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THE POTENTIAL ECONOMIC RENT IN THE UNITED STATES FROM CO_2 ABATEMENT POLICIES

John M. POLIMENI[*], Wyatt HARPER[**]

1. INTRODUCTION

Increasingly, climate change has come to the fore as an environmental issue with nearly universal agreement that the current trend is unsustainable and must be addressed. Of particular concern is the amount of carbon dioxide (CO_2) emitted into the atmosphere, the primary contributor to climate change through the combustion of fossil fuels. In the United States alone, CO_2 emissions account for approximately 85% of all U.S. greenhouse gas emissions, most of which come from fossil fuels (EPA, 2008). Reducing the risk of the damage caused by climate change requires the world to substantially reduce CO_2 production. In the past five to ten years several proposals to address climate change have been suggested; most prominently cap-and-trade and carbon taxes. These market-based approaches differ from the traditional command-and-control policies, such as Corporate Average Fuel Efficiency (CAFÉ) standards which mandate minimum fleet mileage standards for vehicles sold in the United States, by providing firms a cost-effective and flexible form of environmental regulation. Other benefits also exist, such as technological innovation to reduce greenhouse gas emissions and potential revenue sources for governments; the more a firm emits CO_2, the more they pay, either in taxes or through purchased emission permits.

Not surprisingly, revenue generation from these fiscal regulatory policies is controversial as they contribute to the overall costs of the firm and there is concern over the distribution and equity of these costs that will be passed on to the consumer. Market-based approaches, such as carbon taxation and cap-and-trade, are preferred by economists to the command-and-control policies generally used by environmental protection agencies. However, from an economic efficiency point-of-view, a carbon tax

[*] John M. POLIMENI, Associate Professor of Economics, Albany College of Pharmacy and Health Sciences, 106 New Scotland Avenue, Albany, NY 12208, john.polimeni@acphs.edu
[**] Wyatt HARPER, Analyst UBS Investment Banking Division, harper.wyatt@gmail.com

is less costly because the tax is more broadly focused and better addresses the negative externality of carbon emissions than a tax on specific forms of fossil fuels (Metcalf, 2009).

For practical policy purposes, however, the immediate issue is how to develop a climate policy regime with a robust emissions mitigation effort as its centerpiece, one that can progressively incorporate rapidly industrializing nations, and that can adjust over time as more is learned about the science, economics, and technological change that characterizes the climate change problem (Aldy and Stavins, 2008). There is much debate throughout the world today as to what is the best policy mechanism to curb CO_2 emissions. In the United States several different versions of CO_2 abatement policies have been proposed and debated. However, the two most often mentioned are versions of carbon taxes and cap-and-trade, which are described in the following paragraphs.

2. AN OVERVIEW OF CARBON TAXES

2.1 Carbon Taxes

Simply put, a carbon tax is a tariff on the CO_2 emissions. Carbon is present in all forms of fossil fuels and converted to CO_2 when the fuel is burned. A carbon tax is easily administered if paid for upstream, the point where the fuels are extracted or imported, because the carbon content of all forms of fossil fuels are well-known. Of the three most popular fossil fuels used, coal, natural gas, and petroleum, coal produces the most CO_2 while natural gas emits the least. Thus, under a carbon tax coal would be taxed the highest, followed by petroleum, then natural gas.

The use of taxes as a method to reduce environmental degradation has a long history. Pigou (1920) argued that taxes can be used to mitigate the effects of a negative externality such as CO_2 emissions. William Baumol (1972) further developed these ideas by illustrating how taxes could be used to obtain environmental standards in a cost effective way. The key to implementing this policy is that the carbon tax must be set at a level that will counterbalance the negative externality; in other words, at any given emissions level, the tax rate should equal the social marginal damages (Figure 1) from producing an additional unit of emissions or, more or less equivalently, the social marginal benefit from abating a unit of emissions. If the marginal abatement costs are lower than the carbon tax, then firms will reduce their emissions. Figure 1 illustrates that a firm to the left of the equilibrium level of emissions will abate CO_2 because the carbon tax (A+B) is greater than the marginal abatement cost (MAC) equal to area B. On the other hand the high marginal abatement cost firm, a firm to the right of equilibrium, will choose to pay the tax (C+D) instead of abate CO_2, which costs area C+D+E.

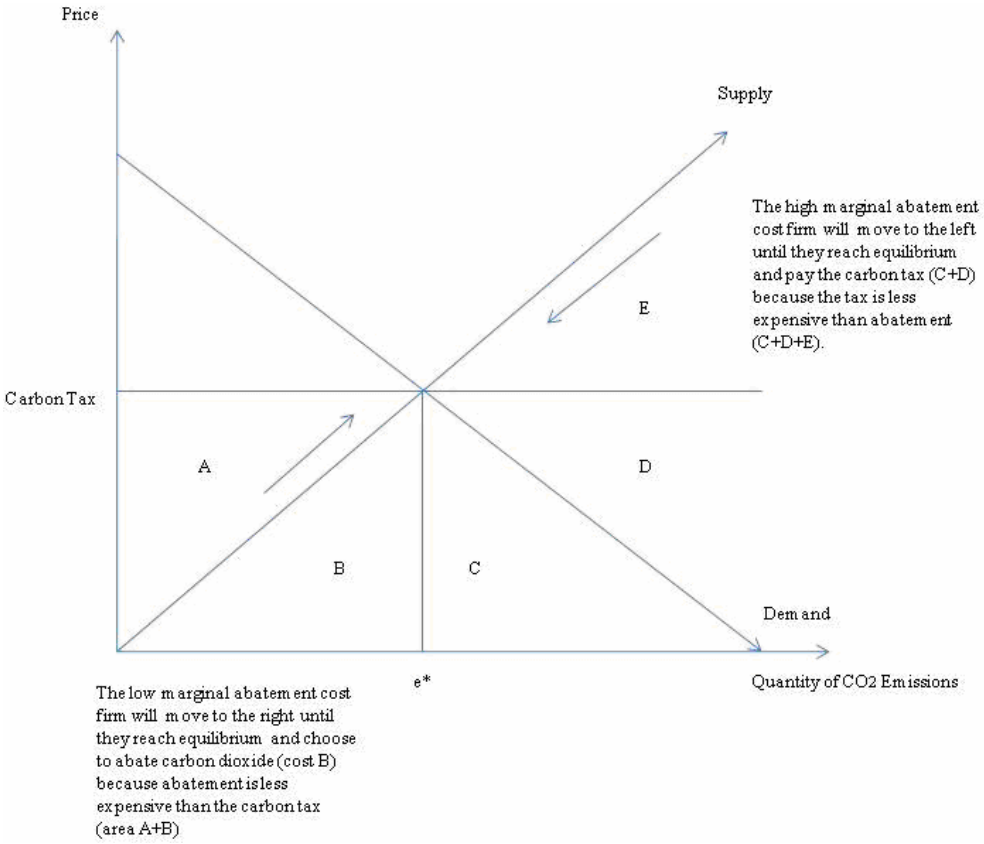

Figure 1 *The Effects of a Carbon Tax on Individual Firms*

The tax will increase production costs which will cause firms to reduce their supply. Thus, emissions levels are reduced, but at the same time part of the tax is shifted onto consumers. The amount of the price increase for consumers will depend upon the elasticity of demand for the product. However, at least part of the tax will be passed on to consumers to bear which is why detractors claim this option to be regressive in nature (see Figure 2).

The central premise of a carbon tax therefore is to obtain large reductions in CO_2 emissions rapidly by creating an incentive to do so. The prices of carbon emitting fuels and energy do not include any of the costs of carbon emissions. Furthermore, as will be shown through examples from several European countries that tax carbon content, not using carbon taxes removes any incentive for individuals and corporations to take measures to reduce carbon emissions and alter their consumption behaviour and choices. No one will argue that carbon taxes will completely eliminate climate change problems; however the taxes can be used in a positive manner.

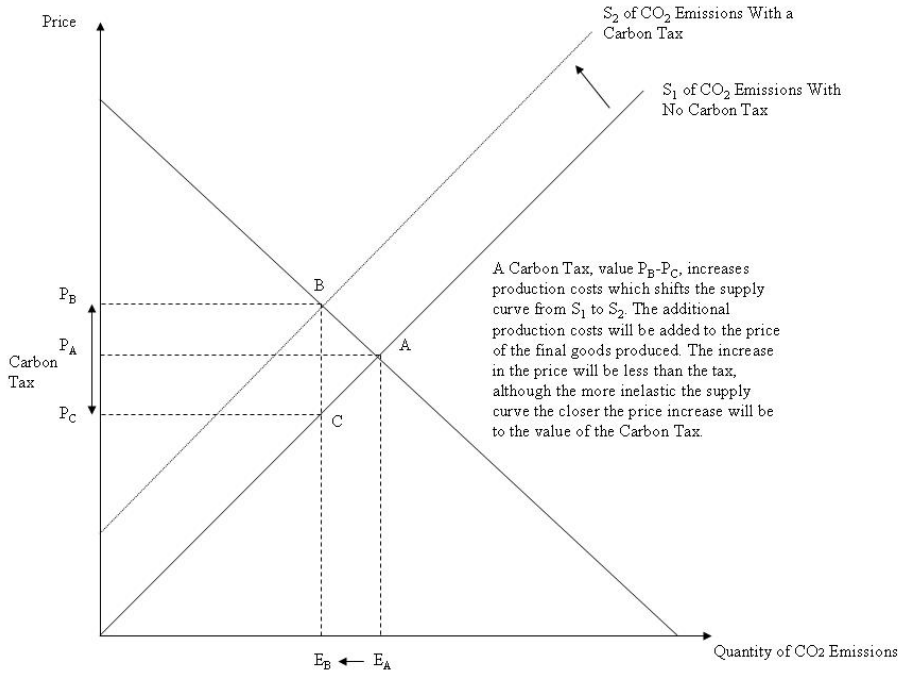

Figure 2 *The Effects of a Carbon Tax on the Market*

Proponents argue that the carbon tax will send price signals throughout the market leading to new technologies and renewable energy sources. They claim that the price signals will provide economic incentives to reduce or eliminate emissions at the source, which will reduce clean-up costs from released emissions and substitute fossil fuels with renewable energy sources such as wind energy. Furthermore, advocates claim that the end result will be more energy-efficient technologies adapted (Andersen, 1999). In economics terms there would be a demand effect, a reduction in the demand for carbon producing energy sources as a result of the price increase, and a substitution effect, a substitution of fossil fuels for lower carbon based fuels.

