimate, the signs are positive, which corroborates the theory.

2.3. Index of liberalization of interest rates

The index of liberalization of interest rates is built up with the same method as that of capitals (DFA). The data used are those of International Financial Statistics (IFS). As for capitals, the choice of variables is based on the availability of data, that's how the bank rate (759 observations) was kept; the money-market rate (659 observations); the interest rate on deposits (758 observations) and the interest rate on credits (759 observations).

However, after several estimates only 50 % of the original observations which are correctly classified one found on average. Moreover, by performing several trials through the step by step method they find only one single variable represents the indicator of interest rates. Statistical results are not very pertinent, that is why there was no interest in that method so the results were not kept. As a result, we represented the index of liberalization of interest rates directly by a rate of interest in the final econometric model (probit model).

2.4. Combined index of liberalization of capitals and of interest rates

Some works (Eichengreen and Arteta, 2000) showed the combined effect of the liberalization of interest rates and of capitals on banking crises. Indeed, according to their results internal liberalization (liberalization of interest rates) augments the likelihood of banking crises. However, external liberalization (liberalization of capitals) only has effect if it is associated with internal liberalization. This combined effect of internal and external liberalization is measured by a composite indicator which was called combined index of liberalization of capitals and of interest rates. This indicator is constructed by using at the same time data on capital flows and data on rates of interest. Thus we retained as exogenous variables the 12 variables which were already used in the construction of the index of liberalization of the capital plus the data on the discount rate, the rate of the money market, the interest rate on the deposits and the interest rate on the credits.

The endogenous variable is constructed by using the data base that has already been worked out on the dates of liberalization of capitals and of interest rates. This endogenous variable is a binary variable, it is equal to 1 if we have at the same time liberalization of capitals and of interest rates, it is equal to 0 if there is no liberalization in both sectors at the same time.

In the building of this indicator the method step by step was first used, but since this method did not lead to any results, the method of simultaneous introduction of data was used. The results of the second estimate were also kept, where the original classification was replaced by the classification got from the first specification. This method is often used by econometrists to lead to better results. The classification table shows that 100 % of original data are correctly classified and 91.5 of crossed validated observations are classified well (Table 23).

The results of the estimate are introduced in appendices (Table 26 and Table 27). The interest rate variables on credits (TCRE), the interest rate on deposits (TDEP), and direct investments from abroad in the economy, authorised capital, commitments (FDI_KS_E) have very high coefficients. However, as it is can be seen in Table 26, only the interest rate variables on credits (TCRE) is significant. Besides, the table of correlation shows us a strong correlation between the interest rate on credits and the interest rate on deposits (0,833); as well as a rather high correlation between the interest rate on deposits and direct investments from abroad in the economy (0,67). Therefore only the interest rate variable on credits for discrimination is going to be kept.

3. ESTIMATE OF THE PROBIT MODEL WITH COMPOSITE ERRORS

The valued model is written as follows:

$$Y_{it} = X_{it} \beta + \varepsilon_{it} \quad (1)$$

with $i = 1, \dots, N$; $t = 1, \dots, T$.

Y : the matrix of the indicatory variables of banking crises,
 β : the vector of N unknown coefficients to estimate,
 X : the matrix of explicative variables,
 ε_{it} : the matrix of residues, with $\varepsilon_{it} = u_i + v_{it}$
 u_i : the random effect specific to the countries,
 v_{it} : the residual random effect.

We have
$$\text{Var} [u_i + v_{it}] = [\varepsilon_{it}] = \sigma_u^2 + \sigma_v^2 \quad (2)$$

$$\text{Corr} [\varepsilon_{it}, \varepsilon_{is}] = \rho(\text{Rho}) = \frac{\sigma_u^2}{(\sigma_u^2 + \sigma_v^2)} \quad (3)$$

If $\rho(\text{Rho}) = 0$, therefore there is no random effect and it is necessary to estimate the model with fixed effects, on the contrary if Rho is different from zero, the model of random effects is justified.

Y_{it} is the matrix of the indicatory variables taking the value 1 when there is a banking crisis and the value 0, in the absence of a banking crisis. In that case the model can be written as follows:

$$P(Y_{it} = 1 / X_{i1}, X_{i2}, \dots, X_{iN}) = \Phi(X_{it} \beta) \quad (4)$$

where Φ is the spreading function this of ε_{it}

The likelihood associated with model can be written:

$$L = \prod_{t=1}^T \prod_{i=1}^N P(Y_{it} = 1 / X_{i1}, X_{i2}, \dots, X_{iN})$$

$$L = \prod_{t=1}^T \prod_{i=1}^N \Phi(X_{it} \beta)^{Y_{it}} \cdot [1 - \Phi(X_{it} \beta)]^{1 - Y_{it}}$$

Our study is based on annual data covering the period 1970-2002 and concerning 24 emergent countries (Table 23). The choice to work on annual data is explained by the difficulty in dating the periods of banking crises. Indeed, contrary to crises of exchange rate, there is not index that can be built up to assess banking crises. Even the rare studies which assessed the dates of banking crises like that of Demirgüç-Kunt and Detragiache (in 1998a), introduce annual dates of banking crises. These authors introduced several phenomena which point out the starting up of the banking crisis. These indicators are generally noticed over a period of time and cannot be determined at a precise time like the fluctuation of the exchange rate. As Hutchison and Glick (1999) specify it, it seems arbitrary to try to date banking crises using monthly or quarterly data.

The initial choice of variables is inspired from the economic theory and works performed in this domain. Then the method from general to specific was used, based the from Student to determine explicative variables. This method first consists in estimating the general model, with all explicative variables. Then, significant variables

will be kept only, and other variables, according to their importance in the economic theory and their econometric significativity will be progressively reintroduced again. The final model retained contains all significant variables and non significant variables, but which are important according to the economic theory.

The specification of the model includes as explicative variables: the growth rate of the real GDP per capita, the inflation rate, FDI, portfolio investments, monetary aggregate M2 in comparison with exchange rate reserves, the growth rate of the real bank deposits, external commitments of banks in comparison with the GDP, claims on private sectors in comparison with the GDP, claims on central government in comparison with the GDP, the international interest rate and the liberalization indexes. Details on the variables of the model are in an appendix.

The results of the estimates are summed up in the following table.

Table 22 *Results of the Probit model*

	(1)	(2)	(3)	(4)	(5)
Constant	-4,175 *** (-3,044)	-5,586 *** (-3,609)	-3,965 *** (-2,487)	-5,320 *** (-4,117)	-6,454 *** (-4,728)
LGDPR	0,060 (0,347)	0,307* (1,602)	0,062 (0,308)	0,277* (1,647)	0,399** (2,185)
T^XINF	-0,173 *** (-3,472)	-0,155 *** (-3,006)	-0,173 *** (-3,123)	-0,158 *** (-2,684)	-0,062 (-0,745)
FDI	-8,590 ** (-2,332)	-11,917 *** (-3,010)	-6,419 (-1,584)	-9,081* (-1,707)	-6,945 (-0,877)
IPF_GDP	-5,598 (-0,809)	-2,113 (-0,192)	-5,265 (-0,741)	-3,862 (-0,401)	-0,491 (-0,100)
M2RC	0,9791E-02 ** (1,944)	0,737 E-02 (1,985)	0,871E-02 ** (1,911)	0,649E-02* (1,866)	0,656E-02 (1,377)
T^XCRER	-0,774 *** (-3,811)	-0,745 *** (-3,290)	-0,776 *** (-3,509)	-0,748 *** (-4,239)	-0,142 (-0,712)
ENG	-0,045 *** (-3,221)	-0,035 *** (-2,952)	-0,041 *** (-2,511)	-0,035 *** (-2,541)	-0,028 *** (-3,744)
CRPV_GDP	3,719 ** (7,784)	3,409 *** (7,030)	3,791 ** (6,452)	3,614 *** (9,055)	3,412 ** (7,886)
CR_GDP	4,107 *** (8,113)	5,432 *** (6,641)	4,095 *** (6,797)	5,223 *** (5,464)	3,751 *** (5,675)
IUSA	0,046 (1,421)	0,069 ** (2,026)	0,049 (1,540)	0,061 ** (2,114)	0,100 *** (3,885)
LIBC	1,260 *** (2,638)		1,238 *** (3,005)		
LIBI	0,363 *** (3,884)		0,312 *** (3,393)		
LIBIC			-0,453 ** (-1,936)		
LIBC0		0,227 (0,879)		0,977 *** (2,366)	0,908 *** (2,407)
LIBI0		0,403 *** (2,468)		0,679 *** (3,440)	0,534 *** (2,349)

	(1)	(2)	(3)	(4)	(5)
LIBIC0				-1,079 *** (-2,736)	-0,971 *** (-2,841)
Number of obs	792	792	792	792	792
Number periods	33	33	33	33	33
Log Likelihood	-345,720	-349,626	-343,200	-343,976	-342,042
Pseudo R²	0,120	0,095	0,117	0,100	0,109
Total LR test (χ^2)	72,526	85,315	80,695	93,438	82,408
Probability (LR STATISTIC)	0,000	0,000	0,000	0,000	0,000

*: significant variable in 10 %

**: significant variable in 5 %

***: significant variable in 1 %

values in parentheses are t-student.

- (1) corresponds to the estimate of the model, using the index of liberalization of capitals constructed by the method of factorial differential analysis. Into this first estimate we have not introduced the combined index of liberalization of capitals and of interest rates yet. The degree of freedom of this specification is therefore 12.
- (2) corresponds to the estimate of the model, using the liberalization indexes, composed of indicatory variables, based on the dates of liberalization. In this estimate we have not introduced the combined index of internal and external liberalization yet. The degree of freedom of this specification is also 12.
- (3) corresponds to the estimate of the model using the liberalization indicators estimated by the factorial differential analysis. This specification of the model corresponds to the first specification, but by introducing the combined index of internal and external liberalization in it. The degree of freedom of this specification is therefore 13.
- (4) corresponds to the estimate of the model made up of 24 countries, using the liberalization indexes, composed of indicatory variables, based on the dates of liberalization. This specification of the model corresponds to the second specification, but by introducing the combined index of liberalization of interest rates and of capitals.
- (5) corresponds to the estimate of the model which includes liberalization indexes constructed from indicatory variables and whose other explicative variables have a period delay. Therefore this specification of the model distinguishes itself from the previous specification due to the fact that all exogenous variables (except liberalization indexes) are delayed by one year. The degree of freedom of this specification is therefore 13.

Before obtaining the results introduced in the table above we tried to estimate different specifications of the model by introducing other exogenous variables there. For example the growth rate of the real GDP, the growth rate of the real bank deposits, the report of bank reserves in comparison with the banking assets, the surplus or the budget deficit in comparison with the GDP, the balance of common transactions in the GDP and the monetary aggregate in the strict sense were introduced. At the beginning

of the estimates these variables seemed to us rather important to be introduced. Some of them were used in other empirical works to assess their effect on banking crises. For example the growth rate of the GDP was introduced into the logit model on the banking crises of Demirgüç-Kunt and Detragiache (1998a). This variable is more significant in this study. Bank reserves in comparison with the banking assets were used in several empirical works such as those of Demirgüç-Kunt and Detragiache (on 1998a) and, Komulainen and Lukkarila (2003), in these two studies this variable is not significant. Both variables budgetary surplus in comparison with GDP and the common transactions in comparison with the GDP were used in a probit model by Komulainen and Lukkarila (2003), to estimate factors affecting banking crises. The first variable is not significant, while the second is significant in 1 %, in this last study.

In our model, by studying different variables closely, a strong correlation between the growth rate of the real GDP and the inflation rate (-0,82) was found. And a strong correlation between the growth rate of the real bank deposits and the growth rate of real credit: T^XCRER (0,88). As the variable growth rate of the head GDP was introduced into our model we preferred to eliminate the variable growth rate of the GDP and keep the inflation rate. On the contrary to cut between the growth rate of the real bank deposits and the growth rate of real credit variables, we had to perform two distinct estimates by keeping each time one of the two variables. These two variables were significant in 1 % and there was the same quality of the model, therefore the choice was made in an arbitrary way and the variable growth rate of real credit was kept.

For the other variables they were introduced into a general model, since the method from general to specific was adopted, then we preferred not to keep them for a better quality of the model. In the absence of a common economic theory on banking crises, the initial choice of variables was based on empirical and theoretical studies on financial crises. On the contrary the final choice of the model was made after several estimates and the introduction of several variables, to choose the best specification which highlights the variables, likely to lead to or point out the happening of a banking crisis. It is possible to note that, in some specifications of the model, variable M1 (monetary basis in the strict sense) was significant in 1 % and the variable budgetary surplus in comparison with the GDP was 10 %. On the contrary, in no specification the banking reserves in comparison with the banking assets variables or the balance of common transactions in comparison with the GDP was significant. In the study of Komulainen and Lukkarila (2003) this variable is significant in 1 % while in our study it is not, this can be explained by a redundancy phenomenon or by the difference of the basic sample.

The results of estimates show that the inflation rates variables, direct foreign investments and real credits variables and external commitments variables are significant and negative, therefore the increase of these economic variables reduces the likelihood of a banking crisis. These results do not correspond to waited signs, since we expected a positive effect of these variables on the likelihood of banking crises. But

other studies found the same result as ours, for example Komulainen and Lukarila (2003), used a sample of 31 emergent countries over the period 1980-2001 to discern reasons of banking crises. The results of their probit model show that inflation rate, direct foreign investments and real credits variables are significant in 1 % but negative. On the contrary, the claims on private sector, the claims on central government and the indexes of internal and external liberalization are significant and positive. Therefore the increase of the claims on private, the increase of claims on central government and liberalization increase the likelihood of a banking crisis. These last variables always come out significant to 1 % whatever the specification of the model.

The interest rate variables of U.S and head real GDP per capita variables are significant only in the second, fourth and fifth specification of the model, which corresponds to models with indicatory variables like liberalization indexes. The positive sign of the U.S interest rates confirms the idea according to which the increase in the interest rates of developed countries favours the risk of crisis in the emergent countries (Eichengreen and Rose, 1998).

The positive sign of the GDP per capita variable, on the other hand, was little awaited. Indeed, this last variable shows the wealth level of the country, and its increase normally reduces the risk of banking crisis. It is also opposite to results of other studies like those of Demirgüç-Kunt and Detragiache (1998a, 1998b) and Mehrez and Kaufmann (2000). This result seems, however, to be robust, since this variable is significant in 5 %, in the model delayed by a period. In the study of Rossi (1999) this variable is significant in 5 % and positive, suggesting that the crisis is more probable in developed countries. The author offers two arguments to support this result, even though it is opposite to other studies.

First it introduces the idea of Lindren, Garcia and Saal (1996), according to which banking crises can happen at any time and at different development stages, which implies that the economic development is not a good criterion to identify the countries which are relatively more disposed to banking fragility. Then, and it is the most important argument, Rossi (1999) studies only the case of developing countries. In these conditions the positive sign of the GDP per capita implies simply that the developing countries which are more developed, have financial markets better spread, and are therefore more exposed to banking crisis risks. Our study is also interested in the emergent countries only, so we can support Rossi's idea (1999). So the dimension of the banking system is directly linked to the development of the country and there can be a critical level, above which, the banking system becomes large enough to augment the risk of financial fragility.

In some specifications of the model the variable M2 in comparison with exchange rate reserves is positive and significant (in 5 % or 10 %). This result shows that the increase of this variable augments banking vulnerability. This result complies with those got by Demirgüç-Kunt and Detragiache (1998a, 1998b, 1999) and Eichengreen and Arteta (2000). Some authors use this variable to measure the escape of capitals. Therefore it can be said that the flight of capital augments the likelihood of

banking crises. This variable is among the most robust results of Eichengreen and Arteta (2000), which explains that banking crises are launched (among others) by a pressure on reserves (in comparison with the debt of the banking system, approximated by M2).

When we define the variable of liberalization of capitals by an indicatory variable (columns (2) and (4)), we find back the result got by Eichengreen and Arteta (2000). Indeed, like in our estimate the authors find that this variable is not significant and so becomes once we introduce the combined index of liberalization of interest rates and of capitals. Through this result, the authors support that the liberalization of capitals has effect only if it is combined with a liberalization of interest rates.

To prove the robustness of results all explicative variables (except liberalization indexes) were postponed by one year to eliminate the impact of the crisis on economic variables. The some variables can be changed after the starting of crisis, and as a result they represent no longer fundamental reasons for crises but their consequence.

Column (5) sums up all the results got with a delay of 1 year. Results show that the inflation rate, direct foreign investments, M2's relation in comparison with exchange rate reserves and the real credits are not significant any more.

The international rate of interest is now significant in 1 %, while in other specifications it was significant in 5 % or 10 %. So, it is possible to confirm the robustness of results for external commitments, claims on private sector, claims on central government and variables of liberalization. The other interesting result is the positive effect of the variation of the rates of international interests on the banking crisis which is confirmed with a risk of error in 1 %, this result was hidden by the effects of causality of crisis on economic variables.

CONCLUSION

The studies on financial stability help to go deeply into the debate on the consequences of deregulation. Since any economic growth is durable only with a stability of markets, the study on the stability of financial markets is necessary to determine the conditions necessary for the smooth running of deregulation and risk exposures.

The first studies on the causes of crises highlighted weaknesses in the economic fundamentals of the countries affected by crisis. The mainly concerns excessive short-term foreign loans contracted by the government and the private sector and the volatility of the short-term capital flows. The recent studies are more and more emphasizing the important role of the weakness of the national financial systems in the starting or strengthening of crises. Our empirical results confirm results got in previous studies where liberalization accentuates banking crises. This effect is amplified by the instability of the macroeconomic and financial environment which could be measured thanks to different variables. Therefore the significativity of these variables with the variables of liberalization highlights reasons of banking crises. Indeed, financial liberalization is translated by the cancellation of the ceilings of the real interest rates and a reduction of barriers at the entry. These

phenomena lead to the fall of the frankness of banks, which encourages them into more risky behaviours. Caprio and Klingebiel (1997) showed among 86 episodes of insolvency of banks over the period 1980-1994 that at least 30 introduce high levels standards of bank loans. These authors also show that macroeconomic and microeconomic factors result in systematic crises. Premature liberalization could be mentioned in practically all cases. But a successful liberalization, as in the case of Chile, can also cause crises if there is no good control of the financial system.

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Appendices

Table 23 *Financial Liberalization and Banking Crises*

	Systemic Crisis	Non Systemic Crisis	Liberalization of Interest Rates	Liberalization of Capital
Africa				
South Africa		1977 / 1985/1989	1980	1985
East Asia				
Indonesia	1997-2002	1994	1983	1971
Malaysia	1997- 2002	1985-88	1978-82/1991	1973-93/1996
Philippines	1981-87 / 1997-2002		1981	1992
Singapore		1982	1973	1978
South Korea	1997- 2002		1984-88/ 1991	1985
Thailand	1983-87 / 1997-2002		1989	1997
Latin America				

	Systemic Crisis	Non Systemic Crisis	Liberalization of Interest Rates	Liberalization of Capital
Argentina	1980-82 / 1989-90 / 1995-1997 / 2001-2002		1977-81/1987	1976-81/ 1991
Brazil	1990/ 1994-99		1976-78/1989	1990-94/1998
Chile	1976 / 1981-86		1974-81/1984	1979-82/1985
Colombia	1982-87		1980	1991-92/1998
Mexico	1981-91 / 1994-97		1989	1989
Peru	1983-90		1980-84 /1990	1991
Uruguay	1981-84 / 2002		1980 ^b	1991
Venezuela	1994-97	1978-86	1981-83/89 /91-93/1996	1989-93/1996
Middle East				
Egypt	1980-85	1991-95	1991	1991
Morocco	Early years 1980		1996	1993
Israel	1977-83		1990	1977-78/1987
Jordan		1989-90	1988	2002
Tunisia		1991-95	1996	1993
Turkey	1982-85 /2000- 2002	1991/1994-95	1980-82 / 1988	1989
South Asia				
India		1993- 2002	1992	1994
Pakistan			1995	1994
Sri Lanka	1989-93		1980	1978

Sources : A.Demirgüç-Kunt and E.Detrégiache (1998), R.Glick and M. Hutchison (1999) and G. Caprio and D. Klingebiel (2003).

Table 24 Results of the classification (b, c) of the index of liberalization of capitals

	Allocation class for analysis 1	Allocation class foreseen envisaged (s)		Total	
		0,00	1,00		
Original	Enrolment	0,00	700	0	700
		1,00	58	67	125
	%	0,00	100,0	0,0	100,0
		1,00	46,4	53,6	100,0
Crossed Validated (a)	Enrolment	0,00	700	0	700
		1,00	65	60	125
	%	0,00	100,0	0,0	100,0
		1,00	52,0	48,0	100,0

The crossed validation is performed only for the observations of the analysis. In crossed validation, each observation is classified by functions derived from all other observations.

b 93,0 % original observations classified correctly.

c 92,1 % crossed validated observations classified correctly.

The table above gives us enrolments and frequencies of the original groups (raw data) and calculated groups (result of AFD). This table is made up of two parts. The first part of classifications is the one called "original" and which gives rather optimistic

results of the good classification. The estimate software provides us with crossed validated estimates which are not biased.

The differential function of the index of liberalization of capitals seems to have good classification results, with 93 % of original observations well classified and 92,1 % validated observations - junctions classified correctly. However, if the crossed-validated classification table is closed examined, we realise that these high rates are due to the good classification of cases of not liberalization (class 0) where 100 % cases are classified well. On the contrary for cases of liberalization (class 1) they find 52 % cases which are badly classified and attributed to the case of non liberalization.

Table 25 Results of the classification (b, c) of combined liberalization indication

		Allocation class for analysis 1	Allocation class envisaged (s)		Total
			0,00	1,00	
Original	Enrolment	0,00	320	0	320
		1,00	0	505	505
	%	0,00	100,0	0,0	100,0
		1,00	0,0	100,0	100,0
Crossed Validated (a)	Enrolment	0,00	309	11	320
		1,00	59	446	505
	%	0,00	96,6	3,4	100,0
		1,00	11,7	88,3	100,0

The crossed validation is performed only for the observations of the analysis. In crossed validation, each observation is classified by functions derived from all other observations.

b 100,0 % original observations classified correctly.

c 91,5 % crossed validated observations classified correctly.

The classification results seem to be very good with 100 % of original observations classified correctly and 91,5 % crossed validated observations well classified. The first part of the table shows us that 100 % of cases of non liberalization of capitals and of interest rates are classified well. Also 100 % of cases of liberalization are correctly classified. But these results are rather optimistic and it is the second part of the table that is going to give us enrolments as well as unbiased percentages. By looking closely at the classifications of crossed validated observations we found cases 11 (3,4 %) of non liberalization classified as cases of liberalization, which is negligible. On the contrary, 59 cases of liberalization are classified as cases of non liberalization, which corresponds to a 11,7 % rate, which remains after all a weak classification error ratio.

Table 26 Tests of equality of the group averages for combined liberalization index

	Lambda from Wilks	FR	ddl1	ddl2	Signification
TE	0,947	1,112	1	20	0,304
TMM	0,967	0,677	1	20	0,420
TCRE	0,822	4,330	1	20	0,051
TDEP	0,920	1,739	1	20	0,202
FDI_KS_E	0,950	1,060	1	20	0,316

	Lambda from Wilks	FR	ddl1	ddl2	Signification
FDI_TR_E	0,957	0,900	1	20	0,354
IP_E	0,989	0,227	1	20	0,639
MON_A	1,000	0,000	1	20	0,988
PRAP_LT_E	0,980	0,412	1	20	0,528
PRBQ_CT_E	0,997	0,051	1	20	0,824
PR_LT_E	0,998	0,040	1	20	0,844
PR_CT_E	0,973	0,549	1	20	0,467
MON_E	0,992	0,164	1	20	0,690
ENG_CT	0,997	0,054	1	20	0,818
RSV_DTS	0,990	0,206	1	20	0,655
RSV_DEV	0,974	0,529	1	20	0,475

Table 27 *Coefficients of canonical differential functions standardised for combined liberalization index*

	Function
	1
TE	2,780
TMM	-3,731
TCRE	17,612
TDEP	-19,166
FDI_KS_E	6,960
FDI_TR_E	-3,985
IP_E	-0,894
MON_A	3,007
PRAP_LT_E	-1,789
PRBQ_CT_E	0,732
PR_LT_E	-0,763
PR_CT_E	-2,579
MON_E	-1,964
ENG_CT	2,818
RSV_DTS	0,347
RSV_DEV	1,747



THE IMPACT OF REAL EXCHANGE RATE VOLATILITY ON SOUTH AFRICAN EXPORTS TO THE UNITED STATES (U.S.): A BOUNDS TEST APPROACH

Lira SEKANTSI*

Abstract: *This research paper empirically examines the impact of real exchange rate volatility on trade in the context of South Africa's exports to the U.S. for the South Africa's floating period January 1995-February 2007. In measuring real exchange rate volatility, this study utilised GARCH. After establishing the existence of cointegration among the variables involved in our two-country export model, we estimated long-run coefficients by means of ARDL bounds testing procedure proposed by Pesaran, et al.(2001). Our results indicate that real exchange rate volatility exerts a significant and negative impact on South Africa's exports to the U.S. Therefore, stable and competitive exchange rate and sound macroeconomic fundamentals are required in order to improve international competitiveness and greater penetration of South African exports to international markets.*

Keywords: *Exchange rate volatility, Autoregressive distributed lag (ARDL), Generalised Autoregressive Conditional Heteroskedasticity (GARCH) Bounds testing, unit root, Error Correction model, Cointegration*

JEL Codes: *F10, F31*

1. INTRODUCTION

After breakdown of Bretton Woods system of fixed exchange rates in 1973, several countries adopted floating exchange rates system in order to reduce protectionist tendencies and promote trade as well as to gain overall macroeconomic independence, by bearing the burden of adjustment vis-à-vis imbalances in the current and capital accounts of the balance of payments. The countries adopted flexible exchange rates regime despite its exposure to exchange rate volatility, which is a threat to the growth of international trade and macroeconomic stability, because of the presence of hedging facilities that would be employed to protect one against exchange rate risk. However, the birth of this new system of exchange rate has engendered a 'hot' and extensive theoretical debate regarding the impact of exchange rate variability on foreign trade (Johnson, 1969; Kihangire, 2004).

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One strand of theoretical models in the literature²³ demonstrates that increased risk associated with exchange rate volatility is more likely to induce risk -averse agents to direct their resources to riskless economic activities since such variability generates uncertainty which increases the level of riskiness of trading activities and this will eventually depress trade. According to these economists, this occurs because markets may be imperfect particularly in less developed countries (LDCs) and also because hedging may not only be imperfect but also very costly as a basis for averting exchange risk. Hence in line with risk-aversion hypothesis exports may be negatively correlated with exchange rate volatility (Doroodian, 1999; Krugman, 1989).

On the contrary, other theoretical models in the literature²⁴ show that higher risk associated with fluctuations in exchange rates present greater opportunity for profits and thus should also increase trade. According to Aziakpono, et al. (2005), this occurs because if exporters are sufficiently risk-averse a rise in exchange rate variability leads to an increase in expected marginal utility of exports revenue which acts as an incentive to exporters to increase their exports in order to maximise their revenues.

This ambiguity in the theoretical literature causes similar ambiguity and inconsistencies in the empirical investigation of the effects of exchange rate volatility on exports flows. De Vita and Abbott (2004) associate this lack of a clear and consistent pattern of results with no consensus on whether exchange rate volatility should be measured on the basis of nominal or the real exchange rate, failure of the studies to reach consensus on the statistical technique that should be employed to construct the optimal measure of exchange rate volatility , the failure of some studies to consider the time series properties of the regressors entering the export equation and last, the use of aggregate data which constrains volatility estimates to be uniform across countries and the sectors of the economy in lieu of disaggregated markets and sector –specific data.

The impact of exchange rate volatility on trade has been studied more in industrialised countries than in less developed economies. Aziakpono, et al.(2005) and Vergil(2002) state that this lack of attention in developing countries is caused by insufficient time series data. According to Klaassen (1999) there is a need for this kind of empirical studies to be undertaken in developing countries (such as that are in Sub-Saharan Africa(SSA)) with time-variant exchange rates in order to counter this prevalent ambiguity in the literature and fill the research vacuum in less developed countries.

As an open and middle income country in SSA, South Africa is not an exception to this debate because ever since it adopted flexible exchange rates system in the mid 1990's to complement its outward looking trade policy which ensued export-led growth, its currency, Rand with over half of the South African transactions taking place offshore, has been very volatile. 'It has witnessed consistent depreciation of exchange

²³ See Hooper and Kohlhagen, 1978; Clark, 1973; Mundell, 2000; Doroodian, 1999; Peree and Steinherr, 1989; among others.

²⁴ See De Grauwe, 1988; Asseery and Peel, 1991; Chowdhury, 1993 among others

rate to the lowest level in December 2001' and has experienced a sharp appreciation henceforth (see Todani & Munyama, 2005, p.1), subjecting South African importers and exporters to uncertainty regarding their payments and receipts in home currency terms (Aziakpono, et al., 2005).

As stated by Aziakpono, et al.(2005) and Todani and Munyama(2005) this requirement by South African government to promote exports in an environment of flexible exchange rates which poses increased Rand volatility requires comprehensive understanding of how this highly fluctuating Rand impacts upon South African exports and the resultant effects on the economy at large. Hence this paper serves to fill the research vacuum on whether the Rand volatility engenders uncertainty with regard to profits and whether it impacts negatively on exports production in South Africa since, currently, there is little empirical evidence on the impact of exchange rate volatility on South African exports. Acquisition of such knowledge is, in fact, crucial for the design of both exchange rates and trade policies. For example, if the policy makers are knowledgeable about the volatility of exchange rates they could always ensure that trade-adjustment programs that put emphasis on export expansion are successful. In addition, possession of such knowledge would also make policy-makers to ensure that the intended effect of trade liberalisation policy is protected from volatile exchange rates in order to safeguard the country from balance of payment crises (Arize, et al., 2000).

In this study the main research question is 'What is the impact of real exchange rate volatility on South African exports to the U.S.?' In addressing this question we consider the afore-mentioned contentious issues and use GARCH (1, 1) as a measure of real exchange rate volatility. After estimating real exchange rate volatility we examine the existence of long-run relationship between real exports and the regressors, namely foreign income, real exchange rate and real exchange rate volatility. Due to the differences in the order of integration of the variables we apply ARDL bounds testing procedure proposed by Pesaran, et al. (2001) on both South African aggregate exports and goods exports to the United States. Now since the existence of cointegration implies the presence of short-dynamics associated with that long-run relationship, the study further examines the speed of adjustment of the variation in exports in the short-run and lastly provides policy recommendations. Unlike other studies carried out in South Africa, we also pay attention to sample period selection to avoid any exchange rate regime switches and also take the issue of trade integration between South Africa and the U.S. into consideration.

2. REAL EXCHANGE RATE VOLATILITY OF THE RAND AND SOUTH AFRICAN EXPORTS PERFORMANCE

As an open and middle income country, South Africa considers exchange rate as a key macroeconomic policy instrument that ensures export promotion and economic growth. SARB's exchange rate policy aims at providing an environment that promotes

exchange rate stability and assists the government’s objective of accomplishing export-led growth (Bah & Amusa, 2003). In line with this, the adoption of the outward-looking trade policy ensured export growth that led to long-term economic growth. The increased liberalisation of trade and foreign exchange controls, exports promotion policies like General Export Incentive Scheme (GEIS) and multilateral trade agreements such as African Growth and Opportunity Act (AGOA) have led to greater penetration of South Africa exporters to the international markets such as the U.S. market. As a result, the ratio of exports to GDP has accelerated substantially from 24.5 percent in 1996 to about 32.71 percent in 2002. This is shown in Figure 2 below:

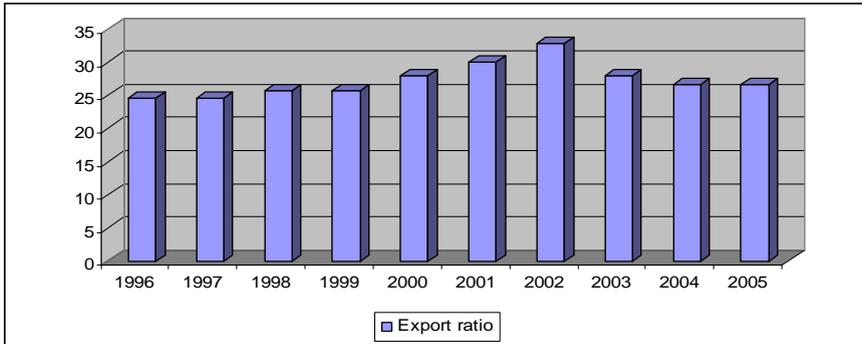


Figure 2 South African Exports as a Percentage of GDP

Source: South Africa Department of Trade and Industry

However, the current flexible exchange rate regime has led to greater volatility of the Rand against the major currencies such as the U.S. dollar and such variability has implications for South Africa’s exports. Figure 3 below shows the performance of South Africa’s exports to the U.S. alongside the bilateral real exchange rate volatility:

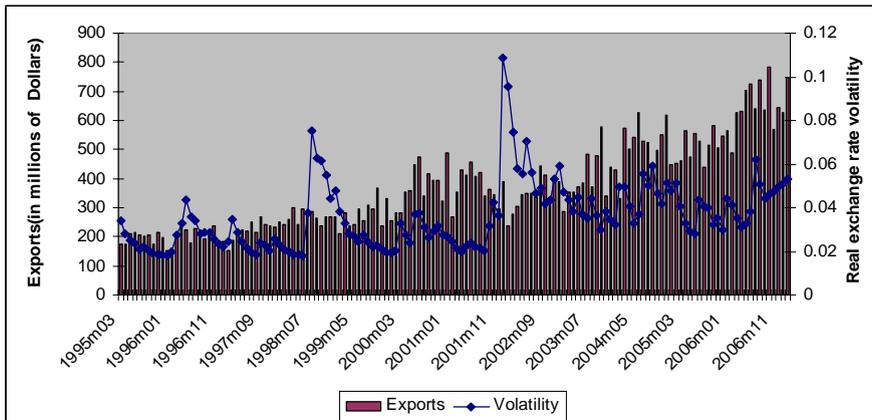


Figure 3 Real Exchange Rate Volatility and South Africa’s Exports Performance

Source: IMF international Financial Statistics

As shown in Figure 3 above periods of low real exchange rate volatility were associated with increase in the growth of exports but those periods of high real

exchange rate volatility such as 1998,2001 and 2002 were associated with a sharp decline in exports. This implies that real exchange rate volatility impacts negatively on South Africa's exports to the U.S. Since we can witness the importance of exports to the growth of South Africa's GDP, this implies that the effects of the volatility of the Rand should not be taken for granted but should be carefully considered by policy makers. Hence, this suggests a need for empirical research that provides further insight into the extent to which this variability of the real exchange rate impacts on exports and to provide possible suggestions of ways to control or alleviate it (See also Azaikpono, et.al, 2005, p.5).

3. REVIEW OF THE LITERATURE

A broad and comprehensive review of the literature on the relationship between real exchange rate volatility and trade shows that there are theoretical models that postulate both positive and negative effects of the exchange rate volatility on trade. However, earlier empirical evidence, using different measures of exchange rate volatility, usually fails to establish statistically significant relationship between exchange rate variability and volume of trade, where such a relationship is established the coefficient of exchange rate volatility is either negative or positive.

More recent studies that utilize cointegration /error correction framework and also take into account the time-series properties of the data and the fact that the effects of exchange rate volatility varies across markets by using disaggregated data in lieu of aggregate data which constrains volatility estimates to be uniform across countries and the sectors of the economy gain greater success in finding a statistically significant relationship between exchange rate volatility and volume of trade.

The impact of exchange rate volatility on trade has been studied more in industrialised countries than in developing or emerging markets economies. In the context of South Africa such a relationship is still unknown since, to the best of our knowledge, Bah and Amusi (2003), Azaikpono, et al. (2005) and Todani and Munyama (2005) are the only published empirical studies²⁵ on this issue. These studies, undertaken in the context of cointegration, are summarized below.

Bah and Amusi (2003) used ARCH and GARCH models to examine the effect of real exchange rate volatility on South African exports to the U.S. for the period 1990:1-2000:4. The findings are that Rand's real exchange rate variability exerts a significant and negative impact of exports both in the long and short-run. The similar study by Azaikpono, et al. (2005) extends the work of Bah and Amusa (2003) over the period 1992:1-2004:4 by employing EGARCH method proposed by Nelson (1991) as a measure of variability of exchange rate. The results of the latter boil down to those reached by the former.

²⁵ And despite being few those studies are also fraught with ambiguity regarding the impact of exchange rate volatility on trade.

Another study by Todani and Munyama (2005) employed ARDL bounds testing procedure on quarterly data for the period 1984-2004 to examine the impact of exchange rate variability on aggregate South African exports to the rest of the world as well as on goods, services and gold exports. Todani and Munyama (2005) employed the moving average standard deviation and GARCH (1, 1) as measures of variability. The results show that depending on the measure of variability employed either there exists no statistically significant relationship between South African exports and exchange rate volatility or when such significant relationship exists it is positive.

3.1 Model Specification

This study follows Aziakpono, et al. (2005) by adopting the two-country model of international trade specified as

$$X_t = \beta_0 + \beta_1 Y_t + \beta_2 Q_t + \beta_3 V(h)_t + \beta_4 D + \varepsilon_t \quad (1)$$

where X_t denotes logarithm of real exports (nominal exports deflated by consumer price index (CPI)), Y_t is the logarithm of real foreign income (proxied by U.S. industrial production) and is used as an indicator of demand for South African exports. Q_t denotes relative prices which acts as an indicator of external competitiveness and is measured as a logarithm of real exchange rate. $V(h)_t$ denotes the measure of real exchange rate volatility and measures uncertainty/risk associated with exchange rate fluctuations. β_0 and ε_t are an intercept parameter and a normally distributed error term. We also include a dummy variable, D , to represent trade integration between South Africa and U.S. because since the year 2000 these two countries have been in bilateral trade agreements such as African Growth and Opportunity Act (AGOA) which increased South African exports to the U.S.. Thus, our export demand equation therefore states that exports of South Africa are linearly dependent on foreign income, relative prices, South Africa-U.S. trade integration and uncertainty brought about by fluctuations in real exchange rates.

Economic theory dictates that β_1 is expected to be positive since an increase in the real income of trading partners should lead to greater volume of exports to those partners. Depreciation in real exchange rate (an increase in the level of directly quoted exchange rate) may lead to a rise in exports as a result of relative price effect, hence β_2 is expected to be positive (Aziakpono, et al., 2005; Todani & Munyama, 2005). Trade theory is not clear about the sign of β_3 , which is the main basis for this empirical research.

3.2 Variable definitions and data sources

This study uses monthly over the South Africa floating period 1995:1 to 2007:2. This sample period is chosen in order to remove specification problems that may arise as a result of the change in the exchange rate policies of South Africa from that of the previous years. The data for South African total (aggregate) nominal exports to the U.S was obtained from IMF's International Financial Statistics (Direction of Trade

Statistics) database whereas nominal South Africa exports of goods to the U.S. were gathered from the U.S. Census Bureau and both were expressed in terms of U.S. dollars. Following Aziakpono, et al. (2005) we express South Africa's exports in real terms by deflating them using the U.S consumer price index (CPI). Although, economic theory requires that quantity rather than value be used, we use this in value terms²⁶ since trade data in South Africa are available in value terms rather than in terms of volume. U.S industrial production was directly observable and gathered from IMF's International Financial Statistics database.

Following Aziakpono, et al. (2005), Bilateral (real) exchange rates (RER) between South Africa and the U.S. was derived from monthly and directly quoted nominal exchange rates (ER) for the South African Rand against U.S. dollar as follows:

$$RER = \frac{(ER \times CPIUS)}{CPISA} \quad (2)$$

where *CPISA* and *CPIUS* are SA and Consumer price index and U.S. price index respectively Consumer Price indices and nominal exchange rates were gathered from the IMF's International Financial Statistics database. Real exchange rate volatility is not directly observable and its measurement is discussed in section 5.

3.3 Estimation Technique: Autoregressive Distributed Lag (ARDL) Bounds Testing Approach

According to Gujarati (2003) and Veerbiik (2004) there are various econometric techniques that can be employed to estimate equation (1). If all the variables are stationary or $I(0)$, then equation (1) can be simply estimated by ordinary Least squares (OLS). On the other hand if some or all variables are integrated of order one or $I(1)$, the data is first of all transformed by differencing before applying OLS on the first differences. If there exist some cointegration among the variables in equation (1), then there are a number of cointegration approaches that can be applied. Some principal approaches to cointegration analysis are the Engel and Granger (1987) two-step residual-based procedure and the Johansen (1991, 1995) maximum likelihood reduced rank procedure. These two techniques require a certain degree of pre-testing to ensure that all the regressors are $I(1)$. This is necessary because the standard statistical inference based on conventional cointegration tests becomes invalid in the presence of the mixture of $I(0)$ and $I(1)$ explanatory variables. For instance, the trace and maximum eigenvalue tests from the Johansen approach becomes difficult to interpret in the presence of stationary series in the model because $I(0)$ variables are likely to generate spurious regression with other variables in the system (De Vita & Abbott, 2004). In addition, these two cointegration techniques do not provide robust results in finite samples (Narayan & Narayan, 2004).

This empirical research borrows methodological technique from Aguirre, et al. (2003), De Vita and Abbott (2004) and Todani and Munyama (2005) by utilising ARDL bounds testing approach proposed by Pesaran, et al. (2001). Unlike the afore-

²⁶since changing data back into price and quantity components often raises difficulties and complexities

mentioned approaches to cointegration, this procedure allows testing for the existence of a level relationship between a dependent variable and a set of regressors regardless of whether the underlying regressors are $I(0)$, $I(1)$ or mutually cointegrated. Another advantage of ARDL bounds testing procedure is that it has better small-sample properties than both the Johansen (1991, 1995) maximum likelihood reduced rank and Engel and Granger (1987) procedures. Furthermore in the context of ARDL framework OLS estimators of the short-run parameters are [square root of (T)]-consistent and the estimators of the long-run parameters are super-consistent in small sample sizes (Pesaran & Shin, 1999).

In order to implement the bounds testing approach, equation (1) is modelled into a conditional ARDL-ECM as follows:

$$\begin{aligned} \Delta X_t = & c_0 + c_1 t + \pi_1 X_{t-1} + \pi_2 Y_{t-1} + \pi_3 Q_{t-1} + \pi_4 V(h)_{t-1} + \pi_5 D + \sum_{i=1}^n \alpha_i \Delta X_{t-i} \\ & + \sum_{j=0}^m \beta_j \Delta Y_{t-j} + \sum_{k=0}^p \delta_k \Delta Q_{t-k} + \sum_{r=0}^q \phi_r \Delta V(h)_{t-r} + \xi_t \end{aligned} \quad (3)$$

where c_0 and $c_1 t$ are the drift and trend components, D is the dummy variable representing South Africa-U.S. bilateral trade agreement. ξ_t is assumed to be a vector of white noise error processes and the rest of the variables are as defined in equation (1). As stated by De Vita and Abbott (2004) the structure of the first difference of the explanatory variables is set to ascertain that there is no serial correlation in the estimated residuals. Y_t , Q_t and $V(h)_t$ are regarded as long-run forcing variables for X_t , so there is no feedback from level of X_t in equation (3).

The first step in estimation is to run OLS on the conditional ECM in (3) and determine or select the optimal structure for the final ADRL specification by following general-to-specific approach which involves selecting the best specification by starting with a maximum lag order of 18 ($\max n = \max m = \max p = \max q = 18$), and then dropping out all insignificant stationary regressors (Shin and Yu, 2006).

Having determined the optimal structure for the ARDL specification of the short-run dynamics, the next step is to test the existence of a long-run relationship between the variables involved in the export demand equation. This is done by conducting the null hypothesis of 'no cointegration' using an F-statistics for the joint significance of lagged levels of variables involved in the error correction model (3), so that $H_0: \pi_1 = \pi_2 = \pi_3 = \pi_4 = 0$. According to Pesaran, et al. (2001) the asymptotic distribution of F-statistic is non-standard under the null hypothesis of the absence of level relationship between the included variables, regardless of whether the regressors are purely $I(0)$, purely $I(1)$ or mutually cointegrated. The decision rule is made on the basis of F-statistic which is compared with the critical value tabulated by Pesaran, et al.²⁷ (2001). If the computed value of the F-statistic in the ECM is greater than the

²⁷ These encompass a range of various deterministic components which are: no drift and no trend, unrestricted intercept and no trend, restricted intercept and no trend, unrestricted intercept and unrestricted trend, and unrestricted intercept and restricted trend.

upper bound, then a conclusive inference can be made that there exist a long-run relationship between the variables without needing to know the order of integration of the regressors. However, if the F-statistic falls below the lower bound the null hypothesis of absence of a long-run relationship among the variables under analysis cannot be rejected. If the computed F-statistic falls inside the critical value bounds, inference is inconclusive and knowledge of the order of integration is required prior to making conclusive inferences. When the knowledge about the order of integration is obtained and it is found that all the regressors are I (1), this test reduces to the no cointegration test so that the null hypothesis means no cointegration. In this case the decision rule is simplified as follows: if the value of the F-test is greater than the upper bound we reject the null, otherwise we do not reject the null. Therefore extra information that the order of integration of the regressors is I (1) removes an inconclusive region (Pesaran, et al., 2001).

As suggested by Pesaran and Shin (1999), once the existence of a long-run relationship is established, the following conditional long-run model for X_t can be obtained from the reduced form solution of equation (3) when $\Delta X = \Delta Y = \Delta Q = \Delta V(h) = 0$:

$$X_t = \Theta_1 + \Theta_2 t + \Theta_3 Y_t + \Theta_4 Q_t + \Theta_5 V(h)_t + \mu_t \quad (4)$$

where $\Theta_1 = -c_0/\pi_1$, $\Theta_2 = -c_1/\pi_1$, $\Theta_3 = -\pi_2/\pi_1$, $\Theta_4 = -\pi_3/\pi_1$, $\Theta_5 = -\pi_4/\pi_1$, and it is assumed that μ_t is an $IID(0, \sigma^2)$ error process. That is, the estimates of the long-run coefficients are given by $\hat{\Theta}_3 = -\hat{\pi}_2/\hat{\pi}_1$, $\hat{\Theta}_4 = -\hat{\pi}_3/\hat{\pi}_1$ and $\hat{\Theta}_5 = -\hat{\pi}_4/\hat{\pi}_1$ ²⁸.

4. EMPIRICAL ESTIMATION AND RESULTS ANALYSIS

We construct a measure of real exchange rate volatility first before we examine the nature of our data and then continue to undertake ADRL Bounds testing procedure for cointegration.

4.1 Measuring Real Exchange Rate Volatility

Previous empirical studies in the literature have used different statistical measures of exchange rate volatility. However, most of these studies have applied standard deviation method. The standard deviation method has two distinct shortcomings. Firstly, it wrongly assumes that the empirical distribution of the exchange rate is normal and secondly, it discards the distinction between predictable and unpredictable elements in the exchange rate (Bah & Amusa, 2003; Aziakpono, et al., 2005).

We use the conditional variance of the first difference of the logarithm of real exchange rate to model exchange rate volatility and we assume that the first difference

²⁸ Note that these are the estimates of long-run coefficients of β_1, β_2 and β_3 .

of the logarithm of real exchange rate can be represented by the following autoregressive process:

$$\Delta \log RER_t = \alpha_0 + \delta_1 \Delta \log(RER_{t-1}) + \mu_t, \mu_t / \Omega_{t-1} \sim N(0, h_t^2) \quad (5)$$

where α_0 is a constant, δ_1 is a coefficient, $\Delta \log(RER_t) = \log(RER_t / RER_{t-1})$ and RER_t denotes Rand/U.S. Dollar real exchange rate. This conditional variance is estimated by the simplest version of GARCH called GARCH (1, 1) proposed by Bollerslev (1986) given by:

$$h_t^2 = \text{Var}(\mu_t / \Omega_{t-1}) = \lambda_0 + \phi_1 \mu_{t-1}^2 + \delta_1 h_{t-1}^2 \quad (6)$$

where h_t^2 denotes the conditional variance of real exchange rate, and λ_0 , ϕ_1 and δ_1 are the parameters to be estimated, μ_{t-1}^2 are the squared residuals generated from equation (5), called ARCH term and measures information about volatility in the previous period and where h_{t-1}^2 is the GARCH term representing the last period's forecast variance. This GARCH (1, 1) model states that the conditional variance of a time series is dependent upon the squared residuals of the process and has the advantage of including heteroskedasticity into the estimation procedure of the conditional variance (as referenced by Choudhry, 2005).

The following inequality restrictions, $\lambda_0 > 0$, $\phi_1 > 0$, $\delta_1 > 0$ are imposed to ascertain that the conditional variance (h_t^2) from the GARCH (1,1) model is always positive. According to Choudhry (2005) the size and significance of ϕ_1 demonstrates the presence of ARCH process in the residuals (volatility clustering).

We adopt GARCH (1, 1) process because it is parsimonious since it has only three parameters in the conditional variance equation and is used quite often in academic finance literature as a result of its sufficiency in capturing volatility clustering. GARCH (1, 1) model also avoids overfitting and is less likely to breach non-negativity constraints (Brooks, 2002). The results from equation (6) may be interpreted as the exporters' prediction of the variance of the real exchange rate in the current period. Hence the predicted value of the conditional variance in equation (6) provides us with the measure of real exchange rate volatility of Rand against the U.S. dollar.

In this GARCH(1,1) model when $\phi_1 + \delta_1 < 1$ the variance process exhibits mean reversion to the unconditional expectation given by $\lambda_0 / (1 - \phi_1 - \delta_1)$. If $\phi_1 + \delta_1 < 1$, this implies persistence of a forecast of the conditional variance over all finite horizons and infinite variance for the unconditional distribution of μ_t . That is to say the current shocks continue to exist indefinitely in conditioning the future variance and such a model is called Integrated -GARCH or IGARCH model. However as the sum of these two coefficients approaches unity this implies that the persistence of shocks to conditional variance (volatility) is greater and the rate of decay of the shock is slower (Choudhry, 2005).

Before estimating GARCH (1, 1) model, we first test for the presence of the ARCH effects in the real exchange rate process by using the LM-ARCH test. In testing for ARCH effects, we follow the normal procedure of collecting residuals from equation (5), square them and then regress them on q lags of their own. Then R^2 obtained from this regression is multiplied by the number of observations in order to construct the test statistic that is distributed as a chi-square. The decision rule for this test is such that if the value of the test statistic is greater than the critical value from chi-square distribution, the null hypothesis of no ARCH effects is rejected and vice-versa (Brooks, 2002).

The test for ARCH effects was carried on the basis of the residuals obtained from equation (5). Estimation results gave LM statistic and F-statistic of 3.67 and 3.68 respectively, both of which are very significant at 10 percent level suggesting the presence of ARCH effects in the real exchange rate series. This allows us to continue with the estimation of the GARCH (1, 1) process in equation (6). Estimation of GARCH (1, 1) model was done assuming student-t density distribution for the conditional distribution of the errors because the unconditional distribution of many financial time series such as exchange rates seems to have heavier tails than allowed by the normal distribution (Bollerslev, 1987). The results of the GARCH (1, 1) estimation are shown in Table 31a in the Appendices. This model is significant, and the Wald test for the null that the coefficients are equal to zero is significantly rejected at 5 percent level. Therefore variability is time-varying and shocks are persistent. We also note that $\square_1 + \delta_1$ is approximately equals to unity. Now suspecting that the process might be IGARCH(1,1), we tested the null hypothesis that $\square_1 + \delta_1$ and results from the test suggested that the process is indeed IGARCH(1,1) implying non-stationarity in variance which has undesirable properties such as no convergence of the conditional variance forecast upon the long-term average value of the variance as the prediction horizon increases (Brooks,2002).

However Nelson (1990)²⁹, as referenced by Patterson (2000) and Hamilton (1994), states that this process is stationary in the sense that the conditional variance tends to unconditional (long-run) variance despite $\square_1 + \delta_1$. Hence our GARCH (1, 1) process is stationary in the strict sense. Therefore we conclude that Rand to dollar real exchange rate follows the GARCH process and the conditional variance can be used as measure of exchange rate volatility (Kikuchu, 2004).

4.2 Preliminary Data Examination

In this study we plot all other variables except real exchange rate volatility in their logarithm forms and real exchange rate volatility in its level form against time in order to have an idea of how they behave as time progresses. Figure 4-Figure 8 in the appendices show the plots of these variables. We observe from these plots that only real exchange rate and its volatility indicate a change in the pattern of their movements. While real exchange rate shows a change in pattern of movement since 2002 when it

²⁹ Theorem 1 and 2

started to appreciate and correcting back to its long term trend after following a weakening trend, its volatility tends to show a change in pattern in 1998 when it fluctuated (showed a significant jump) after which it corrected to long term trend and then started to fluctuate again since 2002.

4.3 Unit Root Test Results

Testing for the stationarity of economic time series is crucial since standard econometric methodologies assume stationarity in the time series while they are, in fact, non-stationary and thus leading to inappropriate statistical tests and erroneous and misleading inferences. Despite the fact that ARDL bounds testing procedure adopted in this study does not necessarily require knowledge about the order of integration of the variables involved in the export equation, we need to check for the stationarity of each data series before undertaking any estimation. We employ Augmented Dickey Fuller (ADF) test which is based on the regression equation with the inclusion of a constant but no trend and regression equation with both constant and trend. Unit root test results are presented in Table 28 below:

Table 28 *ADF Unit Roots Test Results*

Variables	ADF statistic	5% critical value
X_t	-1.5759	-2.8832
X_t^*	-1.4585	-2.8832
Y_t	-2.7147	-3.4440
Q_t	-2.1050	-2.8832
$V(h)_t$	-3.9393	-2.8835

Note: X_t^* denotes logarithm of real exports of good while X_t is the logarithm of total real exports. The lag order for the series was determined by Schwarz information criterion (SBC). All variables includes an intercept and Y_t includes an intercept and trend

Unit root test results in Table 28 above indicate that all other variables; X_t , Y_t and Q_t are I(1) whereas $V(h)_t$ is I(0). This rules-out our suspicion that real exchange rate volatility is non-stationary and conforms with Nelson (1990)'s theorem that this process may still be considered stationary in a strict sense. The differences in the order of integration of the variables involved in the export model therefore justify why we have adopted ARDL bounds testing procedure advanced by Pesaran, et al. (2001).

4.4 Estimation of Error Correction Model (ECM)

Having undertaken unit root testing and found that ARDL bounds testing approach is appropriate, we use general-to-specific approach to estimate the ECM in equation (3) whereby we start with a maximum lag order of 18 and in each stage drop out all insignificant stationary regressors until the best specification is obtained. As we have earlier mentioned, a dummy variable was included in the equation to take into account bilateral trade agreement between South Africa and the U.S. which also plays an influential role in the growth of South African exports to the U.S. This dummy

variable was given a value 'one' for the period 2001m1- 2007m2 and value 'zero' elsewhere. The estimation results of ECM model in equation (3) for both aggregate exports and goods exports models are presented in Table 32a and Table 33a in the appendices. These results suggest that the ECM for both aggregate exports and goods exports models is correctly specified since all the diagnostic tests are satisfactory and the coefficients involved in the model are all statistically significant at 5 percent level.

4.5 Cointegration Analysis

Now that our ECM for both aggregate exports and goods exports models is adequately estimated, we proceed to employ ARDL bounds testing to test the null hypothesis that lagged levels of the variables involved in the ECM of both aggregate exports and goods exports models are jointly equal to zero. As we have earlier mentioned, this test is based on F-statistic which is non-standard and critical values are presented by Pesaran, et al.(2001) regardless of whether the variables are purely I(0) or purely I(1). The results for this test are presented in Table 29 below:

Table 29 Variable Deletion test: Null of no Cointegration

	F-statistic	Table CI(iv) K=3	Decision rule
Aggregate exports ECM	25.54	(4.01,5.07)	Reject null
Goods exports ECM	27.84	(4.01,5.07)	Reject null

Note: Critical bound is based on 5 percent level

The results in Table 29 above indicate that there exists a long-run relationship between exports (both aggregate and goods exports), and real exchange rate, its volatility, and foreign income. This is denoted by the F-statistics that are greater than the upper bounds and thus significantly rejecting the null hypothesis of no level relationship between these variables at 5 percent level.

The establishment of the long-run relationship among the variables involved in the export equations allows us to proceed with the estimation of the long-run parameters in equation (4) following a procedure advanced by Pesaran, et al.(2001) available in the Microfit software written by Pesaran and Pesaran (1997). Estimates of the long-run coefficients for both the aggregate exports and goods exports models are presented in Table 30 below:

Table 30 Long-run Coefficients

Variables	Aggregate exports model		Goods exports model	
	Coefficient	t-ratio	Coefficient	t-ratio
Y_t	1.97	2.6831[.008]	1.56	2.2306[.027]
Q_t	-0.14	-1.0866[.279]	-0.19	-1.4537[.148]
$V(h)_t$	-2.76	-2.2903[.024]	-2.50	-2.0331[.044]

Note: The numbers in parentheses next to the t-ratios are p-values

As reported in Table 30 above all long-run coefficients (foreign income and real exchange rate volatility) except real exchange rate present the *a priori* expected signs

that are statistically significant at 5 percent level. That is, foreign income bears a significant positive sign and has a coefficient of 1.97 and 1.56 for aggregate exports and goods exports models respectively. For aggregate exports model this implies that an elasticity of aggregate South African exports with respect to foreign income is 1.97 (a 1 percent increase in foreign income leads to 1.97 percent increase in aggregate South African exports to the U.S.). For goods exports model, it implies that a 1 percent increase in foreign income increases South African goods exports to the U.S. by 1.56 percent.

We observe that for both aggregate exports and goods exports models the long-run income elasticities are greater than unity and these values for these income elasticities are consistent with estimates obtained by other studies in terms of the positive sign. Riedel (1988) maintains that in aggregate or single country export demand estimations for both developed and less developed countries, the coefficients of income elasticities generally lie between 2.0 and 4.0. However in our case these income elasticities for aggregate exports and goods exports models are less than 2. If these income elasticities were relatively high in magnitude, then several explanations could be made. According to Adler (1970) different elasticities of income reflect the degree to which exports have been adapted to the local tastes of the importing country, where higher income elasticity indicates greater adaption. On the other hand, Riedel (1988, 1989) conjectured that higher income elasticities reflect insufficient treatment of supply of exports.

A significant negative coefficient, -2.76, for real exchange rate volatility in the case of aggregate exports model implies that an absolute 1 percent increase in the variability of the Rand per Dollar real exchange rate reduces aggregate South African exports to the U.S by 2.76 percent. In the case of the goods exports model, a significant negative coefficient of -2.50 for real exchange rate volatility has the implication that an absolute 1 percent increase in the volatility of the Rand per U.S. Dollar real exchange rate decreases South African goods exports to the U.S. by 2.50 percent.

The observed negative impact of real exchange rate volatility on South African exports to the U.S. is consistent with findings of Bah and Amusa (2003) and Aziakpono, et al. (2005). This negative variability effect supports the hypothesis that South Africa exporters are risk-averse and hence they tend to reduce their exports to international markets (U.S.) and produce more for domestic market in order to secure relatively certain profits rather than uncovered profits which are subject to exchange rate fluctuations. According to Doroodian (1999), this may be attributed to lack of well-developed hedging facilities and institutions in South Africa that can protect exporters against exchange risk.

Now from the policy perspective, while South Africa needs to maintain competitive exchange rate in order to sustain its exports performance, it cannot ignore real exchange rate variability of the Rand in relation to policies that aim at enhancing its exports performance and overall macroeconomic stability. Therefore, South African policy-makers should enact intervention policies that aim at reducing excessive

variability of real exchange rate of the Rand in order to improve its export sector and economic growth, and overall external macroeconomic stability (Kihangire, 2004).

The coefficients, -0.14 and -0.19, on relative prices for both aggregate exports and goods exports models, respectively, bear wrong negative signs and are statistically insignificant at conventional level of significance. This is surprising because we expected *a priori* that these coefficients would have significant positive signs implying that depreciation of Rand to dollar real exchange rate increases South African exports to the U.S.

4.6 Short-Run Dynamics

According to the presentation theorem of Angel and Granger, the existence of the long-run relationship between variables implies existence of short-run error correction relationship associated with them. As stated by Aziakpono, et al. (2005) such a relationship represents an adjustment process by which the deviated actual export is anticipated to adjust back to its long-run equilibrium path, and thus reflecting the dynamics that exists between real exports and its major determinants.