On the other hand, opponents will argue that carbon taxation will have a negative impact on economic growth. They claim that an increase in taxes will depress real disposable incomes which will reduce overall demand leading to lower economic gross domestic product levels. In addition, adversaries argue that carbon taxation will lead to inflation because the taxes are levied on households and the whole tax will be reflected in the consumer price index if cheaper alternatives to fossil fuels are not readily available

for industry and consumers. This is in contrast to a carbon tax that would be levied on producers which would pass some fraction of the tax onto consumers.

2.2 Carbon Taxes in Europe

While many economists find carbon taxes the preferable method for abating CO_2 emissions very few countries actually implement this policy. European environmental policies, based on the precautionary principle and the polluter pays principle, could be more easily implemented using carbon taxes. While not developed for the purpose of reducing greenhouse gas emissions, European Union member states have long used energy taxes. However, the implementation of these tax schemes has been very diverse, often differentiating among users, types of energy, and industry. Moreover, these energy taxes were not initiated with the intent of reducing CO_2 emissions but with the purpose of generating revenue to reduce taxes in other areas of the economy.

A few European countries have developed taxes with the purpose of reducing CO_2 emissions. In 1990 Finland initiated their version of the carbon tax, widely regarded to be the first country to use such a tax. The first adaptation of the tax was strictly on carbon content. However, the second derivation of the tax included energy. Sweden followed with their own version of a carbon tax soon after in 1991. The tax has been set to $150 per ton of carbon with the exception of fuels used for electricity generation and industries only have to pay one-half of the tax (Johansson, 2000). Swedish energy policy requires that non-industrial consumers pay a tax on electricity but exempts fuels from renewable sources such as biofuels and biomass (Johansson, 2000). Due to this tax policy the use of renewable fuels for heating and industry has vastly expanded in Sweden. The next European country to use a carbon tax was Great Britain in 2001 which instituted the tax for the industrial, commercial, and public sectors. Tax revenues are partially used to provide subsidies for energy efficiency and renewable energy initiatives. Since 2003 with the development of the Energy Taxation Directive, Europe has had an European Union level carbon tax policy. However, that is not to say that individual member states do not have their own policies aimed at carbon emissions. The policies of several such countries (Denmark, Sweden, and the United Kingdom) will be briefly examined below. Abatement policies differ greatly between the countries so providing a complete and detailed account of the various policies is difficult. Therefore, specifics, such as the amount of taxation, will not be discussed as these details change often and will provide little information as for the purposes of the discussion in this paper. Since there are many derivations to the carbon and CO_2 tax policies of every country, particularly those examined below, the reader is encouraged to go to the European Union's internet sites related to energy and the environment, as well as each country's energy and environment web sites for complete information.

Denmark has a three-pronged tax system aimed at energy, CO_2, and sulfur. The energy tax is imposed on the carbon content of fossil fuels with the exception of natural gas (Speck, 2008). The CO_2 tax is self explanatory. The sulfur tax is levied on all fossil fuels with a 0.05% or higher sulfur content (Speck, 2008). The purpose of this tax scheme is to reduce the amount of emissions into the atmosphere by encouraging reduced consumption of energy products with carbon or sulfur content or by promoting technology that prevents CO_2 or sulfur emissions. However, Denmark has a complex tax differentiation program established for industries. Industries can receive a complete energy tax refund for energy used for purposes other than space heating in which case industries must pay the full tax. The CO_2 tax scheme is even more complex as industries pay according to type of usage. However, industries can reduce their level of taxation through a variety of agreements available with the government.

Sweden uses four types of taxes on energy and carbon indexed to their Consumer Price Index to ensure that the real value of the taxes remains constant over time. Energy taxes were first used on gasoline in 1924 and then extended to include oils and coal in 1957, liquefied petroleum gas in 1964, and natural gas in 1985 (Speck, 2008). The country developed both a CO_2 tax and a sulfur tax in 1991. The CO_2 tax rates are based upon the carbon content of the fossil fuel being used. The sulfur tax is only implemented on heavy fuel oil, peat fuel, and coal. Any fuel with a sulfur content less than 0.05% in weight is exempt from the tax. The last type of tax to abate greenhouse gas emissions that Sweden uses is a nitrogen oxide (NO_x) charge which was first initiated in 1992. Originally, the NO_x tax was imposed on emissions from energy plants fifty gigawatt hours or larger, but later decreased to twenty-five gigawatt hours (Speck, 2008).

In contrast to the above, the tax scheme that the United Kingdom has developed to reduce CO_2 emissions is relatively simple. In 1990 the United Kingdom introduced the Fossil Fuel Levy for all consumers of electricity. The revenues generated from this tax were used to subsidize renewable energy projects, especially nuclear power. In 2001 the Climate Change Levy was introduced. This tax was on non-domestic energy use and did not include household use. The revenues from this tax have been used as a tax shifting program (Speck, 2008).

The main components of the CO_2 abatement programs of three European countries have been briefly examined due to their complexity and often-changing nature. However, the CO_2 abatement policies that exist in individual countries must be just the beginning as the European Union has created a European-wide policy aimed at reducing CO_2 emissions. The first such effort was the Energy Taxation Directive (ETD) created in 2003 and implemented January 1, 2004. The ETD created minimum taxation levels for all forms of energy products aimed at the consumer level (Hasselknippe and Christiansen, 2003). The second effort, the European Union Emissions Trading Scheme (ETS) targets

the energy sector and energy-intensive sectors at the producer level but are different from energy and carbon taxation. Double taxation of emissions is not supposed to occur between these two schemes, so countries are restricted from additional emissions taxes on installations already covered by the ETD (Hasselknippe and Christiansen, 2003). Therefore, the two abatement programs have been developed to work in conjunction with each other rather than in competition. The next section will explain how cap-and-trade schemes work and then show the European Union uses cap-and-trade for abatement. Furthermore, the cap-and-trade proposals currently under discussion in the United States will be explained.

3. AN OVERVIEW OF CAP-AND-TRADE

3.1 Cap-and-Trade

Cap-and-trade programs are based on the economic theories developed by Ronald Coase (1960) who argued that property rights can improve environmental conditions, which he found to be more effective than taxes (Raymond and Shively, 2008). A cap-and-trade program sets a ceiling on the total greenhouse gas emissions, where each firm is issued a permit to emit one unit of pollution during a given time period. For CO_2 for example, a firm must have one permit to emit one ton of CO_2 emissions. Over time, the ceiling for allowable emissions is lowered until the target level is reached. Such a method is what was used to reduce sulfur emissions in the United States; a major factor in reducing acid rain (Benkovic and Kruger, 2001).

The idea behind this concept is that some firms will be able to reduce their emissions below the required levels much easier than other firms. As shown in Figure 3, low polluting firms have smaller abatement costs and can then sell their allocated pollution permits to high polluting firms with greater abatement costs because these firms have more difficulty lowering their emissions levels. Thus, the preset level of pollution is reached while at the same time minimizing the marginal abatement costs by rewarding firms that are able to reduce their emissions efficiently. The firms with high marginal abatement costs will either purchase permits from low marginal abatement cost firms or invest in new infrastructure or technology to reduce their pollution levels. In either case, the total amount of emissions will be reduced to the amount specified by the regulatory body. Proponents of cap-and-trade claim that a cap-and-trade system allows for more efficiency and information sharing in the market which will enables firms to lose less profits. Advocates also argue that permits are a more flexible regulatory option because prices can be adjusted depending upon economic conditions. They will also point out that under cap-and-trade regulation all firms have the same marginal cost of abatement. Opponents on the other hand, argue that cap-and-trade is regressive; most negatively

affecting poorer households (Galbraith, 2009). Furthermore, challengers claim that the cap-and-trade system does not provide firms any incentive to reduce pollution levels beyond what is allowable.

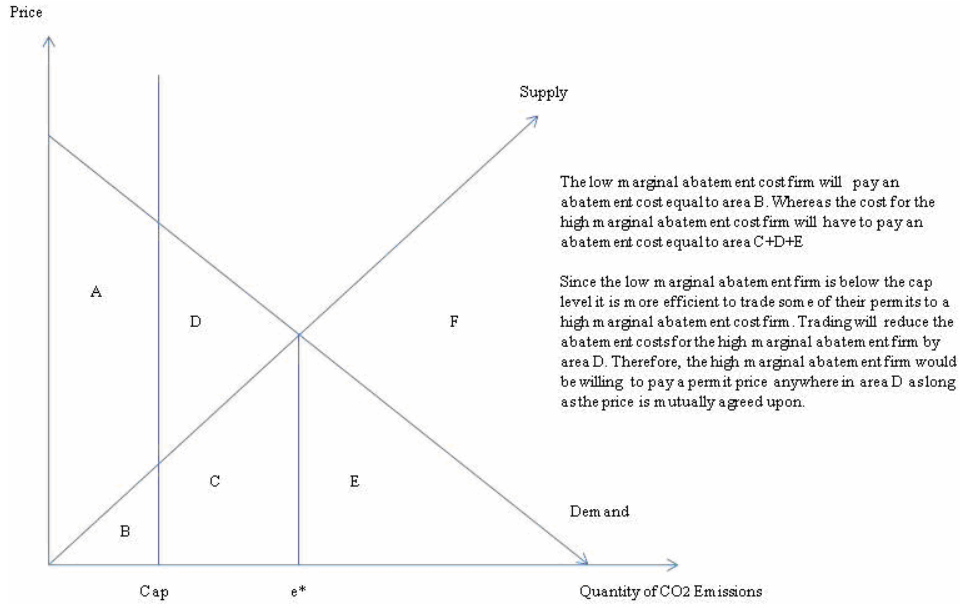

Figure 3 *The Effects of Cap-and-Trade on the Market*

3.2 European Union Emissions Trading Scheme

The European Union instituted the Emissions Trading Scheme (ETS) in efforts to comply with the Kyoto Protocol. The ETS program works in conjunction with individual member states carbon and energy tax programs, as well as the European Union ETD scheme which sets minimum energy tax rates, creating an incredibly complex CO_2 regulatory agenda. Under the European Union ETS agreement each member state is allowed a certain number of allowances based on their national allocation plan (Convery and Redmond, 2007). The objective of the European Union ETS is to reduce CO_2 emissions by 2020 by at least twenty percent of 1990 emissions levels. Each European Union allowance enables a firm to emit one ton of CO_2. Those firms that emit less than their allowances can sell any excess permits to firms that have difficulty keeping their emission levels low. These high-polluting firms either have to continue purchasing allowances from low-polluting firms or invest in CO_2 reducing technology. The ETS program is aimed towards large firms; for example, power plants that are larger than twenty megawatts (Andersen, 1999). The ETS program also covers the most energy

intensive industries (ferrous metal plants, cement factories, glass factories, ceramic products, as well as pulp and paper factories) and refineries (Andersen, 1999).

Similar to the carbon tax programs that have been developed, one of the premises behind cap-and-trade programs such as the European Union ETS is to send a price signal or price signals throughout the market. In the case of the European Union ETS there are two types of costs that are imposed on industries. First, there are the direct costs that firms must incur when they purchase allowance permits. The level of these costs will be dependent upon the amount of CO_2 emissions the industry produces and whether or not the company must purchase additional permits from less polluting companies. Additionally, there is an indirect cost to households as carbon producing firms factor the costs of emissions certificates into consumer prices. Therefore, the implementation of the European Union ETS program is of prime importance.

Phase I of the European Union ETS was launched in 2005. For this first phase the European Union gave nearly all of the total allowances, valued at €65 to €130 billion, to firms for free (Convery and Redmond, 2007). Only three European Union members, Ireland, Hungary, and Lithuania, chose to auction some of their allowances which accounted for 0.12 percent of the total permits (Hahn, 2009). All three of these countries used the revenues generated from the auctions to offset some of the administrative costs of conducting the auctions. As shown in Figure 4, the auctioning of allowances in these three countries has had little effect, albeit in a small sample of three years. During that time period the CO_2 emissions for these three countries remained relatively constant.

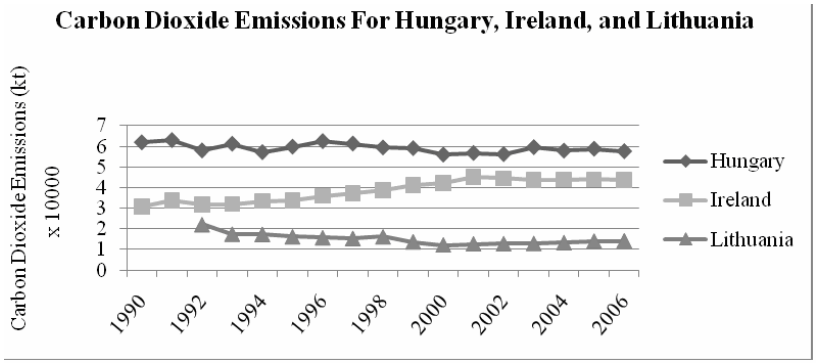

Figure 4 *Emissions in Ireland, Hungary, and Lithuania 1990 - 2006*
Source: Carbon Dioxide Emissions data obtained from the World Bank World Development Indicators.

Phase II, which was instituted in 2008 required that no more than ten percent of the allowances be auctioned to firms. However, the policy of the other European Union member states of giving permits away has largely been a failure as CO_2 emissions has increased throughout the European Union. Therefore, the use of auctions will need to be expanded to create more incentives for firms to reduce their emissions level. Phase II is

also the first time new European Union member countries, such as Romania, are included in the scheme. Phase III of the European Union ETS program, set to begin in 2013, calls for at least two-thirds of the permits to be auctioned (European Commission, 2008). A minimum of twenty percent of the revenues that are generated from the auctioning of the permits will be used for climate change mitigation and adaptation efforts (European Commission, 2008).

As shown in Figure 5, in the limited time that the European Union ETS has been in existence there has been little effect on carbon dioxide emissions. Some countries, such as Germany, have been experiencing decreasing emissions. However, most countries in the European Union have slightly increasing or relatively constant levels of CO_2 emissions.

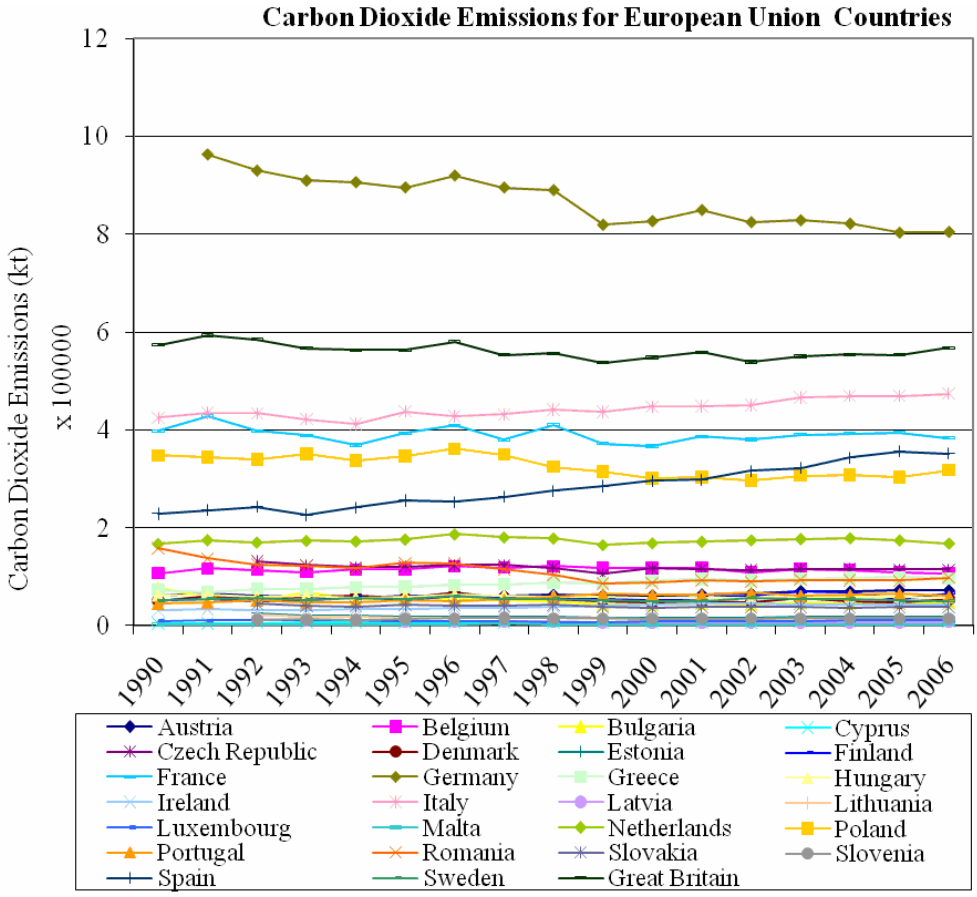

Figure 5 *CO2 Emissions for European Union Countries 1990-2006*

Source: Carbon Dioxide Emissions data obtained from the World Bank World Development Indicators.

As stated previously, the European system of reducing carbon emissions is complex with the various levels of regulation that are imposed. Not surprisingly, many are concerned about double-taxation. However, the ETS program, at least in theory, has been developed to prevent double-taxation from occurring. The European Union ETS program creates two sectors of carbon emitters, the ETS and the non-ETS (Andersen, 1999). The carbon emitters designated as ETS are regulated under the European Union ETS program and, as such, are not eligible to have any additional tax levied on them. Furthermore, because the European Union ETS sets an emissions cap from the companies delegated to the ETS sector, if these companies wish to emit more carbon then they must purchase additional allowances on the market. Theoretically, this directive should prevent double-taxation of companies.

Since this directive has been developed to prevent double-taxation, a number of European Union countries have been considering eliminating their carbon and energy taxation programs in favour of the ETS provisions. However, for any individual European Union member-state to remove taxes selectively, as would be the case if the ETS sector was excluded, they would need approval from the European Commission (Andersen, 1999). The ETD, in contrast to the European Union ETS, was developed with a directive beyond carbon taxation; the ETD also attempts to equilibrate the energy supply with tax rates. However, by definition of the directive, the European Union ETS is heavily dependent upon the specific regional power markets (Andersen, 1999). Therefore, there can be no guarantee that the European Union ETS can synchronize energy tax rates across regions. As such, companies in different European Union countries can be at a competitive disadvantage with each other.

4. THE UNITED STATES

4.1 Comparison of Carbon Reduction Policies in the United States

Figure 6 presents the carbon dioxide emissions for the United States since 1960. As can be seen, CO_2 emissions have steadily trended upwards since 1960. In comparison to carbon emissions in Europe, the United States emits considerably more carbon into the atmosphere.

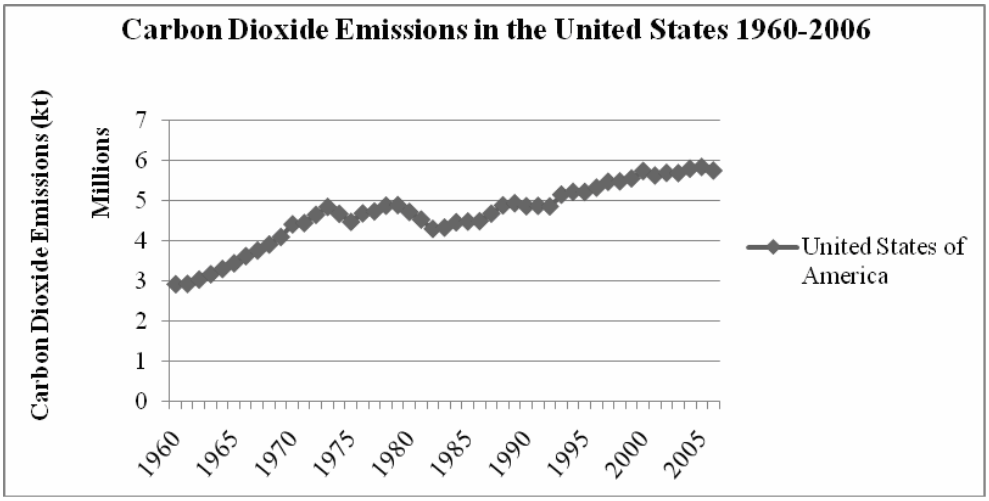

Figure 6 *CO2 Emissions in the United States 1960-2006*

Source: Carbon Dioxide Emissions data obtained from the World Bank World Development Indicators.

Due to these high levels of emissions, many policies have either been used or proposed to reduce carbon dioxide emissions in the United States. As stated previously, market-based approaches to reduce CO_2 emissions such as taxes or cap-and-trade schemes are the preferred methods of economists. While carbon taxes are fairly straight-forward, there are a few different approaches to cap-and-trade programs. The Congressional Budget Office (2008) developed a chart, presented in Table 1, which summarizes the key aspects of each program for the United States.