As reported in Table 32 in the appendices the coefficients of error correction term, -0.8707 and -0.8671 for aggregate exports and goods exports models respectively, are negative and statistically significant as expected *a priori* and are therefore supportive of the validity of the long-run equilibrium relationship between the variables. These coefficients are very large suggesting a quick adjustment process and indicate what proportion of the disequilibrium is corrected each month. For instance, in both aggregate exports and goods exports models the coefficients imply that about 87 percent of the disequilibrium of the previous month's shock adjusts back to equilibrium in the current month.

To sum up, we conclude that the established negative relationship between real exchange rate volatility and South African exports to the United States indicates that GARCH class models can capture volatility correctly and can therefore act as a good measure of volatility.

5. CONCLUSION AND POLICY IMPLICATIONS

One of the principal concerns since the flexible exchange rate regime was introduced has been whether the increase in exchange rate volatility has impacted on trade. In this research paper, we examined the impact of real exchange rate variability on South African exports to the U.S. using both aggregate and disaggregated monthly data over the South Africa's floating period January 1995 –February 2007. In measuring real exchange rate variability of the Rand against the U.S. dollar, we employed GARCH (1, 1) model advanced by Bollerslev (1986).

After undertaking careful unit root testing and finding that all other variables except real exchange rate volatility are I (1), we applied ARDL- bounds testing approach advanced by Pesaran, et al. (2001) to study existence of long-run relationship between real exports, on one hand and its determinants, that is foreign income, relative

prices and real exchange rate volatility, on the other hand. The derived empirical results provide evidence of a significant cointegrating level relationship between exports and the explanatory variables involved in the export function. In addition, estimated long-run elasticities, with an exception of the elasticity for relative prices, are consistent with the predictions of economic theory. In particular the long-run elasticity of foreign income indicates that an increase in income of the South African trading partner, the U.S., leads to exports growth. The negative long-run elasticity of real exchange rate volatility implies that a rise in real exchange rate volatility has an adverse effect on exports. Relative prices proxied by real exchange rate are found to have insignificant negative effect on exports. This is, in fact, surprising because according to economic theory an increase in relative prices (depreciation of real exchange rates) is expected to have positive effect on exports. This long-run relationship is substantiated by the short-run estimates of the error correction model which are negative and statistically significant. The ECM coefficient in each case implies that about 87 percent of the disequilibrium of the previous month's shock adjusts back to equilibrium in the current month.

What are the policy implications that can be drawn from this study? The obtained detrimental effect of exchange rate volatility on exports implies that the government of South Africa has to look for intervention policies targeting at minimising the excessive volatility of the Rand. Following a relatively successful approach adopted by Malaysia in tackling its volatility during the Asian crises in 1998, a proposition can be made that South African authorities might find it appropriate to impose the Tobin tax on foreign exchange transactions (Bah & Amusa, 2003). The advocates of Tobin tax policy argue that such policy reduces profits of short-term speculation by discouraging short-term speculative capital and therefore makes exchange rates to better reflect long-term factors in the economy. In addition to that South African government via its apex monetary policy body, the SARB, in formulating its policy statements particularly those policies related to exchange controls and exchange rate policy 'should be wary of sending signals that encourage external investors adopting negative sentiments towards the domestic financial market' (see Bah & Amusa, 2003, p.17).

Since the results also suggests that South African exporters are risk-averse because they tend to reduce their exports to international markets and instead produce more for domestic in order to secure relatively certain profits rather than uncovered profits which are subject to exchange rate fluctuations, then this implies that South Africa should also consider developing well-developed hedging facilities and institutions that can protect its exporters against exchange risk.

Furthermore, the current objective of South Africa in ensuring sustainable economic growth through increased exports should be substantiated by a stable and competitive exchange rate, viable fiscal and monetary policies as well as structural reforms that contribute to decline in per unit cost of production and the improvement in international competitiveness of South African exporters.

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APPENDICES

Table 31a *Estimates of the GARCH (1, 1) model*

	α_0	$\hat{\sigma}_1$	λ_0	\square_1	δ_1
GARCH(1,1)	0.00266 (1.2845)	0.2823 (2.9538)	0.1175E-3	0.4183	0.5734

Note: The number in parentheses below coefficient is the t-ratio statistic. The degrees of freedom of t-distribution of the and GARCH (1, 1) is 4.9350

Table 32a *Estimation results of the Error Correction Model (ECM) model*

Aggregate export ECM Dependent variable= dX_t		Goods exports ECM Dependent variable= dX_t^*	
Regressors	Coefficient T-ratio	Coefficient	T-ratio
Intercept	-6.6245 -2.4861	-4.9489	-2.0106
Trend	0.0029 1.4400	0.0031	1.4897
X_{t-1}	-0.8707 -10.0277	-0.8671	-10.4874
Y_{t-1}	1.7109 2.6228	1.3522	2.2005
Q_{t-1}	-0.1201 -1.0841	-0.1638	-1.4477
$V(h)_{t-1}$	-2.4050 -2.2725	-2.1657	-2.0212
$D2000$	-0.0663 -0.7595	-0.0779	-0.8717
dX_{t-18}	0.1453 2.2249		

Note: X_t^* denotes logarithm of real exports of goods

Table 33a *Measure of goodness of fit and diagnostic tests (LM version)*

Aggregate exports ECM Dependent variable= dX_t		Goods exports ECM Dependent variable= dX_t^*
R-Squared	0.50	0.45
χ_{SC}^2	18.5210(.101)	17.0535(.143)
χ_H^2	0.2557(.613)	0.9887(.320)
χ_{FF}^2	0.2981(.585)	0.4399(.507)
χ_N^2	2.7517(.253)	1.6994(.428)
F-test	16.7694(.000)	18.5658(.000)

Notes: χ_{SC}^2 , χ_H^2 , χ_{FF}^2 and χ_N^2 denote LM tests for serial correlation, heteroskedasticity; Ramsey's RESET test and normality test respectively. Figures in parentheses are the associated p-values.

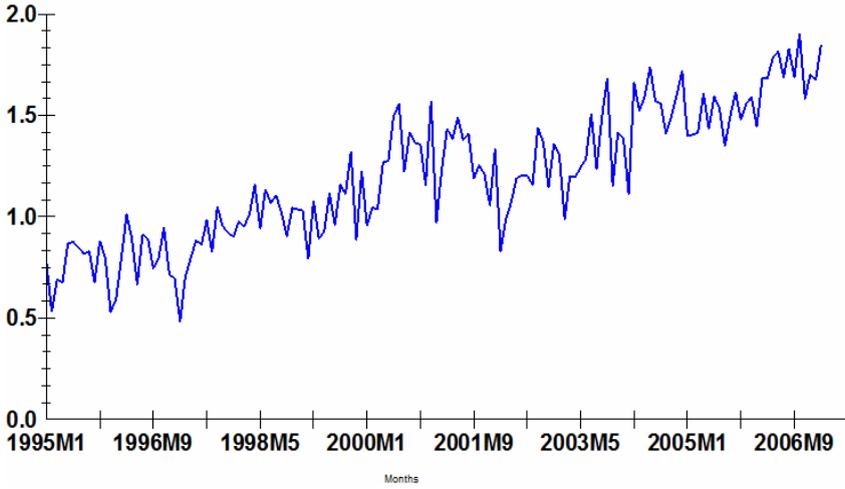


Figure 4 *The plot of X (Log of real aggregate exports)*

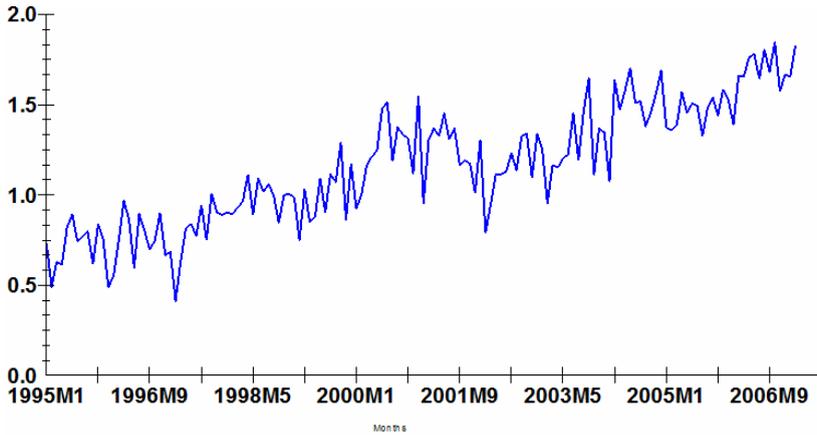


Figure 5 *The plot of X (log of real goods exports)*

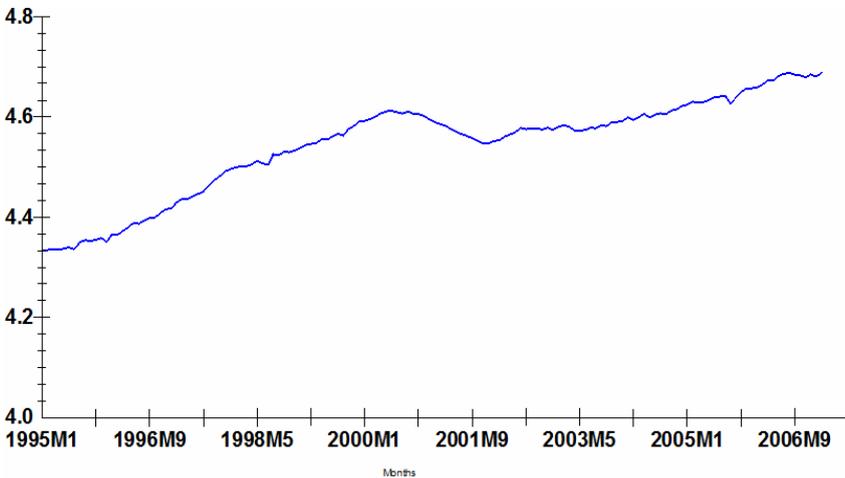


Figure 6 *The plot of Y (Log of foreign income)*

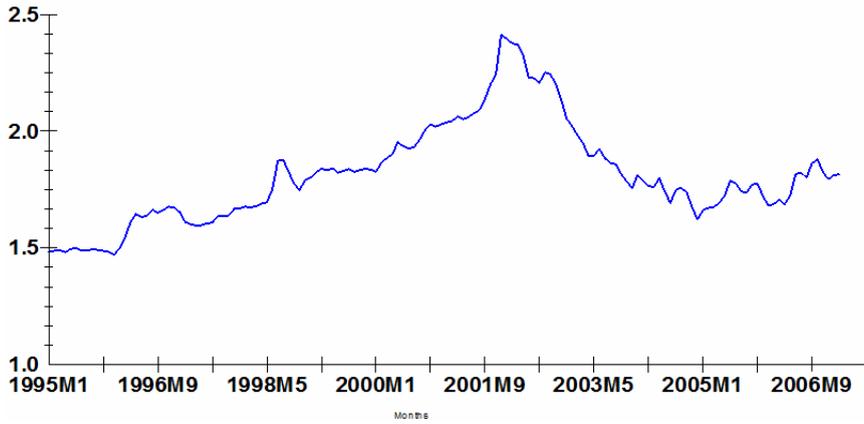


Figure 7 The plot of Q (Log of real exchange rate)

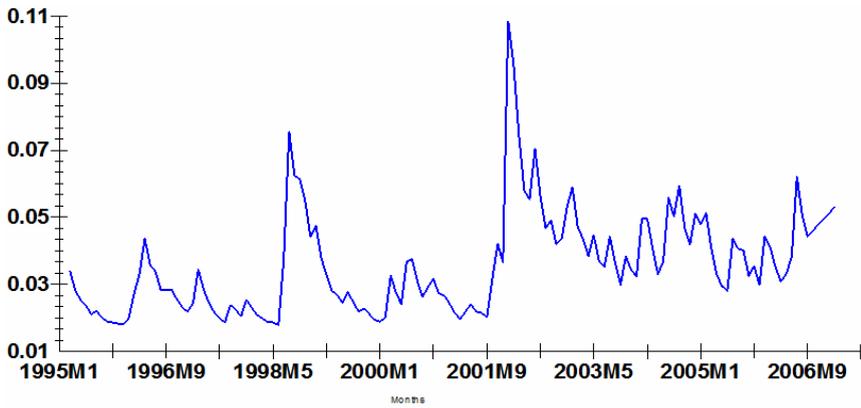


Figure 8 The plot of $V(h)$ (Real exchange rate volatility)



CONTAGION IN INTERNATIONAL STOCK MARKETS DURING THE SUB PRIME MORTGAGE CRISIS

Hsien-Yi LEE*

Abstract: *The sub prime mortgages crises took place in July, 2007 in US which causes the large scare in the global financial markets, and the international stock and foreign market suffer heavy shock. Using twenty international stock indexes, this study examines whether any contagion effect occurred across international markets after the sub-prime financial mortgage crisis in US. Using the heteroscedasticity biases based on correlation coefficients to examine the existence of the contagion effect, this study shows that stock markets of some countries (namely Hong Kong, Taiwan, Australia and New Zealand) did suffer from the contagion effect.*

Keywords: *Contagion effect, sub prime mortgage, correlation coefficients, stock markets, financial crises*

JEL Codes: *G150*

1. INTRODUCTION

The last two decades, bear witness to major financial disruptions roughly every three years, such as the US stock market crash in 1987, the savings and loan collapse and credit crunch in the early 1990s, the 1994 Mexican peso devaluation, the Asian financial crises in 1997, the Russian default and Long Term Capital Management implosion in 1998, the Brazilian devaluation in 1999, the bursting of the technological bubble in 2000, the 2002 post-Enron deflationary pressures in the credit markets, and the 2007 sub-prime mortgages crises in US. These crises caused heavy shock in the financial market of those countries, and potentially these events had influenced reverberating across the financial markets of different countries.

The sub-prime mortgage financial crisis of 2007 was a sharp rise in home foreclosures which accelerated in the United States in the fall of 2006 and triggered a global financial crisis between 2007 and 2008. The crisis began with the bursting of the US housing bubble and high default rates on "subprime". The share of sub-prime mortgages to total originations increased from 9% in 1996 to 20% in 2006. Further, loan incentives including interest repayment terms and low initial teaser rates (which later reset to higher, floating rates) encouraged borrowers believing they would be able to refinance at more favorable terms later. While US housing prices continued to

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increase from 1996 to 2006, refinancing was available. However, once housing prices started to decrease slowly from 2006 to 2007. In many states of the US, refinancing became more difficult. Defaults and foreclosure activity increased dramatically. By October 2007, 16% of sub-prime loans with adjustable rate mortgages (ARM) were 90-days into default or in foreclosure proceedings, roughly triple the interest rate of 2005. Sub-prime ARMs only represent 6.8% of the loans outstanding in the US, yet they represent 43.0% of the foreclosures started during the third quarter of 2007. Major banks and other financial institutions around the world have reported losses of approximately US \$379 billion by May in 2008. The sub-prime mortgage financial crisis in 2007 caused heavy damage to businesses and the economy in the US. The US stock market declined significantly from the crisis, the also causes the large scare in the global financial markets, and the international stock market suffer heavy shock. Therefore, the main purpose of this study is to examine whether any contagion effect occurred among financial markets after the sub-prime mortgages crisis.

This paper, adopts the definition of contagion write in present tense as much as possible that Forbes and Rigobon (2002) introduce contagion is a significant increase in market co-movement after a shock for one country. According to this definition, contagion does not occur if two markets show a high degree of co-movement during both stability and crisis periods. According to the previous findings, during international financial crises, financial markets are characterized by largely decreasing in asset prices, increasing in market volatility, and hence co-movements in asset price among markets. The size of these co-movements have led many economists to raise the question of whether crises periods are interpreted as different regimes in the international transmission of financial shock. Many studies have written about the propagation mechanisms of these crises. In particular, they have focused on the questions whether the relationships between markets in tranquil periods are different from those in crisis periods.

The funds of the world can freely flow through international trades in the economic globalization periods. Forbes (2002) finds that international trade linkages allow country-specific crises to spread over financial markets around the world. Bordo et al., (2001) show that global crises become more frequent since 1973, and they find that one reason for the increased frequency of crises is an increase in capital mobility. Internationally, capital market liberalization facilitates a greater flow of funds to emerging markets around the world. The wide-ranging financial deregulation makes much easier for banks and domestic corporations to tap into foreign capital to finance domestic investments. Such an evolution helps agents to reduce the risk of their assets by spreading their portfolios more widely, and creates new markets for domestic investments, which is no more bounded by national saving. Nevertheless, the also induces a rapid rise in financial flows, which lead to a higher risk of financial instability. Therefore, when large international crisis occurs, the international financial markets often influence each other.

The remainder of this paper is organized as follows. Section 2 presents the related literature on contagion effects. Section 3 describes the data and methodology. Section 4 then discusses the empirical results. Finally, section 5 summarizes the findings and presents conclusions.

2. THE RELATED LITERATURE ON CONTAGION EFFECTS

2.1 Contagion definitions

Not all economists confer about how to measure contagion effects. The World Bank classification uses three definitions of contagion³⁰: First, broad definition: contagion is identified with the general process of shock transmission across countries. This definition is supposed to work during both tranquil and crisis periods, and contagion is associated not only with negative shocks, but also with positive spillover effects. Second, restrictive definition: contagion involves the propagation of shocks between two countries in excess of what should be expected based on the fundamentals and considering the co-movements triggered by common shocks. If this definition of contagion is adopted, it is necessary to be aware of what constitutes the underlying fundamentals. Otherwise, it is impossible to effectively appraise whether excess co-movements have occurred and whether contagion is displayed. Third, very restrictive definition: contagion should be interpreted as the change in the transmission mechanisms that takes place during a period of turmoil, and it can be inferred based on a significant increase in the cross-market correlation. As we have said, this is the third definition that will be used in this paper.

2.2 The relative literatures on contagion

Forbes and Rigobon (2002) define contagion as a significant increase in market co-movement after a shock to one country. According to this definition, if two markets display a high degree of co-movement during periods of stability, even if the markets continue to be highly correlated following a shock to one market, this may not constitute contagion. According to the definitions used in this study, contagion only exists if cross-market co-movement increases significantly after the shock being considered. If co-movement does not increase significantly, then continued high level of market correlation suggests strong linkages between the two economies that exist in all countries in the world. This study uses the term “interdependence” to describe this situation.³¹

Forbes and Rigobon (2002) define contagion as a significant increase in market co-movement after a shock occurred in one country. According to this definition, if two markets display a high degree of co-movement during periods of stability, even if the markets continue to be highly correlated following a shock occurred in one market, this may not constitute contagion. According to the definitions used in this study, contagion

³⁰ Scour: www1.worldbank.org

³¹ Please see Forbes and Rigobon (2002).

only exists if cross-market co-movement increases significantly after the shock being considered. If co-movement does not increase significantly, then continued high level of market correlation suggests strong linkages between the two economies that usually exist in most countries of the world. This study uses the term “interdependence” to describe this situation.

Current studies on contagion offer many methods to measure the propagation of international shocks across countries. Some of the more widely used processes include cross-market correlation coefficients procedures (e.g., King and Wadhvani, 1990; Lee and Kim, 1993), volatility analysis assuming an ARCH and GARCH models (e.g., Hamao et al., 1990; King et al., 1994; Bekaert et al., 2005; Brailsford et al., 2006; Saleem, 2009), techniques looking at changes in the cross-market co-integrating vectors (e.g., Longin and Solnik, 1995; Kanas, 1998; Yang and Bessler, 2008), and direct estimation of specific transmission mechanisms (e.g., Forbes, 2000; Ang and Bekaert, 2001).

For measure of contagion, previous empirical studies focus on the change of correlation coefficient between two markets during stability and turmoil periods. For example, King and Wadhvani (1990) examine the stock market correlations among the US, the U.K., and Japan and find that cross-market correlations were increased significantly after the US market crash in 1987. Lee and Kim (1993) extend similar analysis to twelve major markets and find evidence of contagion in global stock markets after US market crash in 1987. They show that cross-market correlations are increased for many emerging markets during the crisis. Baig and Goldfajn (1999) use a similar methodology to test for contagion in the Asian markets and find clear evidence of contagion in the currency and sovereign bond markets only.

Forbes and Rigobon (2002) use heteroscedasticity bias tests for contagion basing on correlation coefficients, and their empirical findings indicated little evidence of contagion between stock markets after the US stock market crash of 1987, Mexican peso devaluation of 1994, and the Asian crisis of 1997. Collins and Biekpe (2003) also use F-R (2002) method to test contagion and found that most of the African markets, with the exception of Egypt and South Africa, did not suffer from contagion during the crisis period, which resulted from the crash of the Hong Kong market in October 1997. Hon et al., (2004) also use this approach to test contagion in financial markets after the terrorist attack in the USA on September 11, 2001. Their results indicated that international stock markets, particularly in Europe, responded more closely to US stock market shocks for about three to six months after crisis. Caporale et al., (2005) use conditional correlation analysis to investigate contagion in the East Asian region during the 1997-1998 crisis period. Their findings suggested there existed contagion in the East Asian region, and were consistent with crisis-contingent theories of asset market linkages. Corsetti et al., (2005) test contagion in financial markets using bivariate correlation analysis, and they found evidences of contagion for at least five countries during the Hong Kong stock market crisis of October 1997. Boyer et al., (2006) use two different methodologies to estimate correlations for testing the existence of

contagion in the case of 1997 Asian crisis, and the results showed that there existed greater co-movements during high volatility periods, especially for accessible stock index returns, suggesting that crises spread through the asset holdings of international investors rather than through changes in fundamentals. Gravelle et al., (2006) estimate correlation from a regime-switching model to test contagion after the Mexican crisis of 1994, and their empirical results rejected the null hypothesis of no shift-contagion for a number of currency returns, especially for European countries, and found little evidence of shift-contagion in Latin American bond markets. Lee et al., (2007) use the heteroscedasticity biases based on correlation coefficients to examine the existence of the contagion effect after the strong earthquake in South-East Asia of 2004, this study shows that no individual country stock market suffered from the contagion effect, but that the foreign exchange markets of some countries (namely India, Philippines and Hong Kong) did suffer from the contagion effect.

Yang and Bessler (2008) This study investigates financial contagion among seven international stock markets around the October 19, 1987 crash, and the results clearly show that the crash originated in the US market and that an upward movement in the Japanese market after the crash helped the recovery in the US market, which has not yet been empirically documented in the literature. Khan and Park (2009) this paper presents empirical evidence of herding contagion in the stock markets during the 1997 Asian financial crisis, above and beyond macroeconomic fundamental driven comovements, and the paper finds strong evidence of herding contagion. Ahlgren and Antell (2010) this paper proposes to use cobreaking to model comovements between stock markets during the terrorist attack crises in the USA on September 11, 2001 and to test for contagion. The paper find evidence of short-term linkages during times of crisis but not contagion. These short-term linkages have important implications for investors, risk managers and regulators. Saleem(2009) this study considers the linkage of the Russian equity market to the world market, examining the international transmission of the Russia's 1998 financial crisis, They find evidence of direct linkage between the Russian equity market with regards to returns and volatility, while the weakness of the linkage suggests that the Russian equity market was only partially integrated into the world market. At the time of the crisis, evidence of contagion is clear. Longstaff (2010) the study empirical investigation into the pricing of subprime asset-backed collateralized debt obligations (CDOs) and their contagion effects on other markets. The paper finds strong evidence of contagion in the financial markets. The results support the hypothesis that financial contagion was propagated primarily through liquidity and risk-premium channels, rather than through a correlated-information channel. Kim et al., (2010) the study empirical the turmoil of 2007–2009, troubles in a small segment of the US mortgage market escalated into a crisis of global proportions. The paper find that valuation losses on CDS contracts for these Asian borrowers arose in part from movements in global and region-specific risk pricing factors as well as from revisions to expected losses from defaults. Yilmaz (2010) this article examines the extent of contagion and interdependence across the East Asian

equity markets since early 1990s and compares the ongoing crisis with earlier episodes. They show that there is substantial difference between the behavior of the East Asian return and volatility spillover indices over time. While the return spillover index reveals increased integration among the East Asian equity markets, the volatility spillover index experiences significant bursts during major market crises, including the East Asian crisis. Fidrmuc and Korhonen (2010) the paper analyze the transmission of global financial crisis to business cycles in China and India. They find wide differences for different frequencies of cyclical development. More specifically, at business cycle frequencies, dynamic correlations are typically low or negative, but they are also influenced most by the global financial crisis. Finally, they find a significant link between trade ties and dynamic correlations of GDP growth rates in emerging Asian countries and OECD countries.

3. DATA AND METHODOLOGY

3.1. Data

This study investigates the correlations between the returns of the US daily stock index returns and 20 other international stock indexes returns. Taking the US equity markets as the base criterion, this study investigates whether co-movements among national stock markets are significantly strengthened after sub-prime mortgages crisis. The sample period is divided into two sections: the 12-month pre-crisis period (July 23, 2006 to July 22, 2007) and the 6-month post-crisis period (July 23, 2007, to January 22, 2008). The stable period is defined as the pre-crisis period, and the turmoil period is defined as the post-crisis period. To ensure robustness of the findings, the turmoil period is divided into three sections: the 1-month post-crisis period (July 23, 2007, to August 22, 2007) is defined as the short-term turmoil period, the 3-month post-crisis period (July 23, 2007, to October 22, 2007) is defined as the middle-term turmoil period, and the 6-month post-crisis period (July 23, 2007, to January 22, 2008) is defined as the long-term turmoil period. The data used in this study are taken from the 'international stock index of the Taiwan Economic Journal (TEJ) Database.

Table 34 presents GDP and stock market capitalization. As Table 34 shows that US is number one in the all sample countries rank of GDP and stock market capitalization. The evidence indicate that US has the great influence to the world economy.

Table 34 *GDP and stock market capitalization*

Region	Country	GDP			Stock Market Capitalization		
		Million US dollars	Sample Rank	Word Rank	1000 million US dollars	Sample Rank	Word Rank
North America	US	13,811,200	1	1	13,712	1	1
	Canada	1,326,376	7	9	984	5	5
	Mexico	893,364	10	14	144	17	23
South America	Argentina	262,331	14	31	n.a.	n.a.	n.a.
	Brazil	1,314,170	8	10	260	13	17
	Chile	163,915	18	43	86	19	29
Europe	France	2,526,288	6	6	1,280	4	4
	Germany	3,297,233	3	3	896	6	6
	U.K.	2,727,806	5	5	2,559	3	3
North-East Asia	Japan	4,376,705	2	2	3,232	2	2
	Korea	969,795	9	13	357	11	14
East Asia	China	3,280,053	4	4	285	12	15
	Hong Kong	206,706	16	37	551	9	11
	Taiwan	397,965	13	22	432	10	13
South-East Asia	Indonesia	432,817	12	21	56	20	32
	Malaysia	180,714	17	38	145	16	22
	Philippines	144,129	20	46	20	22	37
	Singapore	161,364	19	45	177	15	20
	Thailand	245,818	15	34	89	18	28
Australasia	Australia	821,716	11	15	666	7	8
	New Zealand	129,372	21	52	30	21	34

Table 35 present daily returns on international stock indexes returns from July 23, 2006 to January 22, 2008. As Table 35 shows. That during the stable period all of the average daily returns for the international stock markets are positive. During the short-term, middle-term and long-term turmoil periods, international stock market returns are all negative, respectively. Additionally, the average daily returns of china stock market is positive in the full periods.

Table 35 Summary Statistics of Daily Returns on International Stock Indexes Returns from July 23, 2006 to January 22, 2008

Region	Country	stable period $R_{(12M)}$	short-term turmoil period $R_{(0.1M)}$	middle-term turmoil period $R_{(0.3M)}$	long-term turmoil period $R_{(0.6M)}$
North America	US	0.0928%	-0.1883%	-0.0257%	-0.1139%
	Canada	0.0942%	-0.3542%	-0.0546%	-0.1537%
	Mexico	0.1971%	-0.3603%	0.0133%	-0.1270%
South America	Argentina	0.1358%	-0.5392%	-0.0127%	-0.1935%
	Brazil	0.1989%	-0.4635%	0.1058%	-0.0052%
	Chile	0.2007%	-0.2016%	0.0391%	-0.2225%
Europe	France	0.0799%	-0.3172%	-0.0677%	-0.1585%
	Germany	0.1417%	-0.2028%	-0.0100%	-0.1199%
	U.K.	0.0509%	-0.2447%	-0.0185%	-0.1024%
North-East Asia	Japan	0.0702%	-0.5900%	-0.1907%	-0.3178%
	Korea	0.1892%	-0.5070%	-0.0471%	-0.1576%
East Asia	China	0.3961%	0.9128%	0.5649%	0.0849%
	Hong Kong	0.1475%	-0.1559%	0.3327%	-0.0295%
	Taiwan	0.1729%	-0.4975%	-0.0233%	-0.1710%
South-East Asia	Indonesia	0.2541%	-0.5755%	0.0819%	0.0928%
	Malaysia	0.1694%	-0.4020%	-0.0276%	-0.0087%
	Philippines	0.2165%	-0.6466%	-0.0110%	-0.0772%
	Singapore	0.1790%	-0.3191%	0.0116%	-0.1739%
	Thailand	0.1035%	-0.3621%	0.0279%	-0.1119%
Australasia	Australia	0.1123%	-0.3035%	0.0493%	-0.1517%
	New Zealand	0.0859%	-0.2932%	0.0016%	-0.1409%

Note: New York DJ. Stock Index (US), Toronto 300 Stocks Index (Canada), Mexico IPC Index (Mexico), Argentina MERYAL Index (Argentina), Brazil BOYESPA Index (Brazil), Chile IGPA Index (Chile), France Paris CAC40 Index (France), Frankfurt-Commerzbank Index (Germany), London-FTSE-100 Index (U.K.), Nikkei 225 Stock Index (Japan), South Korea-Stock Index (Korea), Shanghai Synthesis Stock Index (China), Hang Seng Index-Hong Kong (Hong Kong), TSE Weigh Stock Index (Taiwan), Indonesia JSX-Stock Index (Indonesia), Kuala Lumpur-Stock Index (Malaysia), Manila-Stock Index (Philippines), Strait Times Index-Singapore (Singapore), Bangkok Set Stock Index (Thailand), Sydney All Ordinaries Stock Index (Australia), Wellington NZSE-50 Index (New Zealand).

3.2. Methodology

The variety of empirical methods developed for the analysis of contagion have the aim of testing the stability of parameters in the sphere of a chosen econometric model. Forbes and Rigobon (2002) points out four different methodologies, which have been utilized to measure how shocks are transmitted internationally, they are cross-market correlation coefficients; ARCH and GARCH models; cointegration techniques; and direct estimation of specific transmission mechanisms (such as probit model). According to Forbes and Rigobon (2002), GARCH model can provide important evidence that volatility is transmitted across markets, but most of the time does not explicitly test for contagion as defined in this paper. The cointegration techniques does not specifically test for contagion, since cross-market relationships over such long periods can increase for a number of reasons, such as greater trade integration or higher capital mobility. Finally, direct estimation of specific transmission mechanisms (such as probit model) only measure specific cross-market transmission channels, but do not explicitly test contagion for its existence. Here used the correlation coefficient method to solve problems, and Forbes and Rigobon (2002) points out this method is the most direct one.

The traditional approach used to demonstrate the effects of large international crises is to evaluate whether the correlation among international asset returns have changed. However, one problem with this approach is that crises typically increase the volatility of asset returns, which may induce a false or spurious estimated increase in correlation. While the methodologies presented above carry some imperfections, the data often suffer from heteroskedasticity, endogeneity and omitted variable problems. Some authors have tried to solve these problems in a similar way, although they have reached different conclusions in terms of contagion. Forbes and Rigobon (2002) develop a correlation analysis that adjusted correlation coefficients only for heteroskedasticity under the assumption of no omitted variables.

The empirical test on contagion in international financial markets adopts an adjustment to the conditional coefficient, as proposed by Forbes and Rigobon (2002). Forbes and Rigobon (2002) points out that there was a bias with conditional coefficient due to heteroscedasticity in market returns. An increase in market volatility biased the estimates of cross-market correlation coefficients.

Conditional correlation coefficients are measured as follows:

$$\rho = \frac{\sigma_{xy}}{\sigma_x \sigma_y} \quad (1)$$

According to Forbes and Rigobon (2002), the correlation coefficient is adjusted in the following way (see Appendix for proof):

$$\rho^* = \frac{\rho}{\sqrt{1 + \delta [1 - (\rho)^2]}} \quad (2)$$

where,

$$\delta = \frac{\sigma_{xx}^h}{\sigma_{xx}^l} - 1$$

which measures the change in high period volatility against the low period volatility.

To calculate the adjusted correlation coefficient, the turmoil period often used as the high volatility period and the stable period often used as the low volatility period. The following hypothesis is then tested

$$H_0 : \rho_t \leq \rho_s$$

$$H_1 : \rho_t > \rho_s$$

ρ_t is the adjusted correlation coefficient during the turmoil period, and ρ_s is the adjusted correlation coefficient during the stable period. Compare the difference in correlations between stable and turmoil periods. Contagion is then measured by the significance of adjusted correlation coefficients in the turmoil period versus those of the stability period. If financial market contagion exists, co-movement during the turmoil period would be more obvious than that of the stable period. Where H_0 is the null hypothesis of no contagion and H_1 is the alternative hypothesis that contagion does indeed exist.

The utilize Fisher z transformations of correlation coefficient to test for pair-wise cross-country significance. Fisher z transformations convert standard coefficients to normally distributed z variables. Before testing, the ρ value must be transformed to a Z value. The following hypothesis testing demonstrates:

$$H_0 : \rho_t < \rho_s \Rightarrow H_0 : Z_{rt} < Z_{rs}$$

$$H_1 : \rho_t > \rho_s \Rightarrow H_1 : Z_{rt} > Z_{rs}$$

Where

$$Z_{rt} = \frac{1}{2} \ln\left(\frac{1+\rho_t}{1-\rho_t}\right), \quad Z_{rs} = \frac{1}{2} \ln\left(\frac{1+\rho_s}{1-\rho_s}\right), \quad Z = \frac{Z_{rt} - Z_{rs}}{\sqrt{\frac{1}{n_t-3} + \frac{1}{n_s-3}}}$$

where, n_t (n_s) are number of actual observe days during the turmoil (stable) period.

The critical value for the Fisher Z test at the one, five and ten percent level is 1.28, 1.65 and 1.96, respectively, so any test statistic greater than those critical values indicates contagion (C), while any test statistic less than or equal to those critical values indicates no contagion (N).

4. EMPIRICAL RESULTS

4.1. Contagion effect after sub-prime crisis in the short-term turmoil period

Table 36 displays the conditional (unadjusted) and unconditional (adjusted) correlation coefficients for international stock indexes after sub-prime crisis. The cross-market correlations of stock index returns are compared with both stable period and short-term turmoil period during the sub prime mortgage crisis. As Table 36 shows, the cross-market conditional (unadjusted) correlations between US and most of the countries in the sample during the short-term turmoil period are larger than those

during the stable period, with the exceptions of Chile, Germany, Philippines and Singapore. In addition, the volatilities of all of the stock index returns during the stable period exceeded those during the period of short-term turmoil. Contagion effects were observed for four stock markets (Canada, Taiwan, Australia and New Zealand), and those stock index returns experience significantly increases in unadjusted correlation of 1-month after the sub prime mortgage crisis.

As Table 36 shows, that the cross-market unconditional (adjusted) correlations between US and most of the countries in the sample during the short-term turmoil period are larger than those during the stable period, with the exceptions of Chile, Germany, Philippines and Singapore. After the correlation by adjustment, contagion effects were observed for six stock markets (Canada, Korea, Hong Kong, Taiwan, Australia and New Zealand) , those stock index returns experience significantly increases in adjusted correlation of 1-month after the sub prime mortgage crisis. The test contagion effects by unconditional (adjusted) correlation more than two stock markets by conditional (unadjusted) correlation.

4.2. Contagion effect after sub-prime crisis in the middle-term turmoil period

Table 37 displays the conditional (unadjusted) and unconditional (adjusted) correlation coefficients for international stock indexes after sub-prime crisis. The cross-market correlations of stock index returns are compared with both stable period and middle-term turmoil period during the sub prime mortgage crisis. As Table 37 shows the cross-market conditional (unadjusted) correlations between US and most of the countries in the sample during the middle-term turmoil period are larger than those during the stable period with the exceptions of Germany and Singapore. In addition, the volatilities of most of the stock index returns during the stable period exceeded those during the period of middle-term turmoil with the exceptions of China. Contagion effects were observed for seven stock markets (Canada, Japan, Hong Kong, Taiwan, Malaysia, Australia and New Zealand) , and those stock index returns experience significantly increases in unadjusted correlation of 3-month after the sub prime mortgage crisis.

As Table 37 shows that the cross-market unconditional (adjusted) correlations between US and most of the countries in the sample during the middle-term turmoil period are larger than those during the stable period, with the exceptions of Germany and Singapore. After the correlation by adjustment, contagion effects were observed for nine stock markets (Canada, Argentina, Japan, Korea, Hong Kong, Taiwan, Malaysia, Australia and New Zealand) , and those stock index returns experience significantly increases in adjusted correlation of 3-month after the sub prime mortgage crisis. The test contagion effects by unconditional (adjusted) correlation more than two stock markets by conditional (unadjusted) correlation.

Table 36 *The conditional (unadjusted) and unconditional (adjusted) correlation coefficients for international stock indexes after sub-prime crisis in the short-term turmoil period*

Region	Country	conditional (unadjusted) Correlation Coefficients						unconditional (adjusted) Correlation Coefficients			
		<u>Stable period</u>		<u>short-term Turmoil period</u>		Z-test	Contagion	<u>Stable period</u>		<u>short-term turmoil period</u>	
		ρ	σ	ρ	σ			ρ^*	ρ^*	Z-test	Contagion
North America	Canada	0.5628	0.0075	0.7500	0.0132	1.443*	C	0.6703	0.8328	1.657**	C
	Mexico	0.6855	0.0106	0.7092	0.0184	0.198	N	0.7785	0.7983	0.224	N
South America	Argentina	0.5947	0.0119	0.6329	0.0252	0.263	N	0.7326	0.7655	0.322	N
	Brazil	0.7445	0.0135	0.8155	0.0232	0.785	N	0.8254	0.8794	0.858	N
	Chile	0.5104	0.0091	0.3919	0.0167	-0.641	N	0.6266	0.4998	-0.802	N
Europe	France	0.2721	0.0080	0.3968	0.0177	0.604	N	0.3877	0.5408	0.843	N
	Germany	0.3381	0.0086	0.3025	0.0136	-0.170	N	0.4117	0.3707	-0.208	N
	U.K.	0.3076	0.0068	0.4102	0.0203	0.507	N	0.4876	0.6136	0.781	N
North-East Asia	Japan	0.3986	0.0092	0.5511	0.0174	0.850	N	0.5130	0.6723	1.066	N
	Korea	0.4218	0.0091	0.6224	0.0274	1.199	N	0.6281	0.8097	1.666**	C
East Asia	China	0.0739	0.0197	0.3523	0.0203	1.263	N	0.0750	0.3570	1.281	N
	Hong Kong	0.4292	0.0101	0.6156	0.0225	1.112	N	0.5785	0.7591	1.434*	C
	Taiwan	0.2104	0.0088	0.6602	0.0238	2.489***	C	0.3337	0.8224	3.510***	C
South-East Asia	Indonesia	0.3912	0.0102	0.4622	0.0311	0.373	N	0.5960	0.6731	0.556	N
	Malaysia	0.4877	0.0083	0.6438	0.0183	0.995	N	0.6384	0.7807	1.253	N
	Philippines	0.5931	0.0133	0.5615	0.0307	-0.204	N	0.7457	0.7178	-0.258	N
	Singapore	0.5244	0.0097	0.4846	0.0244	-0.229	N	0.6988	0.6601	-0.309	N
Australasia	Thailand	0.2207	0.0154	0.3093	0.0217	0.410	N	0.2594	0.3602	0.479	N
	Australia	0.4869	0.0076	0.8532	0.0187	3.161***	C	0.6583	0.9317	3.787***	C
	New Zealand	0.4054	0.0056	0.7105	0.0104	1.968**	C	0.5172	0.8089	2.368***	C

Note1: This table shows the conditional (unadjusted) and unconditional (adjusted) cross-market correlation coefficients for US and 20 other stock indexes. The test statistics are derived from Fisher Z transformations. The stable period is defined as the 12-month pre-crisis period (July 23, 2006 to July 22, 2007). The short-term turmoil period is defined as the 1-month post-crisis period (July 23, 2007, to August 22, 2007). A "C" indicates that the test statistic is greater than the critical value, and contagion occurred. An "N" indicates that the test statistic was less than or equal to the critical value, and no contagion occurred.

Note2:***Statistical significance at 1% level. **Statistical significance at 5% level. *Statistical significance at 10% level

Table 37 *The conditional (unadjusted) and unconditional (adjusted) correlation coefficients for international stock indexes after sub-prime crisis in the middle-term turmoil period*

Region	Country	conditional (unadjusted) Correlation Coefficients						unconditional (adjusted) Correlation Coefficients			
		Stable period		middle-term Turmoil period		Z-test	Contagion	Stable period		middle-term turmoil period	
		ρ	σ	ρ	σ			ρ^*	ρ^*	Z-test	Contagion
North America	Canada	0.5628	0.0075	0.8038	0.0102	3.270***	C	0.6218	0.8443	3.517***	C
	Mexico	0.6855	0.0106	0.7376	0.0150	0.732	N	0.7459	0.7925	0.792	N
South America	Argentina	0.5947	0.0119	0.7009	0.0185	1.275	N	0.6780	0.7747	1.431*	C
	Brazil	0.7445	0.0135	0.8009	0.0206	0.973	N	0.8092	0.8555	1.049	N
	Chile	0.5104	0.0091	0.5122	0.0132	0.017	N	0.5815	0.5834	0.019	N
Europe	France	0.2721	0.0080	0.3207	0.0139	0.369	N	0.3493	0.4076	0.471	N
	Germany	0.3381	0.0086	0.2639	0.0105	-0.565	N	0.3690	0.2894	-0.618	N
	U.K.	0.3076	0.0068	0.3077	0.0151	0.001	N	0.4340	0.4341	0.001	N
North-East Asia	Japan	0.3986	0.0092	0.5454	0.0155	1.314*	C	0.4913	0.6453	1.587*	C
	Korea	0.4218	0.0091	0.5345	0.0201	1.014	N	0.5687	0.6849	1.333*	C
East Asia	China	0.0739	0.0197	0.2232	0.0182	1.059	N	0.0710	0.2317	1.141	N
	Hong Kong	0.4292	0.0101	0.6462	0.0197	2.145**	C	0.5530	0.7636	2.645***	C
	Taiwan	0.2104	0.0088	0.5453	0.0171	2.756***	C	0.2874	0.6718	3.588***	C
South-East Asia	Indonesia	0.3912	0.0102	0.4744	0.0219	0.710	N	0.5287	0.6197	0.943	N
	Malaysia	0.4877	0.0083	0.6625	0.0127	1.829**	C	0.5685	0.7381	2.084**	C
	Philippines	0.5931	0.0133	0.5943	0.0225	0.013	N	0.6918	0.6930	0.015	N
	Singapore	0.5244	0.0097	0.4221	0.0177	-0.915	N	0.6396	0.5324	-1.135	N
	Thailand	0.2207	0.0154	0.2671	0.0145	0.342	N	0.2145	0.2747	0.443	N
Australasia	Australia	0.4869	0.0076	0.7086	0.0143	2.439***	C	0.6074	0.8092	2.908***	C
	New Zealand	0.4054	0.0056	0.6451	0.0079	2.331***	C	0.4660	0.7081	2.619***	C

Note1: This table shows the conditional (unadjusted) and unconditional (adjusted) cross-market correlation coefficients for US and 20 other stock indexes. The test statistics are derived from Fisher Z transformations. The stable period is defined as the 12-month pre-crisis period (July 23, 2006 to July 22, 2007). The middle-term turmoil period is defined as the 3-month post-crisis period (July 23, 2007, to October 22, 2007). A “C” indicates that the test statistic is greater than the critical value, and contagion occurred. An “N” indicates that the test statistic was less than or equal to the critical value, and no contagion occurred.

Note2:***Statistical significance at 1% level. **Statistical significance at 5% level. *Statistical significance at 10% level

4.3. Contagion effect after sub-prime crisis in the long-term turmoil period

Table 38 displays the conditional (unadjusted) and unconditional (adjusted) correlation coefficients for international stock indexes after sub-prime crisis. The cross-market correlations of stock index returns are compared with both stable period and long-term turmoil period during the sub prime mortgage crisis. As Table 38 shows, the cross-market conditional (unadjusted) correlations between US and less of the countries in the sample during the long-term turmoil period are large than those during the stable period, only China, Hong Kong, Taiwan, Indonesia, Malaysia, Philippines, Australia and New Zealand) . In addition, the volatilities of most of the stock index returns during the stable period exceeded those during the period of long-term turmoil with the exceptions of Thailand. Contagion effects were observed for four stock markets (China, Taiwan, Australia and New Zealand), those stock index returns experience significantly increases in unadjusted correlation of 6-month after the sub prime mortgage crisis.

As Table 38 shows, the cross-market unconditional (adjusted) correlations between US and lease of the countries in the sample during the long-term turmoil period are larger than those during the stable period, such as China, Hong Kong, Taiwan, Indonesia, Malaysia, Philippines, Thailand, Australia and New Zealand. After the correlation by adjustment, contagion effects were observed for five stock markets (China, Hong Kong, Taiwan, Australia and New Zealand) , and those stock index returns experience significantly increases in adjusted correlation of 6-month after the sub prime mortgage crisis. The test contagion effects by unconditional (adjusted) correlation more than one stock markets by conditional (unadjusted) correlation.

To sum up, this study finds that some international stock markets (such as Hong Kong, Taiwan, Australia and New Zealand) suffer contagion after the US sub-prime mortgages crises in 2007

Table 38 *The conditional (unadjusted) and unconditional (adjusted) correlation coefficients for international stock indexes after sub-prime crisis in the long-term turmoil period*

Region	Country	conditional (unadjusted) Correlation Coefficients						unconditional (adjusted) Correlation Coefficients			
		Stable period		long-term Turmoil period		Z-test	Contagion	Stable period		long-term turmoil period	
		ρ	σ	ρ	σ			ρ^*	ρ^*	Z-test	Contagion
North America	Canada	0.5628	0.0075	0.3911	0.0190	-2.005	N	0.7349	0.5602	-2.742	N
	Mexico	0.6855	0.0106	0.0755	0.0174	-6.841	N	0.7699	0.0966	-8.268	N
South America	Argentina	0.5947	0.0119	0.1305	0.0170	-4.959	N	0.6624	0.1554	-5.735	N
	Brazil	0.7445	0.0135	0.0267	0.0213	-8.363	N	0.8139	0.0335	-9.896	N
	Chile	0.5104	0.0091	0.2600	0.0156	-2.662	N	0.6136	0.3325	-3.306	N
Europe	France	0.2721	0.0080	0.2225	0.0141	-0.473	N	0.3515	0.2900	-0.614	N
	Germany	0.3381	0.0086	0.1745	0.0118	-1.573	N	0.3879	0.2033	-1.820	N
	U.K.	0.3076	0.0068	0.1749	0.0150	-1.264	N	0.4328	0.2551	-1.814	N
North-East Asia	Japan	0.3986	0.0092	0.3669	0.0182	-0.333	N	0.5216	0.4851	-0.438	N
	Korea	0.4218	0.0091	0.3713	0.0189	-0.537	N	0.5569	0.4993	-0.715	N
East Asia	China	0.0739	0.0197	0.3825	0.0206	2.946***	C	0.0756	0.3898	3.009***	C
	Hong Kong	0.4292	0.0101	0.5348	0.0234	1.235	N	0.5861	0.6938	1.644*	C
	Taiwan	0.2104	0.0088	0.4846	0.0181	2.825***	C	0.2949	0.6221	3.801***	C
South-East Asia	Indonesia	0.3912	0.0102	0.3916	0.0209	0.004	N	0.5198	0.5203	0.006	N
	Malaysia	0.4877	0.0083	0.5484	0.0121	0.744	N	0.5592	0.6208	0.847	N
	Philippines	0.5931	0.0133	0.6168	0.0199	0.335	N	0.6694	0.6920	0.377	N
	Singapore	0.5244	0.0097	0.3976	0.0171	-1.447	N	0.6330	0.4987	-1.781	N
	Thailand	0.2207	0.0154	0.2187	0.0149	-0.019	N	0.2173	0.2222	0.046	N
Australasia	Australia	0.4869	0.0076	0.6682	0.0144	2.467***	C	0.6088	0.7775	2.974***	C
	New Zealand	0.4054	0.0056	0.5579	0.0079	1.788**	C	0.4660	0.6240	2.028***	C

5. CONCLUSIONS

This study examines whether the sub-prime mortgage financial crisis of 2007 influenced the stability of the correlation structure in international stock markets. Heteroscedasticity biases based on correlation coefficients are used to test for the contagion effect, across 20 economies. The results indicate that six (Canada, Korea, Hong Kong, Taiwan, Australia and New Zealand), nine (Canada, Argentina, Japan, Korea, Hong Kong, Taiwan, Malaysia, Australia and New Zealand) and five (China, Hong Kong, Taiwan, Australia and New Zealand) international stock markets displayed contagion for one, three and six months after the sub-prime mortgage financial crisis of 2007 in US respectively. Those countries of suffer from the contagion effect, which Hong Kong, Taiwan, Australia and New Zealand are most significant.

The sub-prime crisis also places downward pressure on economic growth because fewer or more expensive loans decrease investment by businesses and consumer spending. The financial crisis caused the US stock market declined significantly, also causes the Asia-Pacific region stock market suffer contagion effect. In an economic perspective, the learned that US market influence Asia-Pacific markets performance when these developing or emerging markets were hit by financial crises. One of important results is that contagion effects are more obviously in developing or emerging financial markets than those in developed ones. Our results are similar to previous researches by Collins and Biekpe (2003), Ito and Hashimoto (2005), and Gravelle et al., (2006).

The apparent high correlation coefficients during sub prime crisis periods implies that investors gain from diversification by holding less investment portfolio consisting of diverse stocks from these suffering contagion countries. In other words, if the increase in cross-market correlations during market crashes exists as a real effect and should consider asset allocation and portfolio composition. The benefits of portfolio diversification will be severely limited during periods with high volatility and increased cross-market correlation, when, in fact, international portfolio diversification is needed most.

The results have important implications. That is, when the international major crisis takes place, majority of all the developing or emerging markets are easily affected. And the contagion effect of financial crisis may result from funds of the world can freely flow through international trades in the economic globalization.

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APPENDIX

Proof of Bias in Conditional Correlation

Assume x and y are stochastic variables that represent returns on different stock markets, and these returns are related according to the equation:

$$y_t = \alpha + \beta x_t + \varepsilon_t \tag{A1}$$

where, $E(\varepsilon_t) = 0$, $E(\varepsilon_t^2) = c < \infty$ (where c is a constant), and $E(x_t \varepsilon_t) = 0$.

Note that these assumptions assume that there is no endogeneity or omitted variable. Other than these assumptions, it is not necessary to make any further restrictions on the distribution of the residuals. The further divide the sample data into two portions so that the variance x_t is lower in the first group (l) and higher in the second group (h). Because $E(x_t \varepsilon_t) = 0$ by assumption, OLS estimates of equation (A1) are consistent and efficient for both groups, so that $\beta^h = \beta^l$.

Next, define

$$1 + \delta \equiv \frac{\sigma_{xx}^h}{\sigma_{xx}^l} \tag{A2}$$

Then, according to equation (A1), the variance of y is:

$$\begin{aligned} \sigma_{yy}^h &= \beta^2 \sigma_{xx}^h + \sigma_{ee} = \beta^2 (1 + \delta) \sigma_{xx}^l + \sigma_{ee} = (\beta^2 \sigma_{xx}^l + \sigma_{ee}) + \delta \beta^2 \sigma_{xx}^l = \sigma_{yy}^l + \delta \beta^2 \sigma_{xx}^l \\ &= \sigma_{yy}^l \left(1 + \delta \beta^2 \frac{\sigma_{xx}^l}{\sigma_{yy}^l} \right) \end{aligned} \tag{A3}$$

and when this is combined (A3) with

$$\rho = \frac{\sigma_{xy}}{\sigma_x \sigma_y} = \beta \frac{\sigma_x}{\sigma_y} \tag{A4}$$

then

$$\sigma_{yy}^h = \sigma_{yy}^l \left[1 + \delta (\rho^l)^2 \right] \tag{A5}$$

Therefore,

$$\rho^h = \frac{\sigma_{xy}^h}{\sigma_x^h \sigma_y^h} = \frac{(1 + \delta) \sigma_{xy}^l}{(1 + \delta)^{1/2} \sigma_x^l \left[1 + \delta (\rho^l)^2 \right]^{1/2} \sigma_y^l} = \rho^l \sqrt{\frac{1 + \delta}{1 + \delta (\rho^l)^2}} \tag{A6}$$



GOVERNANCE QUALITY AND MFIS REPAYMENT PERFORMANCE

Ben Soltane BASSEM*

Abstract: *How is MFIs governance quality measured? What is the relationship between MFIs governance quality and repayment performance? This paper sheds light on these questions while using data from 250 African MFIs. While using linear multiple regression, we find first, that better governance can be measured by an aggregated index which encompasses a series of criteria based essentially on binary data. Indeed, this index aims to determine to what extent the observed units are managed on commercially viable bases. Second, we give the first evidence on the impact of the governance quality on the repayment performance. Our results show a negative link between the governance quality and the percentage of portfolio at risk (a proxy of the MFIs repayment performance) indicating that the governance quality improves the repayment performance within MFIs.*

Keywords: *Microfinance, Repayment Performance, Governance Quality, Aggregated Index*

JEL Codes: *G30, G32*

1. INTRODUCTION

During the last two decades, there is a tremendously development of the microfinance industry and its role in the economic growth of developing countries. This success can be attributed to their ability to grant small loans to those excluded from the formal banking sector due to lack of collateral. However, MFIs find themselves in a critical situation because of lower repayment rate. The non repayment problems are thorny. They put in danger the viability and the sustainability of the MFIs that, after granting loans, fail to cover their capital.

In this framework, several studies try to shed light on the main determinants of repayment performance within MFIs. Generally, these determinants include personal's characteristics (e.g. age, education, gender, marital status, experience) and loans' characteristics (e.g. credit rationing, loans size, interest rate). Besides, other studies (Honlonkou et al., 2006; Ben Soltane and Trigui, 2008) dealing with the same subject show that the MFI type determine the happy ending of credits. The authors attribute this fact to the risk taking policy, borrowers tracking policy and the governance quality. Consequently, it seems relevant to investigate the role played by the governance mechanisms in the determination of repayment rate.

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The governance, for the MFIs, is an essential factor of success or failure which stays up to this moment under estimated and badly studied especially when it comes to repayment. This paper attempts to fill this gap in the literature while answering the question how governance quality influences repayment performance within African MFIs? The choice of this context to lead this research is justified by the fact that the African continent includes a broad range of diverse and geographically dispersed institutions that offer financial services to low-income clients: non-governmental organizations (NGOs), non-bank financial institutions, cooperatives, rural banks, savings and postal financial institutions, and an increasing number of commercial banks.

In our knowledge, this paper gives the first evidence on the impact of governance quality on the MFIs repayment performance since earlier studies (Hartarska, 2005; Coleman and Osei, 2008; Ben Soltane, 2009; Mersland and Strøm, 2009) investigate the link between governance and MFIs performance in terms of outreach and sustainability. Moreover, and in order to measure the governance quality of MFIs we constructs a composite index which is an aggregate measure of nine dimensions.

The remainder of this paper will be structured as follows. The second section discusses the specificities of governance mechanisms in MFIs and provides an overview of the empirical literature. The third section presents research hypothesis. The data and the econometric approach will be presented in the fourth section. The fifth section presents the results and the last section concludes and discusses the study implications.

2. GOVERNANCE OF MFIS: A GENERAL OVERVIEW

In the microfinance field, the governance can be defined as the process of guiding an institution to achieve its objectives while protecting its assets. It refers to the mechanisms through which donors, equity, investors and other providers of funds ensure themselves that their funds will be used according to the intended purposes (Hatarska, 2005). As regard to the divergence of preferences and objectives between managers and providers of funds (Labie, 2005; Mersland and Strøm, 2009), the mission of governance mechanism is to reduce agency costs by aligning the objectives of the donors-Principal with the objectives of the manager-Agent (see Figure 9).

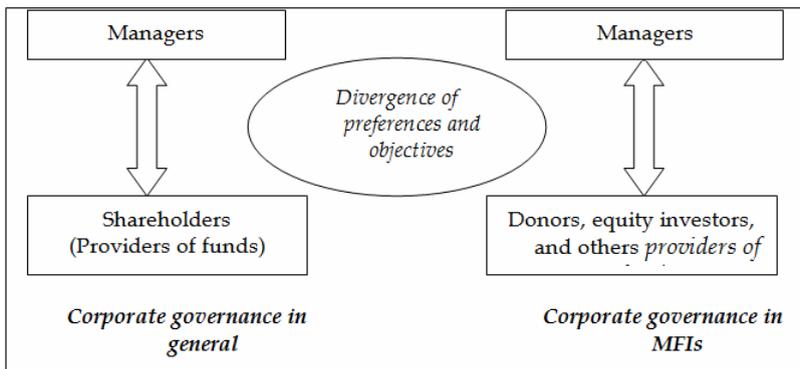


Figure 9 *The mission of governance mechanism*

In microfinance, the agency problems become so severe when we integrate the double vocation of reaching poor borrowers (outreach) in order to contribute to the development of concerned countries (Helms 2006; Johnson *et al.* 2006), and being financially sustainable (sustainability). While the social goals of reaching the poorest and poverty alleviation are valid, financial sustainability has emerged as one of the core management and governance issues. The shrinking resources base for donor funds to support the increasing demand for grants and soft loans implies that MFIs will eventually have to support themselves (Ledgerwood 1999). However, their sustainability will focus on governance structures within the industry. Indeed, as Labie (2001) observes, in the last decade corporate governance principles have imposed themselves as the basic rules for any well-run company to follow. The trend has however transcended from traditional business companies but now is part of the globalization process often seen as a tool for standardizing the controlling vision for any major organization in the world. The drive towards governance has been propelled by a number of factors, particularly the collapses of some of the major players in the industry, the influx of private equity and the fall in donor funding.

Many studies have been dedicated to the link between governance and MFIs performance. In fact, the study of Mersland and Strom (2009), in which the authors use recently released data from third-party rating agencies yielding a unique dataset of 278 MFIs from 60 countries between 1998 and 2007, found a positive link between the governance quality and the MFIs performance measured by the ROA (Return on Assets). In other words, the improvement of the quality of MFIs governance can serve as a leverage to increase their efficiency (Rock *et al.*, 2001; Labie, 2001). In the same way, Coleman and Osei (2008) examine how selected governance indicators impact on performance measures of outreach and profitability in microfinance institutions. Their study shows that governance plays a critical role in the performance of MFIs and that the independence of the board and a clear separation of the positions of a CEO and board chairperson have a positive correlation with both performance measures. These results confirm those obtained by the studies dealing with the banking firms which also showed that governance mechanisms are positively correlated with performance (Louizi, 2006; Marsal and Bouaïss, 2007). However, two other studies carried with a reduced sample of MFIs respectively from Central and Eastern Europe and Mediterranean Countries obtained mitigated results (Hartarska, 2005; Ben Soltane, 2009).

3. RESEARCH HYPOTHESIS

Following the recent literature on corporate governance in the classic bank sector (Louizi, 2006; Marsal and Bouaïss, 2007), some studies show evidence of a strong correlation between the governance quality of microfinance organizations and their performance (Rock *et al.*, 1998; Labie, 2001; Drake and Rhyne, 2002; Mersland and Strøm, 2009). Moreover, Honlonkou *et al.*, (2006) attributed the happy ending of the credit to the MFIs governance quality. Thus, we presume that the governance quality will be positively correlated with the repayment performance.

Hypothesis 1: The governance quality affects positively the MFIs repayment performance.

Fama and French (1993) argue that size may negatively affect firm performance. Some studies such as Berman, Wicks, Kotha and Jones (1999), Hoskisson (1987) and Keating (1997) observed a positive impact of size on firm performance, while others (O'Neill, Saunders and McCarthy, 1989, 1989; Westphal, 1998; Wu, 2006 and Zajac, 1990) revealed that there is mixed or no significant size effects. However, in the microfinance field, it has been shown in numerous studies (Coleman and Osei, 2008; Ben Soltane, 2009) that large MFIs have the ability to accommodate risk and to enhance productivity through diversification of products and services. Therefore, we suppose that the MFIs size will be positively correlated with the repayment performance.