Table 1 *Comparison of CO2 Emissions Policies*

Comparison of Selected Policies for Cutting CO_2 Emissions

Policy	Efficiency Ranking	Efficiency Considerations	Implementation Considerations	International Consistency Considerations
Carbon Dioxide Tax	1	A tax would avoid significant year-to-year fluctuations in costs. Setting the tax equal to the estimate of the marginal benefit of emission reductions would motivate reductions that cost less than their anticipated benefits but would not require reductions that cost more than those benefits. Research indicates that the net benefits of a tax could be roughly five times as high as the net benefits of an inflexible cap. Alternatively, a tax could achieve a long-term target at a fraction of the cost of an inflexible cap.	An upstream tax would not require monitoring emissions and could be relatively easy to implement. It could build on the administrative infrastructure for existing taxes, such as excise taxes on coal and petroleum.	A U.S. tax could be set at a rate consistent with carbon dioxide taxes in other countries. Consistency would require comparable verification and enforcement. If countries imposed taxes at different points in the carbon supply chain, special provisions could be needed to avoid double-taxing or exempting certain goods. Setting a U.S. tax that would be consistent with allowance prices under other countries' cap-and-trade systems would be somewhat more difficult because it would require predicting allowance prices in different countries.
Cap With Safety Valve and Either Banking or a Price Floor	2	A cap-and-trade program that included a safety valve and either banking or a price floor could have many of the efficiency advantages of a tax. The safety valve would prevent price spikes and could keep the costs of emission reductions from exceeding their expected benefits. Banking would help prevent the price of allowances from falling too low, provided that prices were expected to be higher in the future. A price floor, however, would be more effective at keeping the cost of emission reductions from falling below a target level.	An upstream cap would not require monitoring emissions. It would require a new administrative infrastructure to track allowance holdings and transfers. Implementing a safety valve would be straightforward: The government would offer an unlimited number of allowances at the safety-valve price. Banking has been successfully implemented in the U.S. Acid Rain Program. A price floor would be straightforward to implement only if the government chose to sell a significant fraction of emission allowances in an auction.	Either a safety valve or banking would become available to all sources of CO_2 emissions in a linked international cap-and-trade program. Some countries could object to linking with a U.S. program that included those features, because linked countries could not ensure that their emissions would be below a required level in a given year. Linking would also create concerns about inconsistent monitoring and enforcement among countries and international capital flows (as described below in the inflexible cap policy). Countries with different cap-and-trade programs could capture many of the efficiency gains that would be achieved by linking—while avoiding some of the complications—if they each included banking (or set a similar price floor) and agreed on a safety-valve price.

Policy	Efficiency Ranking	Efficiency Considerations	Implementation Considerations	International Consistency Considerations
Cap With Banking and Either a Circuit Breaker or Managed Borrowing	3	Allowing firms to bank allowances would help prevent the price of allowances from falling too low, provided that prices were expected to be higher in the future. Including a circuit breaker—or increasing the ability of firms to borrow allowances—would help keep the price of allowances from climbing higher than desired, but would be significantly less effective at doing so than a price ceiling.	An upstream cap would not require monitoring emissions. It would require a new administrative infrastructure to track allowance holdings and transfers. Banking has been successfully implemented in the U.S. Acid Rain Program. Determining when to trigger a circuit breaker, or modify borrowing restrictions, would require judgment about current and future allowance prices. Such interventions could aggravate price fluctuations if those judgments were incorrect.	Including banking and either a circuit breaker or borrowing in the U.S. program could reduce the likelihood of linking because it would cause uncertainty about the stringency of the U.S. cap relative to other countries' caps and about the total supply of allowances in the global trading market.
Inflexible Cap	4	Allowance prices could be volatile. An inflexible cap could require too many emission reductions (relative to their benefits) if the cost of achieving them was higher than anticipated and could require too few reductions if the cost of meeting the cap was lower than policymakers had anticipated.	An upstream cap would not require monitoring emissions. It would require a new administrative infrastructure to track allowance holdings and transfers.	Linking an inflexible U.S. cap with other countries' cap-and-trade systems would create a consistent global incentive for reducing emissions. However, inconsistent monitoring and enforcement in any one country could undermine the entire linked trading system. Further, linking would alter allowance prices in participating countries, create capital flows between countries, and possibly encourage countries to set their caps so as to influence those flows.

Source: Congressional Budget Office.

Note: An "upstream" tax or cap would be imposed on suppliers of fossil fuel on the basis of the carbon dioxide (CO_2) emitted when the fuel was burned. A "safety valve" would set a ceiling on the price of allowances. "Banking" would allow firms to exceed their required emission reductions in one year and use their extra allowances in a later year. Under a "circuit breaker," the government would stop a declining cap from becoming more stringent if the price of allownces exceeded a specified level.

4.2 Carbon Taxes in the United States

The United States has a long history of using taxes to reduce pollution. In the 1970s, President Richard Nixon proposed two different taxes aimed at reducing pollution, a tax on lead additives in gasoline and a tax on sulfur dioxide emissions. Neither of these taxes was implemented. However, a tax on fuel inefficient cars was instituted in 1978, soon followed by the Superfund in 1980 which was developed to clean hazardous waste sites. The pollution tax that most Americans are familiar with is the

gasoline tax, but this regulatory action is not a widely applied energy tax because the levy is limited to gasoline.

Since that time, other forms of environmental taxation in the United States have been attempted. Soon after his election, President Bill Clinton proposed an energy tax aimed at reducing the deficit and pollution. At the time he stated, "It also combats pollution, promotes energy efficiency, promotes the independence economically of the country …" (139th Congressional Record, 1993). However, the Clinton energy tax was never implemented, instead replaced by an increase in the gasoline tax.

Although the Clinton energy tax was never implemented, some important information can be obtained from examining that potential legislation. The proposed energy tax by President Clinton covered a wide range of energy products including fossil fuels, ethanol and methanol fuels, and nuclear and hydroelectric power. An interesting provision of the proposed energy tax was a supplemental tax on petroleum, without which natural gas would have actually had a higher percentage of market price than oil, which would likely have discouraged the shifting of consumption from petroleum to natural gas which is a lesser polluting fuel (United States Department of Treasury, Office of Tax Policy, 1993). Another important lesson that can be learned from is that the proposed tax was an energy tax, not a carbon tax which would have reduced CO_2 emissions much more than the energy tax. Why this distinction is important is because the differentiation illustrates the importance of politics in environmental policy. Had the proposal been a carbon tax instead of an energy tax then coal would have been taxed the highest, which would have impacted coal mining in West Virginia and other coal producing states and states that are heavily dependent on coal for energy or heat. The coal example further highlights the considerable regional differences that make the passing of any carbon tax extremely difficult in the United States. Besides the regional differences that must be addressed so would any differentiation among energy types. For example, in the Clinton energy tax proposal hydroelectric power would be taxed but not solar electricity. This certainly would have brought considerable objection from hydroelectricity proponents, claiming unfair practices and that solar electricity would be receiving favoured status. Questions of equity and potential impact on both the national and regional economies will have to be addressed with any carbon tax proposal. In addition to these two lessons, the Clinton energy tax proposal also underscores the need to treat imports the same as domestic products in regards to the tax in order to keep domestic products on equal competitive ground.

In the past several years, the United States has considered a few different regulatory actions aimed at creating a carbon tax. The bills that have been considered differ from the Clinton energy tax proposal in that they focus on fossil fuels while the Clinton energy tax proposal also included nuclear power and hydroelectric power. The

first proposed legislation that will be examined is the "Save Our Climate Act of 2007," which was legislation H.R. 2069 drafted and introduced by Congressmen Fortney Stark and Jim McDermott (110th Congressional Record, 2007). This bill proposed a $10 per ton tax of carbon content on coal, petroleum, petroleum products, and natural gas. This $10 per ton tax of carbon content would increase $10 annually until CO_2 emissions in the United States were reduced to eighty percent below the 1990 level. The tax would be imposed on the manufacturer, importer, or producer of the fuel, but could be refunded if the fuel was used for carbon sequestration. In addition, exporters were exempt from the tax (110th Congressional Record, 2007). The bill also proposes that that the tax be used to reduce taxes on low and middle class households and to fund alternative energy development. The bill also proposes that studies be done every five years to determent the environmental and economic impacts of the tax.

The second proposed legislative act is "America's Energy Security Trust Fund Act of 2007," which was legislation H.R. 3416 introduced by Congressman John Larson (110th Congressional Record, 2007). This bill is similar to the Stark-McDermott bill except the Larson bill proposes a tax levy of $15 per ton increasing ten percent every year plus one per cent more than the annual cost of living adjustment (110th Congressional Record, 2007). There are other differences as well. Fuels used for exports and feedstock are exempt from the tax, and taxpayers that sequester greenhouse gases, perform carbon offset projects, or eliminate hydrofluorocarbons in the United States can qualify for a tax credit or tax refund for taxes they paid (110th Congressional Record, 2007). In contrast to the Stark-McDermott bill the Larson bill would create a trust funded by the revenues from the tax to finance tax credits for clean energy technology, to assist industries negatively affected by the tax transition to less polluting production methods, and to provide an income tax credit for individual taxpayers. The income tax credit would be equal to the per capita share of the taxpayer's portion of the trust fund's revenue, but would be capped at the level of federal payroll taxes paid by that taxpayer or ten percent of the social security benefits the taxpayer may have received that year (110th Congressional Record, 2007).

Carbon taxes have been used by other levels of government in the United States. In 2006, Boulder, Colorado instituted the Climate Action Plan Tax that levied a tax on the end users of electricity. The energy tax is collected by the utility companies when consumers pay their bills. The revenue generated from the tax is used by the city to finance their climate action program. Their climate action program seeks to reduce local greenhouse gas emissions to seven percent below 1990 levels by the year 2012.

Table 2 *Carbon Taxes Used in the United States*

Tax	Tax Base	Tax Rate	Taxpayer	Use of Revenue
Federal gas tax now in effect (not including taxes on diesel, aviation fuel)	Gasoline	18.4 cents per gallon	Oil refiner; Position holder of fuel in terminal; Importer	Highway Trust Fund; Leaking Underground Storage Tank Trust Fund
Clinton Btu tax proposal in 1993	Fossil fuels; Hydropower; Nuclear; Ethanol (in original proposal)	25.7 cents per million Btus, with 34.2 cents per million Btus supplemental rate for oil	Oil refiner; End user of coal, electricity; Importer	Deficit reduction; Regressivity offsets in budget package
H.R. 2069 Save Our Climate Act of 2007 (Stark-McDermott)	Coal; Petroleum and petroleum products; Natural gas	$10 per ton of carbon, increased by $10 per year until emissions 80% below 1990 level	Manufacturer Producer Importer	Not mandated
H.R. 3416 America's Energy Security Trust Fund Act of 2007 (Larson)	Coal Petroleum and petroleum products; Natural gas	$15 per ton of carbon dioxide, increased each year by 10% plus cost of living adjustment	Manufacturer Producer Importer	Dedicated to: Tax credit for clean energy technology; Transitional industry assistance; Carbon tax rebate
Boulder, Colorado, Climate Action Plan Tax	Electricity	Capped per kilowatt hour at: 0.49 cents (residential) 0.09 cents (commercial) 0.03 cent (industrial)	End user (collected by electric utility)	Climate action program
San Francisco, Bay Area Air Quality Management District Fee	Greenhouse gas emissions	4.4 cents per ton of greenhouse gas emissions	Industry, businesses subject to air quality permits	Climate protection programs

Source: Congressional Budget Office

The Bay Area Air Quality Management District in the San Francisco region of California levies a fee that is very similar to a carbon tax. The tax that is imposed is based

on the level of emissions but also covers other greenhouse gases beyond CO_2 (Bay Area Air Quality Management District, 2008). The tax is levied on industrial facilities and businesses that must abide by air quality permit requirements. The revenues generated from this tax are used by the Bay Area Air Quality Management District's climate programs.

A list of recent carbon tax initiatives that have either been instituted or suggested are listed in Table 2.

5. CAP-AND-TRADE IN THE UNITED STATES

The United States was the first to implement a cap-and-trade scheme, first in the 1980s to regulate lead in gasoline and ozone depleting chemicals, and then again in 1990 to reduce sulfur dioxide (Harrison, Jr., 1999). The most recent carbon reducing policies discussed in the United States have been of the cap-and-trade variety.

Table 3 *Cap-and-Trade Proposals in the United States*

Cap-and-Trade	Covered Emissions	Cost per Permit	Regulated Entity	Use of Revenue
S. 3036 Lieberman-Warner Climate Security Act of 2008 (Amendment 4825)	Carbon dioxide Methane Nitrous oxide Sulfur hexaflouride Perfluorocarbons Hydrofluorocarbons	Unknown; ability to provide relief if economy subject to harm	Coal user; Importer or producer of natural gas, petroleum, coal-based fuel, or certain greenhouse gases; Producers of HCFCs	Broad range of purposes including: worker assistance; consumer relief; greenhouse gas reduction programs; deficit reduction
Regional Greenhouse Gas Initiative (RGGI)	Carbon dioxide from electricity generation	Unknown; potential for liberalized offset provisions if price above $7/ton	Electricity generator	Extent of auctioning and use of revenue varies with state
Western Climate Initiative (proposed)	Carbon dioxide Methane Nitrous oxide Sulfur hexaflouride Perfluorocarbons Hydroflurocarbons	Unknown; anticipates rigorous offset program to reduce cost	Broad range of sectors for facilities, starting with electricity sector in 2012 and expanding to other sectors in 2015	Minimum of 10% allowances auctioned in 2012, 25% in 2020, possibly higher thereafter; within guidelines, use of proceeds can vary by jurisdiction

Source: Congressional Budget Office .

Starting in 2007, the momentum for a national cap-and-trade policy for the United States really started to take hold. The most relevant legislation introduced in 2007 was the Lieberman-Warner Climate Security Act of 2008, S. 3036 by Senators Joseph Lieberman and John Warner. This legislation proposed a national cap-and-trade program that sought to reduce greenhouse gas emissions to 19% below 2005 levels by 2020 and 71% below 2005 levels by 2050 (Pew Center on Global Climate Change, 2008; Eilperin, 2008). The bill would have imposed carbon caps on upstream producers or users. The proposed cap-and-trade bill would have applied to firms that use more than 5,000 tons of coal per year, process or import petroleum or coal-based liquid or gaseous fuels, methane, nitrous oxide, sulfur hexafluoride, manufacture or import more than 10,000 tons of CO_2 or equivalent, or manufacture hydrochlorofluorocarbons (110^{th} Congressional Record, 2007). The Lieberman-Warner bill states that for each ton of CO_2 or downstream emissions potential that a firm will need one allowance starting in 2012 (110^{th} Congressional Record, 2007). The bill also institutes a decreasing number of allowances between 2012 and 2050, which would significantly reduce the amount of CO_2 emissions. Additionally, there are provisions in the bill that significantly restrict the use of domestic offset projects from foreign trading programs and allow firms to have limited borrowing capabilities against future years' allowances (110^{th} Congressional Record, 2007). In order to try to maintain competitive equilibrium, the Lieberman-Warner bill has a provision that requires importers of products that produce high levels of greenhouse gas emissions during the manufacturing process to purchase emission allowances if the country where the product was produced does not have similar climate change regulations (110^{th} Congressional Record, 2007).

As the number of allowances decrease over time, how these allowances will be distributed also changes. The bill calls for an ever increasing number of the available allowances to be auctioned off to firms with the revenues used to fund a variety of programs such as: tax relief for low income families impacted by the cap-and-trade program, energy efficiency programs, mass transit infrastructure development, research and development, greenhouse gas emission reductions not covered by the bill, international funding initiatives, and for deficit reduction among others (110^{th} Congressional Record, 2007). Additionally the bill will provide allowances for free to industries that are dependent on fossil fuels, such as petroleum refiners and electricity generators that use fossil fuels, and to firms that would use the allowances to encourage the transition to an economy with fewer emissions, provide relief to consumers, reward early action, and attend to adaptation on an continuing basis (110^{th} Congressional Record, 2007). The Lieberman-Warner bill also creates a separate cap-and-trade program for hydrofluorocarbon emissions.

Although the Lieberman-Warner bill was never passed and to date no federal cap-and-trade program exists, there are a couple regional cap-and-trade programs in the United States. One such initiative is the Regional Greenhouse Gas Initiative created by ten Northeast and Mid-Atlantic States. The states involved in the Regional Greenhouse Gas Initiative are Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont. This regional cap-and-trade program targets electricity generating firms that produce at least twenty-five megawatts of electricity. The objective of this Regional Initiative is to stabilize current level emissions by 2014 and reduce emissions to ten percent below 2009 levels by the year 2018 (Regional Greenhouse Gas Initiative, 2005). Each state in the Initiative has some autonomy over the implementation details. However, the Initiative permits offset projects for up to 3.3% of the emissions and allows for more moderate offsets if the price of the permits reaches seven dollars per ton or higher (Regional Greenhouse Gas Initiative, 2005). The distribution of the permits is primarily by auction, with the first auction of the Initiative taking place in September of 2008.

A different regional cap-and-trade program takes place in the western United States. The Western Climate Initiative is composed of seven western states, Arizona, California, Montana, New Mexico, Oregon, Utah, and Washington and four Canadian provinces, British Columbia, Manitoba, Ontario, and Quebec. The objective of the Western Climate Initiative is to reduce greenhouse gas emissions fifteen percent below 2005 levels by the year 2020 (Western Climate Initiative, 2007). The Initiative recommends a broad range of ideas to reduce greenhouse gas emissions covering electricity generation, industrial and commercial facilities, upstream residential, commercial, and industrial fuels, and gasoline and diesel-based transportation (Western Climate Initiative, 2007). The Western Climate Initiative is designed to work in conjunction with carbon taxes. This is an important distinction from other programs because British Columbia, Canada uses carbon taxes. The Initiative enables each of the states and provinces in the Initiative to decide how to incorporate the carbon tax used in British Columbia with the cap-and-trade program (Western Climate Initiative, 2007). The Initiative is continuously changing to match California's commitment to decrease greenhouse gas emission levels to 1990 levels by the year 2020 (California Health and Safety Code, 2007).

The regional cap-and-trade initiatives described above, as well as the Lieberman-Warner proposal, have paved the way and created momentum for the current bill in Congress, the Waxman-Markey Climate Change Bill, H.R. 2454, the American Clean Energy and Security Act of 2009. This bill was introduced by Representative Henry Waxman and Representative Edward Markey and is far more comprehensive than any previous cap-and-trade initiative. The bill was passed by the United States House of

Representatives on May 21, 2009 is currently under consideration in the United States Senate.

The American Clean Energy and Security Act of 2009 would create a renewable electricity program that would require large utilities to increase their production levels of renewable sources of electricity, such as solar, wind, biogas, biomass, biofuels, geothermal, and marine and hydrokinetic energy (111th Congressional Record, 2009). Specifically the Act would require that six percent of electricity come from renewable sources by 2012 and that twenty percent of electricity come from renewable sources by 2020, of which up to five percent of these targets can be met through energy efficiency measures. The Act does provide states some leeway in meeting these requirements. If an individual state does not think that these requirements can be met by the utilities in their state, the percentage of renewable energy sources can be reduced to twelve percent and the energy efficiency measures can be increased to eight percent (110th Congressional Record, 2007). The Act will allocate 85% of pollution permits to industry for free and will hold an auction for the remaining 15%. Furthermore, the Act requires a seventeen percent of the level of carbon emissions in 2005 by 2020.

Since this legislation has been passed in the House of Representatives, the bill has stalled in the United States Senate. So, as a refreshed effort at getting climate legislation passed, Senator Maria Cantwell and Senator Susan Collins introduced the Carbon Limits and Energy for America's Renewal (CLEAR) Act, S. 2877 (111th Congressional Record, 2009). The proposed bill calls for the President to set an initial target amount of fossil fuels that can be emitted starting in 2012, remaining at that level for three years, and then decreasing the amount of carbon emissions by a quarter of a percent each year thereafter (111th Congressional Record, 2009; Cantwell, 2009). The legislation is aimed at producers and importers of coal, natural gas, and oil; in other words an upstream regulatory action. The objectives of the bill is to reduce emissions to twenty percent less the 2005 carbon emissions by 2020, to thirty percent less the 2005 carbon emissions by 2025, to forty-two percent less the 2005 carbon emissions by 2030, and eighty-three percent less the 2005 carbon emissions by 2050 (111th Congressional Record, 2009; Cantwell, 2009). The carbon permits would be distributed among fossil fuel companies through monthly auctions. Seventy-five percent of the revenues generated from the auction would be distributed to consumers every month on an equal per capita basis to offset increases in energy costs (111th Congressional Record, 2009; Cantwell, 2009). Cantwell and Collins estimate that the transfer of the revenues of the cap-and-trade program will result in eighty percent of the American public incurring no net costs from the higher energy prices with low income households receive positive net benefits and high income households experiencing a 0.3% decrease in income (111th Congressional Record, 2009; Cantwell, 2009). The other twenty-five percent of the revenues from the

permit auctions would go to a Clean Energy Reinvestment Trust Fund that would be used to further reduce greenhouse gas emissions, climate change adaptation, low-carbon energy investment, and regional economic development adjustment projects (111th Congressional Record, 2009; Cantwell, 2009).