Hypothesis 2: The MFI size will be positively correlated with the repayment performance.

As regards to MFI age, Coleman and Osei (2008) found a negative impact of MFI age on its performance. The authors attribute this result to the simple reason that microfinance services do not necessarily follow the formal relationship of age and reputation because of the complex and specialized nature of their functions. Similarly, Loderer and Waelchli (2009) give evidence that performance gets worse with age since old age may make knowledge, abilities and skills obsolete and induce organizational decay. However, earlier study by Ben Soltane (2009) showed that the MFI age is negatively correlated with the default probability. Consequently, we suppose that the MFI age will affect positively the repayment performance.

Hypothesis 3: The MFI age will affect positively the repayment performance.

Addressing the question of the relative performance of group loans compared to individual loans and using data from Zimbabwe, Bratton (1986) states that group loans perform better than individual loans in years of good harvest and worse in drought years when peers are expected to default. In contrast, and although Armendariz de Aghion and Morduch (2005) point out that group lending may increase the repayment rate because it leads to positive assortative matching, recent work by Ben Soltane (2009) demonstrates that the use of individual lending lead to a better performance. In the light of these findings, we suppose that the individual lending methodology will affect positively the MFIs repayment performance.

Hypothesis 4: The use of the individual lending methodology will affect positively the MFIs repayment performance.

4. DATA DESCRIPTION AND METHODOLOGICAL ISSUES

Our sample consists of 250 African Microfinance institutions that figure in the MIX MARKET database (www.mixmarket.org), which is the most renowned database. These MFIs are chosen from different countries (Tunisia, Morocco, Egypt, Benin, Nigeria, Uganda, Tanzania, Ethiopia, Ghana, Guinea, Côte d'Ivoire, etc). The choice of these institutions is justified by the fact that microfinance in the African continent is a very developed, growing and dynamic sector characterized by a variety of MFIs. The

data will be used in this study stems also from various sources. They are principally, the MFIs website and from five rating agencies MicroRate, Microfinanza, Planet Rating, Crisil, and M-Cril, and their reports can be found at www.ratingfund.org.

Our empirical model will be estimated as follows:

$$RP_i = \alpha_0 + \alpha_1 GOVQ_i + \alpha_2 \text{Control variables} + \delta_i \quad (1)$$

Where:

- *RP*: is the rate of repayment performance measured by the percentage of portfolio at risk > 30 Days.
- *GOVQ*: governance quality is measured by an aggregated index.
- *Control variables*: these variables are MFIs size, MFIs age and the use of the individual lending methodology.

Since the objective of this study was to establish causal relationship between the dependent and the independent variables in the model, the linear form of the regression was run. Ordinary least square technique was used to test the effect of MFIs governance quality on repayment performance.

Our dependent variable will be estimated by the percentage of portfolio at risk > 30 Days. The portfolio at risk (PAR) tells us how well the MFI achieves its basic goal of lending money and getting it back. Besides, this method is used by CGAP as a basis of comparison between the best microfinance institutions worldwide.

Concerning the governance quality index and as regards to the heterogeneity of MFIs in our sample, it seems relevant to refer to the studies conducted by the World Bank and the International Monetary Fund which compared the quality of the management of organizations issued from many business sectors. Among these studies, the IMF (2004), Briceno-Garmendia and Foster (2007) and Mbangala (2007) suggest an aggregated index of governance that combines a series of criteria based essentially on binary data. Indeed, this index aims to determine to what extent the observed units are managed on commercially viable bases. These criteria cover several dimensions among which four require a particular attention, because of the possibilities of application they offer to the microfinance industry. Consequently, nine criteria are considered and summarized in Table 39.

Among the advantages of the aggregated index of governance, it is necessary to note its capacity to integrate the variety of governance dimensions (Briceno-Garmendia and Foster, 2007). In addition, and from a methodological point of view, it is simple to implement it; simplicity in particular based on its appeal to binary variables. Indeed, and according to Evrard *et al.* (2003), the binary variables «*constitute the most elementary form to which any measure can be reduced*». However, it is necessary to be conscious that this simplicity hides the risk to exclude relevant variables of analysis which would not be binary. Besides, if for certain variables of the aggregated index, a binary status seems to be acceptable, for several others, the reality corresponds clearly more to multiple positions establishing rather a continuum. It is in particular the case of prudential standards respect, the independence towards public authorities, consistency of procedures manuals and the board of directors' autonomy. This remark shows the

interest to complete the analysis of the governance index so defined, by integrating quantitative variables of governance.

Table 39 *The dimensions of the MFIs governance quality*

Dimensions	indicator	modality
Legislation respect	Authorization to exercise	1 if the MFI is authorized, 0 if not
	Respect of prudential standards	1 if 100% of prudential standards are respected, 0 if not
Managerial autonomy	Towards public authorities	1 if independence towards public authorities, 0 if not
	Towards donators	0 if there is a donators influence, 1 if not
Information system quality	Coherence of the manual of procedures	1 if there is coherence of manual, 0 if not
	Audit Report Availability	1 if the audit report is available, 0 if not
	Participation in an international evaluation	1 if the MFI participates to an international evaluation, 0 if not
Board of directors	the Separation of Chairman and CEO Roles	1 if there is a separation of powers, 0 if not
	Decision-making power	1 if the Board of directors is autonomous, 0 if not

Source: adapted from IMF (2004), Briceno-Garmendia and Foster (2007).

As regards to the control variables and due to our recognition of the fact that, we are inadequate to fully specify MFI's performance model, we include the following as control variables; MFI size measured by the value of net total assets, MFI age measured by the number of years of operation using year of incorporation as reference and the lending methodology: a dummy that equals 1 if the MFI use individual lending methodology and 0 otherwise. The variables used in this study are presented in Table 40.

Table 40 *Definition of independent variables*

Variable	Explanation
Governance quality	Aggregated index
MFI size	Logarithm of the total assets of the MFI
MFI age	Number of years since the commencement
Lending methodology	A dummy that equals one if the MFI used individual lending methodology and zero otherwise

The descriptive statistics for this study are shown in Table 41. Notably, we have complete records of data for 250 MFIs. The MFIs of our sample have a mean value of portfolio at risk equal to 8.2%. The average of the governance index is 79.5%. This means that in general the observed MFIs meet a little more seven of the nine criteria that would be required for effective governance. The descriptive statistics show that the MFIs are young with a mean age of 7 years and the individual lending technology constitutes 69.5% of the cases.

Table 41 *Descriptive statistics (N = 250)*

Variable	Mean	Std	Min	Max
Percentage of portfolio at risk > 30 Days	0.082	0.119	0.000	0.870
Governance quality (Aggregated Index)	0.795	0.632	0.687	0.905
MFI size	18.402	3.209	6.420	24.810
MFI age	7.575	3.654	5	16
Individual lending methodology	0.695	0.475	0	1

Source: Authors' estimates

5. DISCUSSIONS OF EMPIRICAL FINDINGS

As shown in Table 42 dealing with the estimation of the impact on repayment performance, our first hypothesis stipulating that the governance quality is confirmed. The coefficient of Governance quality is negative and significant at the 10 percent level. This negative correlation indicates that the governance quality contribute to the reduction of the percentage of portfolio at risk and decreases the likelihood of repayment problems. Indeed, and due to a good governance, MFIs become more efficient and conscious of risk management issues. Our results are in line with CGAP (2006) and Rock et al. (1998) who assert that good governance is the key to a successful MFI.

Good governance, which means guiding the institution to achieve its objectives while protecting its assets, allows reducing information asymmetry between donors and management which in turn affects the repayment rate. Thus, control mechanisms aim at preserving the interests of donors and equity investors, by guaranteeing a high repayment performance often presented by microfinance institutions as evidence of their success. Moreover, and according to Godquin (2004), high repayment rates are indeed largely associated with benefits both for the MFI and the borrower. They enable the MFI to cut the interest rate it charges to the borrowers, thus reducing the financial cost of credit and allowing more borrowers to have access to it. Improving repayment rates might also help reduce the dependence on subsidies of the MFI which would improve sustainability. It is also argued that high repayment rates reflect the adequacy of MFIs' services to clients' needs. Last but not least, repayment performance is a key variable for banks and other private investors who feel more comfortable investing in well-managed MFIs that adopt good governance practices.

As expected, the MFI size has a significant negative impact on the percentage of portfolio at risk. This may be due to the fact that a large firm has the ability to accommodate risk and to enhance productivity through diversification of products and services.

Contrary to what we have supposed and in conformity with Coleman and Osei (2008) and Loderer and Waelchli (2009), the results indicate that the MFI age increase the percentage of portfolio at risk. This fact can be attributed to the simple reason that microfinance services do not necessarily follow the formal relationship of age and reputation because of the complex and specialized nature of their functions. Moreover, old age may make knowledge, abilities, and skills obsolete and induce organizational decay.

Results indicate also that the lending technology improves considerably the financial performance of the MFIs and reduce the percentage of portfolio at risk. This result can be attributed to the fact that the cost argument is more important than the repayment argument for group lending or village bank. From another point of view, it can be justified by the new tendency toward the individual microlending (Armendariz de Aghion and Morduch 2005), since this methodology becomes highly recommended (Armendariz de Aghion and Morduch 2000).

Table 42 Regression Results (N = 250)

Variable	Coefficients	t-statistics
Governance quality (Aggregated Index)	-0.1927*	-4.23
MFI size	-0.524**	-0.025
MFI age	0.234***	0.123
Individual lending methodology	-0.411*	-0.063
Constant	-2.22**	-4.03

*Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level

5. CONCLUSIONS

This paper is part of the current literature considering the governance mechanism as an appropriate way of improving the MFIs performance (Hartarska, 2005; Coleman and Osei, 2008; Ben Soltane, 2009; Mersland and Strøm; 2009). It gives the first evidence of the impact of the governance quality on the MFIs repayment performance while using data relative to 250 African MFIs.

Our results indicated that the governance quality, measured by an aggregated index, affect negatively the percentage of portfolio at risk > 30 Days: a proxy of the MFIs repayment performance. The results demonstrate also that the MFI size and the use of the individual lending methodology improve the repayment performance within the MFIs. However, the MFIs age affect positively the percentage of portfolio at risk > 30 Days and worsen the repayment performance.

These MFIs are invited to respect the prudential regulation in order to ensure the safety of clients and building healthy institutions for the development of the financial sector and finally improving their governance which in turn lead to a better repayment performance. These MFIs need also to be managerial autonomous towards public authorities and donators since this influence is an unfavorable factor in the governance quality. Finally, these MFIs are invited to reinforce the information system quality and the power of decision and control of the boards of directors.

Our study has certain limitations; foremost among them is the inability to test the impact of each dimension of the aggregated index on the MFIs governance quality. Second, our sample is of small size compared to the large number of MFIs in Africa. Hence, future researches are invited to shed light on the influence of each index dimension on the governance quality. In addition, it is appropriate to test our model with a larger number of MFIs in other context.

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RMB DEVALUATION AND ASEAN5 COUNTRIES' EXPORTS TO THE US: COMPLEMENTARY OR SUBSTITUTE?

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Abstract: *This paper aims to examine the impact of changes in the Chinese renminbi (RMB) exchange rate against the United States (US) dollar on the ASEAN5 countries' exports to the US. The Johansen cointegration test and Ordinary Least Square (OLS) regression are applied. The cointegration tests show that there are long-term relationships among real GDP of the US, ASEAN5's real exchange rates and their volatility, and RMB real exchange rate. The RMB devaluation has positive significant long-term impacts (complementary relationship) on the ASEAN5 countries' exports to the US.*

Keywords: ASEAN5, Renminbi (RMB), Volatility, Cointegration.

JEL Codes: F31, F33, F36, F42

1. INTRODUCTION

Over the last two decades, the attention of almost nations in the world has been concentrated on the accession of China in global asset acquisition. This achievement might not be separated from the implementation of market reforms succession which has been applied since in the end of 1978. Particularly, under the era of Deng Xiaoping, China has been transformed from a centrally planned economy to a market economy, while their communist political system remains. China then has performed high economic growth around 8-10 per cent (Ishihara, 1993; Panagariya, 2006). World Bank (2006) and Bloom *et al* (2006) stated that one of the main explanatory reasons for their high economic performance is the extensive of their international trade policies for openness.

Specifically, the Chinese government then created several strategies in order to attract the foreign investors directly doing their business in China mainland. In this case, China implements the form of "decentralization" of trade i.e. independent rights to export and import activities. The number of Foreign Trade Corporations (FTCs, either at the central level or the provincial level) drastically increased from only 12 FTCs with

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monopoly rights on trade in 1978 to 800 in 1985. Moreover, in 1988 the number of FTCs reached more than 5.000 with full authority in trade (Panagariya, 2006).

Foreign investment companies (joint venture or completely foreign owned) has also given the rights to have their foreign trade. Some policies has also established following the “decentralization” of trade such as adjustment the exchange rate through devaluation, incentive for export, establishment a system of rebating the value added, custom duties paid on inputs used in exports, and duty drawback. The Special Economic Zones (SEZs) and Open Cities have established to competitive environment for doing business. For example, Hainan City has only built for coconut industry cluster. The government of China then set the city as the special area only for coconut and its product derivation i.e. “one village one product”. All of needed public facilities have also been provided for creating conducive environment for business activities such as seaport, by pass/tollroad, and electricity. Furthermore, the China government has also encouraged the local entrepreneur for creating international level exhibition by inviting foreign buyer to join their event (Das, 2006; Srinivasan, 2006; Widodo, 2008). All those trade reforms has significantly affected exports and imports of China, particularly in the late of 1980s.

To boost its competitiveness in the international market, in 1994 the Chinese government sharply devalued its currency *renminbi* (RMB) and strongly applied the fixed exchange rate regime to maintain the value of RMB at the constant nominal level. It was pegged at 8.704 against the US dollar (US\$). Even so, after the US government strongly demanded to the China government, in the beginning of 2005 the RMB was revalued by about 2.1 per cent against the US \$. Afterwards, in order to accelerate trade volume and reduce its international barriers, China enlisted as the new member of World Trade Organization (WTO) in 2001. This accession was widely expected to give further impetus to their exports, Foreign Direct Investment (FDI) and overall growth prospects (Rawski, 2009; Yamazawa and Imai, 2001). China has made a remarkable upward trend in exports especially since 2001. Furthermore, data from the UN COMTRADE shows that Chinese exports have achieved a record i.e. exceeding Japan’s exports since 2004.

Thus, it does not surprise if China then emerged as the new major economic power in the world. For the period 1980-2000, the volume of total exports phenomenally increased from 19.3 to 249.2 billion dollar and the share of China in the total world exports expanded from 0.96 per cent to 3.9 per cent. China has become the seventh largest international exporter, following the U.S., Germany, Japan, France, United Kingdom, and Canada (Yue, 2001). Moreover, during 1990s China has emerged as the biggest garment producer in the world, covering 20 per cent of the world’s garment exports (Yamazawa and Imai, 2001). By 2002, China has succeed as the biggest economy in Asia after Japan, the sixth biggest merchandise trading nation in the world, the 12th largest exporter of commercial services, and the largest recipient

of foreign direct investment (FDI) among developing countries (Funke and Rahn, 2005; and Rajan, 2003)³².

In the context of market reforms explained before, the Chinese government has fundamentally applied the concept called as “incorporation strategy”. For instance, the strategy of China Incorporation can be explained as a line of private business and state own enterprises (SOEs) of China supported by the Chinese banking and given various incentives from the government of China. The aim of incorporation strategy is in order to win global trade competition by creating image of China as a “corporation”.

The concept of incorporation strategy was firstly introduced by Japan. For Japanese, it is called “*keiretsu*” or the group of big enterprises. Formally, *keiretsu* can be defined as a collaboration strategy amongst government, SOEs and all of business sectors (Noland, 1997). In the early era, incorporation strategy was firstly applied by “The Big Six”, which are Mitsubishi, Mitsui, Dai-Chi Kangyo, Sumi-tomo, Sanwa and Fuji. All of the Big Six members deal to establish a group purposed to expand automotive networking around the world. In detail, the Big Six established a synergy in almost of operational production level, materials procurement, funding, guarantee, assurance, marketing, distribution and transportation. In this case, the incorporated corporation in their network devolves the production activities to the worldwide group or local business having expertise (Weinstein and Yafeh, 1995). The incorporation strategy might be inspired by the concept of “flying geese” (FG) which was firstly introduced by Kaname Akamatsu in the 1930s, as a catching-up process of manufacturing industries in developing countries (Kojima, 2000; Ozawa, 2001; Kwan, 2002; Kasahara, 2004)

Therefore, China now can be figured as a “corporation” which able to produce goods and services at a competitive price level amongst country competitors, even at lower price. In the context of price level, many economist believe that the accession of China, particularly in the early of 1990th, has been fueled by the strategy transformation, which is the implementation of fixed exchange rate regime.

Funke and Rahn (2005) and Baak (2005, 2007) among others stated that the key factor of the China’s strengthened international competitiveness is by pegging RMB against US dollar after the first its devaluation in 1994. Particularly, Funke and Rahn (2005) argued that the main purpose of the Chinese government devalued its RMB against the US dollar was to keep Chinese competitiveness in exports. It has lead to job losses in the US, Japan and other economies in the East Asian region. Baak (2007, 2005) found that the depreciation of RMB against the US dollar turns out to decrease both in Korean exports to Japan and the U.S exports to China.

In the case of South East Asian countries, China has played role as a dominant major partners for ASEAN5 countries³³. However, Teh (1999) found that China is also

³² China’s exports increased from about US\$10 billion per annum in the late 1970s to US\$326 billion in 2002 or about 5 per cent of total world exports, which making it the sixth largest trading nation in the world (Funke and Rahn, 2005).

³³ The ASEAN5 is the five founder countries of the ASEAN (Association of Southeast Asian Nations), i.e. Singapore, Indonesia, Malaysia, the Philippines and Thailand.

the major competitor country in the world market. The latest data from the *Direction of Trade Statistics – International Monetary Fund* (DOTS-IMF) shows that there had been several changes in the geographic destinations of the ASEAN's exports for 1995, 2000 and 2005. Specifically, intra-regional trade within the ASEAN countries still covered a big portion on average about 24.5 per cent of the ASEAN's total exports for 1995-2005. For 1995 and 2000, the share of total exports destined for Japan, the European Union (EU) and the US decreased from 12.4 per cent to 11.6 per cent, from 14.1 per cent to 13.1 per cent and from 18.5 per cent to 14.8 per cent, respectively. Meanwhile, the shares of total exports destined for China, Korea and the rest increased for the same years.

This paper is aimed to analyze the impacts of devaluation and real exchange rate of RMB on the exports of ASEAN5 to the U.S, particularly in the long-term. The rest of this paper is organized into four specific parts. Part 2 exhibits research method comprising of the econometric model and data. Part 3 shows the empirical results and analysis. Part 4 describes China in the East Asian “flying geese” formation. Some conclusions and policy implications are presented in Part 5.

2. RESEARCH METHOD

2.1. The econometric model

“Product sharing/fragmentation/slicing” has been the phenomenon in the intra-regional trade in East Asia. Trade in the parts and components have been increasing significantly in the region (Ng and Yeats, 2003, Athukorala and Yamashita, 2006). As the “East-Asian fabric”, China has intensive interrelations and interdependences with other East Asian countries (Fouquin et al, 2006, Ng and Yeats, 2003). The changes in the exchange rate RMB against the US \$ will certainly affect the other East Asian countries, including the ASEAN5 countries. This sub-part exhibits the econometric model, which shows how devaluation and real exchange rate of RMB against the US dollar affects the exports of the ASEAN5 countries³⁴. We mainly follow the econometric model by Baak (2007) with some modifications. Based on the work and typical specification of other studies as in Baak (2007, 2006 and 2005), Arize and Osang (2000), Widarjono (2005), and Funke and Rahn (2005), we construct an econometric model as follows:

$$Y_{ijt} = \beta_0 + \beta_1 g_{jt} + \beta_2 p_{ijt} + \beta_3 \sigma_{ijt} + \beta_4 p_{cjt} + \beta_5 D_{ijt} + \varepsilon_{ijt} \quad (1)$$

According to the equation (1), we will estimate the coefficients both of dependent and independent variables in order to understand the long-run relationship between the export volume and RMB devaluation. As of the exports function of Baak

³⁴ Baak (2007) has indicated some studies explored the impact of the renminbi on Chinese trade itself. Zhang (2001), Chou (2000), Tang (2003), Wang and Zhang (2003) investigated the effects of the Japanese yen depreciation on the Chinese exports. While, Battacharya, Gosh and Jansen (2001) determined whether the emergence of China hurt Asian exports.

(2007, 2006, and 2005), both of dependent and explanatory variables are determined in natural logarithm form. The real exports volume from ASEAN5 countries to the U.S. is represented by Y_{ijt} . In detail, subscript i represents exporting countries i.e. the ASEAN5 countries (Singapore, Indonesia, Malaysia, the Philippines, and Thailand), j denotes importing country, i.e. the United State, c is defined as a competitor of i 's country in the market of country j , that is China, meanwhile subscript t symbolizes time in quarterly. Here are the specific variables involved in the equation (1):

- Y_{ijt} denotes the log value of the real exports of i (ASEAN5) countries to j (the U.S.) It equals to the log value of the quarterly nominal exports of country i to country j (EX_{ijt}) divided by exports unit value index of a country i ($EXUV_{it}$) times 100. For ease, according to Baak (2007), it is formulated as follows:

$$Y_{ijt} = \ln \left(\frac{EX_{ijt}}{EXUV_{it}} \right) \times 100 \quad (2)$$

However, the price index from four countries (i.e. Indonesia, Malaysia, Filipina, and Thailand) are incomplete, then real exports are calculated based on the assumption of export equals to imports. Therefore, according to Baak (2006) the quarterly nominal exports of country i to country j (EX_{ijt}) is assumed equivalent (with marginal differences due to the Free on Board, FOB, for exports and Cost Insurance Freight, CIF, for imports) to the quarterly nominal imports of country j from the four i countries (IM_{ijt}). In addition, the exports unit value index of a country i ($EXUV_{it}$) is also assumed equal to the import unit value index of the country i ($IMUV_{it}$). This formula can be constructed, as follows:

$$Y_{ijt} = \ln \left(\frac{IM_{ijt}}{IMUV_{it}} \right) \times 100 \quad (3)$$

- In order to measure real economic activities in such a country, it is common to employ real GDP formulation. g_{jt} in equation (1) above represents real GDP measured from the log value of nominal GDP divided by deflator. As of in economics literature, the real GDP can be formulated as follows (Mankiw, 2009):

$$g_{jt} = \ln \left(\frac{GDP \text{ Nominal}}{GDP \text{ Deflator}} \right) \quad (4)$$

- Although all of the involved variables are measured in logarithm form, however, the real exchange rate of in the conventional ways. Following the Baak (2005), the real exchange rate simbolized as p_{ijt} and p_{cjt} is computed by:

$$p_{ijt} = \ln \left(E_{ijt} \times \frac{CPI_{jt}}{CPI_{it}} \right) \quad (5)$$

In detail, p_{ijt} denotes the real exchange rate each of the i 's countries currencies against the j 's country currency, meanwhile p_{cjt} is defined as the real exchange rate of

country c 's against importing country j 's currency. Next, E_{ijt} denotes the quarterly nominal exchange rate of country i against country j . $QUOTE_{ijt}$ and CPI_{ijt} symbolizes as the quarterly consumer price index each of i countries and j country, respectively. In the case of country c , the real exchange rate of is also computed in similiar way by replacing the subscript i into c .

- In equation (1), σ_{ijt} represents the log value of real exchange rate volatility. According to Baak (2006 and 2007), if the agents of economic are moderately risk averse, it is generally expected that the impact of real exchange rate volatility will be negative, and vice versa if the agents of economic are moderately risk takers. The research determines the real exchange rate volatility as natural logarithm of the absolute quarterly standard deviation of monthly real exchange rate. For ease, it can be constructed as³⁵:

$$\sigma_{ijt} = \ln \left| \sqrt{\frac{1}{n-1} \sum_{k=1}^n [RER_{ijk} - \overline{RER_{ij}}]^2} \right| \quad (6)$$

Specifically, RER_{ijk} represents the monthly real exchange rate, meanwhile $\overline{RER_{ij}}$ is the quarterly average of monthly real exchange rates and k is the index of the months in a quarter.

- In order to investigate the influence of RMB devaluation on the real exports of each five ASEAN5 countries, we involve dummy variables denoted by D_{ijt} in the model.

In this case, the periode before devaluation (1987.Q1-1993.Q4) takes a value of 0 (zero), meanwhile for the period after devaluation (1994.Q1-2009.Q2) takes a value of 1(one).

2.2. Data Sources

The length sample periode for this research spans from the first quarter 1987 to the second quarter 2009. The period is chosen in order to figure out the real condition. In detail, both of data exports and imports for ASEAN5 countries and the U.S were taken from the *Direction of Trade Statistics (DOTS)* of the International Monetary Fund (IMF). Meanwhile, data for nominal exchange rate, Consumer Price Indices (CPI), GDP nominal and GDP deflator of the US were obtained from the *International*

³⁵ The equation above is a correction of formula which has been employed by Baak (2007), as follows:

$$\sigma_{ijt} = \ln \left(\left| \sqrt{\frac{1}{n-1} \sum_{k=1}^n [RER_{ijk} - \overline{RER_{ij}}]^2} \right| \right)$$

According to the equation of Baak (2007), there is a possibility to compute negative and/or zero value from standard deviation, which is impossible to be calculated. Thus, we argue that absolute brackets needs to be added to correct in Baak's formula.

Financial Statistics (IFS) of the IMF. In the case of China the data for CPI were obtained from the *National Bureau of Statistics of China* (NBSC).

3. THE EMPIRICAL RESULTS AND ANALYSIS

To establish the existence or non-existence of an equilibrium relationship amongst variable involved, we have to first test whether the two variables are integrated to the same order. The Augmented Dickey-Fuller (ADF) is employed to test, for both the level and the first difference (order of integration).

3.1. Unit roots test: ADF test

Prior to testing the cointegrating relationship, the presence of unit roots in the variables included in equation (1) is detected by using Augmented Dickey-Fuller (ADF) tests, for both the level and the first difference (order of integration). The length of optimal lag involved in the test is decided by the Aikake Information Criterion (AIC).

Table 43 describes the ADF statistics for all variables that are lower than MacKinnon critical value. This implies the presence of unit roots. In other words, it can be concluded that all variables are not stationary at the level, except the real exchange rate volatility for four countries (which are Singapore, Malaysia, the Philippines, and Thailand). In addition, all the variables are integrated of order one I(1) or stationary at the first difference, except the real exchange rate volatility for the four countries.

Table 43 ADF Unit Roots Test for the Level and the First Differences

Variables	Level		First Difference	
	Lag	ADF	Lag	ADF
Singapore				
Exports (Y_{ijt})	4	-0.417	2	-7.735*, I(1)
Real GDP (g_{jt})	1	-1.954	1	-8.869*, I(1)
Singapore: real exchange rate (p_{ijt})	1	-1.695	1	-7.224*, I(1)
Singapore: real exch. rate vol. (σ_{ijt})	1	-4.760*, I(0)	2	-8.441*, I(1)
China: real exchange rate (p_{cit})	1	-0.409	1	-7.987*, I(1)
Indonesia				
Exports (Y_{ijt})	5	-1.537	5	-4.034*, I(1)
Real GDP (g_{jt})	1	-1.954	1	-8.869*, I(1)
Indonesia: real exchange rate (p_{ijt})	3	-1.834	2	-6.807*, I(1)
Indonesia: real exch. rate vol. (σ_{ijt})	1	-3.086	1	-9.275*, I(1)
China: real exchange rate (p_{cit})	1	-0.409	1	-7.987*, I(1)
Malaysia				
Exports (Y_{ijt})	4	0.701	2	-8.805*, I(1)
Real GDP (g_{jt})	1	-1.954	1	-8.869*, I(1)
Malaysia: real exchange rate (p_{ijt})	1	-2.297	1	-5.978*, I(1)
Malaysia: real exch. rate vol. (σ_{ijt})	1	-5.435*, I(0)	5	-5.933*, I(1)
China: real exchange rate (p_{cit})	1	-0.409	1	-7.987*, I(1)
The Philippines				
Exports (Y_{ijt})	4	-0.594	2	-9.612*, I(1)

Variables	Level		First Difference	
	Lag	ADF	Lag	ADF
Real GDP (g_{jt})	1	-1.954	1	-8.869*, I(1)
The Philippines: real exchange rate (p_{ijt})	1	-1.875	1	-6.193*, I(1)
The Philippines: real exch. rate vol. (σ_{ijt})	1	-4.633*, I(0)	1	-9.973*, I(1)
China: real exchange rate (p_{cit})	1	-0.409	1	-7.987*, I(1)
Thailand				
Exports (Y_{ijt})	4	-1.147	1	-1.597*, I(1)
Real GDP (g_{jt})	1	-1.954	1	-8.869*, I(1)
Thailand: real exchange rate (p_{ijt})	4	-1.581	2	-6.521*, I(1)
Thailand: real exch. rate vol. (σ_{ijt})	1	-3.592*, I(0)	3	-6.561*, I(1)
China: real exchange rate (p_{cit})	1	-0.409	1	-7.987*, I(1)

Source: IFS, DOTS and NBSC. Authors' calculation.

The number in the brackets is the order of integration

*) Denotes rejection of a unit root hypothesis based on Mackinnon's critical value at the $\alpha=1\%$, 5%, 10%.

3.2. Cointegration test: long term relationship

The cointegration test is the next step after we succeed proof the existance of unit roots in the level and degree of integration in each of variable by ADF test. The existance of cointegrating relationships is indicated when two or more non stationary series could have at least linear combination which is stationary I(0). In short, the stationary linear combination cancels out the stochastic trends in the two series, which can be proven by checking the residuals from the regressions are stationer, I(0). The urgency of the cointegration test, as Granger mentioned, is in order to avoid "spurious regression" (Gujarati, 2003: 822).

The use of Johansen cointegration test is based on the form of the empirical model in this research is a multivariate case. Thus, the test of cointegration is investigated by the procedures of Johansen test. Technically, the VAR lag order selection criteria test is applied in order to choose the optimal lags length, in which the lenght of maximum lag entered in in Johansen test test are 8. In addition, if the I(1) variables involved are cointegrated, the OLS estimation are consistent (Thomas, 1997: 428-438).

Table 44 Johansen Cointegration Test

Statistik	Lags	Ho	$r = 0$	$r \leq 1$	$r \leq 2$	$r \leq 3$	$r \leq 4$
		H_A	$r \geq 1$	$r \geq 2$	$r \geq 3$	$r \geq 4$	$r \geq 5$
Singapore		5					
<i>Trace Statistic</i>			89.72**	59.89**	35.54*	14.36	4.683
(critical value 5%)			68.52	47.21	29.68	15.41	3.76
(critical value 1%)			76.07	54.46	35.65	20.04	6.65
<i>Max-Eigen Statistic</i>			29.83	24.35	21.17*	9.682	4.68*
(critical value 5%)			33.46	27.07	20.97	14.07	3.76
(critical value 1%)			38.77	32.24	25.52	18.63	6.65
Indonesia		8					
<i>Trace Statistic</i>			113.69**	71.51**	45.05*	23.95	9.373

Statistik	Lags	Ho H _A	r = 0 r ≥ 1	r ≤ 1 r ≥ 2	r ≤ 2 r ≥ 3	r ≤ 3 r ≥ 4	r ≤ 4 r ≥ 5
(critical value 5%)			87.31	62.99	42.44	25.32	12.25
(critical value 1%)			96.58	70.05	48.45	30.45	16.26
<i>Max-Eigen Statistic</i>			42.19*	26.46	21.09	14.58	9.373
(critical value 5%)			37.52	31.46	25.54	18.96	12.25
(critical value 1%)			42.36	36.65	30.34	23.65	16.26
Malaysia	5						
<i>Trace Statistic</i>			85.92**	49.52*	25.26	10.45	3.96*
(critical value 5%)			68.52	47.21	29.68	15.41	3.76
(critical value 1%)			76.07	54.46	35.65	20.04	6.65
<i>Max-Eigen Statistic</i>			36.40*	24.26	14.80	6.489	3.96*
(critical value 5%)			33.46	27.07	20.97	14.07	3.76
(critical value 1%)			38.77	32.24	25.52	18.63	6.65
The Philippines	8						
<i>Trace Statistic</i>			95.99**	56.87**	25.77	10.63	0.89
(critical value 5%)			68.52	47.21	29.68	15.41	3.76
(critical value 1%)			76.07	54.46	35.65	20.04	6.65
<i>Max-Eigen Statistic</i>			39.11347**	31.10*	15.13	9.749	0.89
(critical value 5%)			33.46	27.07	20.97	14.07	3.76
(critical value 1%)			38.77	32.24	25.52	18.63	6.65
Thailand	5						
<i>Trace Statistic</i>			89.25**	54.87**	27.56	12.79	3.65
(critical value 5%)			68.52	47.21	29.68	15.41	3.76
(critical value 1%)			76.07	54.46	35.65	20.04	6.65
<i>Max-Eigen Statistic</i>			34.38*	27.30**	14.77	9.141	3.65
(critical value 5%)			33.46	27.07	20.97	14.07	3.76
(critical value 1%)			38.77	32.24	25.52	18.63	6.65

Source: IFS, DOTS and NBSC. Authors' calculation.

The asterisk (**)(*) denotes rejection of the null hypothesis of no cointegration at the 5% (1%) significance level, respectively.

Table 44 shows a summary of the test for the number of cointegrating vector. The test are divided into a number of levels with test statistic for $r=0$ (no cointegrating vectors); $r=1$ (one cointegrating vector); $r=2$ (two cointegrating vectors); $r=3$ (three cointegrating vectors); and $r=4$ (four cointegrating vectors). The test follows the procedure: if there is no cointegrating vector then none of hypotheses are rejected; if there is one cointegrating vector, $r=0$ is rejected but $r=1$ cannot be rejected; if there are two cointegrating vectors, $r=0$ and $r=1$ are rejected but $r=2$ cannot be rejected; if there are three cointegrating vectors, $r=0$, $r=1$ and $r=2$ are rejected but $r=3$ cannot be rejected; and if there are four cointegrating vectors, $r=0$, $r=1$, $r=2$, and $r=3$ are rejected but $r=4$ cannot be rejected. Both trace statistics and max-eigenvalue statistics in each country confirm the presence of cointegrating vectors, implying the variables in

equation (1.1) are cointegrated³⁶. In other words, this result means that there are long-run relationship among variables examined.

The impact of RMB Devaluation

This study focused on the impact of Chinese *renminbi* on the bilateral export of ASEAN5 to the US in the long run term (however, the short run impacts of RMB devaluation is presented in the Table 46a from Appendix). To do so, Equation (1) is estimated and the estimation result is presented in Table 45.

Table 45 OLS Estimation

Country	Singapore	Indonesia	Malaysia	The Philippines	Thailand
C	5.521* (0.969)	3.393* (0.993)	5.078* (0.722)	9.678* (0.802)	5.155* (0.701)
g_{ijt}	0.427* (0.277)	0.573* (0.103)	0.255 (0.204)	-0.665* (0.197)	0.381* (0.122)
P_{ijt}	-0.826* (0.272)	0.114 (0.088)	0.196 (0.181)	-0.133 (0.155)	-0.088 (0.163)
σ_{ijt}	-0.023 (0.019)	0.007 (0.012)	-0.041** (0.015)	0.046** (0.016)	0.010 (0.014)
P_{cjt}	0.574* (0.135)	0.244* (0.140)	0.929* (0.185)	0.701* (0.117)	0.917* (0.213)
Dummy	0.194** (0.089)	0.366* (0.143)	0.293* (0.171)	0.262* (0.106)	-0.005 (0.172)
R^2	0.911	0.935	0.950	0.855	0.926
Adjusted R^2	0.900	0.903	0.940	0.829	0.923
F-statistic	17.39	24.23	32.15	99.15	21.22
Prob(F-statistic)	0.000	0.000	0.000	0.000	0.000

Source: IFS, DOTS and NBSC. Authors' calculation.

Standard error in parentheses

The asterisk (*)/(**) indicate the rejection of the null hypothesis of a zero coefficient at the 5% (10%) significance level, respectively.

From the estimation results, we find that dummy variables have positive significant impact on the bilateral exports of four ASEAN5 countries to the US, i.e are Singapore, Indonesia, Malaysia, and the Philippines. This means that the devaluation policy of RMB has a positive impact on the ASEAN5 countries' exports. On contrary, in the case of Thailand, the RMB has an insignificant impact on its bilateral exports to the US.

The real exchange rate of RMB against the US \$ (p_{cjt}) has a positive significant impact on the bilateral exports for all five ASEAN5 countries to the US. In detail, 1 per cent depreciation of the RMB raises ASEAN5 countries' exports to the US by about 0.57 per cent (Singapore), 0.24 per cent (Indonesia), 0.92 per cent (Malaysia), 0.70 per

³⁶ According to the estimation of Error Correction Model (ECM) regression, the test result shows that the estimated coefficient of Error Correction Term (ECT) in all of five ASEAN5 countries are negative and significant at the $\alpha=1\%$, 5%, 10% (see: Appendix 1). Following the work of Baak (2007, 2006, and 2005), these studies examine that negative and significant value of the estimated ECT coefficient confirming the presence of one long-run relationship among the variables involved.

cent (the Philippines) and 0.91 per cent (Thailand). It might indicate that the relationships between China and ASEAN5 countries' exports to the US are complementary.

The strong impact of RMB on the bilateral ASEAN5 exports to the US has influenced the relationships between the bilateral trade and exchange rates ASEAN5 currencies against the US \$- as well as the real exchange rate volatility. This research finds that the ASEAN5 (except Singapore) countries' bilateral real exchange rates against the US \$ (p_{ijt}) and their real exchange rate volatility (σ_{ijt}) (except Malaysia and the Philippines) do not have significant impacts on the ASEAN5 bilateral exports to the US. In the case of Singapore, the bilateral real exchange rate of Singaporean \$ against the US \$, has a negative impact on their bilateral exports. This means that the depreciation of the Singaporean \$ will lead to decrease in the Singaporean exports to the US. This inference is according to the RMB real exchange rate coefficient which much higher than both of domestic real exchange rate (in four countries) and real exchange rate volatility (in three countries).

As theoretically expected, the US real Gross Domestic Products (GDP) has a positive impact on the ASEAN5 (except Malaysia) countries' bilateral exports to the US. This implies that the four ASEAN5 (except Malaysia) countries' bilateral exports to the US is dominated by the normal merchandised goods.

4. CHINA AS “EAST ASIAN FABRIC” IN THE “FLYING GEESE” PARADIGM

In the previous part, we have already concluded that there are complementary relationships between Chinese and each ASEAN5 countries' exports to the US. The RMB devaluation - aimed to increase the Chinese competitiveness and further Chinese exports - has also encouraged ASEAN5 countries' exports to the US. This finding is not the same what many people believe, that the RMB devaluation will hamper the ASEAN5 countries' exports. For sure, this might be happen when the Chinese and ASEAN5 countries' exports are substitute instead of complementary. How has a such complementary relationship in exports happened? We would argue that this is because the Japanese Foreign Direct Investment (FDI) through “flying geese” paradigm (Akamatsu, 1961, 1962), which have then encouraged “product sharing”³⁷ activities in East Asian region (Ng and Yeats, 2003).

International trade and its liberalization have played a vital role as the engine of economic growth in East Asian countries. The “flying geese” (FG) pattern is one of the well-recognized models that strongly considered in explaining economic development in East Asia. The model was firstly introduced by Kaname Akamatsu in the 1930s, as an analogous sequential development or catching-up process of manufacturing industries in developing countries (Kojima, 2000; Ozawa, 2001; Kwan, 2002; Kasahara, 2004). It might be argued that the structural transformation of

³⁷ The alternative names are frequently used such as ‘vertical specialization’ (Hummels *et al.*, 2001, Yi 2003), ‘slicing the value chain’ (Krugman 1995).

industrialization in East Asia follows this ‘flying geese’ formation. Garment, Steel, Popular TV, Video and HDTV are frequently used to illustrate the formation. Those products have been transferred from Japan to Newly Industrialized Economies (NIEs: Hong Kong, Taiwan, Singapore and Korea); from NIEs to the ASEAN4 (Malaysia, Indonesia, Thailand and the Philippines); from the ASEAN4 to latecomer economies.

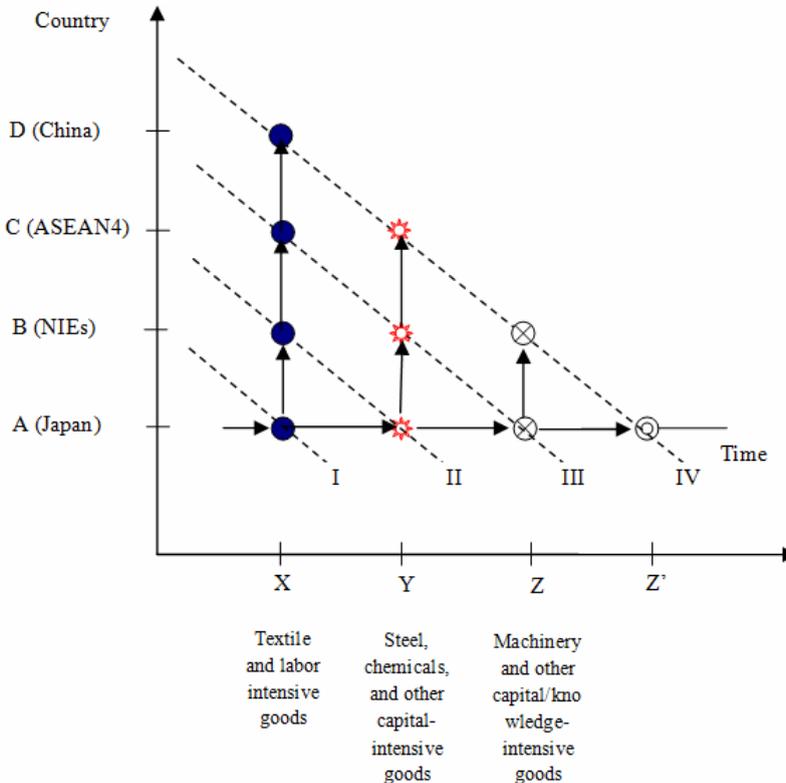


Figure 10 The Modern “Multi-sequentialist” FG Paradigm

Source: Kojima (2000)

The modern “multi-sequentialist” FG paradigm is clearly presented in Figure 10. Kojima (2000) makes two assumptions: (1) an economy’s industrial structure is diversified and upgraded in a sequence from industry X (textiles and other labor-intensive goods) to Y (steel, chemicals, and other capital-intensive goods), and further to Z (machinery and other capital/knowledge-intensive goods). This industrial shift happens horizontally over time. (2) the flying-geese pattern of industrialization is transmitted through pro-trade type of FDI from the lead goose (or Japan), to the follower geese B (or NIEs), C (or ASEAN 4) and D (or China) according to the industrialization or per capita income levels. This geographical spread takes place vertically over time. The passages of time are indicated by broken lines I, II, III, and IV in Figure 10.

Following the “flying geese” (FG) paradigm in East Asia, Japan as the leader in the FG formation had a relatively high economic growth based on exports in the 1960s (Akamatsu, 1961, 1962). It was then followed by the East Asian Newly Industrialized

economies (Hong Kong, Taiwan, Singapore and the Republic of Korea) in the 1970s and 1980s, the ASEAN3 countries (Thailand, Malaysia and Indonesia) in the 1980s; and China in the 1990s. AswicaHyono and Pangestu (2000) and World Bank (1993), among others, note that the governments have encouraged exports development by applying various incentives or instruments such as subsidized export credits, duty rebates, input subsidy, credit facilities with preferential lending rates, duty free imported inputs for manufacturing export products, and one-stop services for investment. The governments have also applied general incentives, for instances: competitive real exchange rates, trade and investment reforms, and sound macroeconomic policies. Recently, China has followed suit intensively the trend in the world liberalization.

There have been changes in the patterns of world trade due to the development of technology in transportation and communication (information technology, IT) and much lowered trade barriers. Thus, the world has become "borderless". Transaction costs in international trade have greatly decreased. Searching countries' comparative advantage may not focus only on final products anymore but also on intermediate products. International production fragmentation has become an interesting phenomenon and led to *de facto* economic integration in East Asia (Fouquin *et al.*, 2006). It is defined as cross-border dispersion of component production/assembly within the vertically integrated production process, where each country specializes in particular stage of the production sequence (Athukorala and Yamashita, 2006). The international production sharing is strongly supported by the belief that the most important determinant of productivity (economies of scale) or unit costs is not the size of plant but how production is organized within a plant of a given size (Verdoorn, 1960).

Having this large number of production sharing activities, East Asian region is sometimes thought to have achieved *de facto* economic integration. Intra-regional trade has increased, especially in parts and components industries. Assembly activities have also increased considerably in the region. Gaulier *et al.* (2006) notes that vertical production networks in the region have formed a 'triangular trade' pattern, where the multinational corporations (MNCs) use China as an export base for the final assembly, in order to export final goods to the United States (US) and the European Union (EU).

5. CONCLUSION

This study examines the relationship between RMB and the ASEAN5 countries' exports to the US. Cointegration test is applied to investigate the long run relationships, while OLS regression is employed to investigate the estimated coefficient in five variables involved, which are real GDP of the US, each of ASEAN5's volatility and real exchange rates, and RMB real exchange rate. The cointegration tests show that there are long run relationships among the variables. Interestingly, the RMB devaluation has positive impacts on the exports of the ASEAN5 countries. This indicates the complementary relationship between Chinese and ASEAN5 countries'

exports to the US. The product sharing activities in the flying geese paradigm of Japanese FDI have become a strong reason of such complementary relationship.

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Appendix

Table 46a Error Correction Term (ECT) Estimation

Country	Singapore	Indonesia	Malaysia	The Philippines	Thailand
C	0.032 (1.651)	0.010 (0.572)	0.045** (2.216)	0.031 (1.391)	0.048** (2.571)
β_{it}	0.845 (1.326)	0.816 (1.324)	0.124 (0.189)	-0.219 (-0.295)	-0.107 (-0.176)
ρ_{ijt}	-0.856* (-1.825)	0.004 (0.003)	0.071 (0.230)	0.128 (0.416)	0.225 (1.020)
σ_{ijt}	-0.005 (-0.588)	0.004 (0.497)	-0.010 (-1.009)	0.023** (2.075)	0.005 (0.545)
ρ_{cjt}	-0.040 (-0.199)	-0.212 (-1.075)	0.087 (0.406)	-0.186 (-0.791)	0.105 (0.500)
Dijt	-0.035 (-1.551)	-0.005 (-0.263)	-0.040** (-1.736)	-0.025 (-0.994)	-0.042*** (-1.977)
ECT	-0.245* (-2.995)	-0.409* (-4.548)	-0.151** (-2.018)	-0.352* (-4.076)	-0.188** (-2.619)
R^2	0.173	0.224	0.096	0.208	0.151
Adjusted R^2	0.112	0.167	0.029	0.150	0.089
F-statistic	3.947	3.947	1.452	3.600	2.434
Prob(F-statistic)	0.001	0.001	0.205	0.003	0.032

Source: IFS, DOTS and NBSC. Authors' calculation.

Notes: Standard error in parentheses

The asterisk (*) (**) indicate the rejection of the null hypothesis of a zero coefficient at the 5% (10%) significance level, respectively. According to the estimation of Error Correction Model (ECM) regression, the test result showed that the estimated coefficient of Error Correction Term (ECT) in all of five ASEAN5 countries are negative and significant at the $\alpha = 1\%$, 5%, 10%.



HUMAN RESOURCE MANAGEMENT AND EMPLOYEE JOB SATISFACTION: EVIDENCE FROM THE NIGERIAN BANKING INDUSTRY

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Abstract: *The paper examines the effect of human resources management (factors) on employees' job satisfaction using data collected from two banks in the Nigerian banking industry. The study attempts to determine the effect of training and development on employee job satisfaction; to determine the influence of working conditions on employee job satisfaction; and to determine the impact of human resources factors on employee job satisfaction. The survey instrument used in the collection of data was the questionnaire. The population of the study covered the entire staff of Intercontinental and Ecobank and the sample size of 200 employees were selected, using the simple random sampling techniques. Correlation and Regression analysis was adopted and the data generated was in line with the objectives of the study. The hypotheses were tested, and valid result was achieved i.e. Human Resources Management has an effect on employee job satisfaction. This suggests that for organization to develop, it must invest more in the human capital. The business environment is dynamic and there is need for organizations to adopt strategies to motivate and equip their staff, so as to ensure their loyalty and be source of competitive advantage.*

Keywords: *Training & Development, Working Condition, Job Satisfaction,*

INTRODUCTION

The Nigerian Banking Sector witnessed shocks and distress in the recent past as a result of the economic meltdown in the western hemisphere. The meltdown and the consequent restructuring in the banking sector has had significant effect on the human resource management practice and employees elements employed in the sector. Indeed, the sector has been characterized by reduction in the number of banks and uncertainties, which further aggravated the security of jobs in the sector (CBN Financial Stability Report, 2010). This espoused situation has had significant effect on human resource management (HRM) in the sector. External pressure on this sector has

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created need to train and re-train the workforce to cope with the changing needs. The intervention of the regulatory authorities, the multi-faceted demand on the sector employees required that not only should they be trained, but a conscious effort is needed to secure their job satisfaction, in order to secure maximum contribution to the banking sector's growth. Therefore, the need to secure willing contributions from employees places HRM functions at the centre of organizational performance improvement effort. However, in the recent past, it is been recognized that managers focus more on output rather than developing and training their employees with skills so as to be more productive and satisfied (Gazioglu & Tansel, 2006; Barrows & Wesson, 2000). It is evident that with the development in the sector staff that lacks proper training in the evolving competitive landscape would become redundant with their old knowledge and skill being obsolete.

Due to the dynamic and competitive nature of the banking environment, an innovative HRM practices have to focus on equipping employees with new and diverse skills, and also to ensure flexibility of employees so as to be able to respond to change. HRM practices need to consciously revolve around provision of issues that not only enhance job security but make the employee satisfied on the job with increased job security and satisfaction (Barrows & Wesson, 2000). This derives from the fact that the best asset in an organization is the people, and not just people, skilled and competent people which need to be managed effectively to ensure job satisfaction. However, the situation in the Nigerian Banking Sector have potentials for high attrition rate due to lack of job security and satisfaction occasioned by adjustments in the industry. There have been many justifiable factors that affect retention, which are company image, learning opportunities, performance recognition and rewards and working conditions (Abraham & Medoff, 1984). The retention policy involves strategies put in place to make employees comfortable at work so as to improve their job satisfaction to enable the workforce remains in that organization (Abraham & Medoff, 1985). Any other practice otherwise would reduce the satisfaction of employees. Consequently, this research is undertaken to address the problems of HRM and seeking how job Satisfaction can be achieved by employees through an effective human resource management, and also determining solutions to the prevailing problem. The paper investigates the effect of HRM such as Training and Development; Staffing Level; and Working Condition, which form major concepts of HRM functions in the Nigerian Banking Industry. In order to achieve these research objectives the paper reviews literature on HRM and Job satisfaction; Staffing Level and Job Satisfaction; Training & Development and Job Satisfaction; and Working Conditions and Job Satisfaction.

REVIEW OF THE LITERATURE

Human Resource Management and Job Satisfaction

The concept of HRM underpins the human side of the management and enterprises and employees' relations with their organizations and its purpose is to

ensure that the workforce of companies are effectively and efficiently utilized in a way that the employer obtains the greatest possible benefits from their abilities and similarly, the employees obtain both material and psychological rewards from the services rendered. Businesses rely on effective human resource management to ensure that they hire, train and develop good employees and that they are able to respond to the grievances of employees in order to have some satisfaction on their jobs. Human Resource Management specialists determine the number and type of employees that a business will need over its first few years of operation. In addition they are responsible for staffing, which involves recruiting employees to occupy newly created positions and in some cases to replace vacant positions (Huselid, Jackson, & Schuler, 1997). A division of HRM engages in training of its staff in order to encourage workers satisfaction on the job (Laursen, & Foss, 2003). Similarly, Human Resource Administrators implement and manage compensation plans and benefits packages for employees. Essentially, this aspect has been argued to be part of the substantive issues link with employees' dissatisfaction, if not timely and adequately addressed (Guest, 2002; Marchington, & Zagelmeyer, 2005).

Human Resource Management is a set of interrelated policies with an ideological and philosophical underpinning and these policies are classified under four aspects vis-a-vis (i) constellation of beliefs and assumptions; (ii) strategic thrust informing decisions about people management; (iii) the central involvement of line managers; and (iv) reliance upon a set of 'levers' to shape employment relationship (Storey, 1989). The human resource management activities can be summarised briefly under five major domains: (i) organizational design; (ii) staffing; (iii) performance management appraisal; (iv) employment training and organization development; and (v) reward systems, benefits and compliance (Berdamine, 2004). The overall purpose of human resource management is to ensure that the organization is able to achieve success through people (Armstrong, 2006). As obtained in the literature, Ulrich and Lake (1990) argue that Human Resource Management systems can be the source of organizational capabilities that allow firms to learn and capitalize on new opportunities. However, as obtained in the literature, HRM is said to be concerned with achieving the following: organizational effectiveness; human capital management; knowledge management; reward management; employee relations and meeting various needs (Armstrong, 2006).

Generally, high job satisfaction is connected with high productivity, low turnover rate and low absenteeism (Hackman & Oldham, 1975). Wong (1989) in his study on the impact of job satisfaction among secondary school teachers in Hong Kong opines that low level of commitment and productivity among the teachers is directly linked with the level of job satisfaction, which was lower than expectation. Further, Wong recorded that teachers were willing and ready to change jobs as soon as opportunity presents itself; it is evident therefore, that job satisfaction plays an important role in employee' decision to change job. Emphasis is placed on the employers' expectation regarding employee's high performance and it is essential to

bring it to fore that employees' satisfaction is a function of employee performance and organization performance (Shen, 2010). With this understanding, we shall proceed further to discuss job satisfaction.

The authors in literature of job satisfaction have defined job satisfaction in various ways. Job satisfaction is a combination of cognitive and affective reactions to the differential perceptions of what an employee wants to receive compared to what he or she actually receives (Boyt, Lusch, & Naylor, 2001). Job satisfaction is an individual's cognitive, affective, and evaluate reactions towards his or her job (Greenberg and Baron, 1997). Job satisfaction is a state where one's needs and one's outcomes match well (Locke, 1976). Job satisfaction is argued to be reaction to one's job emotionally (Kreitner and Kinicki, 1992). It is a singular idea that could be interpreted only in monetary terms (Lazear, 2000). It has been argued that employees generally appreciate rewards on one hand while on the other hand repugnant effort. Therefore, a better wage/salary for same level of effort, will suggest a decision to quit job with lower wage, which will increase the level of satisfaction. Essentially, there is need to see employment demands beyond the exchange of services for salaries. Though, employment demands is seen as economic relation in nature, but it is important to note that it has a strong affiliation to social and psychological views (Baron and Kreps, 1999). An employee may be satisfied with the monetary rewards and express some level of dissatisfaction with one or two aspects of his employment demands such as managerial policies (Festinger, 1954; Adams, 1965), either because they stand as hurdles to fulfil his needs (Salansik and Pfeffer, 1977) or values (Locke, 1976) or because his expectations were not met by the monetary rewards. We hypothesize that:

Hypothesis 1: Human Resource factors have impacts on Employees Job Satisfaction.

TRAINING & DEVELOPMENT AND JOB SATISFACTION

One of the goals of organizations is to succeed in their respective domains. Similarly, the task of Human Resource Management (HRM) has been acknowledged as an essential concept of corporate strategy. In addition, it has been argued that training and development is regarded as one of the most essential HRM concepts (Jennings, Cry, & Moore, 1995). From the Japanese companies' point of view, lifetime employment is of a great importance, which gives employees unique skill acquiring and learning opportunities (Drost, Frayne, Lowe, and Geringer, 1999). It has been argued that Training and development should be done in a systematic manner and follows a discipline process in every organization at every level (Brown, Nakata, Reich, & Ulman, 1997). Training and development practices in both white collar and collar Japanese employees are similar (Koike, 1991, 1993). In similar direction, Korean companies adopt human resources as the central phenomena through which organizations achieve their corporate goals. The focus of training and development in Korea is different from the West, where gaining job related skill is emphasized (Koch,

Nam, and Steers, 1995). Koch et al (1995) argue further that Korean companies focus and pay attention on preparing current and future managers to able to conform to the organization culture rather than current job skills. In addition, the main organizational goal is build a total employee termed “all around man” who would be loyal and dedicated to the organization and good inter-personal relationship with colleagues (Koch et al., 1995). Training and development is said to be one of the ways in which organization can attain its corporate goals. However, some organizations adopt training and development as a means of promotion & compensation (Lee & Teo, 2005; McConville, 2006). Top level managers in some organizations do take promotional examination in order to be promoted (Chan & Chang, 1994). Organizations have been able to reduce turnover among managers, which makes training and development a worthwhile exercise (Farh, 1995). Essentially, training and development programme that covers both job related skills and general skills such as interpersonal skills, communication skills, etc., have been argued to be an avenue to reduce turnover rates and increase productivity (Teagarden, Butler, Von Glinow, & Drost, 1995). As obtained in the literature, training and development has been argued to be a concept that organizations should adopt in order to reduce turnover rates and increase productivity. However, this study goes further to fill the gap in the literature regarding the training and development as it relates to job satisfaction. Therefore, we hypothesize that:

Hypothesis 2: “*Training and Development have impacts on Job Satisfaction.*”

WORKING CONDITIONS AND JOB SATISFACTION

Working conditions is working environment provided by the employer/organization and also known to be the non-pay aspects of conditions of employment, which include the following; amenities, degree of safety, health, well-being, etc., (Bockerman and Ilmakunnas, 2006). Working conditions is the conditions in which employee works and activities such as training; working time, work-life balance, etc., (Majid, 2001). Essentially, there is a distinct difference between employees and jobs. Employers may choose to provide different working conditions for different employees regarding the type of employment offered; contract or permanent. However, the study shall take some of the components into consideration such as safety at work, flexible arrangement, overtime, with no preference to any. Work flexible arrangements have impact on employee family conflict (Kossek et al., 2005). Overtime plays a vital role (Peters, 2000; Robert Reich, 1992). Employees demand more friendly work flexibility (Fleetwood, 2007); they demand employee-friendly flexibility, where they determine how much, when and where they work, which include voluntary part-time work, flexible working hours, etc., (Clorin & Hermans, 2006). Unfavourable working conditions greatly increase the level of job dissatisfaction (Bockerman and Ilmakunnas 2006).

Hypothesis 3: *Influence of working conditions on the Employees Job Satisfaction*

DATA, METHODOLOGY AND RESULTS

The study is focused on the Nigerian Banking Industry and it is also a comparative research studying two different banks (Eco Bank Plc & Intercontinental Bank Plc). These banks have branches across the West African region. Therefore, their results can be extrapolated for decisions across West Africa. The objectives of this study, therefore, are to: determine the relationship between staffing levels, and the job satisfaction of employees; the effect of training and development on the job satisfaction of employees; determine the influence of working conditions on job satisfaction.

Data on human resource management and job satisfaction were gathered through a self-administered questionnaire, which was distributed January, 2011. Respondents were ensured that individual responses were anonymous. The respondents were asked to provide demographic information such as gender, age, position and work experience as part of the questionnaire. However, information regarding age bracket is in 10-year increments; position level (less than supervisor, manager and supervisor categories); work experience groups within 5-year bracket. However, in the second part of the questionnaire, respondents were required to indicate their opinion by rating the extent/degree of their satisfaction or dissatisfaction with the study variables.

Analysis of the administered questionnaire is presented in Table 47.

Table 47 Analysis of Questionnaire Administered

	Intercontinental Bank		ECO Bank Plc	
	No of Questionnaire	Percent	No of Questionnaire	Percent
Harvested	86	86.0%	82	82.0%
Not Returned	14	14.0%	18	18.0%
Total:	100	100.0%	100	100.0%

Source: Field Survey, 2011

In addition to the demographic data, the questionnaire included twenty seven (27) questions item which were classified into sections regarding different aspects of human resource management (recruitment, transfer, training and development, performance evaluation, promotion, work relationship, etc.). Hence, we have considered the following variables: performance, training, satisfaction, security, staff retention etc. The demographic makeup of the respondents is detailed in table below.