6. POTENTIAL ECONOMIC RENT FROM CO_2 PERMIT AUCTIONS

The mere mention of the American Clean Energy and Security Act of 2009 causes great debate. The Act will allocate 85% of pollution permits to industry for free and will hold an auction for the remaining 15%. However, by auctioning-off only 15% of the permits, the bill fails to capture the maximum potential economic rent. This section seeks to measure the amount of economic rent that could potentially be captured if 100% of the permits were auctioned off.

Calculating the economic rent from any cap-and-trade program requires knowledge of the elasticity of demand for each firm. However, the elasticity of demand for every firm cannot be known. On the other hand, an approximate elasticity of demand for individual sectors is known. Therefore, the elasticity of demand for the most important sectors in the United States with regard to carbon emissions (electricity, gasoline, aviation, and other) will be used to calculate the potential economic rent. Additionally, the number of permits that would initially be auctioned to firms would need to be known, as would how much of a decrease in CO_2 emissions would be required annually. This information is also unknown.

Therefore, since the necessary information to calculate the potential economic rent that can be generated from auctioning CO_2 emissions permits is unavailable a spreadsheet developed by the Carbon Tax Center[1] to illustrate the decrease in carbon emissions from a carbon tax will be used. Although this spreadsheet was developed for a carbon tax, the calculations were made based upon carbon emitted instead of the carbon content of the energy. Therefore, in this particular case, the spreadsheet can be used to approximate the potential economic rent from auctioning pollution permits. Various assumptions are built into the model and the reader should follow his or her own curiosity to the Carbon Tax Center for complete information. In addition to the assumptions built into the model, other assumptions have been made for the purpose of this project.

The most important assumption made is about the price of the pollution allowance permit. First, each permit sold in auction is assumed to be an allowance for one ton of CO_2 emitted. Second, for the purposes of this paper the price of the permit will be assumed to be the average price of a permit sold in an auction. As stated previously to

[1] Carbon Tax Center. http://www.carbontax.org

calculate the economic rent that could be generated from an auction would require the elasticity, marginal abatement costs, and marginal benefits for each individual firm.

The other assumptions made are related to the amount of economic rent generated. First, the average amount the permits sell for will be assumed to be between the ranges of $5 per permit to $1,600 per permit. The $5 per ton figure was chosen because that price is below the amount of the initial tax in the proposed Save Our Climate Bill by Stark and McDermott of $10 per ton. The assumption is that the United States Congress would propose an initial value that would allow firms an opportunity to adjust to new carbon regulations without being harmed. Additionally, the $5 per ton assumption is below the range that allowance permits have been trading for in Europe (€10 to €33) in the past year (European Climate Exchange and Point Carbon). The price of European Union ETS permits have ranged from a low of €0.29 in May of 2007 to a high of €31.50 (Point Carbon; Shapiro, 2007; Shrum, 2007). The $1,600 upper limit for CO_2 allowance permits was based on the upper range of SO_2 and NO_x permits (Shapiro, 2007). Second, the average auction price is assumed to increase over time as their supply decreases. Third, the auction price is assumed to increase 2% to 6%. This range of price increase was chosen because they represent the historical inflation rates in the United States since 1990. During this time period, the inflation rate has never been more than 6%, either on an annual or monthly basis, and has rarely gone below 2%. Lastly, to calculate the potential economic rent from a CO_2 permit auction, the number of permits available in the first year of the abatement program and the annual decrease in the number of permits would need to be known, which as previously discussed is unavailable. Therefore, the number of permits available is assumed to be a constant number with the annual price increase for permits serving as a proxy for the decrease in the number of permits. The price increase will cause a decrease in the amount of CO_2 emissions, which in effect is equivalent to a reduction in the number of permits available.

Since a more exact figure cannot be calculated for the potential economic rent generated from CO_2 allowance permit auctions, sensitivity analysis is performed to get a range of the potential economic rent generated. Several variables will be altered to make these calculations. Those variables which sensitivity analysis will be performed with are the initial average auction price for an emissions permit and the annual increase in price of the allowance permits.

The results are shown in Table 4, Table 5, Table 6 and shown graphically in Figure 7 through Figure 12. Table 4 and Figure 7 and Figure 8 correspond to an annual increase in permit prices of 2%, Table 5 and Figure 9 and Figure 10 correspond with a 4% annual increase in permit prices, and Table 6 and Figure 11 and Figure 12 correspond with a 6% increase in permit prices. As shown in Table 4, Table 5, Table 6 the potential economic rent that could be generated from auctioning CO_2 permits to firms

is very large, trillions of dollars. The rent generated from these auctions could be redistributed back to the populace, used to fund a variety of projects, used to reduce the budget deficit, or any combination of the aforementioned ideas. In either case, the proposals currently being debated in Congress do not capture the potential economic rent that is available and belongs to the populace because the atmosphere is common to each individual.

Although just graphical representations of the results presented in the tables, Figure 7 through Figure 12 show some interesting results. For each annual price increase scenario, there is a sharp change in the slope of the curves for both CO_2 reductions and economic rent in approximately the year 2019. From the years 2010 to 2019 economic rent decreases because CO_2 emissions decrease. However, after the year 2019 there is a diminishing marginal decrease in CO_2 emissions. Therefore, economic rent starts to increase. However, this phenomenon only occurs for a starting permit price greater than $100 for the 2% scenario, a permit price up to $250 until the year 2013 for the 4% scenario, and up to a permit price of $500 for the 6% scenario (sees Figure 13 through Figure 15).

The reason that a shift occurs at the year 2019 for the higher starting permit prices is that firms are not able to continue to reduce emissions further at this point. Their marginal benefits of emitting CO_2 are greater than the marginal abatement costs and they continue producing. This increase could also indicate that CO_2 reducing technologies either have reached a limit to the amount of emissions that can be reduced or that the technologies are too costly. Furthermore, the initial permit price could be sufficiently high enough to cause some firms to end operations. Whereas for the lower permit price scenarios ($100 for the 2% scenario, $250 for the 4% scenario, and $500 for the 6% scenario) could be low enough that those firms that would cease operations for the higher permit prices would operate at these lower permit price levels, thus the steadily increasing curves for both CO_2 reductions and economic rent.

Table 4 *Potential Economic Rent From Permit Auctions Assuming a 2% Annual Price Increase*

	2% Annual Increase in Permit Price	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
$5	**CO_2 emissions, millions of metric tons**	5727.48	5799.09	5871.45	5944.54	6018.39	6092.98	6168.32	6244.42	6321.26	6398.86	6487.77	6577.91	6669.31	6762.25	6856.76	6952.87
	Reduction in CO_2 relative to moving trajectory, million metric tons	115.587	129.007	143.006	157.604	172.823	188.683	205.207	222.419	240.343	259.002	267.865	277.028	286.503	296.034	305.617	315.245
	Economic Rent, $ millions (rounded to nearest hundred million)	30600	31600	32600	33700	34800	35900	37100	38300	39500	40800	42200	43700	45200	46700	48300	50000
$10	**CO_2 emissions, millions of metric tons**	5718.45	5780.64	5843.19	5906.06	5969.27	6032.8	6096.63	6160.75	6225.16	6289.84	6375.16	6461.61	6549.19	6638.43	6729.35	6822.02
	Reduction in CO_2 relative to moving trajectory, million metric tons	124.619	147.455	171.266	196.083	221.938	248.867	276.903	306.083	336.442	368.019	380.468	393.333	406.625	419.861	433.024	446.099
	Economic Rent, $ millions (rounded to nearest hundred million)	61000	62900	64900	66900	69000	71100	73300	75600	77900	80300	83000	85800	88800	91800	94900	98100
$25	**CO_2 emissions, millions of metric tons**	5692.92	5728.7	5763.94	5798.6	5832.67	5866.12	5898.93	5931.06	5962.49	5993.21	6069.3	6146.24	6224.05	6303.79	6385.53	6469.34
	Reduction in CO_2 relative to moving trajectory, million metric tons	150.151	199.398	250.514	303.544	358.537	415.541	474.605	535.777	599.109	664.65	686.332	708.696	731.764	754.493	776.845	798.781
	Economic Rent, $ millions (rounded to nearest hundred million)	151900	155900	160000	164300	168600	173000	177400	182000	186700	191400	197800	204300	211000	218000	225300	232800
$50	**CO_2 emissions, millions of metric tons**	5654.78	5651.67	5647.27	5641.57	5634.56	5626.23	5616.57	5605.57	5593.24	5579.55	5644	5709.01	5774.59	5842.43	5912.62	5985.23
	Reduction in CO_2 relative to moving trajectory, million metric tons	188.288	276.428	367.18	460.577	556.651	655.436	756.963	861.264	968.368	1078.31	1111.63	1145.93	1181.22	1215.85	1249.76	1282.89
	Economic Rent, $ millions (rounded to nearest hundred million)	301800	307700	313700	319800	325800	332000	338100	344300	350500	356800	368200	379900	392000	404600	417700	431300
$100	**CO_2 emissions, millions of metric tons**	5590.87	5524.02	5456.14	5387.26	5317.43	5246.71	5175.16	5102.82	5029.74	4955.99	5005.37	5055.03	5104.99	5157.53	5212.76	5270.78
	Reduction in CO_2 relative to moving trajectory, million metric tons	252.203	404.075	558.313	714.89	873.778	1034.95	1198.37	1364.02	1531.86	1701.87	1750.26	1799.91	1850.83	1900.75	1949.62	1997.34
	Economic Rent, $ millions (rounded to nearest hundred million)	596800	601700	606500	611100	615500	619700	623800	627700	631400	634800	654100	673900	694200	715500	737700	760900
$250	**CO_2 emissions, millions of metric tons**	5455.95	5260.25	5069.53	4883.77	4702.96	4527.06	4356.06	4189.91	4028.57	3872	3901.41	3930.9	3960.46	3992.75	4027.86	4065.89
	Reduction in CO_2 relative to moving trajectory, million metric tons	387.123	667.847	944.921	1218.38	1488.25	1754.6	2017.47	2276.92	2533.03	2785.86	2854.22	2924.04	2995.36	3065.54	3134.51	3202.23
	Economic Rent, $ millions (rounded to nearest hundred million)	1456400	1433300	1410100	1386600	1363000	1339300	1315500	1291600	1267700	1243700	1278400	1314100	1350600	1389100	1429500	1472000

2% Annual Increase in Permit Price		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
$500	**CO_2 emissions, millions of metric tons**	5317.03	4996.31	4693.56	4407.89	4138.49	3884.53	3645.23	3419.85	3207.67	3007.97	3026.21	3044.47	3062.75	3083.53	3106.86	3132.81
	Reduction in CO_2 relative to moving trajectory, million metric tons	526.034	931.785	1320.9	1694.26	2052.72	2397.14	2728.3	3046.98	3353.94	3649.89	3729.42	3810.47	3893.06	3974.75	4055.51	4135.3
	Economic Rent, $ millions (rounded to nearest hundred million)	2839500	2724500	2613300	2505900	2402300	2302300	2206000	2113100	2023700	1937600	1988700	2041000	2094600	2151300	2211200	2274600
$750	**CO_2 emissions, millions of metric tons**	5224.67	4824.94	4455.14	4113.15	3796.97	3504.75	3234.73	2985.29	2754.91	2542.17	2555.81	2569.48	2583.16	2599.09	2617.31	2637.87
	Reduction in CO_2 relative to moving trajectory, million metric tons	618.396	1103.16	1559.31	1989	2394.24	2776.92	3138.8	3481.55	3806.7	4115.69	4199.82	4285.46	4372.66	4459.2	4545.07	4630.25
	Economic Rent, $ millions (rounded to nearest hundred million)	4186100	3948000	3722800	3510000	3309000	3119100	2939900	2770700	2611000	2460400	2523400	2588000	2654200	2724400	2798700	2877500
$1,000	**CO_2 emissions, millions of metric tons**	5155.67	4699.01	4282.79	3903.52	3557.96	3243.16	2956.4	2695.22	2457.34	2240.68	2251.81	2262.96	2274.13	2287.34	2302.64	2320.07
	Reduction in CO_2 relative to moving trajectory, million metric tons	687.396	1229.09	1731.66	2198.63	2633.25	3038.51	3417.13	3771.61	4104.27	4417.18	4503.82	4591.98	4681.69	4770.94	4859.73	4948.04
	Economic Rent, $ millions (rounded to nearest hundred million)	5508500	5128000	4773600	4443800	4136900	3851300	3585600	3338500	3108600	2894700	2967700	3042500	3119100	3200400	3286700	3378200
$1,250	**CO_2 emissions, millions of metric tons**	5100.72	4599.98	4148.96	3742.75	3376.9	3047.39	2750.6	2483.27	2242.43	2025.44	2034.97	2044.52	2054.1	2065.56	2078.94	2094.29
	Reduction in CO_2 relative to moving trajectory, million metric tons	742.349	1328.12	1865.49	2359.4	2814.31	3234.27	3622.93	3983.57	4319.17	4632.42	4720.66	4810.41	4901.72	4992.73	5083.43	5173.83
	Economic Rent, $ millions (rounded to nearest hundred million)	6813000	6276200	5782400	5328200	4910500	4526200	4172800	3847800	3548800	3273700	3355300	3439000	3524700	3615700	3712400	3815000
$1,500	**CO_2 emissions, millions of metric tons**	5055.13	4518.68	4040.21	3613.42	3232.69	2893	2589.87	2319.3	2077.73	1862.01	1870.43	1878.87	1887.34	1897.56	1909.57	1923.41
	Reduction in CO_2 relative to moving trajectory, million metric tons	787.934	1409.42	1974.24	2488.72	2958.52	3388.66	3783.66	4147.54	4483.87	4795.85	4885.2	4976.07	5068.48	5160.73	5252.81	5344.71
	Economic Rent, $ millions (rounded to nearest hundred million)	8103300	7399600	6758700	6175000	5643200	5158800	4717300	4315000	3948300	3613900	3703400	3795000	3888900	3988700	4094700	4207400
$1,600	**CO_2 emissions, millions of metric tons**	5038.88	4489.88	4001.93	3568.18	3182.56	2839.65	2534.65	2263.3	2021.82	1806.84	1814.9	1822.99	1831.1	1840.92	1852.48	1865.82
	Reduction in CO_2 relative to moving trajectory, million metric tons	804.186	1438.21	2012.52	2533.96	3008.65	3442.02	3838.88	4203.53	4539.79	4851.02	4940.73	5031.95	5124.72	5217.37	5309.89	5402.29
	Economic Rent, $ millions (rounded to nearest hundred million)	8616000	7843100	7141700	6504900	5926900	5402100	4925500	4492500	4099100	3741500	3833900	3928600	4025500	4128600	4238100	4354500

Table 5 *Potential Economic Rent From Permit Auctions Assuming a 4% Annual Price Increase*

4% Annual Increase in Permit Price		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
$5	**CO_2 emissions, millions of metric tons**	5727.48	5796.79	5866.46	5936.48	6006.8	6077.41	6148.26	6219.33	6290.57	6361.95	6443.9	6526.57	6609.94	6694.64	6780.69	6868.14
	Reduction in CO_2 relative to moving trajectory, million metric tons	115.587	131.309	147.987	165.67	184.408	204.256	225.271	247.51	271.035	295.91	311.726	328.367	345.874	363.647	381.683	399.979
	Economic Rent, $ millions (rounded to nearest hundred million)	30600	32200	33900	35600	37500	39500	41500	43700	46000	48400	50900	53700	56500	59600	62700	66100
$10	**CO_2 emissions, millions of metric tons**	5718.45	5778.18	5837.71	5896.98	5955.95	6014.56	6072.74	6130.45	6187.62	6244.17	6320.24	6396.75	6473.68	6552.2	6632.38	6714.27
	Reduction in CO_2 relative to moving trajectory, million metric tons	124.619	149.919	176.744	205.165	235.26	267.107	300.787	336.384	373.987	413.686	435.39	458.19	482.136	506.082	529.997	553.852
	Economic Rent, $ millions (rounded to nearest hundred million)	61000	64100	67400	70800	74400	78100	82100	86200	90500	95000	100000	105200	110800	116600	122800	129300
$25	**CO_2 emissions, millions of metric tons**	5692.92	5725.81	5757.17	5786.9	5814.92	5841.15	5865.51	5887.9	5908.24	5926.45	5987.85	6049.13	6110.24	6173.62	6239.38	6307.64
	Reduction in CO_2 relative to moving trajectory, million metric tons	150.151	202.287	257.285	315.25	376.289	440.51	508.022	578.937	653.363	731.412	767.777	805.81	845.577	884.665	922.995	960.48
	Economic Rent, $ millions (rounded to nearest hundred million)	151900	158900	166200	173800	181600	189800	198300	207000	216100	225500	237000	249000	261600	275000	289000	303900
$50	**CO_2 emissions, millions of metric tons**	5654.78	5648.23	5638.84	5626.57	5611.35	5593.14	5571.89	5547.56	5520.13	5489.57	5533.57	5576.96	5619.7	5665.52	5714.57	5766.99
	Reduction in CO_2 relative to moving trajectory, million metric tons	188.288	279.872	375.609	475.58	579.862	688.527	801.643	919.273	1041.47	1168.29	1222.06	1277.98	1336.12	1392.77	1447.81	1501.13
	Economic Rent, $ millions (rounded to nearest hundred million)	301800	313600	325700	338100	350700	363700	376900	390400	404200	418200	438500	459700	481800	505200	530100	556400
$100	**CO_2 emissions, millions of metric tons**	5590.87	5519.83	5445.54	5368.09	5287.57	5204.08	5117.75	5028.71	4937.09	4843.04	4866.62	4889.32	4911.12	4936.9	4966.8	5000.99
	Reduction in CO_2 relative to moving trajectory, million metric tons	252.203	408.266	568.906	734.057	903.644	1077.58	1255.78	1438.12	1624.51	1814.82	1889.01	1965.62	2044.7	2121.39	2195.57	2267.13
	Economic Rent, $ millions (rounded to nearest hundred million)	596800	613100	629300	645500	661500	677500	693200	708800	724100	739100	772600	807400	843600	882100	923100	966900
$250	**CO_2 emissions, millions of metric tons**	5455.95	5255.05	5056.21	4859.77	4666.02	4475.27	4287.79	4103.84	3923.66	3747.45	3748.91	3749.66	3749.72	3754.4	3763.77	3777.92
	Reduction in CO_2 relative to moving trajectory, million metric tons	387.123	673.052	958.24	1242.38	1525.19	1806.39	2085.74	2362.99	2637.95	2910.41	3006.72	3105.28	3206.09	3303.89	3398.61	3490.2
	Economic Rent, $ millions (rounded to nearest hundred million)	1456400	1460000	1462100	1462700	1461700	1459200	1455200	1449700	1442700	1434200	1492500	1552900	1615400	1682500	1754500	1831900