Table 48 Respondents Demography

Demographic Variables	Items	Intercontinental Bank Plc		ECO Bank Plc	
		Frequency	Percent	Frequency	Percent
Gender	Male	48	56.5	44	53.7
	Female	37	43.5	38	46.3
	Total	85	100.0	82	100.0
Age	<25	13	15.3	26	31.7
	25 – 34	48	56.5	41	50.0
	35 – 44	17	20.0	9	11.0
	45 – 54	6	7.1	4	4.9
	55+	1	1.2	2	2.4
	Total	85	100.0	82	100.0

Demographic Variables		Intercontinental Bank Plc		ECO Bank Plc	
	Items	Frequency	Percent	Frequency	Percent
Position	< Supervisor	65	76.5	57	69.5
	Senior Manager	10	11.8	18	22.0
	Supervisor	10	11.8	7	8.5
	Total	85	100.0	82	100.0
Work Experience	< 5	39	45.9	30	36.6
	6 – 10	27	31.8	39	47.6
	11 – 20	10	11.8	7	8.5
	21 – 30	6	7.1	4	4.9
	31+	3	3.5	2	2.4
	Total	85	100.0	82	100.0

Source: Field Survey, 2011

Respondents' demographic table above shows that there are more male respondents than their female counterparts in the sampled banks. 56.5% represents male and 43.5% represents female; 53.7% represents male and 46.3% represents female respectively. The age category of the respondents suggests that most of the respondents fall within the age bracket of 25 – 34 (56.6% and 50.0% respectively). The significant representation of the respondents' age group may be due to the nature of the job and the policies that exist in the banking industry. In similar direction, majority of the respondents occupies position less than the supervisory grade (junior employees) this could be attributed to the recent past downsizing in the banking industries as part of the impact of the economic meltdown where several Bankers were relieved of their jobs. In addition, work experience classification suggests that approximately 50% (45.9%) of respondents have less than five years of work experience (Intercontinental Bank Plc); while 36.6% out of 82 respondents from ECO Bank Plc fall under the same category. However, it could be partly because of the fact that the industry is being revitalized, which brought recruitment of new employees.

RESULTS

Table 49 *Effect of Training and Development on the Employees Job Satisfaction Model Summary (b)*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.670(a)	.449	.435	1.283649

a Predictors: (Constant), Performance, Training

b Dependent Variable: Satisfaction

Table 50 *ANOVA (b)*

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	107.264	2	53.632	32.549	.000(a)
Residual	131.820	80	1.648		
Total	239.084	82			

a Predictors: (Constant), Performance, Training

b Dependent Variable: Satisfaction

The results show that the variables for the independent variable which is training and development are learning more skills to improve performance and also having good opportunities to improve skills. R² being 0.435 (43.5%) of job satisfaction can be explained by the variables captured in this model. It could be inferred that satisfaction on current job can be achieved through learning more skills to perform very well and having good opportunities to get more training and also achieving human resource goals.

Table 51 *Influence of working conditions on the Employees Job Satisfaction Model Summary (b)*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.289(a)	.083	.072	1.644680

a Predictors: (Constant), Security

b Dependent Variable: Satisfaction

Table 52 *ANOVA (b)*

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	20.192	1	20.192	7.465	.008(a)
	Residual	221.808	82	2.705		
	Total	242.000	83			

a Predictors: (Constant), Security

b Dependent Variable: Satisfaction

It is evident in Table 52 above that the variable for the independent variable which is working conditions is job security assurance. R² being 0.083 (8.3%) for satisfaction with the current job satisfaction. It could be inferred that satisfaction on current job is achieved through job security assurance for employees.

Table 53 *Impact of Human Resource factors on Employees Job Satisfaction Model Summary (b)*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.694(a)	.481	.468	1.245603

a Predictors: (Constant), Staff Retention

b Dependent Variable: Satisfaction

Table 54 *ANOVA (b)*

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	113.598	2	56.799	36.608	.000(a)
	Residual	122.571	79	1.552		
	Total	235.169	81			

a Predictors: (Constant), Staff Retention

b Dependent Variable: Satisfaction

The results show that it could be inferred from Table 53 above that satisfaction on current job is achieved through maintaining adequate staff level in the organization, employee retention and also achieving human resource goals.

CONCLUSIONS

The goal of this study is to identify the human resources factors that affect employee job satisfaction. The study examined the relationship between staff levels and employee satisfaction, the effect of working conditions on employee satisfaction, the impact of training and development on employee satisfaction and finally, the influence of human resources factors on employee satisfaction in both banks. The strong significant relationship between the examined variables and job satisfaction suggest how efficient and effective employees could be when highly satisfied on the jobs. Therefore, it is evident that organizations need to apply these tested variables: training and development, working conditions, staff retention in their strategies in order to make employees satisfy on their jobs, which in turn will reduce turnover rate and help achieve organizational goals. As a result of our findings and recommendation it can be concluded that equitable rewards system such as pay, working conditions, training and development, fair treatment, and fair human resources practices are determinants of employee job satisfaction.

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RELATIONSHIP BETWEEN PRIVATE AND PUBLIC INVESTMENT IN R&D: A DYNAMIC PANEL DATA ANALYSIS

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Abstract: *This paper investigates the relationship between private and public investment in R&D, while taking into account the effect of several instruments policies such as subsidies and taxes. We design a new look of knowledge spillovers and R&D cooperation to explain the contribution of public and private R&D on growth. We propose a heterogeneous dynamic panel data model to consider the effect as well as endogenous. We also distinguish between the estimated long run and short run results. Our results based on a sample of 23 countries over the period 1992-2009 indicate that both public and private investment in R&D are complement. By establishing an endogenous growth model, the estimates indicate that public and private R&D depend on the host country's human capital investment and that FDI is a more significant spillover channel than imports.*

Keywords: *R&D investment; Technology Spillovers; Complementarity; Economic growth; Dynamic Panel Data; Private investment; Public investment; R&D cooperation*

JEL Codes: *D83, F42, O32, O33, C33*

1. INTRODUCTION

Is public R&D complementary to private R&D, or does it substitute for and tend to “crowd out” private R&D? Conflicting answers are given to this question. A framework for analysis of the problem is developed to help organize and summarize the findings of econometric studies based on dynamic panel data from various countries¹. We conclude by offering suggestions for improving future empirical research on this issue.

Government R&D activities contribute to innovation and productivity, many economists and policymakers have developed the paucity of systematic statistical

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evidence documenting a direct contribution from public R&D (see David et al., 2000). Econometric findings concerning the productivity growth effects of R&D seems to be that there is a significantly positive and relatively high rate of return to R&D investments at both the private and social levels (Cassiman and Veugelers, 2006). In a recent survey, David et al. (2000) suggest that the especially pronounced differential over the returns on tangible capital investments observed at the private level may reflect individual firms' perceptions of especially high private risk in the case of R&D. Public funding of R&D can contribute indirectly, by complementing and hence stimulating private R&D expenditures.

Economists, continuing in the tradition pioneered by the research of Blank and Stigler (1957), recurrently examine a variety of data for signs as to whether the relationship between public and private R&D investments is on equilibrium characterized by complementarity, or by substitution (see for example, Wieser (2005), Xulia et al., (2008)). Cassiman and Veugelers, (2005), in recent econometric studies, suggest that a statistically significant "spillover" effects can stimulate private R&D investment by publicly funded additions to the stock of scientific knowledge. The same idea has been developed by Lopez et al., (2006), Bernardí and Guadalupe (2007) these authors have added that a minimum level of regional development is required to improve the effectiveness of R&D policies, they confirm a complementarity between local knowledge and internationalisation in regional technological progress.

Our approach will be to adopt a new econometric approach using a dynamic panel data studies to analyse if public investment in R&D are complement or substitute for private investment in R&D. In literature review, we can conclude that the majority of the econometric studies are concentrated on the impact of public R&D contracts and grants upon private R&D investment by manufacturing firms and industries (see for example, Lach (2000), Christopher (2005) and Eric (2007)).

Three restricted questions will be asked regarding those investigations. First, is the design of the statistical analysis such that it can yield any reliable findings on the question of whether government R&D expenditures do or do not have a significant and economically impact upon private sector counterparts? Secondly, where the results are credible, may we conclude that government subsidy programs do not displace private R&D investment? Thirdly, how can the econometric findings be reconciled with those of other well-designed studies that addressed ostensibly the same question, yet arrived at different conclusions?

The object of our paper is to give the theoretical and empirical arguments which allow a satisfactory apprehension of the role that the authorities must play in the fields of research and innovation. The activity of R&D represents a significant source of development of new knowledge and technological innovation (Guellec and Van-Pottelsborghe, (1997)). The effort towards activity of R&D involves with a great importance and this through several resources devoted to the various sectors and

institutions of research. Expenditure of research and development especially constitute a principal source of growth of productivity for innovating countries. Whereas, Sigrid (2005) and Ting (2005) suggest that, for countries, where the activity of R&D misses almost technological knowledge and innovations of which they profit are generally resulting from the importation of equipment and goods of intensives investments in technical progress. At the same times, Chaturvedi and Chataway (2006) recommend that knowledge capabilities and knowledge management can be considered as key resources for firms in both developed and developing countries.

There are less works, the object of which is to study the relation between private and public investment in R&D. We propose a model based on the study of this relation through several indicators. The principal message to retrain from results of this work is that sometimes public investment have been just added to private investment and sometimes have just replaced them and tend to exert an effect of crowding out. The governmental policies can contribute to growth. For these reasons, a policy of innovation must be designed so that the State orders its actions according to a hierarchy of responsibilities. Therefore, it is necessary that government must make a favourable environment for innovation and support of the companies in incentive to be innovated because the company itself constitutes a significant factor of innovation and the resources of the latter are varied such as the R&D or the acquisition of technology.

The policies in favour of the R&D and the innovation changed orientation in the industrialized countries since the beginning of the Eighties. The States fiscally supported the companies which financed their expenditure of innovation (Lai et al., (2006)). Several legislative measures to support the effort of investment, tax treatment, the expenditure R&D innovation are taken. Which roles can be played by authorities in the fields of research and the innovation? In other words, how has to act the State in the fields of the R&D to increase the R&D in private sector?

In this work, we will study the existence of a relation of complementarity or substitutability in the case of 23 countries through an empirical analysis on dynamic panel data. This document brings a new look on the public/private relation as regards R&D. This document will be organized in the following way: In the second section, a brief concerning the reason of government aid, i.e. the need for public administrations for supporting the R&D and contains an analysis of the interaction between private and public R&D in theory and in facts. The third section explains our research methodology. The fourth section indicates the evaluation methods and empirical results. The fifth section constitutes conclusion of this work.

2. R&D INVESTMENT AND THE GOVERNMENT'S R&D POLICIES

Today, we can observe an expansion of policies of innovations in the developed countries which devote great investment for R&D. What proves the creation of the climates favourable to the level of these countries for the innovation? It is significant

that during these last years, companies of high technology or advanced technology's (pharmaceutical, aeronautical...) expenditure of research and development increased significantly. The role of the governmental policies as regards R&D is not to neglect. Indeed, the policies of innovation define specific actions of the State, which must encourage the accumulation of a qualified labour on the one hand, and to help the companies to prospect the markets on the other hand. This justifies the need for the public administrations for supporting the R&D (Xulia, González et al. 2008).

Thus, which are the reasons of the government aid and the mechanisms the alternate ones available to the public administrations to support the R&D? To answer these questions we try to analyze the justification of the government aid with the R&D starting from the economic theories of growth (Veugelers, et al. 2005).

2.1 Neoclassic and Endogenous growth theories

For Neo-classic theory of growth, technical progress is supposed to be exogenous factors. With the balance of long term, population growth and technical progress determine the level of the growth rate. This implies, according to the basic assumptions, that the long-term growth rate is stable, and given in an exogenous way. Within this framework, the impact of an action of the authorities is practically ignored (Solow 1956, Solow 1960).

The neoclassic theory of the growth supposes that the economy starts from a weak relationship between capital and labour. Just as the marginal returns on capital are decreasing. What reduces the encouragement to be invested in the new capital? (Griliches, 1969) Thus each new unit of capital produces a lower income and less large savings. In the long run, there will be absence of incentive to invest. In short, we can say that the assumptions which underlie the neo-classic theory are not realistic. The technological change is not always an exogenous factor outside the market, determined by an unknown process. To the 20th centuries, a good number of discoveries and progress were carried out in the commercial sector by companies with lucrative goal and not by public administrations or universities where research is directed by non-commercial forces. Markets are seldom in perfect competition, moreover, the private sector is not capable to produce all the desired goods and services, because some of them are goods public and certain others produce external effects (Solow 1956, Solow 1960).

The endogenous theory of growth recommends the relaxation of certain neo-classic assumptions and incorporates the failures of the market. However, the economic growth in the long run is directed by the accumulation of the factors of production founded this faith on knowledge, in particular, human capital, training, R&D and innovation (Griliches, 1995). The endogenous models of growth are characterized by a great diversity of the resources selected: The investment in physical capital, in human

capital, public capital, and labour division, learning by doing, research and the technological innovation (Romer, 1990).

The endogenous theory of growth recommends that technical progress rises from the R&D carried out by companies with lucrative goals. Research and Development constitute a significant factor of production process. In short, the assumptions according to which the determining factors of long-term growth are endogenous with the decision-making process constitute one of the principal exemptions from neo-classic theory of growth and involve significant effects on the policy. (Jason, et al. 2008, Görg, et al. 2007). Indeed, if long-term growth is directed by factors of production based on the knowledge which belongs to the normal structure of costs of the company, then, by changing the cost of these factors by direct subsidies of tax incentives or of marketing policies, the public administrations can influence the long-term growth. These theories provide a framework of analysis of growth and its determinants which can also be used to study the incidence of public policies on economic growth and investments in R&D (for more details see, Becker and Pain 2002, Busom, 2000).

2.2 R&D investment and market imperfection

Economic theory and empirical proof show that technical progress, because of its incidence on the factors of production, constitutes key element in the long run determining economic growth; in certain countries, it represents even the most significant element. However, it is not a question of an economic justification of the official intervention for allocate the resources in favour of R&D. But, this intervention in a market economy is justified by incapacity of market to distribute resources in an efficient or acceptable way as regards social aspects. With regard to the investment in R&D, external effects and market imperfections testify the incapacity of market, and the effects are felt not only beyond particular companies but also beyond national borders.

In a market economy, a company will not invest in a project if it knows that it can not adapt the possible receipts, however if it cannot adapt a portion of these receipts, it will invest if this portion is enough to make a profitable investment. Asymmetrical information and imperfect competition constitute two other kinds of imperfections of market involving under investment in R&D. For example, asymmetrical information prevents effective operation of capital market. Indeed, it can involve rationing of appropriations as well as abandonment of investments in R&D in projects with strong chances of success thanks to the plan of financing, and the continuation of investments in the project having weak chances of success.

2.3 Complementarities versus substitutability between private and public R&D

Theoretical work did not succeed in slicing on favourable or unfavourable effect using certain political instruments on the level of R&D in private sectors. The results of each model strongly depend on its structure and its assumptions. Empirical work, leads to homogeneous results and identifies a positive effect of public R&D on that private (David, et al., 2000). With an aim of knowing the relation between public and private R&D we give an overall picture of the activities of R&D in world. Indeed, in this section, we attach more importance to activity of public and private R&D in the most significant poles in world.

After the significant increase in the budget of R&D of the States Linked during the Fifties, Blanck and Stigler (1957) were among the first which raise the question about the existing relation between the public and private R&D. Thus, using a sufficiently broad sample of companies, the authors try to test the existence of a relation of complementarities or substitutability between private and public investment as regards R&D. Indeed, the implications of study are still significant until the policies of R&D today because a relation of complementarities is justified for the public funds whereas substitution is observed like a "misallocation".

Through time and with the improved scientific methods in particularly studies of Jason, et al., (2008), it became clearly that the final situation towards the effect of the public funds of R&D cannot be made. Thus, in general, two fields can be identified and which are used to analyze the relation between private investment and public in research and development with knowing quantitative and qualitative studies: On the one hand; for the qualitative studies, data are frequently based on the investigations. On the other hand; for the quantitative studies, they are based on macro and micro-economic information of a significant number of companies (Cassiman and Veugelers, 2006).

In this last context, David. et al., (2000) give highlights of economic surveys with an aim of analyzing the net impact of public research and development on private R&D. Thus, such illustrative example of statistics of the found results, and among 14 studies, only two indicates a substitution effect at the overall level. On the level of the companies, results are less clear, i.e. in 9 studies of 19, there is a substitution effect.

Today, several activities of R&D are carried out on the level of the services sector. On the one hand, this is due to the external sources of the strategies of manufacturing industries in the Eighties. On the other hand, the transformation of information and technology of communication get more opportunities for innovating sectors. So the governments help more and more activities of R&D in several sectors with an aim of stimulating technological performances of their countries. Thus, several examples can be quoted. At this level, for the Nineties and more precisely in 1999, the total expenditure of R&D of Germany is 47 billion dollars where 66% of this amount is

invested by private industries, 18% by government and the remainder are invested by foreign companies.

Thus, Claudia, (2008) suggest that an international comparison on behalf of public programs of R&D shows that Germany is one of principal countries which grant funds for the technological performance. At this level, manufacturing industry plays a very significant role concerning R&D. For example, the strategic planning of the national research evaluation in Thailand as indicates it Jarunee, (2008) is to allocate the budget to support the research programmes and projects. Jarunee suggest that to improve the model evaluation framework for R&D investments, the public hearing forum was organised. From there, a question emerges up to what point evolution of public funds of R&D makes it possible to stimulate R&D carried out by private sector, and on which level results are checked? Recently, an econometric micro study tackled the question of the impact of political instruments about activity of R&D deprived on the level of companies.

In the Nineties, Busom (2000) applies dummies variables in its model suggested to measure the impact of government aid to R&D carried out by private sector. In its turn, Lach (2000) could test the impact of programs of R&D on the amount of investment in both cases, with or without public supports. Tahir et al., (2008) adopted a combined decision model for R&D by using both qualitative and quantitative information for project portfolio selection. In their model Tahir et al., (2008) suggest that the efficient projects with higher feasibility portfolio selection, our specification take account of all private project in R&D for more precision with public R&D relationship.

Several other studies are more precisely interested in testing the effects of public subsidies in R&D on the amount of deprived investment see for example Lai et al., (2006), Hans and Almas, (2005) and Christopher, (2005). The major goal of these studies is to know if public subsidies of research and development can have an effect of reduction or increase in the expenditure of R&D. Most of results suggest that public subsidies of R&D on the level of several industries showed that there is a small tendency to the effect of ousting "Crowding out". In addition, it seems not to have any effect or degree of Complementarities.

In the following section we empirically test fundamental relation which we seek to analyze in the case of 23 countries for the period 1992-2009, in other words we test the existence of a relation of Complementarities and to check this result.

Using a panel of 23 countries and applying the latest panel cointegration technique of Pedroni (1995; 1997) we find that there is indeed a co-integrated relationship between private and public investment in R&D and Growth. To examine the short-run dynamics of R&D and Growth, we classify countries in closed and open economies using various criteria for openness.

Our panel includes 23 countries, and the study period spans from 1992 through 2009. These countries provide a fair representation of all the major developing areas in the world, that is, Asia, Africa, Latin America, and Eastern Europe. Though a complete representation of the developing world would necessitate inclusion of many other countries, availability of data on relevant variables limits our choice to 23 countries listed in the note 1. The significance of these 23 countries, however, is evident from their share of private R&D and the record of their moderate to strong growth performance over the study period. The available data set suggests that the country groupings are major recipients of R&D in equipment from commercial partners in their respective regions. Also, as reflected by country performance indicators, all these countries recorded real positive growth in GDP per capita over the period 1990-2009. The choice of the time period for our sample data set is explained by the following two factors. First, before the 1992s, R&D to developing countries was dominated by flows of funds between multinational firms attempting to jump tariff barriers. Second, 1992 was the latest period for which data on relevant variables were available for all the countries included in the sample.

3. EMPIRICAL VALIDATION: A DYNAMIC PANEL DATA ANALYSIS

There are several econometrics approaches, so we are going to follow a typical approach while holding account of some determinants of private research and development. The theoretical works that studied this question propose models founded on several political instruments. These works show that these policies can have a negative/positive impact on the expenses deprived in R&D. Nevertheless, very little study to these days, value the impact of these research efforts. As for the empiric works, they showed a positive effect of political instruments on private level of research and development. However, these works come up against several limits essentially bound to the used methods econometrics and to the choices of indicators that represent the variable private R&D.

The objective of this work is to test the impact of an action of public policies empirically on the evolution of R&D in private sector while trying to surmount limits. The modelling that we follow to measure the effect of the R&D deprived on the public one; while taking into account some determinants of private R&D; is the one of Bettina and al., (2002). This modelling has also been applied by: Busom, (2000) and Lach, (2000). The gait of these authors can be summarized like follows:

$$\text{Private R\&D} = \beta * \text{public R\&D} + \text{control variables} + e$$

The underlying logic is simple: If the coefficient β^* has a positive sign we can say that public R&D are complementary for private R&D. In other words, an increase of 1% of public research and development level entails a growth of $\beta^*\%$ of private R&D. On contrary, if β^* has a negative sign we can say that there is a relation of

substitutability between public and private R&D. In this part we try, to give a general setting for the models to estimate while putting accent on some remarks and inconveniences of these models. We apply a dynamic panel data model. Finally, after having estimated the model we analyze results.

In our survey we present in fact, a brief of empirical literature on the relation private and public R&D. We propose empirical tests on Panel of 23 countries between 1992 and 2009. We specify for it a dynamic model, which we estimate by different methods, notably Generalized Moments Method (GMM).

3.1 Research Methodology

Our study contributes to the empirical literature -which is discussed here- on the analysis of the existence of a relation between private and public investment in R&D and their real effect on economic growth; do public funds substitute or complement private R&D expenditure?

We derive our econometric specification from a function including interactions between internal and external R&D in the augmentation of the knowledge stock. The model also takes into account potential productivity convergence by including lagged productivity levels. Our study's inferences are based on a dynamic panel data model, which allows us to control for the existence of unobserved fixed effects that are likely to affect R&D decisions. Estimation is carried out by several consistent dynamic panel data methods, among which generalized method of moments, which allows for the presence of weakly endogenous explanatory variables. In this way the analysis can take into account both degree and possibility effects of R&D to address the issue of optimal combinations of R&D expenditures.

In this paper, we contribute the first panel data study exploring complementarities between public R&D and private R&D in a dynamic panel framework. We examine the impact of internal and external R&D on economic growth in sixteen-year panel for 23 developed and developing countries. Our data base sets are taken from various sources²; Table 55 indicate a summary of different variables which are taken in our specification.

Concerning our data base, it is taken from various sources. In fact, several difficulties were encountered during the data base collection. In certain cases we noticed a great difference between the data bases what with led us to check the origin and the data confidentiality. The second difficulty is based on the availability of some variables of the model and for some especially well defined countries at one period for example variable R&D. To cure these difficulties, R&D was calculated for various (especially developing countries) on the basis of imported equipment good near their principal trade partners.

Table 55 *Summary table of the various variables of model*

Variables	Description	Empirical measurement
Input and output of innovation		

Variables	Description	Empirical measurement
Public R&D (G)	Domestic Expenditure R&D (DIRD%GDP)	Logarithm of R&D expenditure in percentages of GDP (Gross Domestic Product)
Private R&D (R)	Outside Expenditure R&D in provenance of commercial partners	Logarithm of private R&D expenditure
Exogenous variables		
(FDI)	FDI stocks data	FDI for countries (i) in year (t)
Added Value (VA)	Added Value for each countries in year (t)	VA for countries (i) in year (t)
Importation (M)	Importation amount for each countries	M for countries (i) in year (t)

3.2 Dynamic panel data: Definition and evaluations method

Dynamic models are characterized by presence of one or several endogenous variables delayed among explanatory variables. Our specified model is a dynamic panel model given by:

$$y_{it} = \alpha y_{it-1} + \beta' x_{it} + v_{it} \quad (1)$$

Under another forms one was writing our model as below:

$$R_{it} = \alpha R_{it-1} + \beta_1 G_{it} + \beta_2 M_{it} + \beta_3 VA_{it} + \beta_4 IDE_{it} + \mu_i + v_{it} \quad (2)$$

Where

y_{it-1} : Endogenous variable appears in the regression as being a retarded explanatory variable. In other words, present stocks of research and development of country (i) are explained by stocks of research of the period (t-1).

X: Represent the vector of exogenous variables; these variables are added value (VA), public research (G), import (M), foreign direct investment (FDI) and private research;

(α, β) : Designate parameters to estimate;

μ_i : Constitute individual heterogeneity as: μ_i i.i.d. $\sim N[(0, 1)]$;

And: $v_{i,t}$ is stochastic term as: $v_{i,t} \sim$ i.i.d. $[(0, 1)]$.

$y_{i,t}$ is the logarithm of volume of R&D in country (i).

$x_{i,t}$ is determinant vector of R&D.

μ_i is the specific effect of country (i). This specific effect can be a stationary or uncertain effect.

Model evaluation by traditional methods (Ordinary Least Square "OLS" and within) gives biased and non convergent values because of inter-relationship between retarded endogenous variable and individual heterogeneity.

Our model should not be estimated by the method of OLS and LSDV due to the fact that estimating by these methods lead to ad hoc results. Which are then adequate

methods to estimate our model? We propose below two methods which consist in obtaining consistent estimators.

4. EMPIRICAL RESULTS

The unit root tests became a current step for analysis of time series stationnarity. However, practical application of these tests on panel data is recent. The tests most frequently used are those of Levin and Lin, (1992) and of Im, Pesaran and Shin (2003)³. Recently, several procedures of unit root tests and Cointegration were developed for panel data models. The addition of individual dimension to temporal dimension offers an advantage, in practical application of unit root and Cointegration tests (Pedroni, 1999 and 2004).

The checking of non-stationary properties for all panel variables leads us to study the existence of a long run relation between these variables. The Cointegration study by applying Pedroni Cointegration tests based on unit root tests on residuals estimated. Cointegration tests on panel data consist in testing the presence of unit root in the estimated residuals. However, the problem of fallacious regressions, of the time series, also arises in the case of panel data. First step is to test unit root for each of series.

As applying test on our complete model our results is summarized in the Table 56.

Table 56 *Unit root Tests*

Statistics	R	G	M	VA	FDI
Levin-Lin ADF stat	-2.35771	-0.34312	1.80911	1.48967	-1.67447
Probability	0.00003	0.56342	0.00342	0.23145	0.03462
IPS ADF stat	-2.29622	1.77303	2.17516	1.640659	-1.57222
Probability	0.00000	0.01242	0.00312	0.13045	0.13002

The application of the tests of unit root LL and IPS shows that the whole of the statistical series are not affected of a unit root. It should be noted that the number of maximum delay is fixed at 3; the selection of the numbers of delay for each individual is programmed by Pedroni for these two tests. In this issue we indicate that we have tested unit root tests for each of variables, in Table 57 we indicate an example for private R&D noted by R.

Table 57 *Unit root Tests for R (private R&D)*

Pool unit root test: Summary				
Series: R				
Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.35771	0.0092	1	74

Breitung t-stat	-2.84504	0.0022	1	73
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.29622	0.0108	1	74
ADF - Fisher Chi-square	9.21996	0.0100	1	74
PP - Fisher Chi-square	13.0702	0.0015	1	162
Null: No unit root (assumes common unit root process)				
Hadri Z-stat	2.00286	0.0226	1	184
** Probabilities for Fisher tests are computed using an asymptotic Chi				

The second step consists on estimation of the whole specification, for more precision we use a comparative study between several methods.

By using Anderson and Hsiao method, our model in first difference becomes:

$$R_{it} - R_{it-1} = \alpha (R_{it} - R_{it-1}) + \beta_1 (G_{it} - G_{it-1}) + \beta_2 (M_{it} - M_{it-1}) + \beta_3 (y_{it} - y_{it-1}) + \beta_4 (IDE_{it} - IDE_{it-1}) + v_{it} - v_{it-1}$$

When we use $R_{i,t-2}$ and $R_{i,t-2} - R_{i,t-3}$ as instrument gives results in Table 58 and Table 59 respectively:

Table 58 Anderson and Hsiao method with $R_{i,t-2}$ as instrument

	Coefficient	T-Stat	Probability
R (-2)	1.043741733	2.61851	0.01862671
G	0.034631350	2.11157	0.01255140
M	0.117410800	3.10834	0.00507352
VA	0.261604184	1.09045	0.02905193
FDI	0.068683520	2.10772	0.01555534

Table 59 Anderson and Hsiao method with $R_{i,t-2} - R_{i,t-3}$ as instrument

	Coefficient	T-Stat	Probability
R (-2)-R (-3)	4.02020750	2.11480	0.0226709
G	1.91820030	1.90250	0.03925921
M	1.86404603	2.34064	0.01364196
VA	1.25706985	2.84950	0.02590034
FDI	0.55898626	3.09396	0.02520837

After we have estimate model by Anderson and Hsiao (1982) method and to get more efficient results, we try to apply the approach of Arellano and Bond (1991) that permits to get a generalized moment GMM more efficient.

The evaluation that we present in Table 60 corresponds to the GMM evaluation of Arellano and Bond (1991). The empirical evaluations confirm the positive effect of the R&D on growth of R&D of different country (positive and significant effect in all evaluations). However, identification of effects of other variables is far from being obvious according to different evaluations, a positive and significant effect in of Anderson and Hsiao evaluation of which public research are affected of a positive and

significant value (0.034631350) with a (T-Stat = 2.11157) in the same way (1.91820030) with a (T-Stat = 1.90250), therefore these results verify the existence of a positive and significant relation between the two variables. For GMM method in first difference the variable spends public research is positive and significant (1.20891059), (T-Stat = 2.90728).

Table 60 *Arellano and Bond method in first difference*

	Coefficient	T-Stat	Probability
R(-1)	0.52001865	0.46582	0.64180074
G	1.20891059	2.90728	0.03425802
M	1.36345220	2.36785	0.01333684
VA	1.15210478	1.29346	0.36944694
FDI	1.14085022	2.15794	0.02465192

Sargan test: $\chi^2(20) = 25.78$ (0.001)

For orthogonal deviation results are indicated in Table 61, from this table we can conclude that private R&D is affected with a positive and significant coefficient. All variable are significant in 5% level, we can say that if we have a supplementary unit added to public R&D it can increase private R&D by 30%. So all countries are invited to appreciate and encourage activities in private sector for R&D.

Table 61 *Arellano and Bond method in Orthogonal Deviation*

	Coefficient	T-Stat	Probability
R(-1)	0.30035445	1.96465	0.0000001
G	0.20561059	2.90728	0.0000002
M	1.25333220	2.36785	0.0000000
VA	1.03430478	1.29346	0.0000000
FDI	0.19056744	2.15794	0.0000000

5. DISCUSSION AND CONCLUSION

Our investigation is dealing with studying relationship between private and public investment in R&D, for the case of 23 countries which presents different levels of R&D. We tried to clarify relation that exists between private and public research. This empirical survey wanted to give account, the effects of different determinants on private investment in R&D and to know if public and private investments in R&D are complement or substitute.

Econometrical approach consists in the regression of some measures of private R&D on public R&D with some control variables. The evaluation that we presented in our work corresponds to GMM estimation in first difference and in orthogonal deviation. We prefer to refer to results of this evaluation because it permits to eliminate rigorous way all bias to none observed individual heterogeneity and offer, a better

efficiency of results. Empirical evaluations confirm a positive effect of public R&D in different country (positive and significant effect in all evaluations). Results of our empirical survey are relative for our sample and they go in the sense of results of ulterior studies, which showed that there is a positive and significant relation between private and public investment in R&D.

All results are in favor of a positive relation between private and public R&D which can be assumed by a complementarity between them. Another important think, we can give the impact of public R&D to private R&D for each country to specify the nature of relation and how private R&D contributes for public sector. In summary, all countries must stimulate private sector in R&D activities to promote economic growth and integrate a new innovation system which can go with their own economic environment.

Some studies put in value of other factors that can be important as: competition in the market, public politics and cooperation concerning R&D between firms. Cooperation in R&D is a part of the new strategies developed by firms in more global and competitive economic environment. These last factors are not to disregard and can be subject of a future research concerning the relation between public and private investment in R&D.

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Notes

- 1 Countries are: French, Mexico, Brazil, USA, Japan, Chine, Finland, Canada, Belgium, Australia, Coree, Spain, Turkey, Sweden, Italy, New-Zealand, Denmark, Portugal, Israel, Tunisia, Morocco, Algeria and Egypt.
- 2 **OCDE:** (1999a), «The OCDE stand database for industrial analysis», Paris.
OCDE: (1999b), «Main sciences and technology indicators» 1999/1, Paris.
World Bank: World Development Indicators CD-ROM – 2009 and
Eurostat: Statistics on research and development, <http://epp.eurostat.ec.europa.eu/>.
UNESCO: UIS Data, Institute for Statistics S&T database, <http://www.uis.unesco.org/>.
CHELEM: <http://www.cepii.fr/francgraph/bdd/chelem.htm>
INS: National Statistics Institute Tunisia, <http://www.ins.nat.tn/>
- 3 We take in abbreviation, Levin Lin test as LL and Im Peasaran Shin as IPS.
- 4 iid means identical and independent distributed.



THE HEALTH COMPONENT OF THE HUMAN CAPITAL AND THE ECONOMIC OUTPUT

Olimpia NEAGU*

Abstract: *The paper has the aim to explore the relationship between health, as human capital component, not very much investigated so far, and the macroeconomic results. It is analyzed the relationship between the evolution of GDP and statistical indicators reflecting the investment in health, the health status of the population and the resource indicators in the EU Member States. The main conclusions of the study reveal a positive correlation between these indicators, except the health expenditure as percentage of GDP and number of hospitals beds at 100.000 inhabitants.*

Keywords: *health status, human capital, economic results*

JEL Codes: *I15, J24*

1. INTRODUCTION

The paper aims to emphasize a deeper understanding of the human capital concept and of the consequences of its accumulation in the economic life by analyzing a component less explored by the researchers: the health capital, measured by the health status.

The World Health Organization (WHO) defines the health status as "the state of complete physical, mental and social well-being; and not merely the absence of disease or infirmity". According to WHO, the determinants of the health status are macroeconomic, environment, socio-economic and educational factors. Each group includes factors with direct and indirect action. Among the factors with direct action, we can mention: the life style (smoking, alcohol, drugs, food), the physical and social environment (access to water resources, habitat, sanitation), group behavior (access to medical services, domestic violence). The indirect determinants are including: GDP, poverty, pollution, climate change, migration, demographic changes, crises. Within the Health Millennium Goals, WHO is referring to the health determinants of the population: poverty and hunger, primary education, gender equality, environmental responsibility, partnership for development (WHO, 2010:3-4)

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The health of individuals, as components of their human capital, determines the extent of their contribution to the creation of the economic wellbeing of a nation. The health status can limit or stimulate the participation to the economic activities, so the relationship between the health status of the population and the macroeconomic results have to be rigorously and carefully investigated.

2. A SHORT LITERATURE REVIEW

In the human capital literature we can identify concerns related to considering health as a form of human capital. A first major collection of articles on human capital, referring to the human capital as education, on the job training, migration, and health belong to Schultz (1962).

A first major step forward was made by Michael Grossman(1972) who modeled optimal investment in increasing longevity, fact that stimulated a large literature, but nevertheless, articles on health as human capital have been only a small fraction of those on education and training. He developed later (1999) a model for the demand of health, in which he considers health as a durable capital stock, result of a household production function, in which the health cares are inputs. A person inherits an initial stock of health that depreciates with age-at an increasing rate at least after some stage in the life cycle-and can be increased by investment. When the health stock of individuals increases, their income will increase, as well. If the knowledge stock of a person has direct effects on his market productivity, then the health stock determines the total amount of time that he can use to obtain earnings and produce goods.

Most of the economics literature on health discusses ways to improve the delivery of health care services, that interacts with considerations of health as human capital, but it is mainly a different topic.

The emerging field of health as human capital builds on three interrelated developments to create a dynamic and evolving field. These developments are: (1) the analysis of optimal investments in health by individuals, drug companies, and to a lesser extent by governments that follows on Grossman's analysis, and also on the discussions in the insurance literature of self protection (Ehrlich and Becker, 1972: 623-648; Ehrlich, 2000:341-367), and the literature on investments by pharmaceuticals; (2) the value of life literature that analyzes how much people are willing to pay for improvements in their probabilities of surviving different ages (Usher 1973:193-225; Rosen, 1988: 285-304; (3) the importance of complementarities in linking health to education and other types of human capital investments, and in linking investments in health to discount rates, to progress in fighting different diseases (Dow et al., 1999: 1358-1371) and to other sources of overall changes in survivorship rates.

Gary Becker (2007) gave us the theory regarding health as human capital. The point of departure of this field is that individuals heavily influence their mortality rates and the quality of their health, subject, of course, to their genetic make-ups,

developments in the medical field, epidemics, luck, and many other considerations. The major foundation of the analysis is optimal behavior by consumers where they maximize utility over time, subject to the resources they have, and to actions they can take to affect their survivor rates at different ages. This enables one to calculate the willingness to pay for improvements in probabilities of surviving to different ages, called the statistical value of life. This value of life tends to decline with age and interest rates, rises with income, is higher when period utility functions are more concave, and depends on other variables too. The Becker's analysis also demonstrates a series of major complementarities between improved survivorship probabilities and many other aspects of behavior. Higher survivorship at adult ages would induce greater investment in education because expected returns on education investment would be greater. Higher survivorship also induces greater investment in beneficial goods—goods that add to future utility—including beneficial habits and addictions, and discourage investments in harmful goods—goods that lower future utility—including harmful habits and addictions. Higher survivorship leads too to greater investment in 'imagination capital' that lowers the discount on future utilities. The lower discount rates of persons with greater survivorship probabilities will lead them to save more, even with full and fair annuities, and is an additional reason why good habits and greater education are complementary with longer life expectancy. Becker highlighted the complementarities between the survivorship rates of different diseases and at different ages. An increase in the probability of surviving one disease raises the expected benefit from improving the probability of surviving other diseases. These various complementarities imply that inequality in a society has several dimensions that are positively correlated with each other. Population at different ages is an important determinant of the amount and type of investments in medical R&D by pharmaceutical companies and by government sponsored medical research. International comparisons of changes in world inequality over time concentrate on per capita GDP, although they sometimes also consider the number or fraction of persons with income below \$1 or \$2 dollars per day. These comparisons are seriously incomplete by not considering also death rates and life expectancies.

In conclusion, health as human capital is a concept based on numerous research regarding to what influences individuals when they decide their life style and living means. This approach is based on economic principles which explain why and how individuals decide their health and work.

3. MEASURING THE HEALTH CAPITAL

Measuring and defining the health status of individuals and nations is very difficult, raising several problems. At the individual level, any estimation is marked by subjectivity. At the macrosocial level, statistical indicators are operating, monitored by the national specific authorities.

For measuring the health at the individual level are relevant the results of the survey carried out by the experts of the European Commission in 20 european countries, gathering data from individuals aged over 16, in 2005, 2006, 2007. There were introduced three variables of the health output: self-perceived health status, presence of long-standing illness or disability and presence of a limitation in the daily activities as results of a poor health. The explanatory variables were: age group, income, education, activity status, degree of urbanisation. United Kingdom, Cyprus, Netherlands and Sweden reported a high level of the self-perceived health and Latvia, Lithuania and Portugal the lowest. Finland, Slovenia and Estonia reported a frequent presence of a long-lasting illness or disability and Latvia, Finland and Estonia indicated a high level of health limitations in daily activities (Atkinson, 2010:203)

For the analysis of the health as human capital at the macroeconomic level, there are several statistical indicators which are good estimates for the dimensions of the human capital stock. In the UNO's system, the estimation of the health status is made by indicators such as: *life expectancy at birth*, *resource indicators* (health expenditures, number of physicians at 10.000 inhabitants, number of hospital beds) *indicators of risk factors* (immunisations at new-bornes, prevalence of AIDS at youth and adults) and *mortality indicators* (infant mortality, mortality until 5, adult mortality, standardised rate of mortality due to the non-communicable diseases).

In the EUROSTAT system there are several indicators: *health expenditure* (absolute and relative sizes), *resources indicators* (health staff, endowment, medical technology), *results indicators* (hospitalisation duration, hospitalisation costs), *indicators reflecting the mortality causes* and *structural indicators*(life expectancy at birth, healthy life years).

From these indicators, life expectancy reflects the most accurately the impact of the medical care accross generations and is related to the economic development, the quality of life and the access to the medical services. The infant mortality is reflecting in what extent the medical services accessible to the majority of population can provide a good health.

4. THE RELATIONSHIP BETWEEN THE HEALTH AND ECONOMIC OUTPUT INDICATORS

4.1. The Methodology of the Study

In order to analyze the relationship between health macroeconomic results, I selected four EUROSTAT indicators: *health expenditure per inhabitant*, *health expenditure as percentage of GDP*, *the average life expectancy and healthy life years (absolute value)*.

I started with the hypothesis that the investment in health produces positive effects in the economic output, respectively, the statistical variables which estimate the investment in health and the health status of the population are positively correlated with the evolution of GDP per capita.

I calculate the correlation coefficients between the indicators of health expenditures and GDP per capita, for 2003-2007, between indicators of health status and GDP per capita, for 2001-2009, between the indicators of health system and GDP per capita, for 2001-2009 for the EU Member States. There were selected, each time, only the countries which had complete series of data for the periods of time taken into consideration.

4.2. Main results

As it is shown in the Table 62, the two indicators *Health expenditures per inhabitant* and *GDP per capita* are positively and strong correlated. From 22 countries with available data, there were selected 9 for which I found complete series of data for 2003-2009.

Table 62 *The correlation between the health expenditure per inhabitant and GDP per capita in different european countries*

Country	Correlation coefficient between the health expenditure per inhabitant and GDP per capita in different european countries (2003-2009)
Czech Republic	0,94
Estonia	0,81
Spain	0,6
Hungary	0,01
Louxiemburg	0,88
Poland	0,85
Romania	0,97
Slovenia	0,74
Finland	0,80

Source: own calculation based on EUROSTAT data, 2011 (tables: hlth_sha1h, tsieb010)

The indicator *Health expenditures as % of GDP* is weak correlated with the evolution of *GDP per capita* (Table 63). For 6 from the 11 countries with complete series of data for 2003-2009, the correlation is inverse and strongly inverse in the case of Germany. The initial assumption of a positive correlation between the investment in health and the economic output is not confirmed. The possible explanations of this fact are the irrelevance of the percentage of health expenditure of GDP to estimate the impact of the health investment in the GDP per capita growth and the insufficient available data (the reduced number of observations) which makes doubtful the accuracy of the conclusions.

Table 63 *The correlation between the health expenditures as percentage of GDP and the GDP per capita*

Country	The correlation coefficient between the health expenditures as % of GDP and GDP per capita (2003-2009)
Czech Republic	0,22
Germany	-0,94
Estonia	0,33
Spain	0,24
Hungary	-0,48
Poland	0,93
Portugal	-0,04
Romania	0,28
Slovenia	-0,24
Finland	-0,02
Sweden	-0,07

Source: own calculation based on EUROSTAT data, 2011 (tables: hlth_sha1p, tsieb010)

Healthy life years (females) are positively correlated with GDP per capita only in some european countries, such as: Denmark, Finland and Sweden, which have a large participation of women at the labour force. The rest of the countries are presenting strong and negative correlations (-0,5; -0,8).

Table 64 *The correlation between the healthy life years(females) and GDP per capita in different european countries*

Country	The correlation coefficient between the healthy life years(females) and GDP per capita (2001-2009)
Belgium	-0,57
Denmark	0,71
Germany	-0,76
Ireland	-0,25
Greece	-0,66
Spain	-0,77
France	0,37
Italy	-0,72
Austria	-0,75
Portugal	-0,57
Finland	0,73
Sweden	0,82

Source: own calculation based on EUROSTAT data, 2011 (tables: tec 00001, tsdph220)

Regarding the influence of the *health status of men* in GDP per capita evolution, the things are similar (Table 65). In countries as Denmark, France, Netherlands, Finland and Sweden, the health of men influences heavily the economic output. It is not a coincidence the fact that these countries have a high the employment rates at males, at age 15-64(68,3%-80%) and at 55-64(42,1%-74,2%), as well.

Table 65 *The correlation between the healthy life years-males and GDP per capita in different european countries*

Country	The correlation coefficient between the healthy life years-males and GDP per capita in different european countries (2001-2009)
Belgium	-0,38
Denmark	0,72
Germany	-0,84
Ireland	-0,46
Greece	-0,46
Spain	-0,59
France	0,88
Italy	-0,88
Netherlands	0,64
Austria	-0,75
Portugal	-0,42
Finland	0,5
Sweden	0,75

Source: own calculation based on EUROSTAT data, 2011 (tables: tec 00001, tsdph220)

The data from the Table 64 and Table 65 are correlated with the employment rates at females and males at the age of 55-64. In countries with a high employment rate for women the correlation is strong and positive: Sweden, Finland, Denmark (Table 66). In countries where the employment rate of women is much lower than of men, the correlation coefficient is strong negative, reflecting the fact that level of employment and, consequently, the contribution of the labour force at the economic output depends on the health status of the population. Countries with a high employment level at age 55-64 are best valorising the health status of the labour force for obtaining the economic wellbeing, this fact being a signal of a healthy population at this age. In countries where the employment rates of women are closed to those of men (Denmark, Sweden), the influence of the health status in the economic results are much more stronger.

Table 66 *The employment rate for women in some EU countries*

Country	Employment rate-males (age 55-64), 2010	Employment rate-females (age 55-64), 2010	Difference
Belgium	45,6	29,2	16,4
Denmark	62	57	5
Germany	65	50	15
Ireland	58,1	42	16,1
Greece	42,3	28,9	13,4
Spain	43,6	33,2	10,4
France	42,1	37,5	4,6
Italy	47,6	26,2	21,4
Netherlands	64,5	42,8	21,7
Austria	51,6	33,7	20,9
Portugal	55,7	43,5	12,20

Country	Employment rate-males (age 55-64), 2010	Employment rate-females (age 55-64), 2010	Difference
Finland	55,6	56,9	-1,3
Sweden	74,2	66,7	7,5

Source: EUROSTAT 2011(table lfsi_emp_a)

Regarding the relationship between the number of physicians at 100.000 inhabitants and GDP per capita, the identified correlations are very strong and positive (Table 67). This highlights the importance of the health care in the preservation of the active population.

Table 67 *The correlation between the numebr of physicians at 100.000 inhabitants and GDP per capita in some european countries*

Country	The correlation coefficient between the numebr of physicians at 100.000 inhabitants and GDP per capita (2001-2009)
Belgium	0,84
Denmark	0,90
Germany	0,85
Cyprus	0,69
Latvia	0,98
Spain	0,78
Lithuania	0,59
Louxeburg	0,97
Romania	0,86
Austria	0,92
Slovenia	0,96
Finland	0,90
Sweden	0,86

Source: EUROSTAT, 2011 (tables: tec 00001, tps 00044)

The *Number of hospital beds* at 100.000 inhabitants is not related to the GDP per capita dynamics.

4.3. Conclusions

Starting with the assumption that public health are positively influencing the macroeconomic results, I found that:

- the investment in health is not reflected in the economic output if it is measured by the percentage of the health expenditures in GDP. In change, I found a positive correlation in several european countries between the health expenditure per inhabitant and the GDP per capita;
- the health status of women and men, measured by the healthy life years is reflected differently in GDP per capita growth, depending on the level of employment. In countries with a high level of employment, the correlation between the health status and GDP per capita is positive and strong. The influence is much more stronger in the case of the labour force aged 55-64, this situation emphasizing a better

valorisation of this active population, as a result of good health status. In countries where the employment rate of women is closed those of men, the influence of the health status in the macroeconomic result is much more stronger.

- not all resources health indicators are positively correlated with the economic results. Only the number of physicians at 100.000 inhabitants has a positive influence, while the number of hospital beds has no relevance for the economic output.

Finally, it is to mention that the insufficiency of available data from EUROSTAT impedes a rigorous analysis of the relationship between health and economic output, being necessary to extend the statistical data base for the correlation calculations.

4.4. Final conclusions and further directions for research

The present paper is a first step in exploring the relationship between human capital accumulation- health component and economic output. For a deeper research are necessary the following actions:

- investigating the complementarity between the components of human capital- education and health and of their differentiate contribution to the economic results;
- a further study on the case of Romania, highlighting the aspects of efficiency and effectiveness of the medical services;
- extension of the study at the world level, by exploring international data bases (UNO, UNDP) which could relate the indicators of health status with the dynamics of GDP and the human development level (human development index-HDI, human poverty index-HPI, inequality -adjusted HDI).

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CASE STUDY



THE INFLUENCE OF EXPERIENTIAL EXERCISES ON ATTITUDES TOWARD ENTREPRENEURSHIP: THE CASE OF BANGLADESH

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Abstract: *Entrepreneurship education is a rapidly growing field of study in the U.S. and around the world. It is a unique and an intangible subject whereby many instructors adopt different styles and exercises to enhance learning. One of the most effective ways has been through experiential exercises. Hence, the purpose of the study was to determine if experiential exercises influenced entrepreneurial attitudes of students enrolled in a business marketing course. A survey was conducted among a convenience sample of students enrolled in a business course at a university in the country of Bangladesh. Findings supported career socialization theory and showed that most of the students wanted to be entrepreneurs; nevertheless, they understood that it was a difficult venture. Findings also indicated that students were confident to pursue such a career path and approached it with high enthusiasm. Implications of the findings were discussed.*

Keywords: *Entrepreneurship Education, Entrepreneur, Benefits of Entrepreneurship Education, Experiential Assignments.*

INTRODUCTION

According to Investment Business Weekly (Kauffman Foundation... 2008) entrepreneurs will become the vital force that will revive the U.S. as well as stabilize the global economy. Further, according to U.S. Department of Labor, “the U.S. Small Business Administration reports that America’s 25.8 million small businesses employ more than 50 percent of the private work force generating more than half of the nation’s Gross National Product (GDP) (Kauffman Foundation...2008)”. But who would likely become an entrepreneur? Poschke (2008), found that the largest percentage of entrepreneurs had doctorates (42.1%) followed by high school graduates (37.1%). For many owning a business has a lot to do with circumstances rather than academic preparation; however, according to the 2009 World Economic Forum Report (Rubin, 2010) those that receive entrepreneurial education have a better chance for longevity and success than those without.

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Vesper and Gartner (1999) noted that entrepreneurship education has been a debated topic among academic and business circles regarding whether the subject can be taught at all. Klein and Bullock (2006) argue that not all entrepreneurial processes can be taught. Moreover, Rose (2011) believes that entrepreneurship education is not same as business education. According to Furr (2011), “Entrepreneurship is about tackling unknown problems or solutions, whereas management is about tackling known problems”. Entrepreneurship education trains people to be entrepreneurs able to solve problems and it happens through experiences such as experiential exercises in a university setting (Tan and Ng, 2006).

Business education doesn't train students to be entrepreneurs, it prepares them to be managers, such as how to plan, coordinate, and increase efficiency and productivity, among known problems. Entrepreneurship education helps people with the knowledge, tools, encouragement and helps to bring about the success of a true entrepreneurial venture (Tan and Ng, 2006).

As a result of this, entrepreneurial education has been adopted in universities such as California State University, San Bernardino that has ranked in the top five since its inception six years ago. In that program students learn and build their skills ultimately to develop and present a business plan to venture capitalists (www.iece.csusb.edu). Skills sets learned include advertising, taxation, consulting, innovation, retailing and partnerships to name a few. Entrepreneurship is viewed as a mindset rather than a concentration (www.iece.csusb.edu) experiential in nature, and is pursued by non-business and business majors alike (Levenburg, Lane and Schwarz, 2006).

As opposed to the U.S., universities have been limited in experiential pedagogy in other countries around the world. According to Gray (2006), almost 2,000 schools offer the ultimate in experiential pedagogy in entrepreneurial coursework; however, these are mostly in the U.S. Experiential methods such as cases, client projects, as in marketing and/or advertising or marketing research projects and plans, and client competitions have been common in the U.S. for some time. However, this is not the case in the European Union (Special Issue on Entrepreneurship... 2004) or Asia. The European Commission recently issued an action plan to have member states introduce entrepreneurship in their programs (Special Issue on Entrepreneurship . . . 2004).

According to 2011 Index of Economic Freedom, Bangladesh is one of the poorest nations in the world and the most densely populated one. Although the majority of the population is involved in agriculture, half of the country's GDP comes from service sectors. Corruption and weak governance are major constraints in the economic growth for the country. In order for the country to grow economically, entrepreneurship education is fundamental to its long term future. Hence, the purpose of this study was to determine the influence of experiential exercises introduced in a business marketing course, on attitudes toward entrepreneurship.

LITERATURE REVIEW

Entrepreneurship as a major started in the 1940's in business schools in the U.S. In fact, the first entrepreneurship education or small business class was given at the Harvard Business School in 1947 (Brockhaus, 2001; Cruikshank, 2005). According to Vesper and Gartner (1999) and Solomon, Duffy and Tarabishy (2002), entrepreneurship education is one of the rapidly growing subjects among U.S. colleges and universities and became even more popular after the technical innovation burst in the 1980's (Furr, 2011). Furthermore, Levenburg, Lane, and Schwarz (2006) found that many students outside of the business school yearned to become entrepreneurs and that business schools needed to look beyond their own students to grow such programs.

In evaluating the characteristics of entrepreneurship education, Tan and Ng (2006) found that most often the pedagogy emphasized experiential learning or the learn-by-doing model resulting in a business plan rather than a final exam. Although taking on risk cannot be taught, the authors suggest that to demystify entrepreneurship that instructors provide students a broad feeling of what it is like to develop a business (Tan and Ng, 2006, pg 416). One way is through simulations while another is problem solving.

The experiential approach to teaching and learning of business skills is not new to the classroom. Traditionally, this form of learning focused primarily on computer simulations, case analysis, and client based projects (Czepiec, 1983; Henke, 1985; de los Santos and Jensen, 1985; Conant and Mokwa 1967; Gaidis and Andrew 1990; Goretsky 1984, Seitz, 1993). Internships have also been utilized as another forum for students to gain real world experience (Razzouk and Henry 1992; Beer, Henry and Razzouk 1995).

Much discussion in Schools and Colleges of Business has focused on accountability and, in particular, outcomes assessment. Students want to learn the skills that prepare them for a job after graduation. The growing importance of these issues has heightened interest in experiential learning as a predominant force in establishing accountability and providing a positive environment for assessing students' outcomes. According to Iowa State University Extension (www.exnet.iastate.edu), experiential learning takes place when a person is involved in an activity and shares the experience by describing what happened, processes the experience to identify common themes, generalizes from the experience to form principles or guidelines that can be used in real-life situations, and applies what was learned to another situation. The experiential approach has been shown to increase student learning as well as excitement about course material by getting the learner more involved (Wedell and Wynd, 1994).

Experiential learning, a non-directive teaching style, provides a forum where students have the greatest opportunity to learn (Shields, 1997). Here, the "instructor delegates, consults, and facilitates (Shields, 1997, p. 2)," but is not involved in the student learning process. In essence, the instructor empowers the student and allows them to develop evaluation skills of the principles learned in the classroom. Furthermore, students that are delegated learning on their own will not only learn the

principles and concepts taught to a greater degree than in directive-style (teacher-oriented) teaching, but will also learn thinking skills, creativity, problem solving, oral communications, written communications, initiative, and leadership skills (Shields, 1997).

In evaluating the influence of experiential exercises on entrepreneurial attitudes, career socialization theory purports that a career path decision is influenced by many social factors including exposure to educational experiences (Dyer, 1994). Experiential exercises integrated into entrepreneurship education provide this exposure and give students an opportunity to take on responsibilities much like owning one's own business. Hence, experiential exercises could be expected to positively influence attitudes towards entrepreneurship when integrated in business marketing coursework. Through experiential learning individuals grow to understand entrepreneurial behaviors and to have an overview of what it is needed to make all the functional areas to work together (Ivancevich, 1991).

METHODOLOGY

The Class

Students enrolled in a business marketing course were assigned experiential exercises such as role playing, negotiation and communication skills, case analysis, and group presentations in partial fulfillment of the course requirements. In these presentations students were asked to show how they would own and operate their business and were instructed to integrate some management knowledge such as business planning, capital development, marketing, and cash flow analysis. Students were advised to think outside the box and capture new innovation or opportunities that have been missed in the marketplace. They were also advised to pay particular attention to seeking venture capital, protecting intellectual rights, and preparing for uncertainty and risks associated with starting a new business. At the end of the course students completed a self-administered question regarding their attitudes toward entrepreneurship.

Sample

The sample was composed of freshmen and sophomore level students enrolled in a business marketing course in a Bangladesh University in April 2011. Respondents' ages ranged from 19 to 25 years with a total of 27 surveys completed.

Survey Instrument

A survey was developed to assess students' attitudes toward entrepreneurship. The first section, initially developed by Krueger (1993) entailed eight questions regarding perceive desirability and feasibility of starting a business and was measured via a semantic differential scale from one to seven. Questions included how hard or easy it would be to start a business, their level of certainty regarding success or failure

of it, if they would be overworked, if they knew everything or nothing about starting a business, their confidence in starting a new business, how much they would enjoy it, how tense of an experience it would be, and how enthusiastic they would be regarding the business.

Additional questions regarding the entrepreneurship experience were developed by Peterman and Kennedy (2003) and included five statements measured with a yes/no response. The second section aimed at understanding the respondent's knowledge of business or entrepreneurship, how much they know about doing business and if so how they got their motivation or knowledge regarding entrepreneurship.

RESULTS

Measures of central tendency were used to analyze the data. Results showed that respondents perceived desirability and feasibility to start a business was overall very positive and realistic (Table 68). For most of the statements respondents knew that starting a business would be hard (Mean = 2.54) but were pretty certain of their success (Mean = 2.77). Respondents realized that they might be overworked (Mean = 2.23) but felt that they had the knowledge to pursue the endeavor and start their own (Mean = 2.73). Furthermore, respondents were confident in their abilities (Mean = 1.96) and noted that they would love doing it (Mean = 1.38). Respondents indicated that they would not be very tense starting their business (Mean = 3.19) but would be very enthusiastic about it (Mean = 2.04).

Table 68 *Perceived Desirability and Feasibility of Starting a Business*
N = 27

	QUESTIONS	RESPONSE RATINGS		MEAN
1	How hard do you think it would be to start a business?	1 = Very hard	7 = Very easy	2.54
2	How certain of success are you?	1 = Very certain of success	7 = Very certain of failing	2.77
3	How overworked would you be?	1 = Very overworked	7 = Not overworked at all	2.23
4	Do you know enough to start a business?	1 = Know everything	7 = Know nothing	2.73
5	How sure of yourself are you?	1 = Very sure of myself	7 = Very unsure of myself	1.96
6	I would love doing it.	1 = I'd love doing it	7 = I hate doing it	1.38
7	How tense would you be?	1 = Very tense	7 = Not tense at all	3.19
8	How enthusiastic would you be?	1 = Very enthusiastic	7 = Very unenthusiastic	2.04

Table 69 *Attitudes toward Entrepreneurship*

	QUESTIONS	YES %	NO %
1	Do you think you will ever start a business?	100.00	0.00
2	Have your parents ever started a business?	65.38	34.62
3	Has anyone else you know started a business?	96.15	3.85

	QUESTIONS	YES %	NO %
4	Have you ever worked for a small or large company?	42.31	57.69
5	Have you ever started a business?	23.08	76.92

Table 69 shows that 100 percent of the respondents would like to be entrepreneurs. The findings indicated that most respondents' (65.38%) had parents that had started their own business or knew someone that had (96.15%). Although old enough to be employed, most respondents had not worked (57.69%) for any size corporation nor had they attempted to start a business yet (76.92%).

IMPLICATIONS

Findings indicated that becoming an entrepreneur would be the next step upon completion of their business education. Students learned about the rewards and how their ideas and efforts might contribute to society as a whole. Such experiential exercises presented in the business marketing course brought a lot of excitement, self confidence and motivation about entrepreneurship thus supporting career socialization theory.

Entrepreneurship education helps business owners work more efficiently and effectively seeing to all aspects of functional areas and making better decisions for the business as a whole. Institutions teaching entrepreneurship courses should provide students with proper tools and hands on experience to enhance their understanding so that they may function effectively in the real world of business. If students decide to become an entrepreneur, such hands-on assignments provide the knowledge to be able to work confidently and successfully. Should they decide to work for a company, such skills allow them to be able to make decisions that affect the company in a positive manner and enhance their chances to move up.

Instructors need to understand that experiential learning encourages entrepreneurial thinking, yet unlike traditional teacher-directive learning, has no right or wrong answers. It should be encouraged by the academic institution to develop relationships with local and international companies in the region so that client based experiential assignments can be integrated into the coursework.

Klein and Bullock (2006) found that the entrepreneurial function and entrepreneurial process can be taught to a certain extent but not all of it. On the contrary, most entrepreneurship education specialists believe that entrepreneurs are made, not born. Drucker (1985) states "Entrepreneurship is 'risky' mainly because so few of the so-called entrepreneurs know what they are doing". Therefore, instructors who have combination of both entrepreneurial experience and professional academic training would be ideal candidates for a school that is interested in introducing entrepreneurial courses as a major course of study.

CONCLUSION

For entrepreneurship education to be successful, experiential exercises are vital so that students can have a “feel” for the subject. The experiential exercises presented provided students a chance for role playing, such as negotiation and communication skills that helped them develop an appreciation for the real world and business ownership. With these exercises students developed enthusiasm and positive attitudes toward entrepreneurship by firmly understanding the risks and skills involved. Experiential exercises enhance entrepreneurial education by exposing students to real world problems and the discipline necessary to open and maintain a business over the long term. Further, such training encourages the personal freedom and independence that can benefit a society and build a nation such as Bangladesh.

Entrepreneurship education is still new in Asia and there is no set pedagogy that has been implemented. However, by imparting concepts along with experiential/hand-on exercises students will be better prepared for the risks and challenges that are involved with the creation of new businesses. As institutions of higher education in Bangladesh move to entrepreneurship education, they will be preparing graduates to be open to new challenges and innovative in their approach by showing how it may affect them positively both financially as well as socially. The earlier students are exposed to entrepreneurship education the better their chances they will have towards new ventures and to the future growth of the country.

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FOREIGN DIRECT INVESTMENT AND FINANCIAL RESILIENCE: CASE OF THE MEDITERRANEAN COUNTRIES

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Abstract: *During the last financial crises, foreign direct investment have shown an important financial resilience comparatively to other category of capital flows, in particular, foreign portfolio flows. For this reason the object of this study is to verify if foreign direct investment favours financial stability in the Mediterranean countries which know not only a great political and geography diversity, but also a different financial development of their financial systems. Evaluated by crisis indicators extracted from the economic literature, financial instability in the Mediterranean countries was clear from the existence of exchange market pressure and of the vulnerability of their banking systems. Moreover, the conduct of a descriptive analysis of the relation between foreign direct investment in its different dimensions (stability versus volatility, the degree of substitution to indebtedness) and the crisis index reveals that financial stability is largely favoured by an important stability of foreign direct investment and by its important replacement effect. This result is greatly confirmed by econometric analysis thinks to the estimation of a pooled panel data on a sample of Mediterranean countries in the period (1990-2006).*

Keywords: *Foreign direct investment, financial crisis, volatility, indebtedness.*

JEL Codes: *F21, G01, F34 ; F30*

INTRODUCTION

Developing countries receive a weak share of foreign direct investment comparatively to the developed world. In spite of such weakness, Asian countries and Latin America countries attract a considerable share of foreign direct investment flows. But, an important attraction of these countries for these types of flows did not save them from the risk of occurrence of financial crises.

Financial crises find their origins in several factors. Among them we can quote microeconomic factors which refer essentially to the fragility of financial institutions and macroeconomic factors such as inflation, budget deficit, and current account deficit. It will be interesting to verify the role played by foreign direct investment in matter of triggering financial crises.

Such interest will be more important when we find no unanimity concerning the effects of foreign direct investment on financial crises. According to Hausman.R and

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Fernandez. (2001), Foreign direct investment represents a stable capital flow since it can't easily leave the country where the first sign of crisis has been revealed. In fact, this type of capital flows is not explosive in the sense that it is less reversible and less sensitive to the contagion effect. Contrary to the short term lending banks, fixed-illiquid assets make difficult disinvestment.

Moreover, foreign direct investment flows reduce capital flight. The conduct of a principal component analysis and of a contemporary correlation between data on the period (1974-1992) has allowed Kant.C (1996) to conclude that at each increase of FDI per dollar correspond a decrease of capital flight from 0,5 \$ to 0,84\$.

Yet, other studies disprove the beneficial effect of foreign direct investment in terms of financial stability. The regression of financial risk indicator (financial crisis) on economic risk indicators and on foreign direct investment flows into two sub periods (1993-2000) and (1984-2002), reveals that foreign direct investment flows were the cause of financial crisis. However economic risk depicts a negative sign which signify that fundamentals are not the cause of financial crisis. Such result finds an evident explication in the fact that capital remuneration is more important than debt remuneration. In other words, foreign direct investment is a costly element³⁹.

Moreover, FDI is not associated only to machines that are hardly liquidated, but also to more liquid and volatile capital flows. In this sense, hedging operations favours the liquidation of investments when countries enter a distress phase. This is the case of countries that posses a relatively well developed financial markets which allow them to repatriate easily these flows.

The object of this paper is to make evident at which point foreign direct investment flows represent a factor of financial shocks absorption in the Mediterranean countries on the period (1990-2006). The first part of this work is devoted to the study of the evolution of different type of flows in the Mediterranean countries. The second one will be consecrated to the study of the role of FDI in matter of financial stability.

I-THE EVOLUTION OF CAPITAL FLOWS IN THE MEDITERRANEAN COUNTRIES:

a) Concept:

In conformity with the International monetary Fund, a foreign direct investment is an investment that allows the direct investor to exercise an important influence on the management of the invested enterprise. A non resident entity that holds more than 10 % of the capital of a resident enterprise represents a foreign direct investment. Consequently, every detention of capital which is inferior to this norm is accounted as portfolio investment. Foreign direct investment flows include the augmented capital

³⁹ Boujedra.F (2004); «Risque pays, IDE et crise financière internationale, évaluation et étude empirique», GDR économie monétaire et financière, Mai.

participation, short and long term loans between foreign investor and the invested enterprise, and the reinvested profits.

In the same meaning, we can advance that foreign direct investment reflects the durable interest of a resident entity (direct investor) on an enterprise located in another economy. This durable interest implies the existence of a long term relation between the direct investor and the enterprise which offers the investor probably the aptitude to participate to the management of the enterprise. Foreign direct investments have taken essentially the form of mergers and acquisitions or the construction of a new production unit (Greenfield investment). Since the second half of the eighties, particularly since the occurrence of the Asian financial crises, the flows of foreign direct investment have known an important increase. But the other form of capital flows (commercial credit, portfolio investment) has neither known such tendency.

b) Recent tendency of capital flows:

Observing the evolution of capital flows in the Mediterranean countries, we ascertain that these countries have known an important increase of foreign direct investment flows and a decrease of their indebtedness in the period (1990-2006). Taking for example the case of Algeria, it is interesting to signal that this country has known a slight recover of foreign direct investments in 1997 reaching a level of 1.5 percent of GDP during the year 2006. Such evolution is largely due to structural reforms in the case of structural adjustment program and to the improvement of macroeconomic performances. The latter was clear from the rise of GDP growth rate because of the augmentation of hydrocarbon production in the aftermath of the rise of petroleum prices.

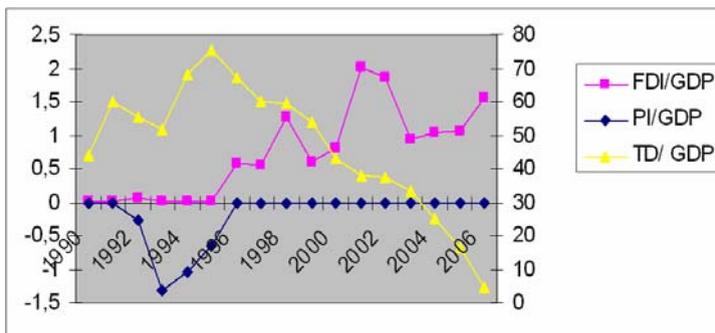


Figure 11 Evolution of foreign capital flows in Algeria

At the same time, this country has known a decline in the volume of total debt which has passed from 43% of GDP during the year 1990 to 4,3% of GDP during the year 2006. As can be shown from the figure below, such evolution is incomparable with the one known by other capital flows, in particular, with portfolio investment flows (PI).

The limited attraction by the Algerian territory for foreign direct investment is due to the absence of a well developed financial market. Moreover, the enjoyment of Tunisia and Morocco of a macroeconomic and political stability has permitted them to attract an important volume of foreign direct investment flows. According to the

European investment Bank, macroeconomic performance has permitted Tunisia to attract more and more important flows of foreign direct investment. The foreign direct investment inflows to the Tunisian territory have passed from 0, 6% of GDP during the year 1990 to 10, 5 % of GDP over the year 2006.

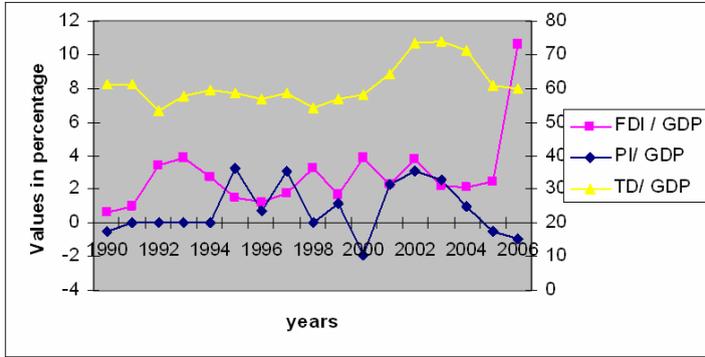


Figure 12 Evolution of capital flows in Tunisia

As can be shown from the figure above, the increase of foreign direct investment inflows in Tunisia is also attributed to the cession of Tunisia Telecom’ social shares during the year 2006. The telecommunication sector has received 3056 millions Dinars as direct investments which represent 69, 4 % of foreign direct investment total receipts.

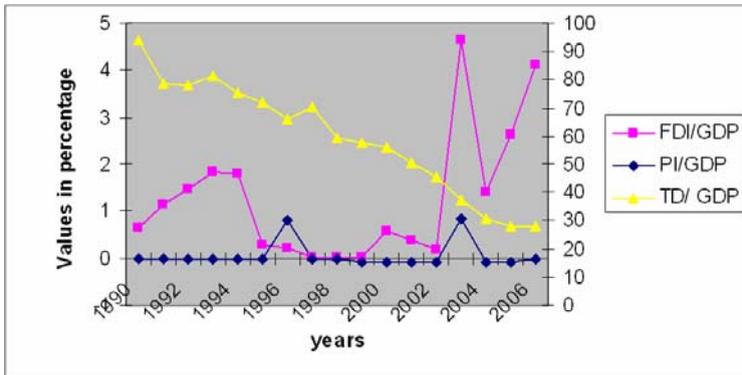


Figure 13 Evolution of capital flows in Morocco

Source: Author from the World Bank Data Base

The growth of foreign direct investments inflows to morocco was evident from their increase from 0.639% of GDP during the year 1990 to 4.12 % of GDP in 2006. Such positive evolution of FDI inflows was caused by the accomplishment of an important effort of privatisation in 1993⁴⁰ and of the repeal of the Dahir (law of marocanisation).

⁴⁰ The increase in the receipts of privatization during the year 2005 was due to the transfer of 16% of the capital of Morocco Telecom to Vivendi Universal.

Moreover, foreign direct investment inflows were stimulated by the creation of many new institutions such as the Regional Center of Investment (RCI) and the inter-ministerial commission. But at this level of analysis, it is important to signal that this country enjoyed like his neighbour some advantages as political stability and higher rate of growth.

Morocco has not only known a positive evolution of its foreign direct investment but also a decrease in its debts. This is the opposite of what Turkey has registered. Indeed, this country remains less attractive for foreign direct investments in spite of its light increase during 2004s and 2005 by reaching a level of 2.02 and 3.78 in percentage of GDP.

Foreign direct investments inflows towards Turkey represent on average only 0.457 % of GDP over the period (1990-2006). So, the weakness of these types of investment inflows in Turkey was due to a greater distrust of foreign investors in this country given that it was considered as risky. In spite of the efforts carried out by Turkey in matter of globalization such weakness puts in doubt the potentialities of this country in matter of attracting these types of investment.

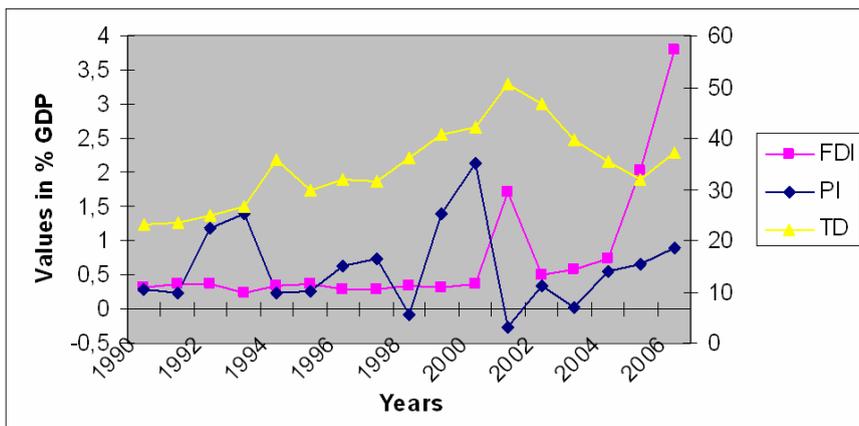


Figure 14 Evolution of capital flows in Turkey

Source: Author from the World Bank Data Base

There are several factors that explicate the weakness of the Turkish foreign direct investment inflows among which we can quote macroeconomic instability, banking fragility, and the weakness of institutional and political infrastructure. Macroeconomic instability was essentially reflected in the achievement of a galloping level of inflation which was essentially due to an important recourse of the State to the monetary instrument in order to finance the budget deficit.

II- FINANCIAL STABILITY IN THE MEDITERRANEAN COUNTRIES:

1-financial stability : Concept and measure

Financial instability is a notion that is not easy to define that's why we will be limited to quote the main definitions that were given by the literature to the notion of financial crises. Financial instability was mostly associated to the release of financial crises episodes which are mostly tracked down by the number of financial institutions bankruptcy or by the number of rescue operations.

According to many studies⁴¹, financial instability indicator's takes the value 1 during the release of a financial crisis, and zero otherwise. Nevertheless knowing that this definition lacks some precision, other studies associated financial instability to the instability of the reserves of exchange and of exchange rate as is illustrated by the following formula:

$$CI_t = \left[\frac{\text{Log}\left(\frac{RER_t}{RER_{t-1}}\right)}{\sigma \text{Log}\left(\frac{RER_t}{RER_{t-1}}\right)} \right] - \left[\frac{\text{Log}\left(\frac{RES_t}{RES_{t-1}}\right)}{\sigma \text{Log}\left(\frac{RES_t}{RES_{t-1}}\right)} \right] \quad (1)$$

RER: Real exchange rate

RES: International Reserves of exchange in dollars.

In accordance with this indicator, there is a crisis when it exceeds its average by two standard deviations. The evolution of this indicator over the period (1990-2006) for the Mediterranean countries reveals that these countries were not shielded from financial crises. As it has been proved by economic literature, Turkey was the most affected country by financial crisis. Nevertheless, this indicator takes into consideration only the international dimension of financial crises since it concerns especially countries that are engaged in the financial liberalisation process and which known an important movement of international reserves inherent to capital flows movements. However, financial instability should be evaluated not only by taking into consideration international dimension but also by evaluating the fragility of financial institutions.

Banking fragility is evaluated thanks to a composite indicator that describes the situation by which banking solidity pass from a situation of vulnerability to a crisis position⁴². This indicator allows us to know exactly the time during which financial institutions are submitted to a crisis. The banking system fragility indicator (BSFI) consists of three components: banks deposits (BD), foreign debts of banks (FD), and of credit to private sector (CPS). This indicator is an average of standardised values of the three components.

⁴¹ Demerguc-Kunt.A ET Detragiache.E (1998b) ; Caprio.G et Klingebiel.D(2003)

⁴² Kibritcioglu.A(2002) ; « Excessive risk taking , Banking sector fragility, and banking crises », Office of Research Working paper Number 02-0114.

$$BSFI = \frac{\left(\frac{BD - \mu BD}{\sigma BD}\right) + \left(\frac{FD - \mu FD}{\sigma FD}\right) + \left(\frac{CPS - \mu CPS}{\sigma CPS}\right)}{3} \quad (2)$$

Each decrease of the fragility indicator is associated to an increase of the banking system fragility. Yet, such decrease is not equivalent to an exposition of the banking system to a systemic crisis. There are higher and medium levels of fragility. When the fragility indicator is comprised between zero and less than zero five, banking system reach a medium level of fragility. But when the indicator is inferior or equal to less than zero five, the banking system is highly fragile to a systemic crisis.

2-Evolution of financial stability in the Mediterranean countries:

In order to evaluate financial stability in the Mediterranean countries, we resorted to the analysis of the evolution crisis indicators on the period (1990-2006) that take into consideration internal and external aspects of financial stability. According to the study of Cartapanis.A, Dropsy.V, Mamtez.S(1999), crisis indicator represents a good evaluation of external financial fragility since it takes into account the variation of exchange rate and of foreign reserves. Moreover, banking index fragility allows us to evaluate the vulnerability of the Mediterranean financial institutions, and consequently to take into consideration financial instability in its internal aspect.

a) Evaluation of internal financial fragility:

The evaluation of the internal financial fragility in the Mediterranean countries thanks to the observation of the evolution of the banking fragility indicator allowed us to note that these countries knew from the end of the nineties years an increase of the fragility indicator which confirm an improvement of financial institutions solidity. Such result is greatly attributed to the reforms executed by these countries in order to reinforce the stability of their financial institutions. Taking for example the case of Tunisia, it is interesting to remark that internal financial fragility reached its apogee during the year 1991. In fact, fragility indicator reached a value of -4.12 during that year, a value that is widely less than zero five, which is in favour of an important exposition of the banking system to a crisis⁴³. Yet, fragility indicator has registered an increase during the period (1998-2006) which is synonymous of an improvement of banking institutions performance. The realisation of such result is due essentially to a reinforcement of prudential regulation of banks.

Showing the evolution of internal financial fragility indicator in Turkey, it seems that it was unstable since it encountered phases of increase and decrease of fragility indicator. The Turkish Banking vulnerability has increased during the periods (1990-

⁴³ This result is largely confirmed by the economic literature. In fact, according to Dell'Aricci.G, Detragiache.E, and Rajan.R (2005) Tunisia knew a banking crisis during this period of time.

1996) and (2000-2002) since the fragility indicator has reached negative values. On the one hand, this country knew a systemic banking crisis at the year 1994 since the fragility index attained a value of -3, 07 which is in favour of an important exposition of this country to a banking crisis. On the other hand, it knew a decrease of banking vulnerability during the periods (1996-2000) and (2002-2005) which is synonym of an improvement of the performance of these banks after the accomplishment of different reforms after crisis.

In the same line of idea, Egypt was strongly exposed to crisis risk during the nineties, as it was confirmed by the evolution of the fragility indicator. The latter reached negative values during the period (1990-1996) surpassing extremely a value of less than zero five. As it was confirmed by economic literature, Egypt was victim of bank crisis during the years 1991 and 1995⁴⁴.

b) Evaluation of external financial fragility:

The evaluation of external financial fragility in the Mediterranean countries thanks to the crisis index according to which financial instability is attributed to the instability of reserves and of real exchange rate allowed us to conclude that these countries were victim of monetary crisis since the index surpassed a value of more than two standards deviation above average. For example, the observation of the crisis indicator's monthly evolution during the period (1990-2006) reveals that this indicator surpassed the value threshold during the years 1994 and 2001, which is in accordance with the results found by economic literature. Effectively, Turkey was often the victim of monetary crises because of the vulnerability of its budget and financial institutions.

An excess of the crisis indicator of its threshold value does not concern only Turkey but it is also the case of other Mediterranean countries. Taking for example the case of Egypt, we remark that crisis indicator exceed its threshold value during the nineties years. These results were greatly confirmed by economic literature. But at the end of nineties years, the frequency of monetary crises was widely lowered in this country. Concerning Tunisia, it represents, in comparison with other Mediterranean countries, the least exposed country to the risk of monetary crisis.

III- FOREIGN DIRECT INVESTMENT'S ROLE IN FINANCIAL STABILITY:

1- The stability of foreign direct investments:

a) Literature Review:

As opposed to others form of capital flows, foreign direct investment inflows represent stable capita flows since they represent long term engagements. In fact, when a crisis occurs, these flows cannot easily leave the receivable country as they are not as explosive as other form of capital flows⁴⁵. "FDI is less subjected to capital reversal and

⁴⁴ Dell'Arizzi.G, Detragiache.E, and Rajan.R (2005); *ibid*

⁴⁵ Fern'andez-Arias.E and Hausmann.R (2001); "Is foreign direct investment a safer form of financing?", *Emerging Markets Review*.

to contagions affecting other form of capitals since the fixed illiquid assets make difficult disinvestment and this is in contrast with short term bank lending that could be easily withdrawn”.

According to Hausman and all (2001), foreign direct investments represent a form of capital that is less exposed to the risk of banking crisis as they reassure equity holders of the payment of cash flows whatever the money in which is libelled and their maturity is. In other words, foreign direct investment reinforces the resistance of countries to the pervasive effects of exchange rate because they allows to cure currency mismatch problems coming from the recourse of emerging markets to foreign borrowing because of their incapacity to borrow in their proper money.

In accordance with Levchenko .A.A. and Mauro.P (2007), financial flows, in particular, foreign direct investments permit to protect against the risks of capital flows reversal “sudden and stops”. Such protection is accomplished not only in function of the payments inherent to financial flows but also in function of their stability. In fact, the weakness of payments attached to foreign direct investment flows at the time of bad macroeconomic performance weaken, contrary to debt contracts for which the payment of coupon remains dependant on the state of economy, the degree of vulnerability to crisis.

Having as an object to study the behaviour of financial flows when there is “sudden-stops”, this study conclude that Foreign direct investment represents contrary to bank lending and portfolio debt the most stable flows at “sudden and stops”. This result is largely confirmed by the analysis of these net flows behaviour on the period of study (1970-2003) for 142 developed, emerging, and developing countries using the study of the net flows average for every group of country, and of their volatility.

In order to testify the effect of foreign direct investment on capital flight, Kant.C (1996) resorts to the analysis of contemporary correlation data in the period (1974-1992). It results that foreign direct investment is negatively linked to the capital flight⁴⁶. At each growth of foreign direct investment flows by a dollar corresponds a decrease of capital flight from 0, 50 \$ to 0, 84 \$. This result is greatly due to an improvement of investment conditions for all investors.

b) The stylised facts:

In spite of the undermining of turkey by a second financial crisis during the year 2000-2001, foreign direct investments have showed, according to economic literature, an important resilience in contradiction with portfolio investments. The stability of

⁴⁶ Capital flight is defined generally as the flowing back of capital from poor countries to rich ones. Capital flight is measured directly or indirectly. According to the direct manner, it is the sum of balance of payment line. The latter includes “omissions and errors” which represent an approximation of short term capital flowing back and the line “other short term capitals and others sectors” to which we add portfolio investments (hot money).

However, according to the indirect method capital flight is the residue of the increase of the due debt to foreign residents, of the net rush of foreign direct investments, of the increase of exchange reserves, and of current account deficit. In the case when two types of sources of funds are not capable of financing financial usages, then capital flight occurs.

these capital flows was evident from their weak reversal after the occurrence of financial crisis and from the reach of their level reached before crisis.

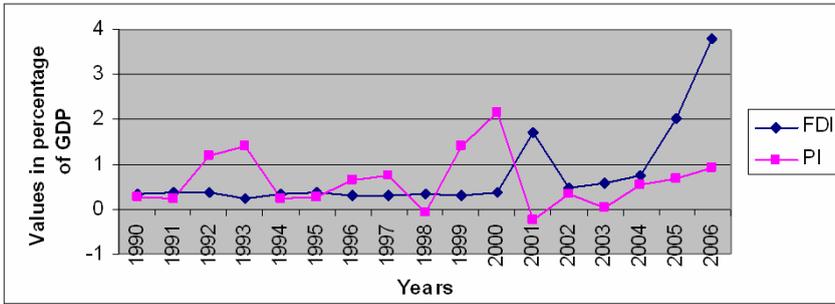


Figure 15 Evolution of foreign direct investments (FDI) and of portofolio investments (PI) in Turkey

Source: Author from the World Bank Data Base

Foreign direct investments inflows resistance to financial shocks bears witness to an important stability of these flows. These types of flows were less volatile in comparison with other types of flows. Taking for example the case of Tunisia, we ascertain that, in depict of the fact that this country didn't know deep crises; this country has attracted stable flows of foreign direct investments in the period (1990-2005). This result is in contrast with the evolution of portfolio investments that have registered a non negligible volatility. The beneficial effect of foreign direct investment in terms of financial resilience is as important as this country receives an important volume of foreign direct investment comparatively to other types of investment, such as portfolio investments as can be shown from the figure below:

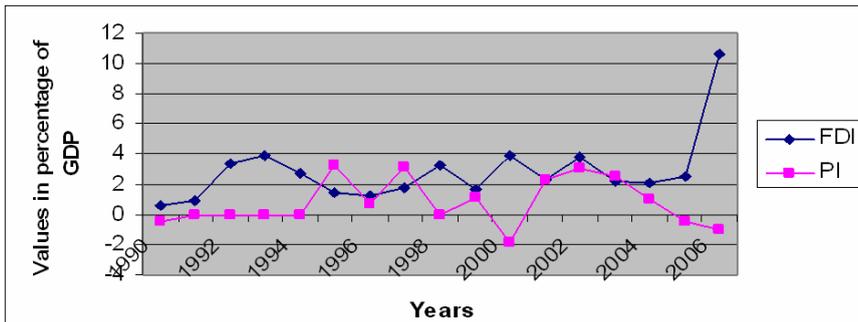


Figure 16 Evolution of foreign direct investments (FDI) and of portofolio investment (PI) in Tunisia

Source: Author from the World Bank Data Base

Stability of foreign direct investments in the Mediterranean countries and financial crises:

Appreciating the volatility of foreign direct investments in the Mediterranean countries by means of the calculation of the standard deviation on four years gap on the period (1990-2006) allows us to ascertain that these countries knows an increase of

foreign direct investments volatility⁴⁷. But in spite of such increase, the volatility remains weak except Lebanon that knew an important volatility of foreign direct investments because of political instability (see graph below). According to economic literature, political factor represents a determinant factor of foreign investment stability⁴⁸.

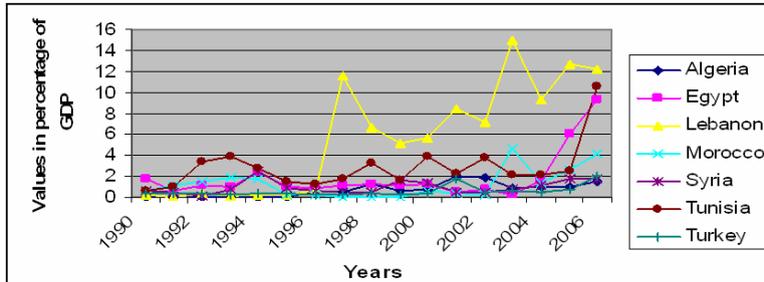


Figure 17 Evolution of foreign direct investments (FDI) in the mediterranean countries
Source: Author from the World Bank Data Base

But when we compare political instability levels in Tunisia and in Lebanon by referring to the World Bank data base⁴⁹, we notice that the latter suffers from an important political instability since the instability indicator takes negative values that bear witness to the instability of political scene. Such position is incomparable with Tunisia.

Besides, the attraction of foreign direct investment flows is determined by other factors, such as, economic fundamentals (economic growth, inflation, and current account deficit,...etc). The enjoyment of certain countries of bad performances (higher inflation,...) prevented them from attracting sufficiently foreign direct investment⁵⁰. This was the case of Turkey that suffered from a galloping inflation provoked essentially by the recourse of the government to monetary instrument in order to finance its budget deficit.

It reveals that foreign direct investment's volatility in the Mediterranean countries is trivial. The effect of such volatility on financial stability in these countries isn't important since as it can be seen from the figure below; there is a negative relationship between the volatility of foreign direct investment and the crisis indicator, what is in contrast to the result proven by economic literature. This result is greatly explicated by the slight role played by volatility in matter of the increase of financial crisis's probability occurrence.

⁴⁷ See annex

⁴⁸ Boujedra.F (2004); « Risque pays, IDE et crise financière internationale, évaluation et étude empirique », GDR économie monétaire et financière, Mai.

⁴⁹ Political instability degree was perceived by the government's disruption probability causes by violence and terrorist acts. Representing one among other World Bank indicators, this indicator takes a value comprised between 2.5 and -2.5.

⁵⁰ See annex

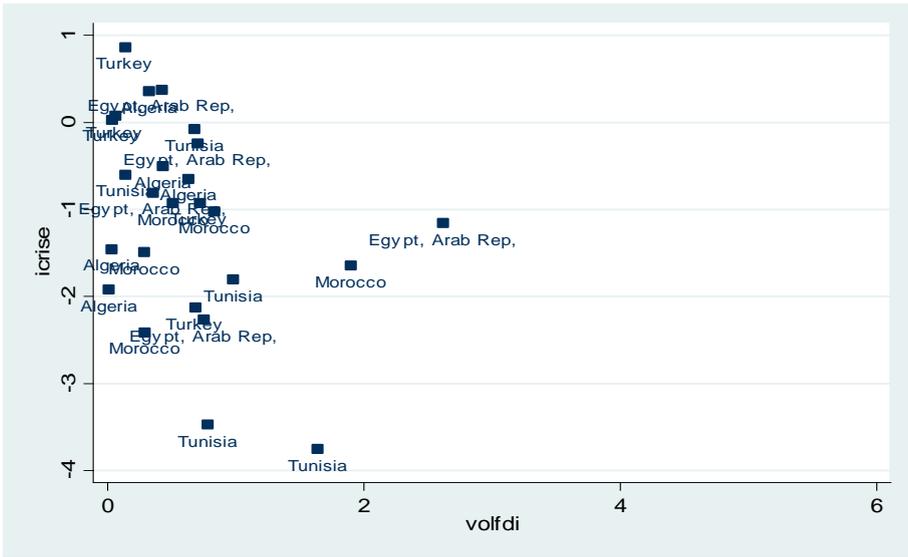


Figure 18 Volatility of foreign direct investment and financial crises

2-Foreign direct investment and reduction of debt:

a) The case of certain Mediterranean countries :

Observing the evolution of annual growth of debt and foreign direct investments flows of the south shore Mediterranean countries, it seems interesting to mention that foreign direct investments allowed reducing the degree of their indebtedness. This was the case of Tunisia for which there was a substitution of FDI flows to debts. Such substitution was caused principally by the adoption of credit rationing policy at the time of recent financial crises on the period (1997-2000)⁵¹. As can be seen from the graph below, the annual growth rate of foreign direct investment inflows exceeds the annual growth rate of debts.

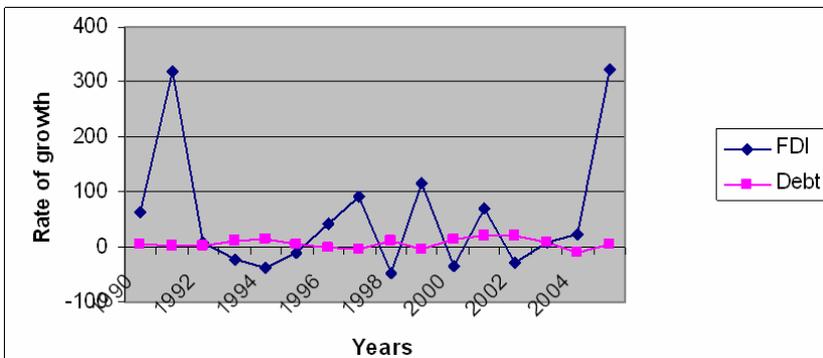


Figure 19 Evolution of FDI and volume of Debt in Tunisia

Source: Author from the World Bank Data Base

⁵¹ Zouari.S et Sboui.F (1998) ; « Investissements directs étrangers et processus de désendettement dans le contexte de mondialisation : Le cas de la Tunisie », Document de travail n°98

An important attraction for this country for foreign direct investment flows allows us to resort less and less to indebtedness as source of finance, and to reduce consequently the weight of debt. But in spite of the beneficial effect of foreign direct investment flows, Tunisia suffers from a heavy weight of debt which represents an important share of GDP, 47.9% against 54.4% of GDP in 2005⁵². According to central Bank report (2007), Tunisia has been able to release an important surplus's balance of payment thanks to foreign direct investment flows (FDI) that allow him to increase foreign currency receipts necessary for reimbursing some part of the debt and not to recourse to international market finance.

The weakness of portfolio investment comes back to the weakness financial development that represents, in contrast to other type of capital flows (debts, foreign direct investments), an important factor for attracting these types of investment⁵³. In contradiction to Tunisia, Turkey registered an important attraction for portfolio investment flows during the nineties, but after financial crises (2000-2001) there was a considerable attraction for foreign direct investment.

In spite of its light increase after the period of crisis, Turkey remains a less attractive country for foreign direct investment given that these flows represent only 3.78% of GDP during the year 2006, against 0, 32% during 1990. Nevertheless, it is important to signal that this country knew a quicker evolution of debt volume comparatively to foreign direct investment flows. As can be shown from the figure below, debt annual rate of growth has exceeded the growth rate of foreign direct investment on the period (1991-1999), excepting the years of internal or external financial shocks. The occurrence of the Asian financial crisis countries, during 1997 year, has increased in a relative way their attraction for foreign direct investment in comparison with debt volume. Consequently, this Mediterranean country is based more on debt than on foreign direct investments.

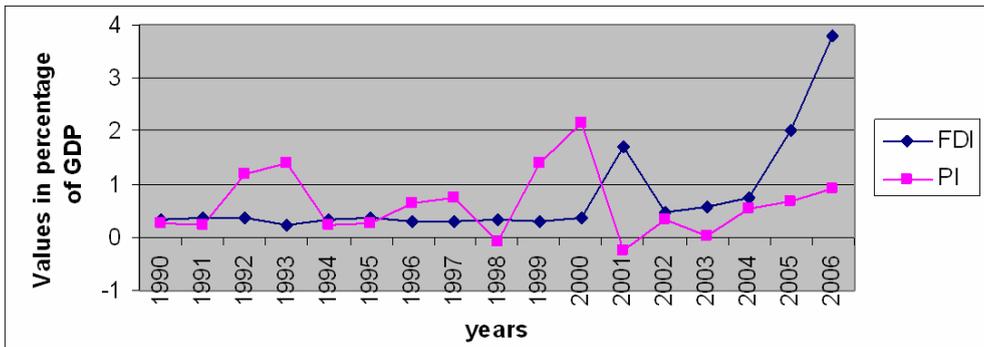


Figure 20 Evolution of foreign direct investments (FDI) and of Portfolio investments (PI) in Turkey

Source: Author from the World Bank Data Base

⁵² Annual report of Tunisian Central Bank(2007)

⁵³ Kinda.Tidiane (2007) ; «Accroître les flux de capitaux privés vers les pays en développement : Le rôle des infrastructures physiques et financières», CERDI-CNRS, Université d'Auvergne.

b) Foreign direct investment, reduction of debt, and financial stability:

The analysis of the evolution of foreign direct investment ratio to debt on the period (1990-2006) shows that there is an increase of this ratio, as the graphic below shows:

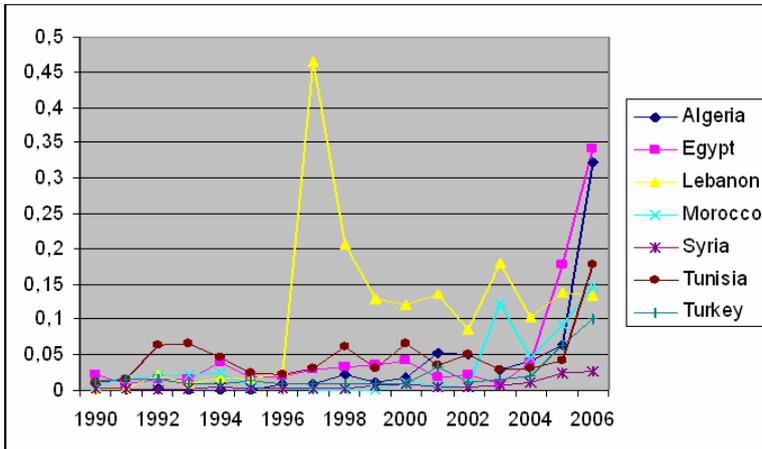
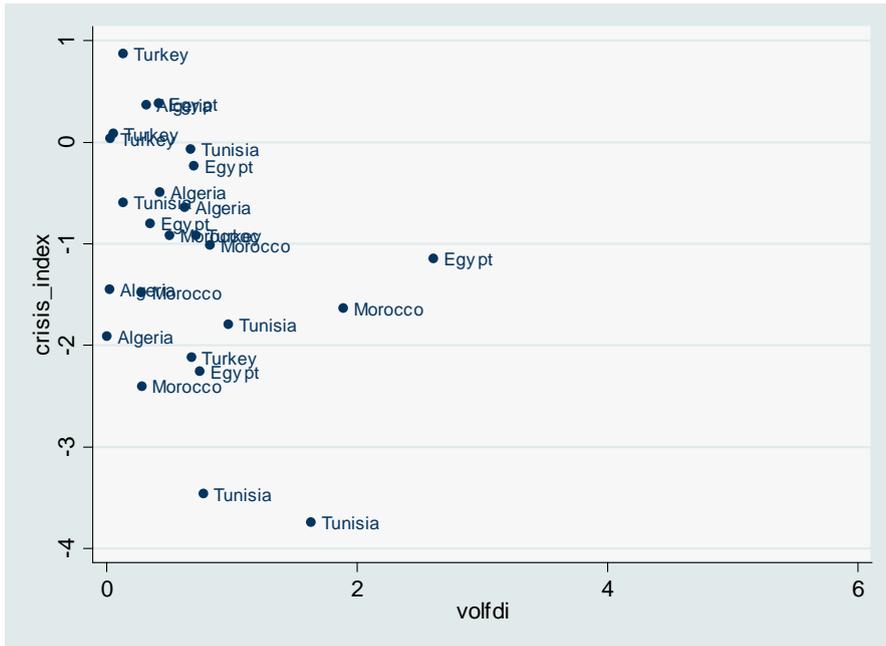


Figure 21 Evolution of the ratio FDI/debt in the Mediterranean countries

Source: Author from the World Bank Data Base

Such evolution finds an obvious explanation in the increase of direct foreign investments, but also in a significant drop of debt weight in these countries. Indeed, except for Lebanon whose debt volume increased for the period (1990-2006), and of Tunisia and Turkey whose debts weight remained relatively stable, the other Mediterranean countries knew a fall of their debt. Consequently, it is reasonable to note that the evolution of the ratio (FDI/Debt) goes in favour of the reduction of the probability of financial crises occurrence. Like the graph below shows, there is a negative relation between this ratio and of crisis indicator, which means that the surge of direct foreign investments reduces the probability of financial crises occurrence since they play the role of debt reducer.



IV- FOREIGN DIRECT INVESTMENT AND FINANCIAL STABILITY: EMPIRICAL VALIDATION

We consider a model in panel data applied to a sample of Mediterranean countries⁵⁴ on the period (1990-2006). The model is specified as:

$$y_{it}^* = \eta_j + \beta x_{it} + \varepsilon_{it}, i = 1, \dots, N; t = 1, \dots, T$$

With:

y_{it}^* : Financial stability of a country i at time t .

x_{it} : The vector of explicative variables

η_j : The fixed effect of each country i .

ε_{it} : Error term

1-Explicative variables:

A higher rate of economic growth reinforces financial stability as it increases the capacity of borrowers to refund their debts, and to reduce the weight of non performing loans which makes vulnerable financial institutions⁵⁵.

⁵⁴ Mediterranean countries include Algeria, Egypt, Lebanon, Morocco, Syria, Tunisia, and Turkey.

⁵⁵ Beck.T(2006) ; "Creating an Efficient Financial System:Challenges in a Global Economy", World Bank Policy working paper.

Inflation supports financial crises occurrence as it was proved by economic literature. According to Schwartz.A⁵⁶, a durable inflation encourages economic agents to engage in speculative investment activities and to increase their indebtedness. But when inflation falls in unanticipated manner (action taken by the monetary authority), the borrower's incomes revealed insufficient to pay the contracted debts which increase their payment default and financial instability risk.

A deep current account deficit, as was the case of the Latin American countries, represents an important determinant of financial crisis. Each increase of current account deficit favours financial instability.

A higher level of financial development measured by the ratio credit to private sector in percentage of GDP or by the ratio M3 in percentage of GDP induces financial instability, defined as the instability of financial development. In consequence, the more the financial system is developed, the more it is unstable⁵⁷.

Concerning the variable foreign direct investment, it influences positively financial stability, and reduced, consequently, the degree of exposure to financial crises risk. Foreign direct investment represents a factor of shock's resorption, and consequently, a factor of financial resilience. In Contradiction, portfolio investment influences negatively the probability of financial crisis's occurrence.

The long-term debt⁵⁸ represents, as it has been confirmed by economic literature, a fertile ground to financial stability, and this is contrary to short term debt.

3- Results:

Before presenting empirical results, it is important to precise the different tests that have allowed us to verify the presence of individual effects and to recognize the nature of model- that is would it be a fixed effect or random effect model?

Homogeneity test confirms the presence of individual effects u_i . When Fisher statistics at (N-1, NT-N-K-1) freedom liberty is equal to 2.72 at a confidence level of 10 %, the null hypothesis is rejected. Hausman test allows us to distinguish between fixed and random effect models. This test verifies if individual effects are correlated with explicative variables (random effect model) or aren't correlated with them (fixed effect model). Hausman test is in favor of the acceptance of the null hypothesis. In consequence, we confirm the presence of a Random effect model and we retrain the MCG estimator as a BLUE estimator.

In order to test Homoscedasticity hypothesis, we have resorted to the Breush Pagan test. The latter has allowed us to conclude that residues are homoscedastic since the statistic P value is equal to 0.6338. In addition, Wooldridge test permits us to verify

⁵⁶ Schwartz.A(2002); "Asset price inflation and monetary policy", NBER working paper series, November.

⁵⁷ Kpodar K. R. and Jeanneney. G .S (2004); « Développement financier, instabilité financière et croissance économique » CERDI Etudes et Documents E 2004.

⁵⁸ Long-term debt is debt that has an original or extended maturity of more than one year. It has three components: public, publicly guaranteed, and private non guaranteed debt. Data are in current U.S. dollars. World Bank, Global Development Finance.

autocorrelation errors between observations (country), and for each observation. Nevertheless, the insufficiency of observations leads us to resort to GLS method in order to resolve autocorrelation problem of errors.

After regressing financial instability measured by crisis indicator on various explanatory variables including alternatively different indicators of foreign direct investments (volatility, substitutability with the debt), it reveals that foreign direct investment had a negative impact on financial instability.

Concerning other variables, they revealed the predicted sign except for certain macroeconomic variables (GDP per capita, current account deficit), and the financial development indicator (domestic bank credit in percentage of GDP). But in spite of the revelation of the contrary sign, these variables remain non significant (see Table 70 and Table 71).

Concerning the variable portfolio investment, it reveals the excepted sign as it represents according to economic literature a factor that increases the probability of financial crises occurrence. For the case of the Mediterranean countries this variable represents a trivial significance since these countries remain a less important destination for these types of investment.

Random effect model estimation for a sample of Mediterranean countries shows that debt indicator (debt with log term expressed as a percentage of the GDP) is negatively correlated with the crisis indicator at 95% confidence level. Concerning the variable foreign direct investment in percentage of GDP, it is correlated negatively and significantly with financial instability, which confirms the big role played by this kind of investment in matter of resisting to financial shocks. In addition, the recourse to FGLS method in order to cure to autocorrelation errors problems consolidates such results (see Table 70).

In addition, the estimation of the random effect model that integrates, besides to control variables, foreign direct investment's volatility (measured by the standard deviation of the foreign direct investment inflows in percentage of GDP), shows that this kind of investment reduces financial instability. This result draws our attention since volatility plays a financial stabilizing role, this is due to the fact that this volatility is low for the case of Mediterranean countries (see Table 72).

Besides, Random effect model estimation, which includes besides control variables, the variable foreign direct investment reported to total debt, shows once again that this kind of investment reduces financial instability as it allows them to reduce their debt. This result was greatly confirmed by graphic analysis that makes a relationship between direct foreign investment and debt for some Mediterranean countries (see Table 71).

CONCLUSION

This study enabled us to confirm that investment generally, and foreign direct investment particularly, represent undoubtedly and in spite of a weak attraction of the Mediterranean countries for foreign direct investment, a reducing factor of financial

crises, and this contrary to the other types of investments, such as for example, portfolio investment.

The enjoyment of the Mediterranean countries of a stability of foreign direct investment inflows in comparison with Latin American countries contributes to ensure financial stability, as it was proven econometrically. Indeed, the existence of a negative relationship between crisis indicator and the volatility of foreign direct investment corroborated by econometric instrument as well as by graphic analysis, confirms that the weakness of the volatility of these types of investments reduces the probability of financial crisis occurrence.

Nevertheless, the Mediterranean countries do not only enjoy a relative stability of foreign direct investments but also an important replacement effect played by these types of investment. Indeed, the regression of the same model integrating, besides control variables the ratio of foreign direct investment, show clearly that this kind of investment reduces financial instability since it reduces their debt⁵⁹.

In consequence, in order to ensure financial stability in developing countries, especially in the Mediterranean countries some interest should be accorded to the stimulation of foreign direct investment inflows. Such inflows are more stable than portfolio investment inflows. Moreover, they don't require an important development of financial market as it is the case of developing countries that enjoyed an under financially developed market. In fact, foreign direct investment inflow is the right path to reduce indebtedness that had made emerging countries more vulnerable to currency mismatches.

Certainly, foreign direct investment allows a reinforcement of the Mediterranean countries financial resilience since it reduces the weight of indebtedness and guarantees a slow reversal of capital flows, but it is important to signal that the beneficial effect of foreign direct investment in matter of financial stability couldn't be ensured without curing institutional vulnerability that impede such inflow.

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Table 70 Evolution of foreign direct investment in the Mediterranean countries

	1990	1994	1998	2002	2006
Lebanon	0,12132473	0,13252441	5,58564426	1,44428343	3,52257716
Egypt	0,7498631	0,42099878	0,70325436	0,35433367	2,61793863
Morocco	0,28744757	0,5093272	0,83219906	0,28537678	1,89860179
Algeria	0,00975851	0,02941349	0,32214255	0,62932991	0,43254317
Syria	0,3944279	0,27499877	0,90457196	0,58510057	0,5499288
Tunisia	0,13908551	1,64	0,67815135	0,98020826	0,77878159
Turkey	0,13953607	0,05987297	0,03195312	0,68339358	0,72015835

Source: World Bank data Base

Table 71 Evolution of fundamental economics in the Mediterranean countries

	Years	1990	1994	1998	2002	2006
Algeria	Inflation	16,6196	29,0469	4,95067	1,41621	2,53114
	Current account deficit	2,29	16,1	na	na	na
	Growth rate	0,80000	-0,89999	5,0999999	4,69999	1,8000
Egypt	Inflation	16,7564	8,15423	3,87258	2,73724	7,64453
	Current account deficit	5,3952643	0,0597325	-3,0249158	0,7084748	2,4518989
	Growth rate	5,70175314	4,05594397	4,02406931	3,18550897	6,84383821
Lebanon	Inflation	62,7281	6,79634	n.a.	n.a.	n.a.
	Current account deficit	na	na	na	-23,589980	-4,8202630
	Growth rate	26,5331593	8,00314808	2,9143281	3,1378386	0
Morocco	Inflation	6,90894	5,14167	2,75311	2,79562	3,28476
	Current account deficit	-0,7574360	-2,3819066	-0,3592125	3,6491724	2,8308435
	Growth rate	4,0344471	10,358034	7,6748352	3,2999999	8

	Years	1990	1994	1998	2002	2006
Syria	Inflation	19,3969	15,3285	-0,797166	-0,130505	10,0241
	Current account deficit	14,317603	-7,8146458	0,3815577		2,7533490
	Growth rate	7,6407723	7	6,3372640	3,9558777	5,0
Tunisia	Inflation	6,54529	4,73323	3,12537	2,72103	4,49051
	Current account deficit	-3,7701886	-3,4338652	-3,4085072	-3,5423298	-2,0462747
	Growth rate		3	4,7837624	1,6537817	5,6606602
Turkey	Inflation	16,7564	8,15423	3,87258	2,73724	7,64453
	Current account deficit	-1,2346552	1,4294455	0,7382666	-0,6535060	-6,1845686
	Growth rate	9,2661466	-4,6681475	2,3082146	6,1638398	6,8934888

Source: World Bank data Base

Table 72 Debt's evolution in the Mediterranean countries

	1990	1992	1994	1996	1998	2000	2002	2004	2006
Algeria	44,2887543	55,3036427	68,3410475	67,346259	59,4968782	42,98913	37,680203	25,3077512	4,79355125
Egypt	76,261676	74,0424793	62,2950569	46,6103781	38,2413594	29,2339536	32,650273	39,5424631	27,2964114
Lebanon	27,0709503	14,9716493	14,2450133	22,0266625	32,6804324	47,6468433	82,7598258	90,3440248	92,2128078
Morocco	93,9327566	78,1422544	75,204847	66,0987153	59,1825629	55,8914686	45,4599184	30,8917879	28,2756185
Syria	190,353652	232,681727	452,554981	467,581004	302,696952	159,422384	128,659689	111,259552	70,0117604
Tunisia	61,1223491	53,2429914	59,5575853	56,8777043	54,0844251	57,9854441	73,4803949	71,1928005	59,6864169
Turkey	23,2463975	25,0159825	35,8069786	31,7768042	35,967104	42,2635008	46,774503	35,5042859	37,1919468

Source: World Bank data Base

Table 73 The effect of foreign direct investment on financial crises (case of Mediterranean countries)

Fixed effects regression		Random effect regression	FGLS regression
Variables	Coefficient	Coefficient	Coefficient
Cste	6.20 (3.14)	0.49 (0.47)	0.44 (0.55)
GDP	0.1415 (1.53)	0.044 (0.52)	0.039 (0.59)
INF	-0.07 (-0.93)	0.0247 (0.43)	0.026 (0.58)
LTD	-0.246 (-1.65)	-0.027 (-1.88)	-0.027 (-2.45)
FDI	-0.154 (-1.84)	-0.166 (-1.69)	-0.169 (-2.18)
CA	-0.0001 (-0.00)	-0.032 (-0.35)	-0.035 (-0.48)
PI	0.359 (1.22)	0.038 (0.1)	0.046 (0.16)
DC	-0.086 (-3.43)	-0.058 (-0.49)	-0.004 (-0.51)
Number of observations	22	22	22

Fixed effects regression			Random effect regression	FGLS regression
Fisher test Pvalue	0.0736			
Hausman test Pvalue	0.1726	0.1726		
R2 Between	0.2092		0.5683	
R2 Within	0.6559		0.2851	
R2	0.1913		0.3649	

GDP: Growth rate of GDP per capita.

INF: Rate of inflation

LTD: Long-term debt having three components (public, publicly guaranteed, deprived debt not guarantie).

FDI: Inflows of foreign direct investments expressed as a percentage of GDP.

PI: Portfolio investment expressed as a percentage of GDP.

DC: domestic Bank credit expressed as a percentage of GDP.

CA: Current account deficit as a percentage of GDP.

Crisis-index; it is the dependant variable, defined in the method of Cartapanis.A, Dropsy.V, Mamtez.S (1999).

* the values between parentheses are the degree of significance at ten percent.

Table 74 *The effect of foreign direct investment on financial crises (Case of Mediterranean countries)*

Fixed effects regression			Random effect regression	FGLS regression
Variables	Coefficient		Coefficient	Coefficient
Cste	6.65 (3.28)		0.55 (0.51)	0.573 (0.65)
GDP	0.146 (1.56)		0.469 (0.53)	0.048 (0.68)
INF	-0.08 (-1.03)		0.017 (0.30)	0.017 (0.36)
LTD	-0.029 (-1.87)		-0.029 (-1.91)	-0.029 (-2.35)
FDI	-0.09 (-1.76)		-0.089 (-1.34)	-0.088 (-1.65)
CA	0.016 (0.18)		-0.005 (-0.06)	-0.042 (-0.06)
PI	0.3916 (1.31)		0.055 (0.16)	0.055 (0.18)
DC	-0.09 (-3.55)		-0.005 (-0.48)	-0.06 (-0.65)
Number of observations	22		22	
Fisher test Pvalue	0.0795		0.0795	
Hausman test Pvalue	0.1722		0.1722	

R2 Between	0.2072		0.5506	
	0.6492		0.2407	
R2 Within				
R2	0.1791		0.3220	

GDP: Growth rate of GDP per capita.

INF: Rate of inflation

LTD: Long-term debt having three components (public, publicly guaranteed, deprived debt not guarantee).

FDI: Inflows of foreign direct investments reported to debt.

PI: Portfolio investment expressed as a percentage of GDP.

DC: domestic Bank credit expressed as a percentage of GDP.

CA: Current account deficit as a percentage of GDP.

Crisis-index; it is the dependant variable, defined in the method of Cartapanis.A, Dropsy.V, Mamtez.S (1999).

* the values between parentheses are the degree of significance at ten percent.

Table 75 *The effect of foreign direct investment on financial crises (case of Mediterranean countries)*

Fixed effects regression		Random effect regression	FGLS regression
Variables	Coefficient	Coefficient	Coefficient
Cste	6.23 (3.38)	0.69 (0.68)	0.679 (0.84)
GDP	0.150 (1.73)	0.08 (0.94)	0.08 (1.15)
INF	-0.067 (-0.93)	0.004 (0.08)	0.049 (0.11)
LTD	-0.003 (-2.14)	-0.03 (-2.15)	-0.031 (-2.73)
FDI	-0.872 (-2.32)	-0.95 (-1.94)	-0.95 (-2.42)
CA	0.023 (0.29)	0.020 (0.22)	0.018 (0.26)
PI	0.525 (1.86)	0.238 (0.65)	0.2349 (0.80)
DC	-0.08 (-3.36)	-0.019 (-0.16)	-0.014 (-0.16)
Number of observations	22	22	22
Fisher test Pvalue	0.0416		
Hausman test Pvalue	0.1225		
R2 Between	0.2121	0.5349	

R2 Within	0.7006	0.3381
R2	0.2116	0.3966

GDP: Growth rate of GDP per capita.

INF: Rate of inflation

LTD: Long-term debt having three components (public, publicly guaranteed, deprived debt not guarantie).

FDI: Volatility of foreign direct investments inflows expressed as a percentage of GDP.

PI: Portfolio investment expressed as a percentage of GDP.

DC: domestic Bank credit expressed as a percentage of GDP.

CA: Current account deficit as a percentage of GDP.

Crisis-index; it is the dependant variable, defined in the method of Cartapanis.A, Dropsy.V, Mamtez.S (1999).

* The values between parentheses are the degree of significance at ten percent.

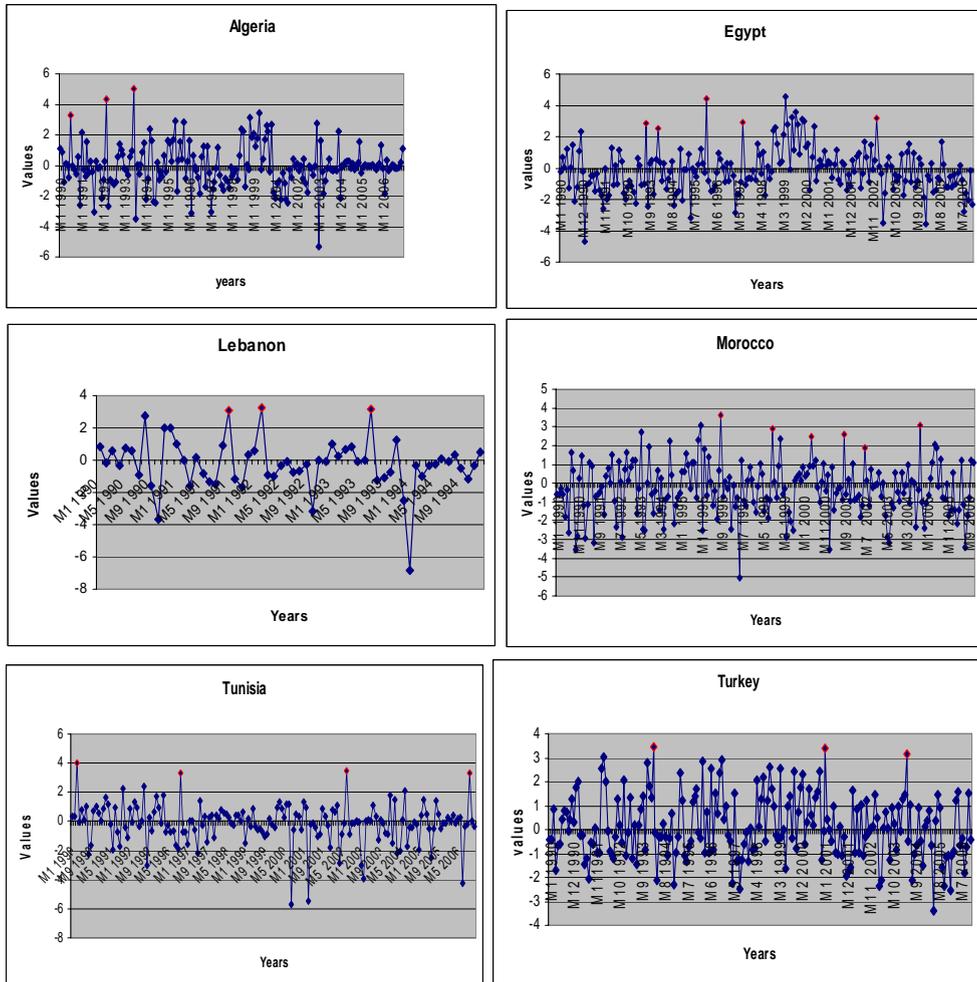


Figure 22 Monthly evolution of external financial fragility in the Mediterranean countries

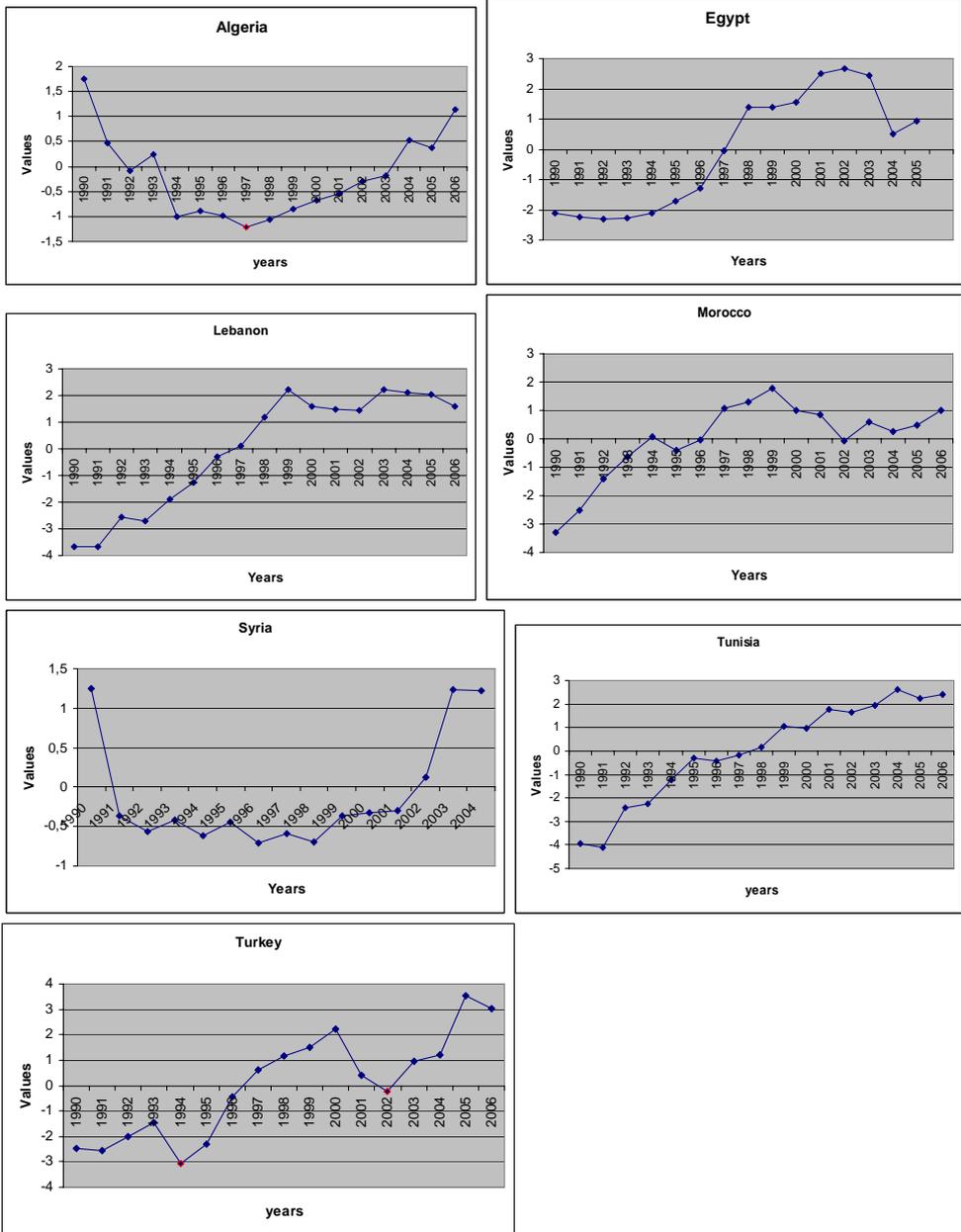


Figure 23 Evolution of internal financial fragility in the Mediterranean countries



AN ATTEMPT TO CAPTURE LEPTOKURTIC OF RETURNS AND TO MODEL ITS VOLATILITY: THE CASE OF BEIRUT STOCK EXCHANGE

Elie BOURI*

Abstract: Repeated turmoil in equity indices in developed and emerging markets puts pressures on market participants to deal with the intense volatility of returns. After examining the normality of daily returns in Beirut Stock Exchange (BSE) from June 1999 to May 2011 with Jarque-Berra test (1980), we have compared the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model of Bollerslev (1986) with the Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH) model of Nelson (1991), under three distribution assumptions: the Gaussian, the t-Student and the General Errors Distribution (GED). Empirical results showed that the distribution of daily returns is far from being normally distributed, with fat tails and volatility clustering being persistent. Furthermore, the asymmetric EGARCH-GED model is found to adequately fit the data and incorporate the leverage effect. Surprisingly, good news generates higher volatility than bad news which gives investors in the Lebanese stock market a particular immunity to negative shocks.

Keywords: Beirut Stock Exchange, GARCH, EGARCH, Leverage Effect, Volatility.

JEL Codes: C01, C15, C32, C52, C81.

1. INTRODUCTION

Throughout history, extreme events have severely affected the performance of equity indices worldwide and especially in emerging markets. Investors often underestimate the probability occurrence of extreme events by assuming that equity returns are independent and identically distributed. The probability distributions of asset returns often exhibit excess kurtosis i.e. fatter tails than in the standard Gaussian distribution. The first who addressed the non normality of returns in equities were Mandelbrot (1963) and Fama (1965). Finally there is a consensus that returns in asset classes in general and in equities in particular have leptokurtosis (Danielson and De Vries, 1997). Time series that exhibit fat tails are often called *leptokurtic*. Furthermore, Claessens, Dasgupta, and Glen (1995) and Harvey (1995) provided evidence that

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emerging market returns significantly depart from normality. Moreover, equity returns are commonly associated with Volatility Clustering i.e. series of large changes tend to be followed by large changes, and series of small changes tend to be followed by small changes. Volatility needs monitoring and presents a major risk to investors and portfolio managers.

Domowitz, Glen and Madhavan (1998) have examined the Middle East and North African (MENA) equity indices and found that these markets are more volatile and less liquid than the developed ones. Additionally, and part of an emerging stock markets survey, Lagoarde-Segot and Lucey (2008) studied the informational efficiency in Lebanon by considering the influence of economic liberalization and market development. Nikkinen et al. (2008) have investigated the impact of the September 11 attacks on 53 equities markets including the MENA markets to, and found that that the MENA region provides investors with the highest returns and the lowest volatility.

However, several empirical studies have recognized the capability and the power of the GARCH process in modeling volatility of returns in several equity markets (Hansen and Lunde, 2005). Though, as market returns in the majority of equity indices exhibit excess kurtosis and non zero skewness, estimating returns with the GARCH model under the assumption that the residuals are normally distributed is not suitable. Baillie and Bollerslev (1989) found that when the returns distribution follows a non normal density distribution, the standard GARCH model is not fully capable to model the conditional moments of the data. To capture the non normality of returns, we will estimate the GARCH under three distributional assumptions, the Gaussian, the *t*-Student and the GED. Bollerslev (1987) was the first to use the GARCH model with a *t*-Student distribution. Moreover, Kaiser (1996) proposed the GARCH with the GED. Later, Beine, Laurent and Lecourt (2000) used the *t*-Student distribution in their modeling.

Conversely, the symmetric characteristic of the GARCH model cannot capture the asymmetries of returns; instead it treats bad news, expressed by negative signs, with the same influence on the volatility as good news, expressed with positive signs. In fact, bad news gives a greater impact on the volatility of returns in the stock market than the good news. This negative correlation between asset returns and volatility, also called Leverage Effect, was first mentioned in Black (1976). Using the EGARCH process proposed by Nelson (1991) allows for an asymmetric of the conditional variance. Despite the existence of other asymmetric models, the EGARCH model surpassed its rivals (Alexander 2009).

With much of the information can be revealed in the volatility of stock prices rather than in the price itself, a comprehension of the volatility within an emerging equity market, like Lebanon, is always an issue that represents a central need for investors. With a distinctive economy, Lebanon is located in a politically troubled and unstable region of the world, the Middle East. Furthermore, one of the major

contributions of this paper is its field of study. In particular, studying the volatility of returns on BSE with developed GARCH / EGARCH type models is unprecedented in Lebanon. By closing this gap, this research aims to contribute to the literature. To sum, this paper is focusing on the following major question:

- Which volatility model adequately fit the equity returns on BSE?

To answer this question, several derivations of GARCH and EGARCH models will be compared and tested in order to choose the model that suitably catches the characteristics that are commonly associated with financial time series, including fat tails, volatility clustering, and leverage effects.

Three sections follow this introduction. Section two presents the data and methodology. Section three presents Blom index's returns and empirical results of the GARCH / EGARCH models. Section four sums the remarks and the conclusions of this study.

2. DATA AND ECONOMETRIC METHODOLOGY

The Blom stock index is a capitalization-weighted index of all the listed companies in Lebanon. It will be used as a proxy for the performance of Lebanon sole exchange, the BSE. As of May 10, 2011, there are 11 companies traded on BSE with market capitalization amounting to USD 12 billion which represents 32% of the Nominal Gross Domestic Product. Our data sets consist of the closing price of the Blom equity index covering the period from June 17, 1999 to May 10 2011, a total of 2 897 observations. The data is collected from the database of Reuters DataStream. All the models are evaluated with 95% confidence level. From the above data we calculated the continuously compounded return using the following formula :

$$\text{Blom Return} = \text{Log}(\text{Blom}_t) - \text{Log}(\text{Blom}_{t-1})$$

Where, Log denotes the natural logarithm of Blom closing price.

The distribution of daily equity returns on Beirut Stock Exchange is compared to a Gaussian one by measuring both the Kurtosis and the Skewness and the normality of the returns is tested using Jarque - Bera (JB) statistics. It tests the null hypothesis that the series is normally distributed. The JB test is the following :

$$JB = T \left(\frac{(S)^2}{6} + \frac{(K - 3)^2}{24} \right) \sim \chi^2(2)$$

Where, T is the number of observations, S is the skewness, and K is the kurtosis.

Furthermore, we tested the null hypothesis that there is no autocorrelation in Blom daily returns using the Ljung-Box (1979) statistics which measures the high-order serial correlation of the squared residuals. The following is the Ljung-Box Q test:

$$LB_Q = T(T+2) \sum_{i=1}^Q \frac{\rho_i^2}{T-i}$$

Where, T is the number of observations, ρ is the i -th autocorrelation, and $i = 1, 2, \dots, p$.

LB_Q is asymptotically chi-square distributed with degrees of freedom equal to the number of autocorrelations.

The stochastic features of the returns are analyzed to determine the appropriate Autoregressive (AR), Moving Average (MA), or ARMA model. The number of lags to be included in AR(a) and MA(b) models are determined respectively based on the correlograms of Autocorrelation Function (ACF) and Partial Autocorrelation Function (PACF).

The autocorrelations for the adequate AR, MA, or ARMA process is then examined using the Ljung-Box statistics and the presence of heteroskedasticity in the residuals is tested with Engle (1982) Lagrange multiplier (LM) test. The latest tests the null hypothesis that there is no ARCH effect in the residuals of a time series, i.e. the sample residuals consists of independent and identically distributed Gaussian disturbances. The equation is a regression of the squared residuals on a constant and on lagged squared residuals up to order q .

$$\varepsilon_t^2 = \beta_0 + \left(\sum_{s=1}^q \beta_s \varepsilon_{t-s}^2 \right) + v_t$$

Where, ε is the residual, β_0 , and β_1 are the estimate coefficients. LM test statistic is asymptotically chi-square distributed. $s = 1, 2, \dots, q$.

After modeling with ARMA process, the ARCH - LM test precedes the volatility modeling as the existence of heteroskedasticity in the returns can justify the appropriateness of modeling returns with the GARCH family. Similarly, the normality test on the series paves the way to use the adequate volatility model beyond the singular assumption that the residuals follow a Gaussian distribution.

2.1. ARCH model

The most common model to track the change of volatility in financial time series is the Autoregressive Conditional Heteroskedasticity (ARCH) model developed by Engle in 1982. Before the introduction of the ARCH model, a simple method to calculate the variance of returns for financial assets consisted of giving historical observations equal weight i.e. rolling standard deviations.

Engle have calculated the variance conditional on past information and incorporated it into current estimates. Therefore, more recent shocks have more impact

on the model. The following equation presents the ARCH model, where the conditional variance is a function of past values of squared returns.

$$\sigma_n^2 = \omega + \sum_{i=1}^p \alpha_i R_{n-i}^2$$

Where, ω is the constant, R is the return, and α the weight given to R^2 ; $\omega > 0$, $\alpha \geq 0$, and $i = 1, 2, \dots, p$.

2.2. GARCH model

The GARCH model suggested by Tim Bollerslev (1986) is an extension of Engle model. We will apply the GARCH (p,q), where p indicates the number of autoregressive lags, and q indicates the number of moving averages lags in the equation. Usually, one lag is sufficient to find an adequate conditional variance. The following is the equation of the GARCH (p, q) :

$$\sigma_n^2 = \omega + \sum_{i=1}^p \alpha_i R_{n-i}^2 + \sum_{j=1}^q \beta_j \sigma_{n-j}^2$$

Where, R is the return, σ is the standard deviation, ω is the constant, α and β are the weight given to R^2 and σ^2 respectively. $i = 1, 2, \dots, p$ and $j = 1, 2, \dots, q$.

According to Bollerslev, for a stable GARCH model the following constraints must be respected :

$$\alpha + \beta \sum_{i=1}^p \alpha_i + \sum_{j=1}^q \beta_j < 1 ; \omega > 0 ; \alpha \geq 0 ; \beta \geq 0.$$

The model requires an assumption about the conditional distribution of the residuals term. Three GARCH models are estimated, under three distributional assumptions (Gaussian, t-Student and GED), by the maximum likelihood approach which chooses the parameters that maximize the chance of the accuracy of the data.

2.3. Exponential GARCH (EGARCH) model

Because the general EGARCH (p, q) model has the Logarithm of the standard deviation in the left side, it ensures that the conditional variance is positive. This specification for the conditional variance has the following formula :

$$\text{Log} \sigma_n^2 = \omega + \sum_{i=1}^p \alpha_i \left| \frac{R_{n-i}}{\sigma_{n-i}} \right| + \sum_{k=1}^r \gamma_k \frac{R_{n-k}}{\sigma_{n-k}} + \sum_{j=1}^q \beta_j \text{Log} (\sigma_{n-j}^2)$$

Where, R is the return, σ is the standard deviation, ω is the constant, α and β are the parameters to be estimated. γ is the parameter that measure the leverage effects. $i = 1, 2, \dots, p$ and $j = 1, 2, \dots, q$. $k = 1, 2, \dots, r$.

The impact is asymmetric if $\gamma \neq 0$, otherwise the leverage effect is insignificant if $\gamma = 0$. As R can follow different density distributions, three EGARCH models are estimated by the maximum likelihood approach under three distributional assumptions (Gaussian, t-Student and GED).

To inspect the suitability of each of the six analyzed models, we examine the maximum log-likelihood value and H. Akaike (1987) Akaike Information Criterion (AIC), together with Schwarz Criterion (SC). According to Akaike, the most accurate model has the smallest AIC. However, when estimating model parameters using maximum likelihood estimation, it is possible to increase the likelihood by adding parameters, as in the EGARCH case; that may result in false fitting signals. The SC is an alternative to the AIC; it imposes a larger penalty for additional parameters.

Additionally, for each accepted model, the autocorrelations in the squared residuals is checked and the presence of heteroskedasticity in the residuals is tested.

3. EMPIRICAL RESULTS AND ANALYSIS

Before examining the descriptive statistics of Blom's returns, Figure 24 displays the chart of the Blom price index.

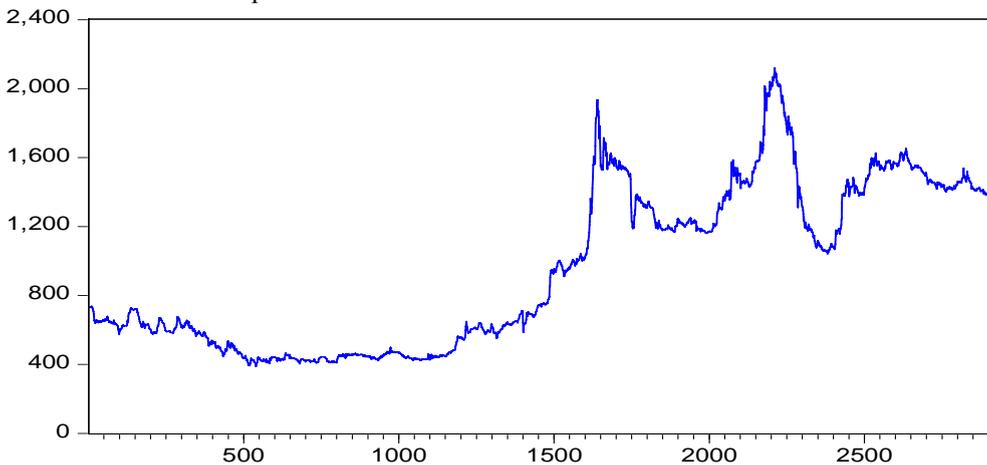


Figure 24 *Chart of Blom equity index*

The volatility of returns in Figure 25 shows that a series of large changes tend to be followed by large changes and a series of small changes tend to be followed by small changes.

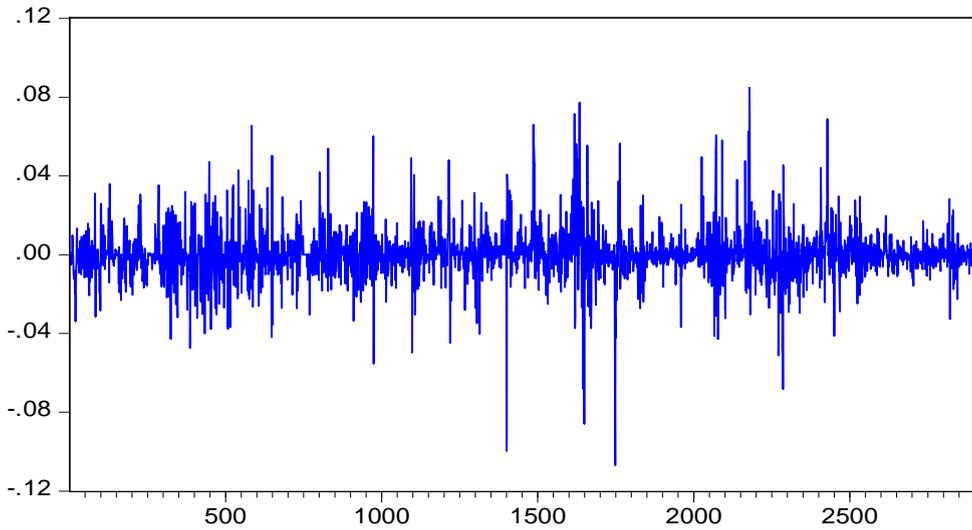


Figure 25 *Volatility of Blom returns*

3.1. Descriptive statistics

Moreover, the histogram of Blom returns is shown in Figure 26. At first sight, the histogram looks like a normal bell curve.

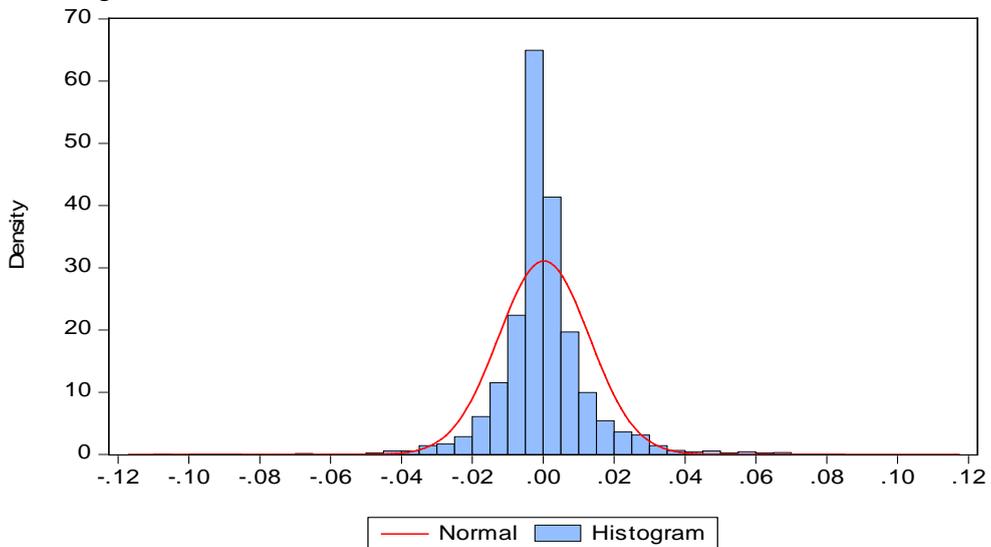


Figure 26 *Histogram of Blom daily returns*

But, the descriptive statistics attached to it in Table 76 show that the distribution is not a Gaussian one. In Gaussian distribution, kurtosis and skewness measure 3 and 0 respectively. In Blom returns, distribution is showing peak and fat tails position i.e.

kurtosis measures 12.73 and the distribution is positively skewed (0.13). Besides, the Jarque-Bera statistic (11446) rejects the null hypothesis of normality of returns at 10%, 5% and 1% significance levels.

Table 76 *Descriptive statistics of Blom daily returns*

Mean	Maximum	Minimum	Standard Deviation	Skewness	Kurtosis	Jarque-Bera	Probability
0.000219	0.084904	-0.106880	0.012830	0.136281	12.733930	11 446	0.000000

Moreover, under Gaussian distribution, 99.73 % of the observations fall between ± 3 standard deviations. Hence, only 8 days out of 2897 observations should be expected to fall outside ± 3 standard deviations. In fact, daily returns exceed ± 3 standard deviations in 54 observations. Table 77 presents the count of the numbers of Blom returns occurrences.

Table 77 *Blom daily returns relative to Sigma scores*

Frequency of distribution	1	2	1	2	1	13	48	205	1 387	956	183	63	16	11	5	2	Total
Standard deviations	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	2 896

3.2. Autocorrelations, stochastic features, and heteroskedasticity of Blom returns

Table 78 displays the autocorrelation and partial autocorrelation functions up to the 18 order of lags as well as the Ljung and Box (1979) *Q*-statistics and their p-values. The output indicates strong existence of autocorrelations and partial autocorrelations in Blom returns.

Table 78 *Correlogram of Blom returns*

Lag	ACF	PACF	Q-Stat	Probability
1	0.160	0.160	74.086	0.000
2	0.020	-0.005	75.294	0.000
3	0.010	0.007	75.559	0.000
4	0.053	0.051	83.613	0.000
5	0.015	-0.002	84.255	0.000
6	0.037	0.035	88.158	0.000
7	-0.001	-0.013	88.162	0.000
8	0.033	0.033	91.283	0.000
9	-0.001	-0.012	91.285	0.000
10	-0.021	-0.024	92.580	0.000
11	0.007	0.015	92.723	0.000
12	0.009	0.002	92.973	0.000
13	0.018	0.017	93.867	0.000
14	0.003	-0.003	93.888	0.000
15	-0.009	-0.009	94.121	0.000

Based on **Table 78**, we can identify that the MA(1) can be the right model. A moving average MA(1) has the following form:

$$M_t = \varphi_0 + \varepsilon_t - \theta_1 \varepsilon_{t-1}$$

where φ_0 is a constant, and ε_t is a sequence of independent, identically distributed random variables with mean zero and variance 1.

The output of the least square regression between Blom returns and MA(1) is significant at the 1% significance level. Table 79 summarizes this regression output.

Table 79 MA model estimation for Blom returns

Variable	C	MA(1)
	0.000219	0.157289
Coefficients	(0.803956)	(8.569585) ***

Note: *, **, *** indicate statistical significance at 10%, 5% and 1% levels respectively. T-statistics are reported in parentheses.

The results of LB Q and ARCH - LM statistics are shown in Table 80. We reject the null hypothesis that there is independence in the residuals up to 5, 10 and 15 lags; similarly and under Engle's LM test, we reject the null hypothesis that there is no presence of an ARCH process in the residuals up to 5, 10 and 15 lags.

Table 80 LB Q and ARCH-LM values : MA residuals

	LB Q (5)	LB_Q(10)	LB_Q(15)	ARCH-LM (5)	ARCH-LM (10)	ARCH-LM (15)
Values	9.32	19.12**	20.35	51.43***	27.57***	21.49

Note: *, **, *** indicate statistical significance at 10%, 5% and 1% levels respectively.

Given a strong evidence of heteroskedasticity presence in the residuals, Blom returns is an appropriate candidate for modeling the volatility using GARCH / EGARCH category of models to capture and eliminate the ARCH effects.

3.3. Volatility models with GARCH and EGARCH

Obviously, shocks and major events were behind the high and unstable volatility of Blom equity returns. Table 81 display the GARCH (1,1) and EGARCH (1,1) parameters estimation under the three distribution assumptions.

From Table 81, we can deduce the following : for t-Student GARCH, $\alpha + \beta > 1$ violates the constraints of the model by making it unstable; moreover, both the Gaussian and the t-student EGARCH models are ineffective in modeling asymmetries of returns as their leverage effect (γ) are not significantly different from zero.

Table 81 GARCH and EGARCH estimations outputs

Model	ω	α	γ	β
GARCH - Gaussian	0.0000134 (17.39)***	0.302316 (27.81)***		0.671117 (70.91)***

Model	ω	α	γ	β
GARCH - Student	0.0000195 (2.26)***	0.957690 (2.65)***		0.623945 (24.27)***
GARCH - GED	0.0000095 (10.89)***	0.360273 (10.99)***		0.611057 (26.39)***
EGARCH - Gaussian	-1.5252035 (-22.77)***	0.4901730 (39.48)***	0.0148102 (1.54)	0.8662358 (120.36)***
EGARCH - Student	-1.3489612 (-9.75)***	0.9553009 (4.31)***	0.0249221 (0.61)	0.8818733 (60.55)***
EGARCH - GED	-1.7300583 (-8.89)***	0.4164463 (12.25)***	0.1087360 (4.60)***	0.8411958 (41.77)***

Note: *, **, *** indicate statistical significance at 10%, 5% and 1% levels respectively. T-statistics are reported in parentheses.

For the three accepted models, Table 82 exhibits the results of the autocorrelations in the squared residuals and the heteroskedasticity presence in the residuals.

Table 82 *LB Q and ARCH - LM values for GARCH/EGARCH residuals*

Model	LB					
	$Q^2LB_Q(5)$	LB $Q^2LB_Q(10)$	LB $Q^2LB_Q(15)$	ARCH- LM (5)	ARCH- LM (10)	ARCH- LM (15)
GARCH-Gaussian	2.15	4.53	5.20	0.42	0.44	0.44
GARCH-GED	2.53	4.77	4.97	0.52	0.48	0.43
EGARCH-GED	2.23	8.07	10.77	0.44	0.79	0.70

Note: *, **, *** indicate statistical significance at 10%, 5% and 1% levels respectively for Ljung-Box and Engle LM tests.

The Ljung-Box statistics indicate that the three models have eliminated the autocorrelations presence in the squared returns. Similarly, the ARCH - LM values ensure that the three models have removed the heteroskedasticity presence in the residuals up to 5, 10 and 15 lags.

Moreover, table 83 reports the log likelihood, the AIC scores, and the SC values for the accepted models.

Table 83 *Log likelihood, AIC and SC values for GARCH/EGARCH models*

Model	Log likelihood	AIC	SC
GARCH-Gaussian	8 940.04	-6.17	-6.16
GARCH-GED	9 435.50	-6.51	-6.50
EGARCH-GED	9 454.90	-6.52	-6.51

Compared to Gaussian and t-Student distributions, the models based on the GED distribution generate the largest log likelihood and the smallest AIC/ SC values, while the GARCH model that assume a Gaussian distribution produce the worst values. Based on the likelihood, AIC, and SC values, the EGARCH under GED produces the most significant results which means this model is better fitted. Additionally, the EGARCH-

GED model captured the asymmetries of returns. Hence, it implies the superiority of the EGARCH model under GED distribution assumption in modeling the Lebanese stock index returns. Figure 27 plots the conditional variance derived from the selected model.

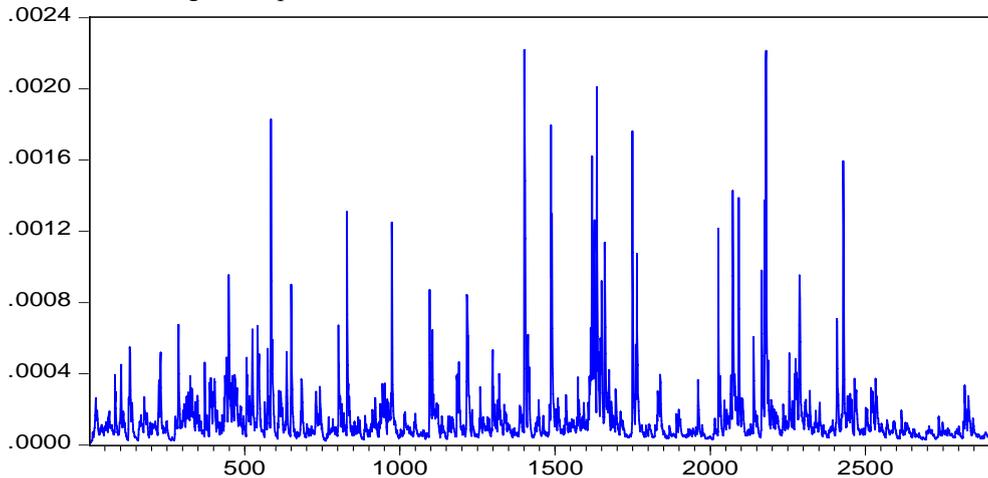


Figure 27 *Conditional variance*

In fact, in the EGARCH-GED model, the positive sign attached to the leverage effect (γ) indicates that good news produce higher volatility than bad news.

4. CONCLUSIONS

This study investigated the daily equity returns on BSE. The normality statistic test of JB and the descriptive statistics showed peak and fat tail postures. Hence, large changes are more probable than the Gaussian distribution would imply. All of that means the null hypothesis of a normal distribution of Blom index's returns is rejected. Our empirical estimates are consistent with that of major equity indices worldwide that market returns are skewed and have leptokurtosis (Danielson and De Vries 1997, and Harvey 1995).

Furthermore, and despite the fact that the GARCH model has been successfully applied to most financial series, it cannot model asymmetries of returns and fails to capture all the skewness and kurtosis in assets returns, especially under the assumption that the residuals are normally distributed (Nelson 1991). As a result, we have compared GARCH and EGARCH models under three distribution assumptions: the Gaussian, the t-Student and the GED and found that the EGARCH (1,1) under a GED distribution assumption is the adequate model to analyze the volatility of BSE. The validity and the goodness of fit of the chosen model have been qualified based on the maximum likelihood, AIC values, SC scores, and the heteroskedasticity presence in the residuals.

Although the chosen model does not address the causes of the volatility clustering, it quantifies the leverage effect into the model. Surprisingly, our empirical results showed that the volatility in Lebanese stock market during falling days is lower than during rising days. Hence, investors are more sensitive to good news than to bad news. This unveiled characteristic of the Lebanese stock market imply that the reaction of its returns to good news will outperform others in the MENA region whose leverage effects are negative.

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ESSAY



MERIT GOODS AT FIFTY: REEXAMINING MUSGRAVE'S THEORY IN THE CONTEXT OF HEALTH POLICY

Roger Lee MENDOZA*

***Abstract:** This paper reviews the prevailing debate about the theory of merit (and demerit) goods, which marked its fiftieth anniversary in 2009. It suggests an interdisciplinary approach to address its basic dilemmas, and underscores the efficacy of popular participation by using illustrations derived from the field of public health. The healthcare field was also chosen to provide a policy context to examine the developmental and regulatory roles of modern government. The study finds that collaborative social science research on the normative and axiological bases of public policy, and the extent to which they are founded on popular consent, enrich the theory of merit (and demerit) goods. It also allows such a theory to transcend the microeconomic analytical levels of the individual consumer and household.*

INTRODUCTION

In 1959, public finance pioneer Richard Musgrave introduced the concept of merit goods into the economic literature.¹ His purpose then was to explain why governments needed to set aside funds in their budgets for certain goods that could otherwise be supplied by the private sector. He argued that these merit goods tended to be under-consumed, and consequently, under-produced in a free market economy. To Musgrave, the problem justified some form of government intervention, so that consumers might value these goods differently. Among the classic examples he cited were obligatory public education and subsidized housing for low-income families. Merit goods included public goods² that, like certain private goods, had positive and measurable spillover effects (or “externalities”) on other people and society as a whole. Musgrave deemed merit goods desirable “where evaluation of a good ... derives not simply from the norm of consumer sovereignty but involves an alternative norm.”³

Over a period of fifty years, the notion of merit goods was critique and refined by other scholars, particularly in examining public expenditures and state regulation.⁴ It is currently used in a variety of other ways, such as those relating to categorical equity and non-tradable goods.⁵

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After half a century, merit goods remain under considerable debate. They appear to be as “fuzzy” as they were when Musgrave initially conceived them, and many economists continue to resist their theoretical and empirical applications. This paper discusses the unresolved dilemmas of merit goods, suggests an interdisciplinary approach in addressing them, and underscores the efficacy of popular participation using illustrations derived from the field of public health. The healthcare field was also chosen to provide a policy context in examining the developmental and regulatory roles of modern government.

DEFINING AND DELIMITING MERIT GOODS

The question of what constitutes the general welfare of society lies at the very core of the theoretical dilemma of merit goods. Ancient political philosophy reminds us that the quest for “the true, the good and the beautiful”⁶ can be long and arduous, if not elusive. However, absent a social welfare objective, positive externalities (as depicted in Figure 28) cannot be expected to arise; and government interference with consumer preferences and consumption patterns cannot be justified. On the other hand, if merit goods become too inclusive, the concern is that governmental power becomes unrestrained.

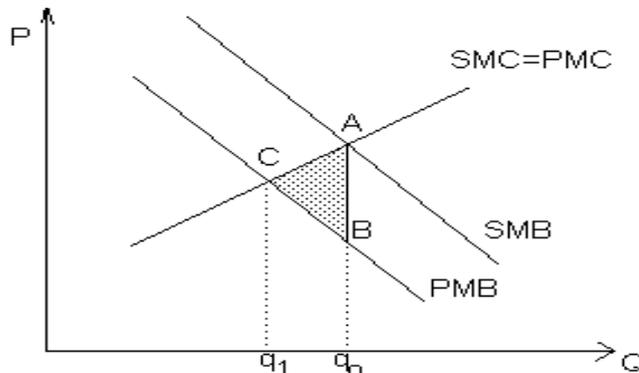


Figure 28 *Social Marginal Benefits > Personal Marginal Benefits of Merit Goods*

Where:

Q_0 = socially efficient level of usage

Q_1 = free market equilibrium

ABC = loss of welfare due to underproduction

In countries like Great Britain and Canada, broad public consensus exists about the universality (or near-universality) of health insurance and its consistency with the goals of their welfare states. A confluence of historical events (in the 1940s) and social values (derived from noblesse oblige and the citizen’s right to basic healthcare) led these countries to adopt a tax-funded health system free at the point of service.⁷ The British model of universal health insurance (as it was in the case of the Canadian provinces some years later) was helped by extraordinary political leadership, a

parliamentary system that gives the winning party great control, and the willingness of political leaders and institutions to make major concessions to the key stakeholders.⁸

In marked contrast, even the most vigorous political attempt to establish universal health insurance in the United States failed, the last of which occurred in 1994. Serious concerns about its implications on income taxes, along with the underfinanced and undersupplied health systems of Great Britain and Canada (resulting in long wait lists, chronic shortages of specialists, rundown facilities, etc.), have made universal coverage virtually an impossible dream in the U.S. As one scholar notes, "How well a system is designed must always be distinguished from how well it is funded; the [British health system] is quite well designed but under-provisioned. In contrast, the US health care system is richly funded but designed so that it maximizes waste, inefficiency, and inequity."⁹ The American experience nonetheless exemplifies how the discretionary power vested in government by the merit concept can be significantly delimited by history, culture, politics and economic system.

The case of state-mandated short-term disability (STD) insurance in the U.S. offers yet another insight into the ambiguity that clouds the definition of a merit good. For a variety of social and political reasons, California, New York, Hawaii, Rhode Island, New Jersey and the U.S. territory of Puerto Rico require employers to offer STD benefits to all employees. There is, of course, considerable variance in these six jurisdictions when it comes to insurance provider, funding source, amount and duration of coverage, and wait time. The rest of the states do not have mandated STD programs, but many employers offer comparable plans. The patterns set by the six jurisdictions "have had a strong influence on the growth of employer-initiated or -negotiated short term disability plans in the United States."¹⁰

State-mandated STD insurance, like mandatory FICA contributions, illustrates how government coercion induces another type of merit goods consumption: one that is involuntary and premised on the assumption that the individual is not simply entitled to them but must perforce have them. Compulsorily purchased merit goods can be more problematic,¹¹ especially when the normative "higher end" it purports to serve is not recognized or upheld by other, comparable jurisdictions as in the case of state-mandated STD insurance.

One key challenge is to pursue avenues for interdisciplinary research and collaboration that eschew the traditional cost-benefit dichotomy in economic theory. Merit goods by definition must rely on some socially redistributive goal, standard, value orientation or cultural norm -- whether partly imagined or real -- the way it has been studied by historians, sociologists, anthropologists and political scientists. Such normative and axiological criteria do not easily lend themselves to quantification the way rivalness and excludability¹² of private goods do. However, confusion and resistance expectedly arise relative to merit goods when they are isolated from a broader social science framework. That framework needs to reconcile consumer sovereignty with the regulatory and developmental imperatives of government and the extent to which these are grounded on popular consent.

THE FLIP SIDE: DEMERIT GOODS

The foregoing leads us to those goods that Musgrave himself denominated as demerit goods (or “demerit bads”).¹³ They include cigarettes, alcohol, recreational drugs, junk food, prostitution, HIV/AIDS, and environmental pollution, to name just a few that relate to the sphere of public health. For the purpose of this paper, any government measure designed to address a particular demerit good problem or issue shall be referred to as a demerit good remedy, although such remedial measure is arguably a merit good by itself.

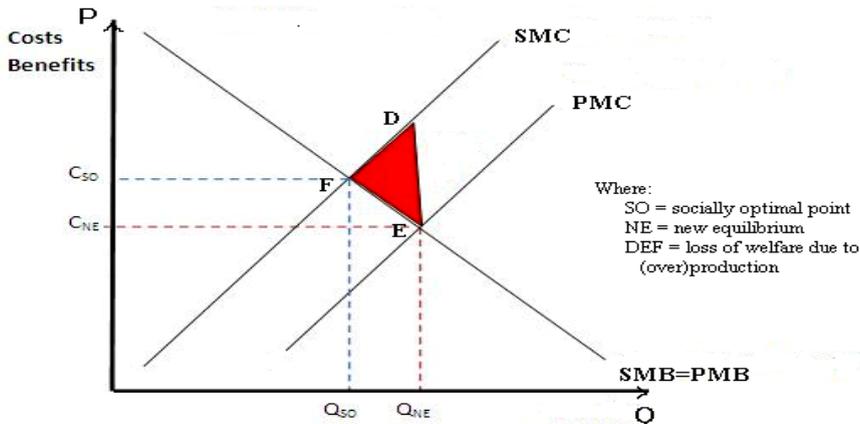


Figure 29 *Social Marginal Costs > Personal Marginal Costs of Demerit Goods*

Demerit goods are considered to be unhealthy and socially undesirable for individual consumers. In addition, their production and consumption bear negative consequences to others and to the general welfare (Figure 29). These include crimes arising from substance abuse or alcoholism, and environmental degradation due to pollution in common property resources. Demerit goods tend to be overconsumed, and hence, overproduced, if left entirely to private suppliers. Hence, the government employs its taxation, appropriation, regulatory, police and general administrative powers to reduce or eliminate their supply. Like merit goods, the government overrides consumer utilities, and addresses market failure and inefficiencies arising from demerit goods in two ways: by inducing voluntary consumption (e.g., free condoms distributed under the AIDS prevention program of the Philippine Department of Health) and enforcing mandatory consumption (e.g., compulsory drug testing for driver licensing under Philippine law¹⁴). The latter can be controversial when special treatment is granted producers of demerit goods. States like Pennsylvania, for example, exempt certain businesses from their smoking ban legislations on rather superficial grounds (such as when food accounts for less than an arbitrarily-determined percentage of total bar sales).¹⁵

Yet, it is interesting to see how little academic controversy and debate, if any, the concept or definition of demerit goods has actually stirred compared to merit goods.¹⁶ Whether the objective is to redress individual or collective harm, by and large,

the legitimacy of government authority appears unquestioned in the economic literature. Such is the case although resort to coercion is more frequent under the demerit concept. It is true that the costs of demerit goods are more visible or measurable than the benefits of merit goods. But the outcomes of paternalism and government intervention in both are at best ambiguous. How much safer local residents might be from the flu virus as a result of free flu vaccinations offered by a municipality is just as difficult to gauge as the question of how much less dependence on cigarettes or alcohol will result from increased (“sin”) taxes. Price or commodity substitution, for one, is as much of an issue for demerit goods as it is for merit goods. If cheaper, chain smokers might resort to tobacco (or even cocaine use) in the same way that many people might find it more convenient to pay for a flu shot at a nearby pharmacy than to travel farther and line up to get it for free (Figure 30).

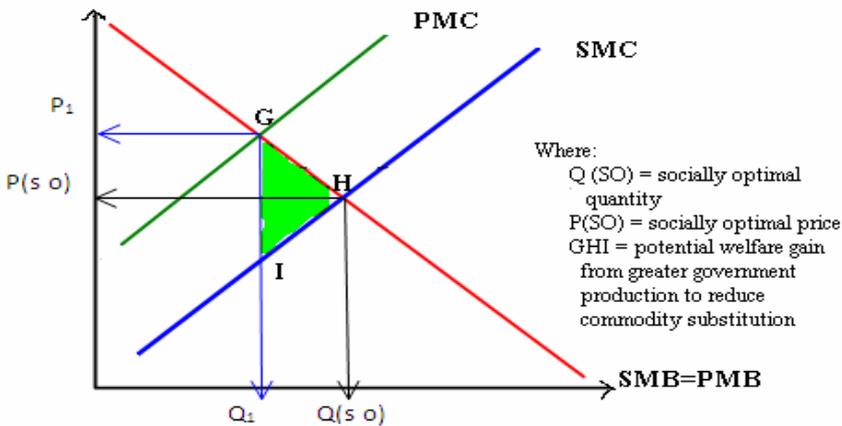


Figure 30 *Private Marginal Costs > Social Marginal Costs for Community-Provided Flu Vaccination*

Most analyses of demerit goods support government intervention of a corrective and redistributive nature, particularly if the solution to a demerit problem is non-exclusive and beset by free riders (e.g., mosquito abatement program to control malaria in some tropical countries).¹⁷ It is this notion of enlightened government interest, predicated on tacit or active popular consent, that a coherent and interdisciplinary social science framework needs to offer. It also helps keep the definition and objectives of merit and demerit goods from being over-inclusive and “fuzzy.”

PAYING FOR MERIT AND DEMERIT GOODS

The price of merit goods, and demerit good remedies, raises three interrelated questions that further highlight the theory’s dilemma: 1) How should they be paid for? 2) Who should produce them and how? and 3) How are their required quantity and quality determined and assured?

The supply of merit goods, and alternatively, the “de-supply” of demerit goods can be paid for by the government, consumers, or third parties (such as employers and

institutional sponsors) depending on their costs, quantity, relative scarcity, and other factors. Many local governments in the U.S., for example, offer free inoculations to their residents with the costs shouldered by the county/municipality and/or sponsoring organizations. More expensive and non-seasonal goods could be paid for by consumers and third parties, and governments may subsidize them. There are also instances where the sheer magnitude of the costs involved does not deter the government from paying for the good entirely or almost entirely. Many states and local governments in the U.S. cover health and educational services for physically and mentally challenged individuals. The economists' discomfort with these financing issues stems from the breadth and depth of governance required under the merit/demerit concept. Along with these come the tax, budgetary and accountability implications of government expansion.¹⁸ As the scope of a jurisdiction's regulatory power increases, the ability of the market to allocate goods correspondingly decreases.

A variety of arrangements have been devised for merit and demerit goods. The field of public administration typically divides them into two distinct functions: provision and production.¹⁹ Provision covers the determination of whether to offer the good (in the case of merit goods) or remedy (for demerit goods), arrangements for their delivery, and financing (e.g., taxes, user fees, fines). Production involves actual service delivery, asset management and operations. In some states, for example, U.S. Medicaid is subcontracted to private health insurance companies, while other states pay providers (i.e., doctors, clinics and hospitals) directly. Health care in Canada is delivered through a publicly-funded system, with most services offered by private entities resulting in benefit differentials from province to province.

The multiplicity of possible arrangements has led to a significant amount of debate in the merit/demerit goods literature about the appropriate "public-private mix" for financing and delivering services/remedies.²⁰ Considerable variance across countries and political jurisdictions relative to the extent to which benefits are covered, and costs shifted to consumers and third parties, have generated many contentious issues. There are also concerns about the impact of privatization and co-production (e.g., worsened labor conditions, negative environmental impacts, and lack of financial sustainability). One major problem is that the defense of the public interest continues to rely on the government whose commitment and capacity to act accordingly may be in dispute.

Some economists suggest that the valuation of merit and demerit goods should incorporate macroeconomic analysis. Appraisals should be concerned with what purpose a good serves most and if the provision of the good or remedy increases or decreases macroeconomic performance (efficiency). Public health policy, for one, has obvious macroeconomic and welfare implications, especially in the aging societies of North America and Europe. They include redistribution and growth-enhancing policies (social goals) and support of consumer choices that are constrained by lack of income or knowledge (development-oriented paternalism).

Majority-rule voting is a common procedure for consumers to express their preference for merit goods and demerit good remedies, especially with respect to the three questions raised in this section. Under majority rule, the level of spending and the quantity and quality of the goods provided will be those preferred by the median voter. However, this need not be the most cost-efficient outcome. Majority rule is usually inefficient “not least because of the incentives for people to mis-state their levels of preference depending on how they think the information is going to be used”²¹ (i.e., information asymmetries exist and majority rule weighs each individual’s preference equally). Besides, by the very nature of these goods, people tend to undervalue merit goods and overvalue demerit goods.

The foregoing suggest that governments inevitably gain and exercise independence in making choices given the impracticality of median preferences in many instances. However, “proxy” decisions would still need some form of validation through public interest aggregation or representation (e.g., public hearings/investigations) if, at the very least, the tacit consent of the governed is to be obtained. Adequate access for all viewpoints is the objective. Adequacy means sufficient enough for consumers to recognize any truth or wisdom in the viewpoint. Without this access, government interference with consumer choices is effectively undermined.

VALUE CONFLICTS AND THE ISSUE OF LEGITIMACY

The dilemma of merit/demerit goods finally raises the question of their own legitimacy. Who has the right to interfere with consumer utilities, and on what grounds? What if the same merit goods are “recast” and treated as demerit goods by consumers? How does the government respond to concerted public opposition to merit goods?

The raging controversy in the U.S. over fluoride-treated public water²² exemplifies the competing values of consumer accessibility and desirability under the merit/demerit concept. The federal Department of Health and Human Services has set a minimum goal of 75 percent of the U.S. population with access to optimal levels of fluoridated water to combat tooth decay and periodontal disease and improve oral health.²³ However, this has encountered strong opposition nationwide, particularly in battleground states like Hawaii, New Jersey, Oregon, Montana, and California where less than 25 per cent of state residents receive fluoridated tap water. Anti-fluoridation coalitions, health-oriented and environmental organizations, and ad hoc neighborhood advocacy groups have sprung nationwide and locally, and have successfully resisted fluoridation through lobbying, public hearings and referenda. Various health risks – some scientifically-backed and others purely conjectural – have been well articulated and publicized by these organized groups (e.g., fluorosis, bone cancer, kidney disease, genetic damage, osteoporosis, Alzheimer’s disease). The U.S. Congress and federal health agencies have consequently declined to enact legislation and policies mandating fluoridation, thus leaving the issue for the states and/or local governments to decide. By asserting that fluoridation is dangerous and undesirable, anti-fluoridationists gradually gained considerable parity with fluoridation advocates. In turn, political

stalemate has increasingly bred the kind of median voters who find it difficult to choose sides given the scientific evidence and passionate campaigns offered by two diametrically opposed sides, thus favoring the opposition to fluoride.²⁴

The U.S. fluoridation experience points to the need to incorporate the vitality of associational life in the normative framework of merit and demerit goods. An assertion that government intervention by fluoridating public water is imperative does not consider how the costs and benefits of a good may be valued or devalued by consumers, how their feedback will be obtained and expressed, how conflicts over provision and production will be resolved, or how (public health) policies could be recast in terms of their presumed demerits. The spatial dimension of public policy should be taken into account to shed light on potential obstacles to regulatory initiatives.

Doubtless, political culture and regime type could be supportive or restrictive of civic and associational life. The family planning programs of China and India -- the two most populous countries in the world -- offer useful illustrations. India, a transparent parliamentary democracy, adopted a two-child policy through a 1994 federal legislation, which its Supreme Court upheld based on "national interest." However, its consequences proved disastrous. In addition to grave health risks to women, reports showed couples aborting third pregnancies, giving up children for adoption, and failing to register their children's birth.²⁵ By 2007, several Indian states had already abandoned or were considering abandoning the policy, after mass protests and criticisms by federal government leaders for the use of coercion or quotas (besides economic disincentives) to slow population growth. It should be noted that a forced sterilization policy adopted by the ruling federal party back in 1976 was instrumental in bringing down the prime minister and his entire government, indicating the high sensitivity of this issue in the context of India's electoral politics.

The Chinese policy, on the other hand, has been far more successful in view of its unitary and authoritarian political system and cultural homogeneity.²⁶ Family planning in China limits urban couples to one child and rural couples to two children if their first-born child was a girl, with exceptions granted to small ethnic groups and those living in areas with "harsh natural conditions." However, coercive measures (forced sterilizations, abortions, forced IUD use) were gradually relaxed and supplemented by less invasive measures (e.g., child spacing counseling, fines, optional contraceptives) under the 2001 Birth-Planning Law. Mounting international criticisms in the 1990s of Chinese policy and the resulting human rights abuses were largely responsible for this development.²⁷ One study concludes that "[i]ncreased wealth and freedom also make it harder for the [Chinese] government to enforce the policy."²⁸

The reciprocal checks imposed by non-economic variables on government choices and initiatives enrich any analysis of the merit concept beyond what traditional economic theory may offer. It also allows for the evaluation of a government's regulatory and developmental responsibilities of government, and the extent to which these are (or are not) founded on popular consent. That, once again, underscores the importance of scholarly collaboration in normative theory-building.

CONCLUSION

There are myths that inevitably grow around economic theory. One of these involves the fundamental assumption that only consumers' autonomy and preferences have normative value.²⁹ In contrast, the novelty of Musgrave's merit and demerit goods derives from the relative autonomy of government based on normative and axiological grounds. Unlike pure public goods which, by default, are left for the government to provide, Musgrave's goods depend on the deliberate substitution of political value judgments for consumer choices.

The dilemmas of merit and demerit goods presented in this paper underline the difficulty of locating normative reasoning purely within traditional economic theory. What should constitute merit and social welfare, how should the goods or remedies in question be paid for, delivered and evaluated, how is the competition of other values with the government's own judgment resolved, and how is public accountability of government choices achieved are questions that simultaneously offer a challenge and opportunity for Musgrave's concept. To remain novel, the economic theory of merit/demerit goods needs to build upon extensive scholarship in the social sciences about the role of government and the dynamics of public policy choice. After half a century of debate, it is time to revisit Musgrave's merit/demerit concept in terms of what may be considered its most lasting contribution: it calls attention to the interdependence of the social sciences in infusing economic theory with a normative dimension that transcends the individual and his/her household. Economics, as a scientific discipline, should find greater theoretical and empirical utility in the theory of merit (and demerit) goods from this proposed interdisciplinarity.

End Notes

- ¹ The classic treatment of merit goods was presented by Richard A. Musgrave in his book, *The Theory of Public Finance: A Study in Public Economy* (New York: McGraw-Hill, 1959), 13-15. He had coined the term "merit wants" which initially appeared in his article, "A Multiple Theory of Budget Determination," *FinanzArchiv* 25, no. 1 (1957): 33-43.
- ² Public goods are *non-rival* (once a good is supplied to a consumer, little or no extra cost exists in supplying it to others) and *non-excludable* (no one can be effectively excluded from consuming that same good). *Rivalness* and *excludability*, on the other hand, typify private goods.
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- ¹² See note 2.
- ¹³ Michael Pickhardt, "Some remarks on self-interest, the historical schools and the evolution of the theory of public goods," *Journal of Economic Studies* 32, no. 3 (July 2005) 275 – 293.
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- ¹⁸ See, for example, Eddy Van Doorslaer *et al.*, The Redistributive Effect of Health Care Finance in Twelve OECD Countries, *Journal of Healthcare Economics* 18, no. 3 (June 1999): 291-313.
- ¹⁹ Yair Aharoni, *The Evolution and Management of State-Owned Enterprises* (Cambridge, MA: Ballinger, 1986): 316.
- ²⁰ See, for example, P. Burrows, " 'Efficient' pricing and government interference," *Public Expenditure: Allocation between competing ends*, ed. M.V. Posner (Cambridge: Cambridge University Press, 1977): 84-91; Jesse Malkin and Aaron Wildavsky, "Why the Traditional Distinction Between Public and Private Goods Should Be Abandoned," *Journal of Theoretical Politics* 3, no. 4 (July 1991): 355-378; Richard Batley, "Public-Private Relationships and Performance in Service Provision," *Urban Studies* 33, nos. 4-5 (May 1996): 723 – 751; A. Nickson, "The public-private mix in urban water supply," *International Review of Administrative Sciences*, 63, no. 2 (June 1997): 165-186; Santosh Mehrotra and Enrique Delamonica, "The Private Sector and Privatization in Social Services," *Global Social Policy* 5, no. 2 (2005): 141-174.
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A BROADER LOOK ON MIGRATION: A TWO WAY INTERACTION BETWEEN DEVELOPMENT AND MIGRATION IN THE COUNTRY OF ORIGIN

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Abstract: *Most studies on migration are limited to economic impact of migration. But this is only one side of the coin. In order to understand it better, international migration should be placed within the broader context of development. The first part of the article shows the channels through which international migration affects the home country. But the new migration theories have moved to a wider view, considering that development leads by itself to migration, first internally and then externally. Although not sufficient, internal and external mobility are perceived as indispensable for development. Thus, an overview of migration within the more complex process of development is essential, capturing the mutual influence between migration and development. Therefore, the second part of the article points out the need to place migration as an endogenous development variable, along with other variables like internal migration, demographic and economic developments and indentifies different development stages, according to migration transition theory and migration hump theory; so it aims to indicate the necessity of replacing the “one-way—impact of migration on development” approach with “the reciprocal relationship between migration and broader development processes” in order to a better understand of migration and competent policy recommendations definition.*

Keywords: *international migration, economic consequences, origin country, labour market, remittances, return migration*

JEL Codes: *F22, O15, J11*

1. THE VISION ON THE IMPACT OF INTERNATIONAL MIGRATION ON THE ORIGIN COUNTRY – BETWEEN OPTIMISM AND PESSIMISM

Migration was regarded differently by economists in the 20th century, their opinions varying from optimistic to pessimistic ones (De Haas, 2007; Abreu, 2010). The optimistic vision originates in the neoclassical theory claiming that migration

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brings benefits both to the origin country and⁶⁰ the host country as it favours the optimal allocation of production factors and, as a result, the increase of marginal productivity (Massey *et al.*, 1993, p. 433). The optimist vision of neoclassicists was completed by other supposed benefits of migration brought to the origin country such as the remittance flows received or the human capital of immigrants that return to their home country.

At the opposite pole lie the pessimistic theories based on the theory of cumulative causality⁶¹ defined by Myrdal (1957, cited in De Haas, 2007: 41) who believed that migration does not lead to the optimal allocation of production factors as neoclassicists claimed, but, on the contrary, to greater differences in development between regions, i.e. more poverty in the peripheral area and an increase of economic growth in the nucleus area. This perspective is completed by the phenomenon of *brain drain* which means that many educated people leave their origin country, thus becoming a wasted investment in human capital (Bhagwati and Rodriguez, 1975) that can have a negative impact on the development of the host country.

Recently, a mixed vision came into being; this accepts both the advantages and the disadvantages of the phenomenon of international migration. However, this vision tends more to the positive side of migration (there are more advantages than disadvantages), being favoured by the culminating ascendant of the value of reminiscences worldwide and the coining of new concepts: *brain gain*⁶² and the perspective of the collaboration with the diasporas which can contribute to the development of the origin country.

2. THE ECONOMIC IMPACT OF INTERNATIONAL MIGRATION – A SOURCE COUNTRY PERSPECTIVE

2. 1. The effects of international migration on the labour market in the origin country

In what follows, we will present the effects of international migration on the workforce in the origin country. First, it is important to mention that initially, the impact of immigration depends on several factors: the status of the immigrant on the labour market, the presence of a deficit or surplus on the local labour market or the costs for which the companies manage to recruit the necessary workforce from the internal labour market. All these factors have a various influence on the level of

⁶⁰ As the title shows, we mention the fact that we will only focus on the migration-economic performance relation from the perspective of the origin country;

⁶¹ We have to distinguish between the mechanisms of cumulative causality described by Massey (1990) which explain why social-economic effects of migration self-support the phenomenon of migration.

⁶² *Brain drain* may become a resource which may contribute to the social-economic development of the origin country on the long term (*brain gain*), by means of the human capital accumulated by returning immigrants or the networks which will be built in the origin and destination countries due to them (Hunger, 2002: 1).

salaries, productivity and economic growth. However, the negative impact of migration on the workforce (for instance, in case companies cannot easily replace emigrants due to their experience or the workforce deficit on the internal market) may be partially or totally compensated by other channels. In case the value of the remittances to be received is high enough, they will trigger the demand of services in the origin country, as well; this will stimulate the increase of production and of the workforce demand, respectively (thus allowing an increase in salaries, as well). Therefore, remittances may lead to the increase of demand for the workforce even though immigration originally determined a decrease in the demand for goods and services in the origin country (Bodvarsson and Van den Berg, 2009: 185-188).

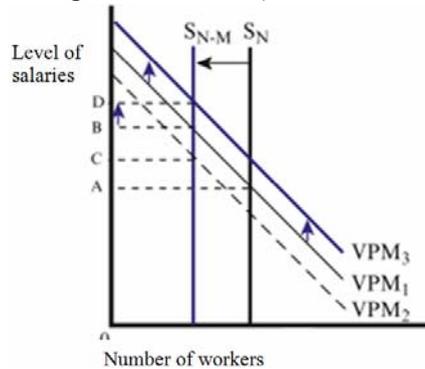


Figure 31 Migration, remittances and demand of the workforce in the origin country

Source: Bodvarsson and Van den Berg, 2009: 186.

Figure 31 shows the compensating effect of remittances which, by the mechanisms it triggers, may stimulate the increase of production and demand for the workforce even in the context of immigration (provided that its level equals the value of consumption in case emigrants were not to leave the source country). Thus, in the absence of remittances and in the conditions of the decrease of the workforce offer from S_N to S_{N-M} (as a result of immigration), the level of salaries increases from A to C and not from A to B , as the demand for the workforce also decreases from VMP_1 to VMP_2 (the departure of immigrants leads to a lower demand for goods and services in the origin country in exchange for a higher demand for goods and services in the host country which will diminish production and, as a result, the decrease of the workforce in the source country).

In the context of sending remittances according to their dimension, they stimulate consumption in the host country for the ones who remained in the country. Therefore, the level of production may remain constant or increase and the demand for the workforce in the origin country may also be stimulated. According to the amount of remittances, the level of salaries may increase from level C to level D , in case the amount of remittances is superior to the consumption the immigrant would have achieved if he had stayed in the origin country which increases the workforce demand from VMP_1 to VMP_3 .

Although it is simplistic, this model proves that sending remittances may stimulate the increase of production and workforce demand in the origin country, even if there are people who decide to immigrate.

2.2 The effects of remittances on the economy of the origin country

Remittances are transfers of money and goods from workers abroad to their close ones in the origin country. We will stop on the analysis of the influence of remittances in a narrow sense, i.e. of the ones in currency.

It is important to mention that these flows are extremely difficult to estimate due to the informal channels by which they can be transferred to the origin country (for instance, the immigrant himself may bring them when returning home). Another problem is the attempt to estimate their impact on a microeconomic and macroeconomic level as they cannot be differentiated from the other revenues due to their identical form (Taylor, 1999).

Theorists on migration became interested in remittances quite late. For instance, the *neoclassical theory* did not leave room for the introduction of the concept of remittance in the models proposed. The theories that appeared later on treated remittances as simple money transfers that were based on pure altruistic considerations. The *new economic theory on migration* would “revolutionize” the vision on international migration, considering that the decision to immigrate is taken by the entire family which involved the division of costs and benefits of migration at the family level (Stark and Bloom, 1985: 174). Between immigrant and family, a sort of virtual contract is entered into, bringing advantages to both parties and obliging the immigrant to send remittances to the ones who remained in the origin country as a reward for having him supported to leave.

Probably one of the main benefits of remittances is the contribution to the diminution of poverty. This impact depends on the expansion of the phenomenon of migration. In the areas with a low immigration rate, the impact on the decrease of poverty is not significant as the first immigrants of the area are not poor (because, at first, migration is selective). However, as far as the migration networks develop, the contribution of migration to the decrease of poverty becomes significant (Taylor, Mora, Adams and Lopez-Feldman, 2005). Several studies have shown that remittances contribute to the increase of the population’s revenues and the decrease of poverty, respectively (Adams and Page, 2005; Taylor, Mora, Adams and Lopez-Feldman, 2005; Jongwanich, 2007). A study of the World Bank in Morocco (*Report 11918-MOR*, 1994 in Schiff, 1994: 15) highlighted the fact that due to the selective character of migration (as certain qualities are required and the poor cannot afford such costs), remittances go to less poor families.

Thus, we may say that remittances contribute to higher revenues. This increase in revenues may stimulate economic growth. First, as mentioned in the previous section when we presented the effects on the labour market, the surplus of revenues determined by remittances may trigger a multiplier effect by boosting the demand of

goods and services, which, in its turn, contributes to the increase of production and to the demand of workforce. However, the multiplier effect created by the plus of revenues of the immigrant families depends on the tendency of the families with immigrants for consumption, the capacity of local manufacturers to increase production (thus prices will rise or imports will increase) and the economic relations of the immigrants' area of origin with the other areas as there are only certain regions or areas with high migration rates (i.e. of the capacity of passing the multiplier effect) (Katseli, Lucas and Xenogiani, 2006: 53). Thus, revenues from remittances may exert pressure on prices on the short term by increasing demand until offer reacts accordingly. However, the prices for real estate or the workforce (which can only rise if immigrants are attracted) whose offer cannot vary on the long term, will remain high (Taylor, 2006: 9-10).

Second, remittances may stimulate economic growth directly from the source country as investments. Thus, remittances solve the problem of accumulating the necessary capital for investments especially in poor countries where the access to the financial market is restricted (Stark and Bloom, 1985). However, investments require an economic environment to stimulate them, besides the accumulation of capital. As a result, the extent to which remittances may generate the multiplier effect by stimulating the increase in demand and production, respectively, depends on national economic policies and the ensuring of a stable economic environment which favours investments in the source country (Taylor *et al.*, 1996: 202-2003). Many studies have shown that, by remittances, immigrants contributed to the increase in investment in the country they left (e.g. McCormick and Wahba, 2003; Woodruff and Zenteno, 2004; Acosta, 2007). Other studies proved that remittances are too small sums which aim at meeting the basic needs of the population, being targeted to consumption, and not investments (e.g. Sandu, 2006; Noica and Stoiciu, 2006; Mallick, 2008).

Of course, we should not omit the studies on the negative effects of remittances. At a microeconomic level, remittances may discourage work which shows in the economy of the source country (Acosta, 2007). Family members who receive remittances are discouraged to look for a job or they are no longer willing to work long hours. At a macroeconomic level, although the remittances are an important source of currency for the source countries along with the reception of remittances, there also comes the risk to neglect the commercial deficit and let imports rise to a higher extent than exports in hope of covering the deficit by remittances (Chami, Fullenkamp and Jahjah, 2003). Moreover, remittances may influence the exchange rate, in the sense of allowing the appreciation of the currency in the origin country (e.g. Amuedo-Dorants and Pozo, 2004; López, Molina and Bussolo, 2007) which affects external trade, i.e. imports increase and exports decrease. This favours a higher disequilibrium of the balance of payments, creating a dependency on the amounts sent to the immigrants.

2.3 Return migration

We should not neglect the fact that international migration of the workforce has a mainly cyclical character, i.e. the immigrant returns to the origin country. Apart from the acquired financial capital, he also accumulates a specific human capital which may create benefits both for him and the economy of the origin country (*brain gain*). Personally, besides remittances, the benefit consists in the salary surplus obtained due to his experience abroad – *wage prime* (see Coulon and Piracha, 2005; Hazans, 2008; Ambrosini, Mayr, Peri and Radu, 2011). The poverty of the source country is often a constraint to the human development of persons, wasting their potential. The longer the time they have spent abroad, the more skilled the workers become, and more likely to start a business. As far as the unskilled workers are concerned, the experience abroad is not very helpful for them but they still manage to set a business as they saved money (Katseli, Lucas and Xenogiani, 2006: 41-42). If we consider the economic benefits of the source country, they depend on the possibility of contributing the knowledge acquired (i.e. the technology and infrastructure of the origin country). It is possible for the ones who returned home not to find work due to the higher salaries demanded, the qualifications obtained or the high availability of the workforce (Katseli, Lucas and Xenogiani, 2006: 38). Moreover, it is extremely important for them to readjust to the society they left from. This reintegration is achieved more easily when the experience abroad was a happy one, to be appreciated in the home country as well (Davids and Van Houte, 2008) and when return does not come by force, but voluntarily (Casarino, 2008). But on the other hand, reintegration of the ones from the host country may be hardened by the close ones' blaming or denial of their having left the country. The immigrants returning to their country often lose priority to housing, jobs or social services in favour of locals (Davids and Van Houte, 2008), which makes their reintegration almost impossible.

Thus, if the immigrant returns to his home country, it is extremely important for him to reintegrate in society and find an economic environment which is eager and capable of exploiting the human and financial capital he accumulated abroad; otherwise, economy can only be influenced by means of the increase of social costs in the origin country.

3. THE RECIPROCAL INFLUENCE BETWEEN MIGRATION AND THE BROADER DEVELOPMENT PROCESS - TOWARDS A NOW MIGRATION PERSPECTIVE

The diversity and complexity of the migration phenomenon, the difficulty to separate it from other social-economic or political processes raised scepticism regarding the possibility to formulate a general theory on migration (Salt, 1987, Van Amersfoort, 1998, cited in de Haas, 2007: 9). Therefore, the approach in the analysis of migration starts to change. Migration starts to be regarded as more of an endogenous variable of the development processes, that is “one-way—impact of migration on development” is replaced by “the reciprocal relationship between migration and

broader development processes” (de Haas, 2007: 62; Castles, 2010” 4-5). In this sense, de Haas (2010) correlated the stages of mobility transition (defined by Zelinsky, 1971 cited in Gedik, 2005) with the development levels (*development tiers*) defined by the regionalization theory (Skeldon, 1997) and the areas shaped by the world systems theory (Wallerstein, 1774, 1980). The result consisted in the definition of 5 stages of development, taking into account economic evolution, demographic evolution and people’s mobility evolution (Figure 32):

- at first, in the **pre-modern traditional society**, when the country is not even close to the world economic nucleus (the *external area*), mobility among population is limited and low. This is a phase of demographic stability (with high birth and death rates);
- **early transitional society** – the country becomes a source of workforce for developed countries as the population witnesses a process of accelerated growth (especially due a decrease in mortality), along with the increase of population mobility (both internal and international migration). Thus, the country takes another step in the direction of development processes, becoming a part of the peripheral zone to the world economic core;
- **late transitional society** – the country becomes stable from an industrial viewpoint, the growth of population is more temperate, international migration decreases, international migration from the rural area to the urban one stops at a high level, and the number of circulating movements increases. As semi/peripheral area of the world economic nucleus, this becomes a destination for immigrants.
- Once it becomes a **advanced society** (the last development level known today – postindustrial societies), it is part of the world economic nucleus. The internal decentralization process comes to an end. The population is now stable with low birth and death rates, and the country changes its profile, turning from a migration country into an immigration one;
- The next development stage would be that of the “**superadvanced**” **society** in which natality and mortality will stay low (the birth rate may even go under the death rate) and most part of resident migration will be carried out between urban areas. The reception of immigrant flows will continue.

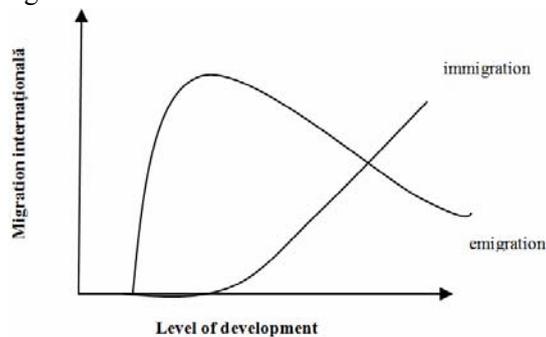


Figure 32 *Evolution of international migration along the development processes*
 Source: adapted from Zelinsky (1971: 233) and Martin and Taylor (1966), taken from de Haas, 2007: 29

Thus, de Haas (2010) formulates a new theory of migration – *migration transition theory* - that treats migration as an endogenous variable of development processes, having the following main hypothesis: human development generally leads to the highest levels of migration and mobility especially due to the lack of obstacles in the way of the free circulation of people, the increase of the individuals' aims and the deepening of occupational specialization. The explanation given to this evolution (shown in Figure 32) is the following: initially, due to the means of information, the individuals' aims increase more rapidly than local opportunities can offer. This is the main cause for development to initially determine the acceleration of migration (more and more persons wish to immigrate and manage to do it). Gradually, although the capacity to migrate continues to increase (to a lesser extent due to diffusion), the smaller the development inequalities between the origin country and the destination one, the lower the aim at migrating as local opportunities satisfy the life needs of individuals.

First, this new theory completes older theories of transition, introducing the possibility of stagnation or reversibility in the succession of stages. Second, de Haas (2010) relates the phenomenon of migration to development processes, claiming that at the basis of migration lies not only in the differences in revenues, but also in the difference of opportunities between the place of origin and the destination one which varies according to the destination level. Third, this theory conceptualizes migration according to the individuals' aims, going beyond the artificial categorising which distinguished between voluntary and involuntary migration and applying to all migration forms.

This evolution of migration shaped by *migration transition theory* is confirmed by *migration hump theory* at an economic level (Martin, 2009), emerged in the context of joining and being integrated into a commercial block. This claims that, in the beginning, the liberalization of commerce and investments in view of economic integration first determines the acceleration of migration. Thus, although initially the phenomenon of migration is spreading fast, gradually creating a *migration hump*, as the process of economic integration determines the convergence of salaries between the immigrants' origin country and the destination one, migration will increase considerably, and the country which provided workforce may even change its profile in an immigration one.

At demographic level, the same trajectory of migration is confirmed along the demographic transition implied by development processes. On the one hand, international migration is one of the factors which favoured the demographic transition (Fargues, 2006; Fargues, 2011; Beine, Docquier and Schiff, 2009) by passing the values and practices of the developed countries to the developing countries, including the ones that encourage a lower fertility (such as the increase of the education level in children). On the other hand, demographic transition influences international migration, determining the change of the emigrant's lifecycle from marriage-procreation-migration to migration-marriage-procreation (Fargues, 2011: 602-606),

encouraging a greater investment in personal development and a decrease in fertility among the population.

All these arguments seem to confirm the fact that migration theory is heading to a new start. This overall vision, which encompasses the migration phenomenon along demographic and economic evolution within the wider phenomenon of development, is an extremely important step in understanding the migration phenomenon and the role it plays in the development of the origin country.

CONCLUSIONS

The article presents the main ways in which international migration affects the economy of the origin country. However, it is important to mention that in all cases, several scenarios are possible. Yes, migration may contribute to the development of the origin country by means of remittances and human capital acquired abroad. At the beginning, the effects on the source country economy may be negative if migrants had a job and the domestic labor offer cannot provide alternatives at the same level of wages. In this case, the wages may increase (in order to attract new workers), affecting production. Later on, the sending of remittances may change the situation. As remittances increase family income, it increases demand for local products that can generate a chain multiplier effect. So, under certain conditions, the magnitude of the multiplier effect can compensate for possible loss of production due to labor migration. Still, some other negative consequences may appear as remittances may discourage work at a microeconomic level, the equilibrium of the balance of payments at a macroeconomic level or raise social costs when the returned emigrants cannot be reintegrated in society.

The vision upon international migration and its effects on source and destination economies varied from optimistic to pessimistic. Recently, a mixed vision which accepts both the advantages and the disadvantages emerged. But the debate on migration remains open, because all the scenarios vary from case to case. It is the main reason why this approach – the impact of migration on development – is limited and it has been replaced with - the reciprocal relationship between migration and broader development processes. This is the vision which should lie at the basis of drafting migration policies. Population mobility (both at an external and internal level) was and still is a feature of every society to a greater extent in developed countries and to a lower one at the opposite pole (Skeldon, 1997). Development will not stop migration; on the contrary, it helps diversifying mobility forms (Skeldon, 2011, Zelinsky, 1971 in Skeldon, 1997). Thus, policies on migration cannot stop migration but can influence the volume and patterns of migration flows. On the other hand, this does not mean that migration should be promoted as if it led to development all by itself, being a necessary condition, but not a sufficient one for development. It reflects the differences in development among regions. Thus, the causes of migration and not just its consequences have to be considered (remittance, “brain drain” or diaspora). If migration can contribute to development, or, on the contrary, damage it, depends a lot

on the context. It is certain that migration is generated by certain changes and triggers other changes, in its turn. Therefore, once more, migration has to be viewed as a variable (along with other variables it is correlated to, such as demographic evolution, internal migration, economic conditions etc.) in the development equation and not by itself.

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FRAMING THE EUROPEAN UNION: THE STATUS QUO SHIFT

Raluca OPRESCU*

Abstract: *The paper aims to examine the current situation of EU from various perspectives and uphold that in order to move forward, EU first needs to change. The framework of this article is an imaginary snapshot of the European Union, based on which the colors, shadows, objects in the picture are observed. By adjusting the “focal distance” depending on the degree of depth of the analysis, the main goal is to break down into components the whole image and assess the overall status quo. Using exploratory research based on qualitative methods, the article seeks answers to the following questions: “Does the present image of EU indicates the necessity of a metamorphosis? What could be EU’s motivation for changing?” Europe’s snapshot doesn’t reveal a homogeneous “chromatic spectrum” as the screen capture is rather sprinkled with budget deficits, high unemployment rates in peripheral countries and it pinpoints that EU is still the “community of multiple speeds”.*

Keywords: *economic integration, the core-periphery model, European Single Market, uneven development, regional competitiveness.*

JEL Codes: *R11, O52, R50.*

1. INTRODUCTION

After taking a few steps back while choosing the right lens, setting a focus range and making a snapshot of the European Union, intriguing facts are revealed. First of all, the current picture is twisted, fuzzy and the chromatic spectrum is limited to less vivid colors, especially because of the rough times EU had to face lately. This present image of EU is sprinkled with budget deficits and traces of sustained unemployment in several periphery countries as it still appears as the “community of multiple speeds”. It can be noticed that nowadays EU seems to have forgotten about the community method, as it tends to tackle problems mainly through the intergovernmental approach, thinking that it could be faster and less rigid. The union is surely walking on a bumpy road but since it’s still bouncing between choosing the convergence over the competitiveness path or vice-versa, things are unclear regarding to where all this is heading. Secondly, due to the recent economic turmoil, there is a lot of anxiety on the market. Because EU had to concentrate on striking back, the consistent process of creating a friendly environment fostering entrepreneurship and innovation had to be put on hold. On the other hand,

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Europe's snapshot has sundry highlights determined by the diversity of culture, talent, knowledge and a wide array of skills spread throughout the Member states.

The present performance of EU displays a mixed image. The figures reflect the region's macroeconomic recovery but at a slow pace. The GDP is increasing but unfortunately so is the inflation rate which in the beginning of 2011 was 2,8%. Eurostat estimates that 23 million EU citizens started this year as unemployed. In 2010, the industrial production increased by 6,7% compared to the previous year and so did the retail sales index which rose with 1,9% (Eurostat Statistical Books, 2011: 6). Households gradually seem to become more optimistic and are willing to raise their purchases, mostly because the labor market started to stabilize despite the alarming rate of unemployment. As a direct effect, the industrial sectors raised the production and consequently the new orders index has surged by 17,2% compared to 2009. During the past year, the private final consumption increased with 1,3% and the gross fixed capital formation by 3%, which suggests an improvement of the business confidence and in the pattern of EU's economic growth. Despite of this particular fact, the refinancing operations don't seem to provide any incentive since the global short-term interest rates are still at the historical low of 1%. However, an increase in the long term government bond yields brought them to 4,3% this year, which could be the result of better growth forecast and decreases in budget balance-to-GDP as scientific evidence points out (Alfonso, 2009).

As a result of the financial disarray, the public debt issues are adding up shadows to this image. Bailout solutions were carried out but the main dilemma was if countries were unwilling or unable to deleverage public debt. Present poor economic growth adds to the strain of EU and under these circumstances it is nearly impossible to sustain budgetary retrenchment, fact that only prolongs the public debt crisis. In addition, the European Central Bank doesn't seem to tolerate an inflation rate much above 2%, despite the need of Italian and Spanish economies for a higher rate. Moreover, this whole legacy of the economic uproar means the cycle of debt repayment is a drawback force on growth and public finances. Lately, the German chancellor emphasized the necessity of the countries in the Euro zone to become fiscally disciplined by adopting the German-style debt brake model. The financial stability of the euro was shaken and the results of it are still visible. Controversies were quite frantic between political leaders, some even claiming that dropping the euro would be beneficial for the weaker economies in EU. But such an outcome would surge the inflation rates and lead to diminishing the purchasing power of the currencies outside the Euro zone. Giving up on the euro is not a compelling option because the costs would outperform the benefits. The euro is the "common language" of the Single Market, without it the market would be put in high danger and taking such risks should simply be avoided. However, these attitudes only fueled the tensions on the financial markets and in the end broader interventions were needed. It's not the euro that is at stake but the questionable solvency of several member states that is overcasting the snapshot of EU.

So, what is the invisible side behind this picture? Europe is still undergoing the integration process, but it is lagging as EU strives to adjust and respond to the challenges coming both from inside and outside the union. Structural reforms also continue along the way but problems often arise because of the subsidiarity and proportionality principles that sometimes mismatch the degree of empowerment in key areas that should be addressed at the EU level instead of the national level, or vice-versa. This whole imprint is unpredictable because political, economical and institutional realities are continuously changing. Further in this paper I will zoom these reality sections in hope of finding explanations for the overall graininess of the effigy, and to examine the facts from certain angles.

2. REALITY CHECK: DIFFERENT WORLDS FUSING UNDER THE SAME SKY

Using a selective focus, the attention is drawn by the high contrast between the left and upper side (known as the core of EU) versus the right and lower side of the picture (often referred to as the periphery). The statistics show large differences in the Sustainable Development Indicators. According to Eurostat, the rate of population at risk of poverty or exclusion in 2009 was 15,9% in Sweden and 17,4% in Denmark, while in countries such as Lithuania, Hungary, Spain or Romania these percentages were significantly higher, reaching 29,5%, 29,9%, 23,4% and 43,1%. Nevertheless, the information society looks just as heterogeneous, with wide regional difference for example in the broadband access. The access rates range from 84% in certain regions of the United Kingdom, Netherlands or Sweden and ends up with just 20% in the Kentriki Ellada region in Greece (Eurostat Regional Yearbook, 2010). Statistics show that a center-north gradient differs greatly from the rest of EU in terms of FDI stocks and business economy, disposable income per inhabitant, final consumption expenditure, the level of opportunities for the citizens, the use of ICT by households or individuals, education and many more. All these pinpoint that a snapshot of EU is a blend of colors and shades, of objects with different shapes and sizes, placed in the center, corners, further up or down. However, everything holds together under a common European frame that joints all the spare and divergent elements.

2.1. The challenges of the core-periphery model: Convergence Vs. Competitiveness

The European Union undergone a process of spatial structural change and bridging the European Backbone, the Sunbelt and the Eastern axis is certainly not an easy task. For centuries, the metropolitan axis stretching from London to Milan has been Europe's breeding place for growth, development and innovation. Once the 1986 enlargement took place, the premises for a new metropolitan axis were created and as time went on, it was identified a Sunbelt from Milan to Valencia. Later, new potential growth poles appeared on the map of Europe once the Eastern countries joined EU and the axis Paris – Warsaw - Bratislava - Budapest started to thrive. If this image of EU is zoomed in, any viewer can observe regional highlights caused by the polycentric

spatial structure. Friedmann (1966) claimed that the world could be divided into four types of regions: core regions, upward transition zones, development corridors and resource-frontier regions. Core regions are centers, usually metropolitan, with a high potential for innovation and growth. Beyond the core are the upward transition regions defined as areas of growth spread over small centers rather than at the core. Development corridors are upward transition zones and the resource-frontier regions are those peripheral zones of new settlement. The current picture of the EU reveals the fact that it roughly comprises of these types of regions.

The spatial structural change in Europe could be explained through a mix of reference points such as the Schumpeterian economics, the structural change theory, the core-periphery model or the “localization economies”, and the agglomeration theory. The European Backbone still differs from the other European locations because it is highly populated, highly urbanized, disposes of large industrial concentrations and strongly developed service centers (Hospers, 2002: 3). It’s no wonder why it was described as the “city belt”, the “central European urban region” or even the “Central Megalopolis” since it comprises of cities such as London, Amsterdam, Zurich, Frankfurt and Milan that are known as dense financial, business, cultural and communication hubs. It is certainly not a coincidence that Brussels, the “heart” of the EU, is located within this region. However, sustained efforts managed to slowly turn the Sunbelt into a structure of service regions and economies with driving forces such as entrepreneurship or innovation. As for the third axis, the economic progress continues as countries and their regions strive to shift from the efficiency stage based on investments to the innovation stage of economic development while they are still bound for institutional and market adjustments. For the moment, there is no real threat for the European Backbone to be overtaken by the other regional structures.

As pointed out earlier, the business development in the EU still uneven. The causes for this situation include transaction costs, agglomerations and spillovers, urbanization of the economies and the institutional thickness (perceived as all institutional forms and supports of the enterprises). The picture of EU’s regional development shows the following spatial scale phenomena: different centers of regions are more attractive to industries characterized by lower average cost as production increases, because the location serves a much larger integrated market, while the periphery undergoes an acute relocation of economic activity (Cojanu, 2010: 157). But there are also other aspects to be considered when observing the regional status. Capital-rich countries such as Germany or France attract labor from peripheral countries like Spain, Greece, or other non-EU members (Turkey, Algeria). Higher wages and prices are found at the core while the lack of employment in the periphery keeps wages low there. The result is a balance of payments crisis at the periphery or the necessity of increased exports from the periphery to pay for imports. However, the labor is the factor that has the lowest degree of mobility within the European Single Market and this situation strains the integration process.

Two fundamental concepts of regional development are the convergence and the competitiveness. The importance of the regional competitiveness as a framework for developing and implementing the European policies has risen over the past few years. This happened especially due to the increased number of official reports pointing out that the competitive advantages of EU on the global scene are constantly threatened. Some experts claim that competitiveness should be tackled starting with cities and urban centers and later consider a regional approach. Urban areas are so important because they are perceived as focal points of competitiveness because they gather both resources and the entrepreneurial initiative. In most of the cases, local administrative decision-makers have also a role in enforcing these areas (Cojanu, 2009: 9). New concepts describing the geographical side of development have been introduced in the literature, such as FUA (Functional Urban Areas), MEGA (Metropolitan Economic Growth Area), PUSH (Potential Urban Strategic Horizon) and PIA (Potential Integration Area) as an attempt to square off competitiveness issues from another perspective. Despite these initiatives, the European Commission that is in charge for the Regional Policy still has a very broad approach instead of narrowing and tailoring it.

2.2. European's attitude - shared patterns or discrepancies?

Europe seems to be unified mostly by its economic diversity and uneven development, but the citizens of EU also tend to have different attitudes towards specific matters. For instance, the confidence and perception of Europeans regarding the economic status is improving but this trend conceals noteworthy differences between the states. While confidence indicators have improved considerably in countries such as Germany and Austria, the situation in Ireland has deteriorated, accompanied by the increased public pessimism regarding the short-term outlook. However, the Eurobarometer Report published in February 2011 reveals that Europeans are more optimistic about the future in the post-crisis time, relating to the job situation. A large majority of European citizens (78%) continue to be satisfied with the life they lead and are slightly more confident about the future. Almost 33% of Europeans believe that their household situation is bad. Economic issues remain at the forefront of public concerns, including rising prices (38%) which is a striking concern in Malta, Portugal and Lithuania, the economic situation (25%) which is less of a concern for the Germans and an increased concern for Spain and Greece. The health care system is an important cause of distress in Sweden, Netherlands and Germany, whereas energy costs are a reason to worry for Malta.

In the present, the relationship of the citizens with the European Union is somewhat mixed. One dire problem that EU has to deal with is the growing skepticism, particularly in the light of the fresh events. Empirical evidence shows that starting with 2008, due to the financial disarray the citizens' net trust in the European institutions has dramatically declined and that contrary to what many might believe, the citizens' net trust in national governments initially increased in most of the countries (Roth, 2009). Econometric studies analyzing the direct aftermath of the financial crisis

concluded that the drop in the real economy (in the GDP per capita) was associated with an increase in citizens' trust in the national institutions, thus corroborating a rally-around-the-flag effect. However, in the post-crisis period, this association proved to level out. The rally-around-the-flag effect can only be detected for the national institutions and not for the EU institutions (Roth, 2011: 15). Other interesting results point out that unemployment leads to a fall in trusting the national and European institutions, primarily in the EU-15 countries. This could explain why in Germany or Italy the citizens' trust hasn't been shattered significantly. The government actions that supported companies to maintain employment levels through short-term work schemes had a positive contribution to maintaining citizens' trust. Moreover, studies confirm that inflation reduces trust in both national and European institutions in all EU-25 member states but only under favorable economic conditions. It appears that in difficult times, the inflation issue is almost inexistent. EU had and still has public debt problems. The increase of debt over the GDP is negatively correlated with the trust in the national Parliament.

3. THE NEED FOR A CHANGE: QUITTING THE LIMBO

The snapshot of EU does not unveil a bright picture and therefore it needs retouching. The colors are not vivacious and the fuzziness is rather confusing and somewhat disturbing. This present image is not only the result of certain inconsistencies within EU but is also influenced by the diffuse lightning coming from the world economy. However, EU has proven repeatedly over the time that despite of dark horizons ahead, it can go on and follow its path.

3.1. Leading the status quo shift

As an upshot of the external and domestic torments that European Union had to cope with in the past few years it seems that now it is trapped in limbo. Conditions of prolonged economic weakening and the stifling effects of political interdependencies are straining the cohesion of EU. It is obvious that unemployment rates in Spain and Ireland of approximately 20% and 14% simply fail to lead to any sustainable social and political cohesion. Any change starts with finding the motivation for taking such a step. In EU's case, the reasons are plenty and they encompass global competitiveness issues, social cohesion, economic convergence, political unity and stability as well as rebuilding the trust of its citizens. However, because of the complex mechanism underlying it, EU is not a flexible and shifts cannot happen quickly. In fact, this particular layout and structure of it makes the process of implementing fundamental changes quite challenging. All parties need to reach the awareness phase of what is critical and needs to be changed, they have to assess the content and the context and decide on the most appropriate trade-offs to be made. EU has to figure out whether it should prioritize a strategic change with effects on long run or it will stick to operational ones that could create immediate effects. After a severe cool-down, it's time for EU to turn up the heat and spin the wheel one more time. Deepening the

integration is still a current reality and a strategic goal of the future. On the other hand, EU leaders should understand the stringent need for coherence, transparency and consistency. Likewise, the European institutions ought to make an objective assessment of the balance of power, cautiously identify possible opponents and allies whenever proposing action plans.

EU can decide to widen the “aperture” (the way it tackles the European issues through its institutions) and let the light pass to expose the “film” (the plain European reality). The “light” is the change and it can be the element that brings together all the parts of this picture. By widening the aperture it could gain flexibility to deal with most of the existing problems, both on economic and social levels. Some of the policies don’t seem to be reality-grounded anymore or they have an outdated simplistic approach, such as the Regional Policy. Besides, the way EU managed to cope with the financial turbulence underlines that it still lacks coordination in decisions between the national and European level. Also, it can be questionable to what extent the implementation of the reformed policies has a follow-through. This snapshot shows reduced synergies between the objects in the picture and tends to suggest that some entities work rather independently then cooperating with others in order to achieve higher overall gains.

3.2. New shine for the main pillars

The regional and competition policies together with the Single-Market are the most important pillars on which the whole European architecture holds its weight. After redefining it by trying to leave behind the old patterns and taking a similar shape as the north-American antitrust policy, the Competition Policy seems to be quite solid. For a long period of time, a legal approach was preferred but the present trend has shown an increased use of economics, which emphasizes that decisions are taken in light of their effects on markets and particularly on consumers. One key policy challenge is to preserve competition and not competitors (ERT, 2010: 13). Shifting focus away from the public controlled administrative and legalistic approach towards a more market-based approach and the incorporation of enhanced microeconomics produces a whole range of cross-purposes. It’s true that the ex-ante approach was dropped, but the screening rules of the competition environment still tend to offer limited alternatives to the decision-makers and private actors. This policy had to undergo a reform that clearly indicates a paradigm shift. However, even though this new market-oriented vision has an ultimate beneficial goal, some competitors simply don’t have the expertise to assess on their own the effects of a merger or acquisition might have. That entails to be somehow forced to hire experts, which only boosts the costs hence the consumers might be affected after all. The costs of such services provided by legal service companies may be unaffordable for certain potential plaintiffs (Wigger, 2006: 20).

Policy-makers finally started to comprehend that for the policies to be effective, they must customize them based on the territorial specificity of the issue that is tackled,

this being valid peculiarly in the case of the Regional Policy. It's important to take a brief look on this policy because it is considered to be an essential policy for the future of EU that can help reaching the objectives of the Europe 2020 strategy. This policy aims to reduce the social and economic development discrepancies between the regions in terms of income, welfare and opportunities. The main problem regarding this pillar is that before addressing these differences, the appropriate measurement tools should be chosen. The European Commission, which is in charge of this policy, quantifies the disparities and groups the NUTS 2 regions by using the GDP per capita as a key indicator. Researchers are strongly emphasizing that such a simplistic vision provides an incomplete picture as it does not account for the potential development prospects associated with demographic distribution, population density or qualification of labor in the regions. Empirical evidence from several studies using multivariate statistical analysis uncovers that a GDP-based classification does not necessary identify the correct group in which a country should be included. One of those studies concluded that both the group of convergence regions and the competitiveness regions contain at least two significantly different groups of regions that substantially differ in terms of certain indicators (Campo, Monteiro, Soares, 2008). The adoption of a European regional policy where financial resources would be allocated according to a multivariate classification it would reduce the general heterogeneity and would group countries with similar characteristics and problems. A major benefit of this alternative is that it would associate policies and funds more clearly with the issues identified by using indicators such as long term unemployment, youth unemployment, the percentage of aged population, industry and services employment or education indicators. By taking this approach, the policy could be more efficient and speed up the process of diminishing the discrepancies. The Stiglitz Report also suggests the need of a paradigm shift regarding the quantitative tools on which the policy is based. The aim should be a drift from measuring the economic activity or performance to measuring the wellbeing of the Europeans.

4. CONCLUSIONS

After closely analyzing the snapshot of EU from different angles and adjusting the focus, several questions arise. Is this twisted picture a result of using the wrong lens or the reality itself is significantly flawed? The crisis surely could be seen as a "special effect" that was applied and it resulted this picture. The contrast between the core and the periphery is unfortunately quite striking and the development in the latter is still lagging. Can EU find the right ways to turn the regional diversity into an advantage? Growth surely is a powerful centripetal force, but as literature points out spillovers are a powerful centrifugal force, therefore EU has to find ways to cope with both of these phenomena. The way they are designed now, most of the European policies focus on the demand side rather than on the supply side and a switch might enhance the benefits of implementing them. Authority is a chair and it needs legs to stand up. EU has a multi-level governance and if initiatives are not supported at the national level their

effectiveness decreases. For the moment, national governments seem unwilling or too weak to boost competitiveness by fixing the inefficiencies. EU's limited fiscal capacity has proven to be the most critical constraint in responding to the global financial crisis in a coordinated manner. Because EU didn't have enough resources to rescue the troubled member states, the compromise was the nationalization. This undermined the Single European Market principles.

In order to continue moving towards the goal of a political union, EU has to challenge its status quo, and mostly to lower the inertia. More consistency and coherence in decisions could lead to better governance. EU must take action in order to complete the lacking elements of the Single Market architecture and strengthen the global policy. The distressing issues of citizens losing their faith should be a wake-up call for the European leaders. But are the decision-makers of EU really assessing the status quo bias? This can be further investigated.

Any picture can be framed and that's what keeps it together. Does this image of EU have a broken frame? It is debatable whether the European institutions or authorities can be the frame or they are rather objects in the photo. Looking back at the history of EU, it's clear that political interests somehow always seemed to put the picture back together whenever it was in danger of drifting apart. However, a real frame could somehow be the sense of belonging and the European identity of its citizens. EU can have a *festina lente* approach with carefully assessing all the further steps. Nobody can predict what will be the path of Europe. The potential danger for the future evolution is that after this economic turmoil, somehow EU doesn't appear to have got the lesson right. The final thought is that EU has to assess its balance, therefore to check if the placement of colors, the light and the dark masses, the shades, the large and the small objects are creating harmony and equilibrium and if not, it should decide faster to shift the status quo by adding extra exposure which could make the European scene a lot brighter.

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THE IMPORTANCE OF OIL ON THE INTERNATIONAL MARKET

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Abstract: *The purpose of this paper is to emphasize the importance of oil on the international market, its role and influence on the world economy. If oil had a remarkable continuity of its use in history, we see that today all modern industry depends on this "black gold", as it is rightly named. Hydrocarbons in the form of oil and its derivatives have become the main source of energy for most of the countries. It is a product that cannot be ignored neither in politics, nor in industry or economy. We can say that it is the product with the strongest influence in these sectors.*

Keywords: *oil, international market, influence*

JEL Codes: *F19, F20, F50, F51, Q40*

1. INTRODUCTION

In the last one hundred years oil has been one of the most important goods traded, this product being crucial in defining national strategies and global politics alike. As the nineteenth century was the century of coal, we can say that the twentieth century was the century of oil, as it seems that twenty-first century will be the century of gas due to increasingly limited possibilities of oil production, the reticence in the nuclear sector and the weak contribution of unconventional sources.

Oil has imposed on the international market through a continuous and remarkable diversification of its use throughout history, becoming used everywhere. In the last century it became absolutely necessary for the modern economic life, causing frequent and heated diplomatic conflicts, tensions and suspicions between different countries.

The late nineteenth century, early twentieth century, for the first time the derivatives obtained from the extraction of oil have been used as fuel, but the interest in oil jumped with the invention of internal combustion engine. The wide use oil has gained caused a fast increase of the global demand. This in turn led to increased oil production, making it an extremely appreciated and sought product. Oil has helped bring together important capital necessary for its exploration and extraction and also for the creation of powerful companies worldwide. Within few decades oil has turned

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into one of the fundamental elements of modern economic life, the "blood of the economy" as the writer Anton Emmerich Zischka said. Not only that oil was the decisive factor in the prosperity of industry, offering many features and benefits, but was an important element in the entire international life.

Within this research we intend to analyze the influence of oil on the economic life but also the effect which the economy has over oil. Our analysis is performed also on the international demand and supply of oil and on the international flows in the geostrategic challenges context, on the determinants of the evolution of oil price and the dollar exchange rate influence on the oil price. Finally it will be taken into account the possibility to replace oil as primary energy source, considering that oil reserves seems to no longer meet the needs of society soon. In XXI century one of the biggest problems of the mankind is the energy, in the context in which it is expected that the world population will reach in 50 years the figure of 9 billion people. All these facts forced scientists to find new alternatives to replace at least part of traditional energy sources. The paper will review the state in which the implementation of new energy sources is and accordingly, the future of oil. The main conclusions are presented in section 4.

2. INTERNATIONAL DEMAND AND SUPPLY OF OIL

The economic growth and prosperity depend partly on the availability of natural resources. The development of energy sources is of a very high importance for the economic development. Today, commercial energy, which accounts for over 80% of all energy use, is the lifeblood of modern economies. Indeed, it is the biggest single item in international trade. Oil alone accounts for about one-quarter of the volume (but not value) of the world trade.⁶³

Global oil reserves are very unevenly distributed around the globe, most countries importing crude oil and oil products. Permanent extension of reserves, both in area and in depth, resulted in their increasing and finding new major fields scattered in many countries. Today there are known oil reserves in over 80 countries, most of them having also oil processing industries. The highest concentration of oil is in the Middle East, which has transformed this area into a strategic target for international oil companies. Middle East is the center of gravity of the world oil market, here being concentrated 63.3% of the global oil reserves, Saudi Arabia holding the largest reserves-22.9%, followed by Iran with 10% of the world reserves. O.P.E.C. remains the center of gravity on the world oil market, covering about 45% of the global oil. It follows Russia, which after having had a downward trend in the oil market caused by the collapse of the Soviet Union experienced a series of major structural changes and it's production and exports registered a continuous increase since 2001. Refining capacity worldwide is also unevenly spread across the globe, large weights harking

⁶³ Stutz, P. Fredrick, Barney Warf (2005), *The world economy: Resources, location, trade and development*, 4th edition, Pearson Prentice Hall, New Jersey, pp. 128

back to consuming states in Western Europe, North America and recently in Asia and the Pacific, especially China's; the largest refining capacity in the world is being reached by the United States.

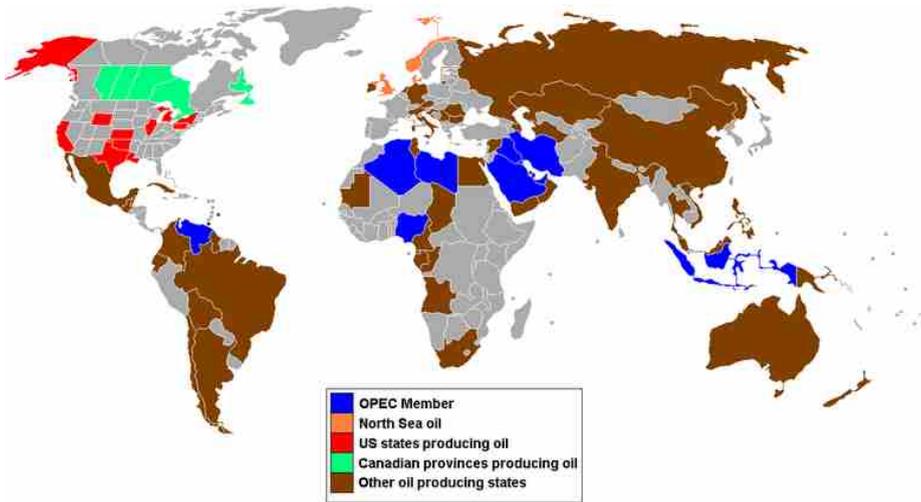


Figure 33 *Oil producing countries*

Source: IEA Energy Statistics, <http://data.iea.org/ieastore/statslisting.asp>

In terms of oil reserves, there are two broad categories: proven oil reserves, which are "quantities of oil that geological and technical research estimate with reasonable confidence that can be exploited in technological and economic conditions of the moment"⁶⁴ and potential reserves that have not yet been discovered but geological research speculate their existence. The evaluation of reserves depends on the operational technique used, showing the proportion of the existing oil that can be recovered. Oil economy is shaped by its business infrastructure and it's undertaking regarding the operation, transport, processing and distribution of oil. The economy of oil resources, whose range is global, lies by this under compulsion of a more and more extensive concentration, under monopolization and globalization. Companies that were once international, are now global corporations such as BP, ExxonMobil, Total SA, Shell, ChevronTexaco, which are the major operators on the world oil market.

Until 1973, the supply has been dominated by large international oil companies, the Majors, seven at number, namely Shell, British Petroleum, Mobil, Standard Oil of California, Gulf, Texaco and Exxon⁶⁵, and some large independent companies, Arco and Amoco, which activated through concession contracts within states which had oil reserves. With this system, the major international oil companies ensured their privileged access to less expensive crude oil in the Middle East and like this they controlled the oil fields in this region. These oil companies controlled actually the

⁶⁴ Geopolitique du petrole et du gas, Ed. Techip, Paris, 1989, p. 64

⁶⁵ Jacquet P., Nicolas F., Petrole: crises, marche, politique, Ed. Dunod, Paris, 1991, pp. 25

entire oil infrastructure, from exploration and refining to transportation and distribution of the petroleum products. This vertical integration allowed these companies to control various stages of oil production and to ensure a supply of crude oil in the best conditions, developing the leading strategy through cost. During this period, OPEC went aware of oil's power and launched a global strategy, essentially changing the existing system on the oil market. Namely, by setting up public oil companies in OPEC countries and through nationalization of the patrimony of the foreign international companies (mostly American), OPEC got control of oil reserves and through this of the world market outcome and manipulating the production in order to rule the prices. The market share of large companies on the world oil market regarding the reserves held decreased considerably from 98% in 1950 to 5% in 2002⁶⁶. Thus, after this period, on the world oil market have appeared: Saudi Aramco (Saudi Arabia), INOC (Iraq), NIOC (Iran), Pemex (Mexico), PDV (Venezuela), Pertamina (Indonesia), Adnoc (UAE), KPC (Kuwait). But these companies were active only in the upstream sector, which is the production of crude oil. However, they were the main competitors of the international companies in this sector. Thus, the political climate of the oil changed, having a direct impact on competition in the oil industry. Large companies have lost direct control over fields and privileged and protected access to crude oil in the Middle East. This has made them change strategies, namely to diversify geographically activities outside OPEC. However, they have always favored an international approach, which allowed them to follow broad competitive strategies. There was then a total transformation of the structure of the oil industry, namely its breakup and the radical reorientation of the companies towards global has become the most important force leading to accelerating competition and instability. Currently a reorientation is observed of the strategies of international companies to seize the oil fields through buying non-extracted reserves. Investments and technological differentiation are their main weapons in the competitive fight in this sector, which recently becomes again very tempting thanks also to the price which is favorable for transactions. Most of this sector's companies do their business plan on medium and long term, taking into account a possible decrease in quotations. Oil market has proven over time being a market with many surprises, where we can always expect sudden changes. Evidences of this are the crises of 1973, 1979 and 1990. Also it can be seen how the development of Asian countries which have increased their consumption, Iran's nuclear programs, the arming program developed by North Korea and Katrina Hurricane were the basis for the so-called fourth crisis of 2003-2006. Finally, if in July, 2008 the oil price reached \$147.27 per barrel at the end of the same year it fell to \$40 per barrel, due to the extreme weakening of the global economy.

The most important challenges the oil industry faces are:

- big fluctuations in the quotations of crude oil and oil products;
- currency fluctuations on the international markets;

⁶⁶ OPEC's Statistical Yearbook, 2002, p. 124

- global geopolitical events (wars, terrorism, new economic and political structures as economic unions and others);
- structural changes in adjacent sectors (e.g. increased demand for diesel to the detriment of gasoline);
- global climate phenomena, more stringent requirements on the environment.

The instability of the conjuncture of oil and oil products markets stood out considerably, the main factors that caused such changes being the dynamism of demand, supply, resources, technical and scientific progress. However, the oil field business is and will remain attractive.

Problems of geographical location of oil reserves have nowadays a crucial importance. Oil's geographical concentration causes major oil companies to direct investments to these regions. But in the oil industry the investments claim considerable sums, much higher than in most other industries, mainly because the exploration results are random. Wells often prove fruitless: to reach new reserves it has to be penetrated ever deeper into the soil, and more frequently under the sea. For this reason companies are turning to the easy exploitable fields with minimum costs and of appropriate quality (for example, Shell focuses on China, British Petroleum on Russia). Each oil company aims to achieve a higher turnover and have a market share as high as possible comparing to the competitors. For this, it uses different strategies that allow it to hold competitive advantages. One basic strategy is the costs strategy. In general, companies are moving into areas where oil deposits have lower extraction costs and are cheaper. For example in the Middle East, especially Saudi Arabia, the average cost of mining and processing of crude oil for export is \$2-3 per barrel, to which it is being added \$2-3 for transport to the importing markets. Thus from the merchandising of this product, companies get a substantial sum. This sum is the incentive through which oil companies in industrialized countries are motivated to explore oil reserves in the countries of this region. In North America the production cost is \$8 per barrel, in Europe it reaches \$10 per barrel. Of course, each region has its own particularities; in some regions or countries the duration of life of the oil reserves is much higher, such as Iraq, or the exploited oil is different in terms of chemical composition.

The gap between needed and owned production (evident in most industrialized countries, but also in many small and medium sized countries) is being compensated by the import, USA being the because of the economic development the country has registered, Northeast Asia is expected to become the main region of oil consumption, with the largest increase in demand.

The general level of economic activity and economic growth is a major political and economic concern for both developed countries, but especially those in development. Developing countries have high economic growth potential, even if the recent problems of economic and financial nature have slowed down the development rate. Currently, forecasts for oil global demand appear to change substantially as a result of the current financial crisis.

In XXI century one of the biggest problems of the mankind is the energy in the context in which the global population is expected to grow more and more. All these facts forced scientists to find new alternatives to replace at least part of traditional energy sources. Experts believe that to be kept the current level of oil production, it would be needed to be discovered four more Saudi Arabia. Given that for years, discovered oil sources are becoming less and less, this would be impossible. Seventy percent of the oil produced worldwide is being consumed in transport. But beyond this, 90% of goods produced rely directly or indirectly on oil. American expert Matthew Simmons, comes with four concrete proposals designed to protect a world oil crisis: "We have to travel less. We should encourage people to work where they want and to pay them for productivity. Revenue shall be calculated according to the work result. The more work, the pay will be better. Food must be produced locally in order to reduce energy consumption. And we must stop globalization goods. If we do these things, we can win a respite of 50 years."⁶⁷

Industrialized countries are the largest petroleum consumers, their prosperity being largely conditioned by an intensive use of oil. Important buyers are also international oil companies, which buy crude oil for refining and resale, and the main inquirers for the crude oil are the traders. These trading companies are engaged in a purely commercial activity, being specialized exclusively in the oil sector or may interfere on other markets also. Their relations with the producing countries are based on regular contracts or purchasing agreements. Some OPEC countries prefer to appeal to these companies for merchandising the crude oil.

Like the supply, the worldwide oil demand also had a contradictory dynamic. The rapid development of Asian countries involved additional quantities of consumption. Industrialized regions like Europe, USA, Canada, Japan and others, big oil importers (fig. no. 2) tend to increase the share of alternative energy sources in energy consumption in order to reduce the dependence on imported oil.

Meanwhile, in the less industrialized Eastern Europe, CIS, Africa, etc., the share of oil will remain important, primarily from the fact that considerable investments are needed to implement an appropriate infrastructure. Studies, such as of the Shell corporation, show that by 2050 no less than 50% of global energy needs will be provided by regenerative sources, in a context in which oil deposits account in the present 40% of the energy provision of the world. For the future we must take into account the fact that new energy sources like wind or solar are becoming increasingly effective, presenting a real alternative to oil, in covering the growing demand for energy.

⁶⁷ *DEUTSCHE WELLE* 24.03.2009, Juergen Webermann/ Vlad Drăghicescu, www.dw-world.de

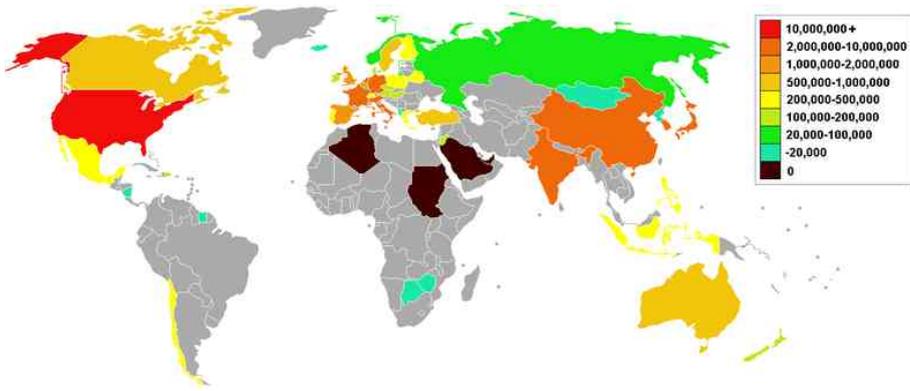


Figure 34 Oil imports (million barrels per day)

Source: IEA Energy Statistics, <http://data.iea.org/ieastore/statslisting.asp>

Dynamic development of the petroleum products market is characterized by a fierce competition. In this fight wins those companies that optimally exploit the advantages arising from the market conditions. In this context, it is understandable the aggressiveness shown by oil companies to win new markets. Likewise, many of the relations between states are based on interests related to the black gold, this becoming a factor of the economy and world politics which cannot be ignored (in Figure 35 we can see the world oil circuit complexity, having in the center the Middle East and the USA).

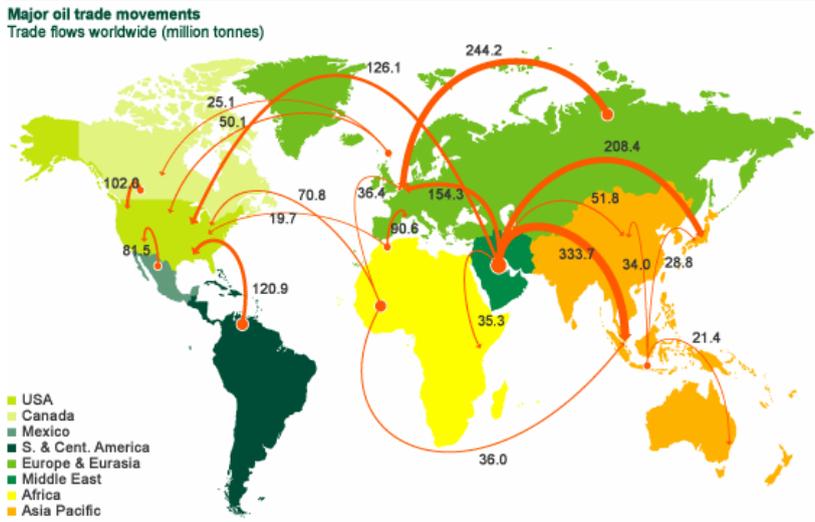


Figure 35 Global oil circuits

Source: CSIS, Energy Security in Changing Global Marketplace, JDA Executive Program, March 2006

3. DETERMINANT FACTORS AND TENDENCIES OF THE EVOLUTION OF OIL ON THE INTERNATIONAL MARKET

One of the key-element which is determined by the economic growth, but which can also determine it, is oil.⁶⁸

The experts of the Goldman Sachs European banking institute announced in 2005 that oil prices will soon reach the threshold of \$100 per barrel, at the time the price being of just \$50 per barrel. If at that time their words were not credible, two years later these predictions came true, in the last days of 2007, when the price per barrel of oil reached \$100. Among the causes of this spectacular leap of the black gold price are included: the attacks on oil fields in Nigeria, low international reserves, the slow-down of the U.S. economy. Also, the weak dollar rate affected in a negative way the evolution of the oil prices, given that the dollar is the reference currency worldwide in calculating the price of petroleum. Not least should be considered the growing demand for this product in China and India. All these factors have led to the record level of the barrel price, leading for the financial markets to estimate more and more an oil barrel priced at \$200. By the second half of 2008 predictions seemed to come true but with the start of the economic crisis, we could see a price collapse even up to 40 dollars per barrel. Given the evolution in time of the oil prices, this would no longer surprise, but the problem which arises is the course that the oil prices will follow and the implications that this implies.

Oil price increase from 10 to over 147 dollars a barrel over the last decade, virtually changes the wealth and influence map of the nations and industries in the world. On how the oil market will evolve in the future have been made a variety of studies, scenarios and speculations. However, in order to predict the future we need to know the past, and one of the oil history lessons is to expect to surprises.⁶⁹ Regarding how well the world economy is prepared for potential oil crisis, we see that after the shock in 1973 is clear that the big oil companies will not be able, but also will not want to manage these crises. In the years that followed the first oil crisis, the governments of developed countries have developed energy security systems, built around the International Energy Agency and deposits with strategic stocks, such as Strategic Petroleum Reserve in the U.S., and some others alike in Japan and Germany, which would come into operation in the event of major disruptions on the market. While developed countries have succeeded in time to have a controlled reaction in the event of market disruptions, they do not remain indifferent to the attempts of some of the oil producing states to dictate the direction of the oil market. We have as examples the Gulf War and the conflict in Iraq, explaining the bringing again on the agenda of world's countries of the issue regarding the security of a continuous oil supply. Security of oil supply sources are translated also through the development of major

⁶⁸ Nicolae Al. Pop (coord.), *International markets research*, Documentary study, Ed. ASE, Bucharest, 2006, pp. 7

⁶⁹ Murzakova, Angela, *International flows of oil and oil products in conditions of new geostrategic challenges*, Ed. A.S.E., Bucharest, 2006, pp.137

investment projects in countries like Russia, which can partially substitute oil trade flows of the Middle East in Asia and Europe, through development of oil extraction in the North Sea, Mexico and Alaska, through modernization of the refineries in North America and Japan, that can process heavy crude and sulfur oils.

Given that oil resources are located in regions different from those of consumption, on the organization of trade flows will depend, ultimately the economic development.

3.1. Determinants of the evolution of oil price

Experience over time has given us some expensive lessons about the energy market in general and particularly about oil's market. Price development of the most important commercial product is nowadays influenced by several factors.

The energy resources prices are extremely sensitive, being influenced by various events from any part of the world. If over time the oil price has known fluctuations, in the year 2008 it exceeded \$100 / barrel (fig. no. 4), although there were few who did not believe in it's so fast growth. But for the economy, such an increase in oil prices was, as the economist Brian Bethune said, "like sand would be thrown in the economy wheels."

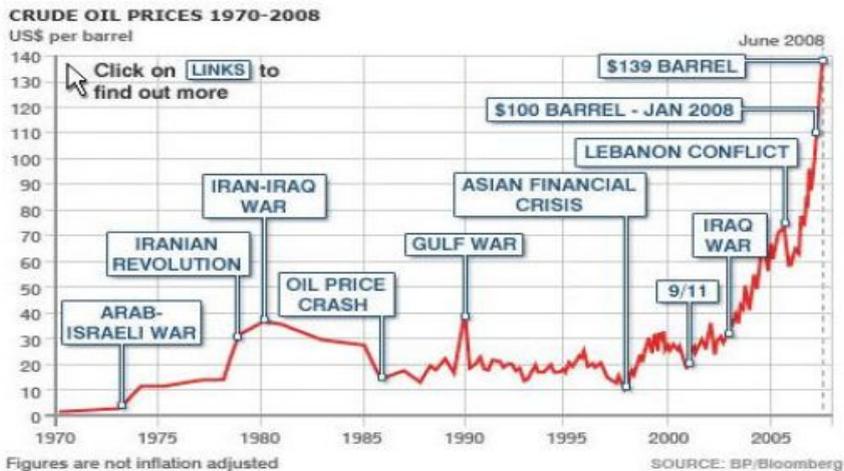


Figure 36 *The evolution of oil price during 1970-2008*

Source: Bloomberg Markets Magazine, www.bloomberg.com

Fluctuations in oil prices are notorious; they have been always difficult to predict. As a result, the international actors, in order to take part in decisions of international oil pricing, gathered in Organization of Petroleum Exporting Countries (OPEC) - which manages the quantities produced by the member countries and parallel markets: NYMEX- New York, SIMEX- Singapore, IPE-London. Parallel markets can influence the international price of oil and can counter OPEC's decisions. Meanwhile, oil producing nations spotlight on them, having an important word to say in terms of oil prices and international oil flows.

At present, mainly due to the economic crisis which inevitably influenced the oil market, it is difficult to make predictions about the evolution that oil price will follow. If there are some experts who believe that the price will drop considerably, others believe in an upward trend of the price. OPEC's task is to develop an unique position in order to limit the influence of big oil companies on the market and in order to have a certain control on the market. Who is in control holds the financial power, and oil prices are subject to remarkable fluctuations in periods when there is a market failure or a surplus product. Manipulating the volume of supply in order to maintain a high price of oil on the market destabilizes the situation on the market. In general, price increasing always coincide with a political conflict situation in the area.

The oil price and the price of other products and services reflect the fundamental production costs and also the market conditions at all stages of production and distribution. Thus, oil prices reflect:

- raw material, crude oil;
- transportation from the operating field to the refinery;
- processing of raw materials in refined products;
- transportation from the refinery to the consumer market;
- transportation, storage and distribution from market distribution centers to retail outlets or consumers;
- market conditions at each stage of merchandising and the local markets.

Oil prices are formed also as a result of thousands of transactions taking place simultaneously worldwide, at all levels of the distribution network from producers to individual consumers. The oil market is essentially a global auction- the strongest auctioneer will win the offer. Like at any auction however, the auctioneer will make every effort in order to pay the lowest price possible.

Generally, the price of oil is determined by the supply and demand conditions on the global market. Energy prices in general and oil prices in particular have a major impact on economic growth in developing countries, taking into account on one hand, limited alternatives for access to other energy sources and, on the other hand, the lack of financial resources for investment in energy conservation, these countries being vulnerable to large swings in energy prices.

If there is the belief that the offer is the one that largely determines the oil price, we can see especially lately, how the demand may have an influence almost as great. Not least, speculations may amplify changes occurring in the oil price. However, given the importance that oil has in the world energy balance, it should be noted that the high price of oil does not necessarily lead to increased competitiveness of other energy sources.

3.2. The dollar exchange rate influence on the oil price

The implications of fixing the oil price in a single currency are much larger than it seems at first sight. Some oil producing countries ask their customers to pay in euro, but this does not mean that their oil is priced in euro. And even if prices in dollars would be replaced by euro, the impact of rating in a single currency would be the same.

While oil-exporting countries receive revenues in dollars (or their equivalent in euro), they use different currencies to import goods and services in various countries. Any change in the exchange rate of the dollar affects the purchasing power of these countries and therefore their real income. Similarly, international oil companies sell most of their oil in dollars, but operating in different countries, they pay some of the costs in local currency. Any change in value of the dollar affects therefore cost structure and profitability. This in turn affects investment in exploration, development and maintenance.

The relationship between the value of the dollar and the oil price is very complex. The two can influence each other, producing a vicious circle, but their short-term relationship is different from the long term one. In the short term, dollar depreciation does not affect supply and demand, but speculation and investment affect the oil futures market. As the dollar declines, the merchandise, including oil, attracts investors. Investing in futures becomes both a hedge against a weaker dollar and an investment vehicle with substantial profit potential; especially in an environment where production capacity is not very large, the demand increases, the interest rates go lower, the real estate market is decreasing, and the banking system is in crisis. But on long term, statistical analysis of the oil industry variables shows that a weaker dollar affects supply by reducing production, whether oil is owned and produced by national or international companies. A weak dollar affects demand also by increasing consumption. The result of decreasing supply and increasing demand is a higher price. A low dollar rate reduces the purchasing power of oil exporters. If the nominal price of oil remains constant, the real income of oil producing countries declines, resulting in less investment in additional capacity and maintenance. This is also available for oil companies. Consequently, oil prices rise.

4. CONCLUSIONS

Oil remains a topical issue, causing the interest of small and multinational corporations, of the private business leaders and those leading state interests. As demonstrated by the conflicts that took place in 1991 and 2003, oil is the essential element of national power, a factor of utmost importance in the global economy, a decisive force in world affairs, a hotbed for conflicts and wars. The explosive development of oil production and also its absolute share in the energy balance of the world has led to a real oil policy.

Oil industry in the global economy has a special place, given that most industrialized and technologically advanced countries are large energy consumers. The duty of an uninterrupted supply of energy resources remains a priority direction of economic policy in any country. Spontaneous fluctuations in oil prices and oil products lead to profound changes in the structure of the global economy and periodic energy crises affect the economies of all countries of the world without exception. Oil companies and governments strategy is influenced by different perceptions and estimates regarding the future of the world oil industry.

Of course, most investors identify China's increased demand as one of the main drivers of increasing prices, but experts point out that also industrialized countries consume a substantial part of the volume of oil daily extracted. Surprisingly however, is that the international economy does not seem to be affected very much by events on the oil market. One explanation for this phenomenon seems to be the efficiency with which each barrel of oil is being used today to cover the same consume, today being necessary only half of the required amount of oil from 30 years ago.

Old oil companies are today into mergers, consolidations and concentration on principal activities, giving up the operations they have used during high oil prices. Thus, they look forward to strengthen the role seeking new cooperative arrangements with oil exporting developing countries. In a general sense it cannot be said that there is a world market of oil cartel, but more an oligopolistic structure, which includes many companies, but only a few powerful transnational companies which may influence the market and especially the price of petroleum and petroleum products by their decisions.

We can see that a research which has oil as the main subject is dynamic, always with new elements. A theme dedicated to the main energy source for most of the countries, upon which all modern industry relies, is a topic of interest, which calls for continuous research and information.

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THE REGIONAL CLIMATE OF FOREIGN DIRECT INVESTMENTS IN ROMANIA

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***Abstract:** The paper aims at identifying the development regions in Romania (corresponding to NUTS III classification), which have similar patterns regarding the investment environment and how these similarities evolved from 2006 to 2008, one year before and one year after becoming a member of the European Union, respectively. Using a cluster analysis technique, we found that the regional disparities increased. In 2008, the areas that contained agglomerations of foreign direct investments attracted even more foreign capital than in 2006 (the capital region and the Western regions) and the areas that lacked investments before are now even more behind the leading regions (the Eastern and Southern regions).*

***Keywords:** Foreign direct investments, Regional disparities, Agglomerations*

***JEL Codes:** F21, F2, R11*

1. INTRODUCTION

While companies cannot survive in isolation, multiple connexions with other companies enhance competitiveness. The more a company can use the externalities created by the other actors, the more it can improve its efficiency and become more competitive. The geographic proximity to the entities that the company has connections with, brings a large variety of advantages, starting with the possibility to communicate more easily, (establishing long term and close relationships, creating spillovers) and reducing the costs and the time of transportation, etc (McCann, 1998). There are also important synergies created, like workforce attraction, professional training, enhancing labour competitiveness and stimulating innovation. These are advantages that are expanded when there are more companies in the area and when these companies are more efficient and competitive. Pelinescu, Rădulescu (2009) certify the role of other transnational companies (TNCs) in attracting foreign direct investments in Romania, sustaining the fact that a good level of foreign direct investment is an essential condition for the countries (especially the less developed) to become more competitive by producing more efficiently and by getting well integrated in the global economy.

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Therefore, an important factor for developing agglomeration economies is leading foreign direct investments to certain geographical areas where is more need for capital inflows, suppliers, work places, technology spillovers, etc. Revising a spatial distribution of the transnational companies established in Romania, in the general investment context, offers a first view over the investment agglomerations, location opportunities and regional disparities.

According to Bălan (2010), Romania began the transition process with a relatively low level of regional disparities, compared to the other member states. Nevertheless, the gap expanded on a high rhythm (in terms of the index of regional disparity calculated by the National Institute of Statistics), especially between the Bucharest-Ilfov region and the rest. The focus is on the emigration of the Romanians in Western European countries and the internal migration after the revolution in December 1989. This process increased the regional differences, created many labour shortages and changed the general local conditions and patterns for foreign investments. However, the earnings that were brought by the Romanians who worked abroad increased the internal consumption and created new market opportunities for foreign investors. Constantin and Diminian (2007) believe that the economic policy should be centred on the sectors that can add more value to the labour force, which is more qualified, obtaining a competitive advantage, as a solution to diminish migration and regional disparities. Implicitly, he advises the attraction of the foreign direct investment in these sectors. Părean & Oțil (2009), on the other hand, consider that the need for foreign investments is stronger in areas where the technological lag is larger. Regardless the causes and the effects of regional disparities, the purpose of this article is to describe the regional investment environment.

In this paper, by applying a cluster analysis technique, we intend to detect the development regions that show similar, homogenous patterns according to a number of indicators that describe the investment environment. Our intention is to identify the similarities between the eight development regions as investment destinations in two different time periods. Firstly, the year 2006 was an extremely growing period, with high investments, both domestic and foreign, obtaining an important growth in the GDP. Secondly, 2008 stood at the beginning of the economic decline in the context of the global financial crisis. The analysis also contains an assessment of how the regions cluster together according to common characteristics and the cluster composition is modified over the two periods concerned.

Data analysis methods have the advantage that, comparing to the econometric methods, the variables are not separated into explanatory and explained, which permits all the influences to be represented in the same vector space (Gabor, Ștefănescu and Conțiu, 2010). Lefter and Constantin (2009) also use a descriptive method in order to show the economic disparities in Romania among the eight development regions, the principal components analysis. Along with other descriptive methods, cluster analysis

can be used to identify the basic dimensions or factors that explain correlations among multiple variables. Therefore, it can be introductory to the classical explanatory analysis. Nevertheless, this is not among the purposes of this paper.

The paper is structured as follows: the first part consists in a specification of the used methodology and data, the second part is a description of the regional clusters that were obtained in 2006 and 2008, making a brief comparison and the last part contains the conclusions of the analysis.

2. METHODOLOGY

Cluster analysis identifies similarities among a set of objects, according to a set of characteristics that are equally important. Through this method we cannot establish how certain variables determine the evolution of others. The purpose is to obtain a number of groups, named clusters, which have the most common features from the set of given variables.

Due to the fact the variables are expressed in different measure units, we have applied a standardization procedure. Therefore the variables must be comparable. Standardization also has the advantage of eliminating extreme values, which unifies the variables' influence. This is important because, if extreme values were kept, some variables would have a more significant influence than others and the results would be improper. The standardization method that we used consisted in the following formula:

$$\frac{\text{the current value of the variable} - \text{average value}}{\text{standard deviation}}$$

In order to determine the regional clusters, we have used the Ward method, first of all because it is a hierarchical clustering method and the only method in which the distance between clusters is evaluated by maximizing the degree of the clusters' homogeneity or by minimizing the variability inside the clusters. The degree of homogeneity of a cluster is considered to be the highest as the total sum of the within cluster square standard deviation is the smallest.

In Ward's method ("of minimum-variance"), the distance between two clusters is calculated as the sum of squares between the two clusters added up over all the variables. At each generation that it determines, the within-cluster sum of squares is minimized over all partitions obtainable by merging two clusters from the previous generation. The sums of squares are then divided by the total sum of squares to give proportions of variance (squared semi partial correlations), in order to be easier to interpret.

The hierarchical clustering methods group the observations two by two until all of them are compound into a single cluster. It has been decided, in this study, to focus on a certain number of clusters to obtain a clearer comparison between the two years. It keeps only four clusters, which group the eight development regions, because it was

considered that half would be the optimum number of clusters. If they grouped two by two, there would be a very equal distribution and if, oppositely, we obtained a cluster containing three regions or more and other cluster(s) with one region, clearly the disparities would be larger.

The output from the hierarchical cluster analysis is graphically represented into a 'dendogram', which is a diagram that shows each step of the final cluster composition using a tree shape.

Due to the fact that the groups of development regions should be based on a better similarity across all the variables, the Euclidean type of measurement of the distance between clusters was used. The Euclidean distance emphasizes the outliers, which describes extreme values. The same method was used in some studies from the same reason (Wolfson, 2004, Gutierrez & Sorensen, 2006).

Through the variables that we used, we intended to obtain a good description of the foreign direct investments that were made at regional level in Romania, in the general investment climate. In this regard, we chose to run the cluster analysis of the development regions according to four indicators: the share of FDI (foreign direct investment) in the total investments, the share of FDI in the gross domestic product, the FDI per capita, and the share of TNCs in the total number of companies. The amount of FDI that is already present in Romania is an important factor for the future attractiveness because it offers multiple advantages: scale economies, available business networks, a developed market, available inputs, qualified work force, connected services, possible spillovers, etc. The analysis offers conclusions regarding the regions where the most important FDI agglomerations exist and what are the differences between each other's scale. Several authors have proved the existence of the agglomeration as a precondition for the location of FDI: Pusterla and Resmini (2007), Roberto (2002), Hilber și Voicu (2007), Trăistaru (2001), etc.

3. RESULTS

Bucharest-Ilfov is clearly the leading destination of foreign direct investments in Romania. The gap between this region and all the others is very significant in both periods. The capital area is the most developed, hosting the largest amount of qualified labour, the best universities and research centres and all the advantages searched by investors. A very important asset, which is still lagging in the whole Romanian territory, is a well developed infrastructure. Even if the cost of land and decongestion represent a motivation to locate a business away from the capital region, the issue of difficult transport operations keeps the investors as close as possible to the most developed area of the country. The underdevelopment of the other regions is derived from the past monoindustrial areas that were caught unprepared by the liberalisation process. These companies' failures left entire areas with too little economic activity, which does not bring sufficient added value. Being the most different region comparing

to the others, the Bucharest-Ilfov consists in the last cluster and is added last to hierarchical grouping in both years.

In 2006, the first cluster that was formed contained three regions: Nord-Vest, Centru and Sud. The second cluster, also having small inner distances between its components, contains the Sud-Est and Sud-Vest regions. The first cluster that is formed is the one that has the smallest Euclidean distance among its components so it is not necessarily the most developed or undeveloped one. The components of each cluster are listed in Table 84.

Table 84 *The clusters formed in 2006 and 2008 by the regional development regions*

Cluster Number	Included Development Regions (2006)	Included Development Regions (2008)
1	Nord-Vest, Centru, Sud	Nord-Vest, Centru, Vest
2	Sud-Est, Sud-Vest	Sud-Est, Sud
3	Nord-Est, Vest	Nord-Est, Sud-Vest
4	Bucharest-Ilfov	Bucharest- Ilfov

Source: own calculations

The Sud-Est and the Sud-Vest are the two most unattractive areas for investments in 2006. In 2008 the stock of FDI increased considerably in Romania, due to the entrance in the European Union, offering new interesting opportunities for green-field investments. A series of large privatisations that were made in this interval also had an important influence. The composition of the most unattractive cluster changed, including the Sud region instead of the Sud-Vest, while the Sud-Est remained. The fact that the Sud-Est has such a low amount of FDI represents an unexpected result, because it contains large sea ports such as Constanța, Mangalia and Danube ports like Galați and Brăila. Nonetheless, the Sud and the Sud-Est are areas with less and newer industries. Improvements are expected to take place in the Sud-Est because of its harbours' activities reflect the success of the whole country, but also due to its touristic potential in sea resorts and in the Danube Delta. The region's specificity is represented by the largest development gap between the industrialized counties (Constanța, Galați, Brăila) and the counties that use mainly the local resources (Buzău, Focșani, Tulcea) as well as the development gap between the rural and the urban areas.

In 2008 the Sud attracted less foreign direct investments, comparing to other regions, than it did before, despite of its good position that surrounds the capital region. Looking at the percentage of FDI from the GDP and the amount of FDI per capita, the Sud is on a better position, but the share of FDI in the total investments is very low. The Sud is still very much relying on agriculture and it is characterized by significant natural resources and geological complexity, being known worldwide for the oil in Valea Prahovei. During the years, the industries developed in the region were quarrying, manufacturing and their derivative industries. The same region has a good commercial activity, bringing a high contribution to the country's external trade. The

leading county is Argeş with the highest inward FDI, attracted especially in the car industry.

The Sud-Vest region improved its position, moving in the second less developed cluster, together with the Nord-Est. These are most isolated areas with little traditional industry and little assets to privatise. The work force was concentrated on very narrow array of professional activities, being hard to obtain a reconversion after the collapse of the local industries. The Sud-Vest region offers an important part of the country's energy production through its numerous hydropower plants. A special resource that can attract tourism is represented by the thermal waters. The development of the river transportation system is also an interesting perspective.

Due to the poor infrastructure, the Nord-Est is also difficult to be reached from the most developed areas in Romania. The infrastructure has seen a certain improvement in the past years but it is still not proper for an intense economic activity. The isolation is a principal cause for the lack of interest in this area in what the investments are concerned. The problem of the infrastructure is present in almost all the Romanian regions, but the Nord-Est region stayed behind the others mainly because the others grew faster. In this precarious situation many of this region's inhabitants have emigrated into other countries, fact that left the area with a progressive shortage of skilled labour force. The potential of the Nord-Est region consists mostly in the development of the construction and the additional service sector as there is a high level of population with growing incomes. The touristic potential, both rural and urban, is very significant and beginning to be exploited more and more in the Bucovina, Piatra-Neamţ and Iaşi regions. The most developed pole in the region is Iaşi, an important university centre and one the country's most important cultural and economic centres. The human capital is the most abundant resource of this region and it primarily needs to be exploited.

The development of the western regions has its origin in its traditional urban university and research centres and their proximity to the oldest European Union members. From the indicators that were used in the analysis, the share of TNC in the total number of companies has reached the highest level for this region, after Bucharest-Ilfov. The Vest improved its investment environment and formed a cluster with two more developed regions. Instead of Nord-Est, which was the most appropriate region in 2006, the Vest was more similar, in 2008, from the point of view of investments, to the Centru and Nord-Vest forming a more compact geographic area. Nevertheless, the attractiveness of the Vest region remained on the same position being included in the second most attractive cluster after Bucharest-Ifov. The Centru region has a high percentage of heavy metal industry and mining, which have decreased in production facing the external competition. Nonetheless, an improvement has been made in this area in regard in the last period of time bringing the Centru in more attractive cluster in 2008. The region has also begun to concentrate more on the food

industry and tourism where it is gaining more competencies. The leader county in this region is Braşov, which has traditionally been a leader in many economic, cultural and touristic activities within Romania. Sibiu has also begun to obtain its well deserved international renown for its touristic attractions and traditional products in food industry and crafts. The area's remarkable hydropower energetic resources still leaves place for further investments.

The Nord-Vest has met a similar evolution during the analysed years, growing in a superior cluster, although it remained behind the Centru region. Its geographical position brings the advantage that the region stands at the entrance from both Hungary and Ukraine into the regions of Romania. The transport corridor continues with Bulgaria, Serbia, Moldova and the Black Sea ports. It is an area with immense natural resources: wood, argyle, ore but with few energetic resources. A major part of the attracted investment was determined by the facilities offered by the government in the programme referring to disadvantaged areas.

Analysing the evolution of the Romanian regions under the influence of inflow of foreign direct investments, Voicilaş (2007) also found enormous disparities among the capital region and all the other regions. The less developed regions that he identified were the North-East and the South-West and the most developed and attractive regions were the South and South-East. The most important foreign direct investments were done in the Bucharest-Ilfov region and the second most important amount was drawn to the South. The least interesting regions, from the investors' point of view, were the East and the West.

In Romania, the stock of foreign direct investments increased by 41.57%, from 2006 to 2008. The fast growth of this indicator was due to the expanded integration of the Romanian economy in the international economic environment simultaneously with attaining the European Union membership. Nevertheless, the increase in the stock of FDI reached only the level of 21731.50 million Euros in 2008. In the same time, the net inflows improved only with 4,82% in the two years period, which is not a satisfactory effect of the foreign direct investments policy. So the increase in the stock of FDI is the result of a rather constant foreign capital accumulation.

Designed as regional development measures, the European pre-accession funds (PHARE, ISPA, SAPARD) were lead more to the public administration and institutions rather than to regional development measures (Lefter, 2009). According to the agglomeration effect, the foreign direct investments were attracted mainly in the most developed areas, widening the development gap. This process was sustained and accompanied by the need of proper and sufficient regional development programmes.

Our results indicate an increase in the disparities among the development regions' indicators regarding the investment environment. The gap that expanded mostly is the one between the Bucharest-Ilfov region and the others. The polarization of the economic activity around this area determined migratory phenomena, fact that

creates long term distortions. The other regions are left without sufficient qualified work force, which acts against the FDI attractions. On the other hand, the regions grouped into more compact clusters, with lower inner discrepancies than before. Also, the new cluster map shows a better regional grouping along the national borders. Instead of having in one cluster two or three regions from different corners of the country, in 2008 only neighboring regions cluster together. This shows a more mature setting of the investment environment with a more clear characterization of the specificities of each development region and geographic area, perhaps a deeper specialization of each region, as well. Botezatu (2007) also recognizes the influence of the proximity to the other EU members at the Western border.

According to Părean & Oșil (2009), the regional disparities are the cause of the technology gap, the small and medium enterprises limited access to financing, the common conceptions of the people regarding business and the area accessibility and potential. Nevertheless, our analysis cannot indicate the causes of this process, it just shows the enlargement of the regional gap in what investments are concerned. Several empirical studies (Marelli, 2004, Overmans & Puga, 2002) sustain the expanding importance of the regional differences as well as economic and policy relevance at regional level.

Botezatu (2007) considers the capital city a catalyst for the development of surrounding rural communities, taking the predominant agricultural activity as the cause of the underdevelopment in regions like the North-East. The small level of services and industrial activity also determine the lack of interest of the investors for these areas.

4. CONCLUSION

The cluster analysis of the foreign direct investments in the eight development regions in Romania in 2006 and 2008 has shown the similarities of these regions in terms of investment patterns, bringing out the evolution of regional disparities.

In the interval 2006-2008 a further concentration of the investment activity took place around the capital region, leaving the Nord-Est and Sud-Vest regions even less attractive for foreign investors. The analysis does not provide the possibility to see what is standing behind this process but it is obvious that the efforts of the regional policy, which was applied so far, have proved to be inefficient. Even though there wasn't any data available at industry level for each region, we tried to explain the current development of the investments through the historical specialization and the specific assets and resources.

After becoming a member of the European Union, the regions from the Western border obtained a better integration in the investment environment among the older members. These regions have shown more similarities in 2008 comparing to 2006

proving that the common advantage of being close to the Western border indeed determines a growth in the investments.

In the context of the regional policy led by the European Union, which were meant to reduce regional disparities by improving the development of each region, Romania has obtained an increase of the foreign direct investment gap. The rather small attraction of new FDI shows that the conditions for developing new businesses has not sufficiently improved in the unattractive areas of the country, while the fact that most of the investments were drawn by the areas that have always hosted the highest percentage of investments shows that clusters are more attractive due to the advantages provided by the existent business connections. Nevertheless, the macroeconomic climate is the first cause of the weak investment evolution at the whole country level.

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BAD CATEGORIZATION KILLS GOOD MARKETING STRATEGY WHY PRODUCT CATEGORIZATION IS IMPORTANT IN ELECTRONIC COMMERCE

Sorana Varvara MITYKO *

***Abstract:** The Internet has become a great catalyst in the advancements of completing transactions independent of the time and space barrier. There is little consensus on the understanding how products should be classified and the vast number of models the literature provides makes it challenging for retailers to correctly use the element of product type in their marketing mix. The objective of this paper is to examine the existing classification models and illustrate the advantages and disadvantages of some selected models. The selection was made by choosing models which differ in the methods used in the respective studies, the unit of analysis and in the way the data has been interpreted by the individual researchers. The conclusion of this paper is no model is perfect and therefore it is vital that the scientific community agree on a standard, which can be used by all parties involved in the transaction.*

***Keywords:** Product Classification Models, Marketing Strategy, Electronic Commerce, Product Category, Literature Review*

***JEL Codes:** M31, L81*

1. INTRODUCTION

Product categorization has started to play a vital role both in the way the consumer searches, buys or evaluates a product and in the way the firm advertises or sells its products. If a decade ago the every day consumer was not very internet or e-commerce savvy and was satisfied with just one plain website offering for sale a couple of products – with limited customization possibilities – as an alternative to shopping in the traditional physical store, nowadays the expectation, needs or customization requests have increased remarkably. Firms now see themselves almost backed into a corner to sell their entire assortment carried in the traditional store – if not more – and at the same time they have to ensure their customers find in the online store what they want and as fast as possible. This calls for a rigorous categorization mechanism both internally – inside the company – and externally.

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The Electronic Commerce research combines – maybe like no other discipline – researchers and researches from different fields. While computer scientists are mainly concerned with electronic commerce artefacts, researchers from other disciplines, such as information systems, economics, psychology or marketing, are primarily interested in examining phenomena enabled by those artefacts, such as product suitability for the electronic commerce platform, product categorization, purchase decision making process, customers' attitude towards websites and shopping online, perceived risks or readiness and willingness to adopt new technologies.

The second chapter presents the methodology which has been used to select the classification models which constitute the content of the following chapter. The third chapter analyzes some selected product classification models and presents the challenges companies face when confronted with the multitude of categorization mechanisms. The fourth chapter aims at showing how poorly chosen classification systems can negatively influence the marketing strategy by analyzing the different systems and illustrating the practical implications their adoption would have for specific companies or industries. Chapter five summarizes the conclusions of this paper.

2. METHODOLOGY AND OBJECTIVES

The purpose of the literature review is to provide the reader in a concise and consolidated manner an overview of the existing product classification models. Since their number is increasing day by day, the analysis proves to have specific characteristics and only lists the major, ground breaking models developed by researchers in the past eight decades. The selection of the classification models introduced in chapter four has been made on a quantitative basis of how many other studies have cited the individual models and on a qualitative basis of how different they are in the units of analysis and presented findings. The literature review does not follow a chronological approach; instead the method used is thematic. The query has been made in the following scholarly literature databases: ABI/INFORM®, JSTOR®, Elsevier®/ScienceDirect®, WilsonWeb®, EBSCO host®(Business Source Premier) and the reference lists of each article were reviewed in detail to find additional articles. Both forward references search and forward authors search have been applied. Case reports, white papers, editorials, letters, and commentaries were excluded. The review process was conducted in two steps. First abstracts were examined according to the eligibility criteria, consulting the full article if in doubt about the inclusion or in case the abstract did not highlight clearly the objectives and conclusions. In a second step, all full-text papers of the selected articles were read to finally decide about inclusion and to order it thematically and in context with the previous encountered articles. In total 271 articles have been analyzed, out of which 52 papers have been ordered thematically, by the specific classification model they represented.

This paper aims at providing an insight into some of the existing categorization systems available, presenting the way in which marketing strategy is dependant on product classification and vice versa and providing an insight into the dangers they

could pose if not used synchronized with the company's overall marketing strategy and values.

To summarize, the following questions are investigated:

- *What are the major product classification models?*
- *What are the advantages and disadvantages of the selected product classification models?*
- *How dependent is the marketing strategy on product classification and why?*

3. RESULTS

3.1 Diversity in the electronic commerce research

Today, online marketing is as common as direct marketing while companies advertise for and sell their products both on and offline. The research conducted by the author until present found no standardized model to explain why certain products are predominantly sold online or why consumers prefer to purchase specific products on-rather than offline. Moreover, there are no standardized models which can be used, by both consumers and producers, to classify the products.

If the literature research done by the author showed that between 1996 and 2006 more articles were dissecting the issues of product-related e-commerce adoption issues from the seller's perspective, the researchers decided after 2006 to invest more time in finding out what the adoption issues from the buyer's perspective are, i.e. trust, privacy or retailer's reputation. Two historical facts justified selecting 1996 as the starting point. First, the International Journal of Electronic Commerce, the best-known journal in the field, published its first number in 1996. To effectively compare diversity across the journals while ensuring the quality of publications, it was necessary to omit issues of other journals published before 1996. Second, as demonstrated by Ngai and Wat's study of nine research journals, the number of articles on electronic commerce has substantially increased since 1996 (Ngai and Wat,2002:420).

During the research for the conducted literature review it has been noticed that the angle has shifted from the seller on to the consumer. While it is true that the drivers behind the success of e-commerce are the individual buyer and the ability of internet retailing to fulfil his/her needs, attention must be paid in the exact same amount as before to the seller's side, and to the innovations which can bring customer satisfaction to higher levels or increase the positive shopping experience. The buyer and seller perspective are therefore closely interlinked: one cannot be researched in depth without taking into consideration the other.

A content analysis conducted by the author over the period of 2010 and the first eleven months in 2011 showed that scientific journals such as the Journal of Electronic Commerce Research (Issues 21, 42, 43 February, May, August 2010, Volume 12 Number 1, 2 and 3 in 2011), the International Journal of Electronic Commerce (Volume 14 Number 3, Volume 15 Number 1 and 2) or Journal of Theoretical and

Applied Electronic Commerce Research (Volume 5 Number 2 and 3) have published articles on topics such as online auctions, secure and encrypted paying systems, protection of intellectual and property rights, consumer comparison shopping, globalization of the e-commerce system and the effects cultural differences have on the adoption issue, consumer value creation or models to build trust and loyalty in the e-commerce environment.

Table 85 *Overview of the journals published in the Journal of Retailing over the past 10 years*

	Regular articles	Special Issues Articles	Invited Articles	Editorials	Total
2002	15 (2)	7		1	23
2003	21 (1)				21
2004	21 (6)	3	2	2	28
2005	22 (4)		3	1	26
2006	31 (1)			1	32
2007	20 (3)	10		4	34
2008	34 (3)	(1)		3	38
2009	38 (6)	7		4	49
2010	36 (3)	3 (1)		4	43
2011	38 (3)			3	41
(e-commerce)					(32)

In the period of 2002-2011 the Journal of Retailing has published articles tackling a host of conventional issues (see Table 85), such as understanding online information search patterns for search versus experience goods, retail and market characteristics that may explain price dispersion on the Web, and service quality. But in addition, research has confronted novel issues pertaining to the specific problems posed by Internet retailing, such as privacy, as well as the unique opportunities provided by the Internet, such as interacting with others using online chat, forums, and reviews or buying merchandise through online auctions. What is the impact of Web site design in terms of enhancing consumer stickiness to the site, how do integrated marketing communications moderate these linkages, and what factors influence a consumer's choice of the Internet versus a conventional channel are only a few of the major questions for which answers are investigated by the majority of the (e)-retailing marketing journals.

When it comes to product categorization models, the literature provides a vast array of choice. There are several models, which use the same ground principles, but do not deliver the same result. Depending on the object or unit of analysis, on the methodology used or data collected and interpreted, a different model is being used or an existing one is being extended to incorporate the research object therefore producing a new categorization model. While some models in the current literature focus on the classification from the consumers' perspective, which will lend products specific attributes, other models group products based on the products' attributes, which in return raise a certain reaction from the consumers.

A literature review has revealed 22 different streams of product classification from a total of 52 researchers. The next subchapters are presenting only a part of the multitude of product classification models available since 1920 until present. This paper is detailing on these models since they differ from each other in the way the product and its attributes is being perceived. The vast differences presented below will draw attention once more on the challenges that retailers face should they attempt to categorize their products.

The following selection has been made as the individual product classification models are relevant to build the theoretical foundations of any future researcher interested in analyzing the product classification topic. Each of them represents a key fundamental study, a cornerstone for any discussion evolving around categorization. The other studies which build on the below presented researches are only remotely relevant and are therefore mentioned at the end of each subchapters to support the selected model.

3.2 De Figueiredo (2000) Classification Scheme

The unit of analysis in this particular study is the product and the reaction it obtains from the individual consumer. Unlike other models, this classification is based on the information asymmetry between retailers and consumers in the electronic commerce environment. Starting from his statement “On the Web goods are not equal” (de Figueiredo,2000:42) de Figueiredo developed a product classification scheme arguing that products possess different attributes and different levels of the same attributes. His “Dot-Com Retail Continuum” lists on one end of the spectrum the commodity products, for products where quality can easily be assessed, articulated, presented and perceived. On the other end there are the “Look and Feel” goods with variable quality, for which the decisive element is the individual consumer’s perception, not the product’s characteristics or the available information. In between the author also defines quasi-commodity and “Look and Feel” goods.

For the commodity products – or undifferentiated commodities – the title and its specifications are enough to provide the customer with an exact definition of quality and what to expect. The consumers in the commodity products market care very little about the seller of this product, regarding the item as being standardized and having several alternatives to choose from (e.g. cooking oil, paper clips, wooden screws, nails or stocks and shares). The sellers of these products mainly compete on price and delivery conditions. (de Figueiredo,2000:43)

The quasi commodity products market has experienced the biggest increase in e-commerce. Books, videos, CDs, toys all fall under the same product category according to de Figueiredo. Vendors compete in the retailing of these products on price, delivery conditions and reliability. What is interesting to mention about these products is that they can easily fall into the category of commodity products: before ordering a book, the consumer has to have some ideas of the type of book he is looking

for. Once it is chosen, that book will be available at different vendors online and can be regarded as a commodity good. (de Figueiredo,2000:43)

When it comes to cosmetics, suits or furniture it is hard for sellers without a strong reputation and brand names to conquer the e-commerce world since these products fall into the category of “Look and Feel” goods. Examples include clothes and furniture. Although the products in this class are diverse, they all share a common characteristic, namely their quality is difficult to assess from a distance, requiring physical contact with the goods. The advantage of this class is that once a consumer is familiar with the quality he can expect from the product, there are few substitutes and alternatives available, like in the case of the commodity products. The “Look and Feel” goods differ from one another on several dimensions, including quality, look, outlay or reliability. (de Figueiredo, 2000:44)

The last product class on de Figueiredo’s continuum spectrum is the “Look and Feel” goods with variable quality. For these products, even after the consumer has completed his search and knows the brand and its reputation, the need to feel and see them are still there. Original art, used cars, collectables, fresh produce and grocery goods belong to this category. The goods are so different from one another because each consumer has his own preference and expectations on how ripe an apple must be or what kind of colour the watermelon has to possess. (de Figueiredo, 2000:44)

While this classification approach clearly differentiates between product attributes, it poses some difficulties in the process of ordering a product to a specific category. If a product present attributes from two categories, the choice that the marketer faces will not be supported by additional ordering mechanisms. This model is one of its kind, as it does not build on an existing model and no other researcher until present developed an extension to it.

3.3 Li and Gery (2000) Product Classification

The unit of analysis in this particular study is focused on the products’ attributes and characteristics. One of the first classification models was introduced by Copeland in 1923, with the convenience, shopping and specialty goods, the model being re-used by Edward and Richard in 1971 and Thirumalai in 2005 in their respective studies.

Other researchers who have developed extensions include Holton (1958) and Mayer et al. (1971), Holbrook and Howard in 1977, Murphy and Enis (1986) and Sindhav and Balazs (1999).

Li and Gery (2000) extend the initial model developed by Copeland and define four categories of products with the following characteristics (Li & Gery,2000:50):

- The convenience goods are products and services bought frequently, immediately, and without effort. Product impulse buying also falls under this category. Moreover, they require little brand comparison or information search and the perceived risk is low. Examples include food, sodas, toothpaste, haircuts, or dry cleaning.
- The shopping goods are those products and services which require substantial information and choice comparison prior to purchase. The price of this product class

is relatively high compared to the convenience goods one, and the perceived risk and uncertainty is higher. Examples include airline tickets, books, CDs, electrical goods, clothing, furniture or home improvement services.

- The specialty goods are characterized by unique features which require intensive information processing, are infrequently purchased and consumers' knowledge prior to purchase is high. The brand comparisons, as in the case of shopping goods, are similar to the convenience goods, but going into the opposite direction. Since there are few substitutes on the market, consumers know exactly what brand they wish to purchase and believe a different brand will not perform the same. Examples include Rolex watches, Tiffany jewellery, or high end handbags.
- Unsought goods are those products and services which consumers do not know about or do not purchase until the need arises, e.g. encyclopaedias or gravestones.

3.4 Peterson et al. (1997) Product Classification

One of the earliest product classification models that distinguishes between the offline and online distribution channels is discussed in this subchapter. Peterson's et al. (1997) elaborate product and service classification grid outlines along three dimensions the possible product classes, focusing rather on what a product could become, or what a product is perceived as than on the intrinsic value of the product (see **Table 86**).

- Belonging to the first dimension – outlay and frequency of purchase – the goods can either be expensive or inexpensive and frequently or infrequently purchased.
- The second dimension relates to the tangibility of a product, classifying it into either a physical, tangible one or an intangible, informational and service related one.
- The third dimension deals with the differentiation capability of a product and/or service characterizing a product by the degree to which it is differentiable. Furthermore, it reflects the extent to which a seller is able to create a competitive advantage through product differentiation. (Peterson et al., 1997:336)

Table 86 *Product and Service Classification Grid.*

Dimension 1 Outlay and Frequency of Purchase	Dimension 2 Value Proposition	Dimension 3 Differentiation Potential	Examples
Low outlay, frequently purchased goods	Tangible or physical	high	Wines, soft drinks, cigarettes
		low	Fresh produce
	Intangible or informational	high	Online newspapers and magazines
		low	Stock market quotes
High outlay, in frequently purchased goods	Tangible or physical	high	Stereo systems
		low	Precious metal
	Intangible or informational	high	Software packages
		low	Insurance

Source: Peterson et al.:1997:337.

The same dimensions have been used by Phau and Poon in 2000 and Kiang and Chi in 2001 in their studies.

3.5 Kiang and Chi (2001) Classification Model

The authors chose to model the problem of Internet marketing, its advantages and disadvantages, not by analyzing the individual product level, but by grouping products into categories. (Frag et al, 2007:159) Thus, following Peterson's et al. classification, Kiang and Chi structure products based on three dimensions: cost and frequency of purchase, value proposition and degree of differentiation. The value proposition and degree of differentiation concepts have been new elements introduced in the classification models literature up to 2001. The advantage of this classification model is that not only do the dimensions present two values, i.e. low/high cost, low/high frequency of purchase (Frag et al, 2007:160), but they also led the authors to investigate the effect these parameters have on the success of e-retailing. Based on these findings, marketers can easily relate their products to a category and the decision making process is being facilitated by the results of the study, i.e. a certain product's suitability for the online distribution channel.

3.6 Nelson (2004) Product Type Classification

One of the most prominent models of classifying products – as we will see in the next chapter – is the so called Search Experience Credence paradigm. The first distinction has been made by Nelson in 1970, namely between search and experience products. He develops a very simple theory of consumers' quest for information regarding products and their quality, in the sense that the consumer is always in search for product information in order to confirm the quality. If he cannot assess the quality just by the amount and format of information available, he will opt for trial experience. (Bei et al., 2004:451)

Products and/or services belong to the "search" category when full information for the dominant product attributes can and are known before purchase.

A good qualifies as an experience good under one of the following conditions: (1) direct experience is required for obtaining full information on the dominant product attributes; (2) the search for information for these dominant attributes is more costly or proves to be more difficult than the direct product experience. (Nelson,1974:730)

An important distinction is that the product's dominant attributes can be both search and experience attributes. If full information regarding them can be provided prior to purchase, a product characterized mainly by experience attributes can be qualified as a search good. (Nelson,1974:729)

In both off- and online shopping environments some product attributes are not readily available, attributes which are perceived by the customer as being important in the purchase decision making process. This happens either because the medium (e.g. online store) is not able to provide this information to the customer, like scent or texture, or the search costs incurred by the customer to find this information outweigh the benefit. (Degeratu et al.,2000:57) By classifying products into search and

experience, Nelson predicts that for search products pure information is sufficient, whereas for experience products, in case of lack of trial experience, the consumer will tend to opt for recommendations – the so-called post-trial experience – from others. (Bei et al., 2004:451)

3.7 Tractinsky and Lowengart (2007) Classification Concept

This classification concept concentrates on describing products along four continua of product characteristics: hedonic vs. utilitarian, experience vs. search goods, durable vs. non durable goods and convenience vs. speciality goods. The study's focus is on web-store aesthetics in e-Retailing, and this is the reason why the various types of aesthetics are associated with the different product characteristics. It is the first time that the product attributes can be classified as either hedonic or utilitarian. The aesthetics aspect has not been receiving much acknowledgement up to 2007, however consumers react based on first impressions, affect, emotions and perceptions (Lal & Sarvary, 1999:4) In a discussion as to what products are suitable for online retailing, the consumer cannot be left out of the discussion and therefore the fact that a firm could categorize one or several of its products based on the known reactions from its customers is a valuable addition to existing product type related literature. This model could be interpreted as a mix of two models presented in previous subchapters, namely that of Nelson (1970) and Copeland (1923). However, the study is relevant not necessarily because it develops a new classification mechanism, but because its findings are connecting product attributes to the web experience.

4. DISCUSSIONS AND IMPLICATIONS

If a company is to understand how to better align its product categorization methodology or culture with its marketing strategy, it has first to understand the concept of category management. Category management is not by any means a new concept, or one which is particular solely to the electronic commerce environment. Instead, it is a concept which is applied to both retailers and supplier and in which the range of products purchased by a business organisation (from a supplier) or sold by a retailer is subdivided into groups of similar or related products; these groups are known as product categories. There is no standard definition of category management, which leads to a certain degree of confusion among marketers and researchers alike as to what constitutes a product category.

The question arises why no standard is being used in product typology models. As the typology criteria are not fixed, it can prove challenging for firms to choose among the multitude of models available. The author of this study sees as reasons for this the following (Varvara Mityko,2011: 2):

- technology is constantly evolving, bringing about changes. Therefore, a standard – if one existed – would have to constantly be adjusted, deeming the initial purpose of the standardisation futile;

- online buyers become more and more confident with the act of purchasing products online, rendering some categorization criteria less important or even irrelevant;
- offline buyers' requirements change, bringing about changes to the existing products or raising the need for new products altogether, products whose attributes have not been considered in the existing criteria;
- an increasing number of customers feels the need to have customized products, which makes the categorizing exercise – if not futile from the start – a recurring job, which might increase a company's costs and inefficiency.

The question now arises how the marketing strategy fits into this context. Some could argue that if the marketing strategy is to be successful, no degree of categorization – fit or unfit – will spoil it. However, if the retailer did classify its products, should the same marketing strategy be applied to every category, or should the strategy differ depending on the product class. Moreover, should a firm deploy the same strategy to the two distribution channels, duplicating each activity in the specific channel or should a firm design for each channel a specific strategy and set accordingly the short-/longterm goals? When deciding on the investment amount, should both channels be considered equally important in terms of infrastructure (IT in the case of online and store-infrastructure in the case of the traditional retailing); R & D (website layout, secure environment, warehouses, transport efficiency); Advertising campaigns (ads on the internet could potentially produce less cost than print media). Before deciding to even choose the internet as a distribution platform, how does a firm calculate its odds in succeeding in the new environment? The answers to all these questions could be a simple one, namely choosing the right product classification model for its products, implementing it and then designing a tailored marketing strategy for each category and/or distribution channel, keeping in mind that the overall strategy of the company is to be followed and is not being contradicted by the sub-strategies.

One of the ingredients in the marketing mix is the product. Some researchers claim that this is the first most important ingredient. Therefore it is not hard to see why a faulty or a wrong kind of product categorization might have a counter productive effect on the success of the marketing strategy. Classification and strategy are intertwined, as depending on whether a certain product category is successful in the electronic commerce environment, the marketing mix ingredient “place” (or distribution channel) might be different. Product classification has implications for marketing decisions. For example, if one looks at Norton and Norton's (1988) or at Liebermann and Flint-Goor's (1996) distinction between durable and non-durable goods, this distinction is a reflection on the life expectancy of the product. These classifications have strategic implications to the producer because of many reasons: durable products are purchased infrequently and require personal selling; therefore the marketing strategy should reflect that. Perishable products need speedy distribution and

luxury goods can be priced highly, but retailers must be ready to offer the consumer either an extensive after sale service or an excellent return policy.

4.1 Advantages and Disadvantages of de Figueiredo Classification

If we were to highlight the advantages and disadvantages of the few classification models presented in the previous chapter, it would have to be said that de Figueiredo's model makes from the very beginning a clear distinction between the products which require additional senses ("feel" and "look"), senses which are not available in the electronic environment. Therefore it is of imperative importance for a retailer to order the products in such a way as to investigate if electronic commerce classifies as a valid distribution channel. On the other hand de Figueiredo's model is too vague and high level. It provides an aid for a first sub segmentation, but leaves much to be desired when a retailer has to tailor or design a marketing strategy for the "commodity products", "quasi-commodity products", "look and feel goods" or "look and feel goods with variable quality" categories. In addition, in the past decade the technology advancement in the electronic commerce area have been booming, allowing retailers to create a more convincing presence and giving them the tools needed to bring their customers closer. Therefore, the "look and feel" category should be renamed and defined in a new way, differentiating among those products which not only require touching, but involve other senses as well.

4.2 Advantages and Disadvantages of Li and Gery Classification

The starting point for this classification model is ideal since it creates categories to which the consumer can very easily relate to. The consumer will be able to clearly state what products are "specialty" and he/she will buy only when a specific need arises. The model is general enough that it can be applied to all industries and distribution channels; however it lacks particular description of the addressed scope. Moreover it can be considered as almost subjective, as depending on different circumstances, the category of the product is different. This is also the case for the price dimension, which would be the criterion by which consumers would put a certain product in the specialty or shopping category. The higher the income and the larger the web experience, the less degree of risk will be perceived by the consumer when buying a good classifies initially as specialty.

This classification concept not only presents four main categories, but also includes subcategories. This offers marketers with a wider range of ordering choices. Moreover, the concept can be easily applied by any firm by simply analyzing the product attributes and the product characteristics in the specific market, i.e. sales revenue, market share, frequency of purchase or competition analysis.

4.3 Advantages and Disadvantages of Peterson et al. Classification

One of the strongest arguments in favour of Peterson et al.'s model is that its distinction can be applied to not only categorize products, but also predict the degree of success of a certain product class in the electronic commerce environment. The retailer

could easily outline the marketing strategy based on the dimensions highlighted by the model, i.e. frequency of purchase or tangibility, which could determine the distribution channel. A disadvantage of this model is that the distinction is made only on the retailer side, i.e. the customer him/herself would not consider or classify the products the same way: for some consumers purchasing books online is a daily activity, while others would not classify books as something they “frequently” purchase. Just like Kiang and Chi’s model, Peterson et al.’s is ideal for developing a roadmap of a company’s marketing strategy, but it might not find resonance with the end user. This particular downside of the model could be solved by extending it and including certain selection criteria for each of the categories.

4.4 Advantages and Disadvantages of Nelson Classification

Traditionally, the search/experience distinction is based on the extent to which consumers *can* evaluate goods or their attributes prior to purchase (Nelson (1970) and Nelson (1974)). However, given that information search costs differ across channels, a search good or attribute through one channel may be an experience good or attribute through another channel. For example, the smell of flowers can be assessed prior to purchase in a bricks-and-mortar, but not an online, florist shop. The latter only offers visual aids with disclaimers from the vendor that the purchased good may be different in appearance when delivered and the pictures are for orientation purposes only. Consequently, using this paradigm in channel-related research (e.g., in an effort to match goods to channels) can present problems. However, in an effort to minimize potential situational effects of factors such as the channel through which the good is being sold, one could take a slightly different view of the search/experience distinction. Specifically, one could base the classification on the extent to which consumers feel they *need* to directly experience goods to evaluate quality. The greater the need to use one’s senses to evaluate a good, the more experience qualities the good possesses.

However, when analyzing the Search Experience Credence paradigm we have to ask ourselves how stable it is. Should we decide to choose a classification model as a standard for categorizing products in the electronic commerce environment, we have to ensure it is not only sustainable and applicable to the majority of the industries (while being aware that there are some products belonging to certain industries and manufacturers which will always constitute the exception to the rule and will necessitate specific attention and classification), but also stable. Klein (1998) has argued that the Web can transform experience products into search products, so what does that say about the Search Experience Credence paradigm? And if a retailer does choose it as a basis for the classification of his products, then the risk that products may shift and migrate from one product type to another has to be acknowledged. Therefore, one of the main disadvantages of this model is that it can prove to not be stable enough. In addition, it can prove relatively subjective, as depending on consumer the category type of a product can differ. However, there are several advantages: the model is easy to use and apply and can be extended to all industries and products. Moreover it is one

of the most pragmatic classification models, which can be applied to production independent of the distribution. Another advantage of this model – which could be considered at the same time its disadvantage – is that it does not go deeper into details for digital products, as the model has been developed before the power of e-commerce started showing. Because of that, it does not take into account those product attributes which are specific solely to e-commerce. However, as the previously discussed model, it can be used as a starting point in the classification journey.

4.5 Advantages and Disadvantages of Tractinsky and Lowengart Classification

Unlike Nelson's model, this mechanism discerns between the offline and online medium of selling products and incorporates the digital dimension, specific to a multitude of products nowadays. This could constitute a great advantage of the model. However, since it goes too much into detail when analyzing the product characteristics, it could be more useful as a model to explain the e-commerce suitable products, rather than a general classification model. While it develops a sturdy model, it focuses more on the "aesthetics" dimension rather than on the objective product attributes.

1.1. 4.6 A Standard Unified Classification

Figure 37 aims at positioning the segmentation models illustrated in Chapter four, by depicting the scope and the distribution channel specificity. It is interesting to notice that the models which take the electronic commerce platform into consideration in their models have been developed after 2000, so after researchers and marketers alike have realized the potential of this platform.

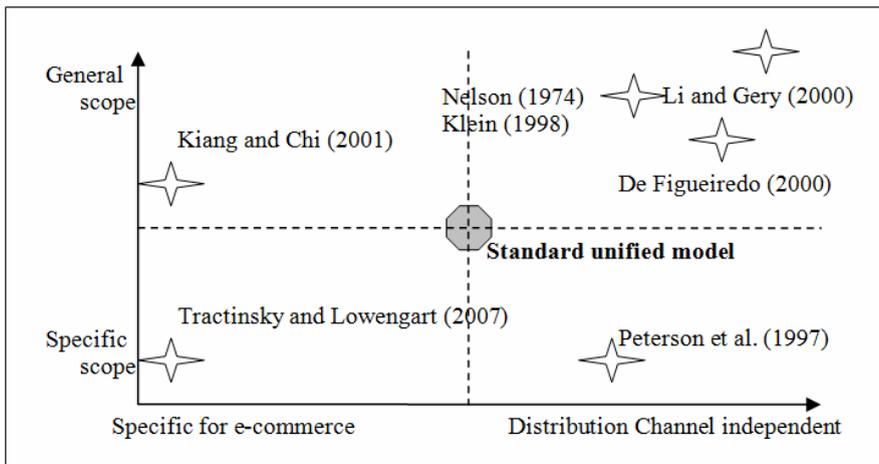


Figure 37 A mapping of selected product classification models.

Li and Gery's (2000), de Figueiredo's (2000) and Nelson's (1974) aim at the same direction, classifying based on a general scope, which allows the use of the model independent of the distribution channel. At the other end of the spectrum Kiang and

Chi (2001) and Tracktinsky and Lowengart (2007) concentrate more on incorporating the e-commerce dimension of products' attributes. The latter even includes the "hedonic" versus "utilitarian" dimension into the model, creating a bridge between the product attributes and the customer.

A standardized, unified model would have to be positioned in the middle, at the intersection of the "scope" and "distribution channel specificity" areas. The reason for this is two fold: on the one hand such a model could be used for both distribution channels and would not have to be adapted to electronic commerce, or to the physical store. On the other hand, the scope would need to be specific enough to incorporate the majority of existing products, but general enough so as to be applicable to the majority of the industries. Firstly, it would have to make the distinction between digital and non-digital goods; this would place it in the middle compared to the x-axis's value of "specific for e-commerce" and "distribution channel independent". Secondly, the author of this paper would propose to keep the Search Experience Credence model. Although it is not very detailed, it would allow both retailer and consumer to have a common understanding. Starting from the product types, each individual retailer could then be at liberty to internally refine the classification and develop specific types which fit its assortment, industry and company vision and mission.

For a general, uniform company wide product classification, using a model which is situated to the far left or the far right would pose a certain danger – unless the company only intends to be active in one particular distribution channel, either the internet or the traditional physical store. Last but not least, the retailer should never forget the consumer when categorizing its products. Even if future research should develop and implement a standardized classification model, retailers must not forget that the model would serve to better reach out to the customer, to better respond to his/her requirements and to facilitate his/her understanding and to create that lasting bond between buyer and seller, also known as brand loyalty.

5. CONCLUSIONS

The hopes for the Internet to replace the traditional stores with the rise of e-commerce have been high. Experience has shown however, that e-retailing should not be regarded as a complete substitute for the physical store, as the new and only way of doing business, but as a complement, supporting the firms' sales. Instead they should look for synergies between on- and offline shops, for efficiencies in delivering or serving the customer base, for methods of growing that base and for ways in which the Internet would not replace the traditional marketing, but would help sustain the current business model.

One of the objectives of the study was to analyze the advantages and disadvantage of some product classification models. Six models have been presented in chapter four and the findings suggest that no model is perfect and therefore it is vital that the scientific community agree on a standard, which can be used by all parties involved in the transaction. Judging by the multitude of classification models in the

literature, this study affirms the assertion that categorizing products is of importance to the electronic commerce research, each researcher trying to find a way to not necessarily develop a new model, but to incorporate the best elements from the existing ones, by eliminating some of the shortcomings of previous concepts. Another finding is that there is no mathematical formula to determine the class a certain product belongs to or should be a part of. However, it could be quantified if a certain product type is successful online or not.

To conclude, this study adds to other articles in the same research area in several ways. First, it consolidates the major classification models developed in the past eight decades. Second, it compares the models amongst each other by mapping them onto two dimensions: distribution channel dependency and scope. This helps to highlight the advantages and shortcomings of each of them and encourages a more in depth future research.

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BOOK REVIEW



Ion Pohoățã, Landmarks in Institutional Economics, Economic Publishing House, Bucharest, 2009, 335p.

Reviewed by Oana-Ramona SOCOLIUC*

Leaving behind the classical and neoclassical perspectives on economic growth and the determinants of wealth, *Institutional Economics*, especially *the New Institutional Economics* (NIE) has been used to explain the development gaps between states. Its specific features and the particular manner of converting the economic theory into a more earthly version are emphasized with an exceptional accuracy in an exceptional book of Professor Ion Pohoățã. The book *Landmarks in Institutional Economics* published in 2009 is a result of more than three years of hard work, a considerable effort dedicated to a thorough study of the *New Institutional* paradigm with all its valences. Undoubtedly, the author creates an integrative view designed to provide consistency and structure to institutional vision.

Even before the appearance of the book, the author generated a series of articles on this topic, just to name a few - *Transaction costs, institutionalism and neoclassical paradigm* (2005), *Arguments for the study of institutionalism and institutional reform in Romania* (2006), *To the springs of a modern economic theory: Institutionalism* (2007), *An institutionalist outlook on the origins of property from the perspective of transaction costs* (2008), or *The institutional dimension of Hayek's work* (2008) - showing quite a unique propensity of the author for the study of institutionalism.

The book offers a multidimensional approach, starting with the most representative figures of the *institutional family*, like T. Veblen, J. R. Commons, W. Hamilton, and continuing with even more remarkable names which combine the Old and the New Institutionalism, such as: J.A. Schumpeter, J.K Galbraith, G. Myrdal, Fr. Perroux, M. Weber, or K. Polanyi and others. Relying on NIE, Professor Pohoățã emphasizes from the very beginning that the neo-institutional paradigm is, in fact, *a unity in diversity* (p. 52). First of all, NIE encompasses a mixture of trends, thus gathering many different positions under the same umbrella, but at the same time, in this entire „ocean” of studies we can capture a common trend line, the *reaction to the neoclassical school*. It is certain that NIE is a response and not a complete break from neoclassical school. In other words, the author explains that NIE does not deny

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neoclassicism and its values: natural order, private property, free market, or competition, but to the contrary, it tries to provide a new answer to unanswered questions through critique. D.North had a defining contribution in this respect, with his attempt to explain why ineffective institutions survive and persist when individuals are perfectly rational? Even though this contradiction had come from a neoclassical register, only New Institutional paradigm was able to provide the necessary instruments for a relevant answer. It is what professor Pohoată calls *the hard core* of NIE, which consists of: *transaction and transaction costs, institutions, property rights, governance structures, economic evolutionism or path dependence* (p.54).

Secondly, NIE promotes a *dynamic analysis* of economics in general; its representatives advocate for *economic evolutionism*, a different perspective that brings together biology and economics in order to explain the development processes. As an example, professor Pohoată cites the article *Uncertainty, Evolution and Economic Theory (1950)* of Armen Alchian, which emphasized that market (an institutional environment) could be assimilated with a selection tool that is able to choose only those profitable firms that survive the competition. Furthermore, the author makes a masterly association between the genetic and economic components. The economic correspondent of genetic heritage is the good management practice; in other words, only the firms based on profitable management skills will be chosen as patterns of behavior, worthy of imitation (p. 303). All these attributes that come to shape the new paradigm have their origin in the works of Ronald Coase, Douglas North and Oliver Williamson, *the three pillars* of the theoretical scaffolding of NIE. Institutions are placed in the center of analysis even if free market remains a key element. As author observed, everything could be explained through *institutions* without using mathematics or other calculations. This assumes the eminently social character of the new institutional paradigm.

Thirdly, the NIE admits the *principle of bounded rationality*, which brings theory closer to the real world. The author generally agrees with Herbert Simon in order to offer an explanation: humans are not computers, or perfectly informed robots and information they get in contact with is incomplete (p. 58). The fact that people perceive the present and anticipate future through some clichés based on past experiences, as North stated is also an explanation (p. 60). In neo-institutional world everything might be defined as a sequence of circumstances, nothing is precise. *Incomplete contracts* defined through uncertainty and adaptability reveals another differentiation from the neoclassical model (p. 62).

Finally, the brilliant minds of Hayek and Mises inspired institutional economists with their *methodological individualism*. However, from NIE perspective institution is "*the first violin*", and then comes the individual. As author highlighted, the NIE shapes a new kind of individualism, *the institutionalized individualism*, totally different from the possessive individualism of Smith or Hayek (p. 64). Institutions are a human

construction and once produced they have the role to monitor human activity. Moreover, rules are always improved and innovated from a generation to another, which creates an institutional change. As we can easily notice, there is a permanent circularity relationship that explains the specific individualism of NIE.

To define *institutions*, the author highlighted the perspective of D. North according to whom institutions may be defined as *rules of the game or constraints created by people in order to shape human interaction* (p. 76). There are *formal* and *informal* institutions. In the former category, we can include political, legal and economic rules as property rights, even contracts, while the latter consists of codes of conduct, conventions, traditions and customs. While official rules are created to increase the efficiency of informal constraints, these should provide consistency for social changes. Evenmore, as author maintains, these informal institutions that are very hard to change have a major role in influencing future orientation, since it consists of a synthesis of the past.

If we have a game with strict rules played by institutions, then it is important to state that organizations are the players. The same North emphasized the distinction between these two elements by saying that *institutions are the rules of the game and organizations are the agents of institutional change* (p. 83). There is a symbiotic relation between these two parts; organizations appear and develop within the institutional background, but at the same time institutional change cannot be made without organizations.

The book illustrates various ways of explaining the existence of institutions. These abstract and impersonal rules must configure human cooperation in order to make life easier and reduce the uncertainty. In this respect, we cannot neglect the example that the author uses to explain the origins of institutions. He refers to “Mending Wall” poem of Robert Frost and compares institutions with fences. In fact, people need fences because they offer safety and intimacy, but at the same time a cold wall will isolate and restrict freedom. So, we feel very comfortable when we are protected by rules, but there is something in human construction that is fallible and here appears the need for institutions to prevent the propensity for selfishness or exacerbated individualism. Institutions are necessary to reduce market imperfections, informational asymmetry and also to minimize risks and transaction costs. All these deficiencies come from the imperfect world we live in, so institutions are the instruments that make living possible under such conditions.

D. North had a remarkable phrase: *in the process of economic growth, institutions matter* (p.247). As a completion, the author proposes the technological change; innovation is also an engine of growth. In translation, there is a strong connection between institutions and economic dynamics. Institutions appear as a rule generated by economic evolution, but at the same time these institutions are able to support economic growth or, moreover, to induce an economic contraction.

As book reveals, *time* is a variable included in the analyses, taking into account that our world is non-ergodic, nothing is repeatable. The changes that will come will create new situations that request new institutions and the old institutional system will be restructured. In other words, institutional change is a permanent process where not all institutions disappear; some of them are just reproduced. Unfortunately, there is no institutional model that might be adopted, so institutional change is *incremental*; the past is connected with the present and future. This incremental changing is from the inside to outside, things are totally reformed; it is a sort of “creative destruction”, where the disintegration is made by transformation and construction, not through annihilation.

The author further argues that economic activity is, in fact, a human activity, which bears the mark of *intentionality*. Economic and social changes take place under the rule of consciousness and they pass through a cultural filter. With D. North this incremental evolutionary process to order and balance remains under the mark of intentionality. Enlarging the perspective, a society needs a minimal state intervention in order to guide the game and its rules. Democracy is essential in this case, only here formal and informal institutions are able to reduce uncertainty and establish the balance. From this point of view, NIE provides a totally different vision from Hayek or Mises. They do not admit state intervention; for them the spontaneous evolutionary process to order and balance is guided by the invisible hand.

Learning remains the only solution; its origins are in the genetic heritage of every nation. Through learning, uncertainty is limited and nations are able to take from the past only those elements that promote progress, adoption of rules and good practices. We must learn from the past experiences in order to prevent other similar disasters in the future. When the institutional level is able to fit economic changes, there appears a strong connection between economic and institutional dynamics which is called *adapted efficiency*. This should be the guarantee of success, but it might be achieved only on long-term basis. This connection between past and future allows institutional economists to argue development gaps between states using *the path dependence*. Countries that were conducted by good rules in the past have encouraging perspectives to achieve development in the future; healthy institutions from the past serve as solid basis for new ones. For example, the efficient institutional structure of the American economic system is a consequence of path dependence, of political and economic institutions inherited from the British Empire. Basically, the future is closely related to the cultural heritage of every nation; in NIE specific language it is called *artefactual structure*.

In his attempt to investigate institutional economics, the author converges to the idea that Ronald Coase, the parent of the NIE had a great contribution to the creation process of the new paradigm with his article *The Nature of the Firm* (1937). As professor Pohoată indicates, this article was the starting point for new research scopes

related to firm, transaction costs, or governance structures, elements that together create a solid part of the *hard core* of the NIE.

Coase generally agreed that economy is based on two alternative mechanisms of coordination: the prices mechanism, which is responsible for market allocation resources and the hierarchy, which ensures resource allocation within the firm through authority and planning. As a result of his investigation, Coase focused on some reasons that might argue the emergence of firms.

First, he emphasized the option of some individuals to work for other people for less money; the individual desire to lead, control and have power over others, or customers' preference for certain goods made by companies. Second, to reduce transaction costs which consist of an information cost, omnipresent when the transaction takes place on the market and a cost of contracting. Finally, the public authority applies different regulations to firms and markets. As an example, sales taxes target only market transactions, not those that take place within firms.

So, in order to reduce transaction costs, Coase came with an innovative proposal: *the incomplete contract* which should be negotiated and signed for a longer period of time, thus reflecting an antagonistic view towards rigorous neoclassical contract, with many clauses and terms of execution. It provides uncertainty and supports opportunism. Another option would be *vertical integration*.

For Coase, the firm is *a small planned company* that operates alongside other firms within the market competitive system. In his perspective, an efficient economic system must be based on free market, but must also include some planning. As the author highlighted, the firm does not appear as a reaction to free market, but to reproduce market conditions at the level of some smaller transaction costs. In other words, firms exist just because the transactions within firms are made with lower costs than on the market. This subject was widely investigated by many authors and Harold Demsetz, for example, pointed out that the firm and the market cannot be coordination alternatives of production. In Demsetz perspective, authority has a minimal role in the process of resources coordination. It is what he called "*the perfect decentralization*". The contract has almost the same value with the entrepreneur because the firm and the market belong to the same network of contractual relations. As the author of the book noted, Demsetz, Alchian and others have identified a *contractual nature of the firm*, according to which the firm is not replacing the market, it would be more proper to say that a certain type of contract is replacing an another type (p. 157).

However, transaction cost is a key element governing the economic reality and the theory related to this subject was also introduced in the extensive analysis of institutional economics. As author shows, the origins of transaction costs came from the origins of the emergence and nature of the firm. From a large variety of definitions the author retains the one provided by A. Iancu. He divided the production process into three components: pre-production, post-production and production and stated that the

first two periods (pre and post-production) properly determine the transaction costs. Apart from these costs, he also mentioned the production costs which are related to organization and management of the firm. This approach sustains that transaction costs appear upstream and downstream of production.

As the author emphasized, O. Williamson operates with another structure: ex ante and ex post transaction costs. In his view, in ex ante category there are costs related to relevant prices identification, negotiation, or advertising; in terms of ex post transaction costs, he included costs of imposing and monitoring the behavior of partners, the ones related to tracking and damage recovery, etc. In order to enumerate the determinants of transaction costs, Williamson argues that uncertainty, bounded rationality and informational asymmetry have a great influence, because they supports opportunistic behavior. In such conditions of instability, risk, or incomplete contracts, the transaction costs might become very high. The solution offered by O. Williamson consists of *governance structures*. He defines it as contractual and non-contractual mechanisms that have the ability to reduce transaction costs (p. 189). Furthermore, these governance structures do not replace the incomplete contract, but adjust it in order to reduce uncertainty and risks. Their role is to assure the proper conduct of transactions, to protect transactions against risks and opportunistic behavior, or to settle conflicts with minimal costs.

Between institutional environment and governance structures, there is a dependence relationship. Property rights, contractual arrangements, reputation or uncertainty are elements that define the institutional environment, but also the governance structures. For example, well-defined property rights and contractual guarantees are associated with low transaction costs, which means orientation to market and hybrid forms. At the same time, these elements may signal the existence of a developed economy or of a third world country.

The evolution of a society is highly determined by the hereditary mark, especially what comes from the cultural background. This component of institutional system is responsible for development gaps between states. In Romania, for example, the path dependence is obvious. There is a hereditary mark of the ex-soviet regime that obstructs development. The socialist institutional performance, which seized the moral values of individuals and their freedom of thinking, is responsible for low institutional performance. After more than two decades of freedom, the values of a civilized society like: freedom, competition, property rights are incomplete. Even if Romania is now a member of the European Union, it does not have all the attributes of a developed country. The change of political regime, the democracy or freedom have not succeeded in creating a new prosperous society. Romania is still suffering from the institutional crisis; private property and competitive market do not function well, and even if there is a democratic background, there are no political initiatives targeted at activating democratic institutions and ensuring their proper functioning.

As the author highlighted, Romania is not able to learn from its past, it does not even imitate a successful model from outside because the institutional structure does not allow this. In a world guided by bureaucracy and corruption, institutional performance cannot be promoted, so until this path dependence will not be improved, Romania has no chance to be among the developed nations of Europe.

There are still many issues to be tackled after reading a book developed on such a large scale that offers an integrative perspective to institutional economics. This impressive endeavour is the result of a huge effort to understand and explain the evolution of institutionalism in all its complexity and address not only economists, but also other categories of readers that are interested in making sense of both economic theory, and also the economic reality. The book offers clear answers to sensitive questions that had no answers before and also solutions to achieving growth and development because *in the process of economic growth institutions matter!*