4% Annual Increase in Permit Price		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
$500	**CO_2 emissions, millions of metric tons**	5317.03	4990.6	4679.11	4382.35	4100.06	3831.95	3577.69	3336.93	3109.28	2894.32	2887.46	2880.21	2872.59	2869.32	2870.4	2875.87
	Reduction in CO_2 relative to moving trajectory, million metric tons	526.034	937.495	1335.34	1719.8	2091.15	2449.71	2795.84	3129.9	3452.33	3763.54	3868.17	3974.73	4083.22	4188.97	4291.98	4392.24
	Economic Rent, $ millions (rounded to nearest hundred million)	2839500	2774800	2708500	2641000	2572500	2503200	2433200	2362800	2292100	2221400	2305300	2392100	2481800	2578700	2683400	2796600
$750	**CO_2 emissions, millions of metric tons**	5224.67	4819.09	4440.53	4087.7	3759.32	3454.1	3170.8	2908.16	2665	2440.13	2431.42	2422.48	2413.31	2408.1	2406.83	2409.52
	Reduction in CO_2 relative to moving trajectory, million metric tons	618.396	1109.01	1573.92	2014.44	2431.89	2827.56	3202.73	3558.67	3896.6	4217.73	4324.21	4432.46	4542.51	4650.19	4755.55	4858.6
	Economic Rent, $ millions (rounded to nearest hundred million)	4186100	4020600	3857700	3697900	3541200	3388100	3238600	3093000	2951300	2813800	2916500	3022700	3132400	3251400	3380400	3520200
$1,000	**CO_2 emissions, millions of metric tons**	5155.67	4693.13	4268.26	3878.51	3521.42	3194.65	2895.97	2623.26	2374.53	2147.9	2138.81	2129.56	2120.16	2114.39	2112.23	2113.66
	Reduction in CO_2 relative to moving trajectory, million metric tons	687.396	1234.97	1746.19	2223.63	2669.79	3087.01	3477.56	3843.57	4187.07	4509.96	4616.82	4725.38	4835.65	4943.89	5050.15	5154.46
	Economic Rent, $ millions (rounded to nearest hundred million)	5508500	5222100	4946100	4680600	4425700	4181300	3947200	3723500	3509900	3306100	3424600	3546900	3673300	3810700	3959800	4121800
$1,250	**CO_2 emissions, millions of metric tons**	5100.72	4594.11	4134.58	3718.25	3341.48	3000.85	2693.22	2415.64	2165.41	1940.01	1930.98	1921.84	1912.61	1906.72	1904.17	1904.94
	Reduction in CO_2 relative to moving trajectory, million metric tons	742.349	1333.99	1879.87	2383.89	2849.73	3280.81	3680.31	4051.2	4396.2	4717.85	4824.65	4933.1	5043.21	5151.56	5258.21	5363.18
	Economic Rent, $ millions (rounded to nearest hundred million)	6813000	6391200	5990800	5611300	5252000	4912400	4591700	4289100	4004100	3735900	3868000	4004600	4145700	4299100	4465900	4647300
$1,500	**CO_2 emissions, millions of metric tons**	5055.13	4512.83	4026.01	3589.43	3198.29	2848.2	2535.09	2255.3	2005.47	1782.53	1773.71	1764.82	1755.87	1750.04	1747.32	1747.69
	Reduction in CO_2 relative to moving trajectory, million metric tons	787.934	1415.26	1988.44	2512.72	2992.92	3433.47	3838.44	4211.53	4556.14	4875.33	4981.92	5090.12	5199.95	5308.24	5415.06	5520.43
	Economic Rent, $ millions (rounded to nearest hundred million)	8103300	7535100	7002000	6502400	6034800	5597600	5189300	4808200	4452900	4121900	4266500	4415900	4570200	4738200	4921000	5119800
$1,600	**CO_2 emissions, millions of metric tons**	5038.88	4484.05	3987.8	3544.38	3148.54	2795.48	2480.82	2200.6	1951.22	1729.43	1720.72	1711.94	1703.11	1697.33	1694.58	1694.83
	Reduction in CO_2 relative to moving trajectory, million metric tons	804.186	1444.05	2026.65	2557.77	3042.67	3486.18	3892.71	4266.23	4610.38	4928.43	5034.91	5143	5252.7	5360.96	5467.8	5573.28
	Economic Rent, $ millions (rounded to nearest hundred million)	8616000	7986700	7398600	6849700	6337900	5861300	5417800	5005400	4622400	4266800	4416000	4570200	4729500	4903000	5091700	5297200

Table 6 *Potential Economic Rent From Permit Auctions Assuming a 6% Annual Price Increase*

6% Annual Increase in Permit Price		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
$5	**CO_2 emissions, millions of metric tons**	5727.48	5794.49	5861.4	5928.13	5994.61	6060.74	6126.45	6191.62	6256.15	6319.93	6393.23	6466.36	6539.23	6612.92	6687.43	6762.76
	Reduction in CO_2 relative to moving trajectory, million metric tons	115.587	133.61	153.055	174.018	196.603	220.92	247.085	275.22	305.456	337.929	362.401	388.582	416.585	445.365	474.948	505.362
	Economic Rent, $ millions (rounded to nearest hundred million)	30600	32800	35100	37700	40400	43300	46400	49700	53300	57000	61200	65600	70300	75400	80800	86700
$10	**CO_2 emissions, millions of metric tons**	5718.45	5775.72	5832.14	5887.6	5941.98	5995.14	6046.95	6097.27	6145.94	6192.82	6257.7	6321.91	6385.36	6450.08	6516.1	6583.5
	Reduction in CO_2 relative to moving trajectory, million metric tons	124.619	152.381	182.311	214.546	249.234	286.525	326.581	369.568	415.659	465.036	497.933	533.029	570.453	608.209	646.273	684.621
	Economic Rent, $ millions (rounded to nearest hundred million)	61000	65300	69900	74900	80100	85700	91600	97900	104700	111800	119800	128300	137400	147100	157600	168800
$25	**CO_2 emissions, millions of metric tons**	5692.92	5722.93	5750.3	5774.87	5796.45	5814.86	5829.92	5841.45	5849.26	5853.18	5897.67	5940.56	5981.73	6025.32	6071.46	6120.3
	Reduction in CO_2 relative to moving trajectory, million metric tons	150.151	205.171	264.148	327.278	394.762	466.805	543.612	625.389	712.344	804.681	857.959	914.38	974.085	1032.97	1090.92	1147.82
	Economic Rent, $ millions (rounded to nearest hundred million)	151900	161900	172400	183600	195400	207800	220900	234700	249200	264400	282500	301600	322000	343900	367400	392700
$50	**CO_2 emissions, millions of metric tons**	5654.78	5644.79	5630.33	5611.25	5587.41	5558.7	5525.01	5486.25	5442.35	5393.25	5414.76	5434.04	5451.01	5471.81	5496.61	5525.6
	Reduction in CO_2 relative to moving trajectory, million metric tons	188.288	283.306	384.122	490.901	603.799	722.961	848.517	980.582	1119.25	1264.61	1340.87	1420.9	1504.8	1586.48	1665.77	1742.52
	Economic Rent, $ millions (rounded to nearest hundred million)	301800	319400	337800	357000	376900	397600	419100	441300	464200	487800	519300	552500	587700	625400	666100	710000
$100	**CO_2 emissions, millions of metric tons**	5590.87	5515.66	5434.9	5348.68	5257.11	5160.37	5058.62	4952.08	4841	4725.64	4722.26	4716.62	4708.71	4706.21	4709.24	4717.96
	Reduction in CO_2 relative to moving trajectory, million metric tons	252.203	412.437	579.55	753.47	934.096	1121.3	1314.91	1514.75	1720.6	1932.22	2033.37	2138.32	2247.1	2352.08	2453.14	2550.15
	Economic Rent, $ millions (rounded to nearest hundred million)	596800	624400	652500	681000	709900	739000	768300	797700	827100	856400	907400	960900	1017200	1077900	1143700	1214800
$250	**CO_2 emissions, millions of metric tons**	5455.95	5249.89	5042.93	4835.74	4628.96	4423.23	4219.17	4017.39	3818.45	3622.9	3596.98	3569.74	3541.25	3519.32	3503.94	3495.11
	Reduction in CO_2 relative to moving trajectory, million metric tons	387.123	678.212	971.52	1266.41	1562.25	1858.44	2154.36	2449.44	2743.15	3034.96	3158.65	3285.2	3414.57	3538.96	3658.43	3773.01
	Economic Rent, $ millions (rounded to nearest hundred million)	1456400	1486700	1515000	1541100	1565100	1586600	1605600	1622000	1635700	1646500	1733400	1824000	1918700	2021800	2134400	2257400

6% Annual Increase in Permit Price		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
$500	**CO_2 emissions, millions of metric tons**	5317.03	4984.96	4664.79	4356.97	4061.88	3779.77	3510.81	3255.08	3012.57	2783.19	2752.68	2721.66	2690.17	2664.93	2645.82	2632.73
	Reduction in CO_2 relative to moving trajectory, million metric tons	526.034	943.139	1349.67	1745.18	2129.33	2501.9	2862.72	3211.76	3549.03	3874.67	4002.95	4133.28	4265.64	4393.35	4516.56	4635.39
	Economic Rent, $ millions (rounded to nearest hundred million)	2839500	2825000	2805200	2780400	2750700	2716300	2677400	2634300	2587300	2536700	2660300	2789000	2923000	3070300	3232100	3410000
$750	**CO_2 emissions, millions of metric tons**	5224.67	4813.32	4426.07	4062.51	3722.07	3404.12	3107.9	2832.62	2577.39	2341.32	2311.88	2282.26	2252.48	2228.4	2209.86	2196.74
	Reduction in CO_2 relative to moving trajectory, million metric tons	618.396	1114.78	1588.38	2039.64	2469.14	2877.55	3265.63	3634.22	3984.21	4316.54	4443.75	4572.68	4703.34	4829.89	4952.52	5071.37
	Economic Rent, $ millions (rounded to nearest hundred million)	4186100	4093100	3994700	3891500	3784200	3673300	3559500	3443300	3325300	3206100	3356700	3513600	3677000	3857100	4055600	4274500
$1,000	**CO_2 emissions, millions of metric tons**	5155.67	4687.32	4253.9	3853.8	3485.37	3146.93	2836.73	2553.07	2294.24	2058.55	2030.86	2003.15	1975.42	1952.91	1935.47	1922.96
	Reduction in CO_2 relative to moving trajectory, million metric tons	687.396	1240.78	1760.55	2248.35	2705.84	3134.74	3536.8	3913.76	4267.37	4599.31	4724.77	4851.79	4980.4	5105.37	5226.91	5345.16
	Economic Rent, $ millions (rounded to nearest hundred million)	5508500	5316000	5121100	4924700	4727800	4531100	4335600	4141900	3950800	3762700	3936000	4116400	4304300	4511900	4741100	4994300
$1,250	**CO_2 emissions, millions of metric tons**	5100.72	4588.32	4120.38	3694.07	3306.58	2955.14	2637.1	2349.85	2090.95	1858.02	1832.02	1806.07	1780.18	1759.13	1742.76	1730.92
	Reduction in CO_2 relative to moving trajectory, million metric tons	742.349	1339.78	1894.07	2408.07	2884.63	3326.52	3736.43	4116.98	4470.66	4799.84	4923.61	5048.87	5175.63	5299.15	5419.62	5537.19
	Economic Rent, $ millions (rounded to nearest hundred million)	6813000	6506000	6202400	5903100	5609300	5321900	5041500	4768800	4504400	4248800	4442000	4643100	4852600	5084400	5340600	5624000
$1,500	**CO_2 emissions, millions of metric tons**	5055.13	4507.07	4011.98	3565.76	3164.44	2804.26	2481.62	2193.18	1935.76	1706.42	1681.91	1657.51	1633.21	1613.43	1598	1586.8
	Reduction in CO_2 relative to moving trajectory, million metric tons	787.934	1421.03	2002.47	2536.38	3026.77	3477.41	3891.91	4273.66	4625.85	4951.44	5073.72	5197.43	5322.61	5444.86	5564.38	5681.32
	Economic Rent, $ millions (rounded to nearest hundred million)	8103300	7670300	7248900	6840000	6444500	6063000	5696100	5344200	5007300	4685700	4896900	5116900	5345900	5599500	5880200	6190800
$1,600	**CO_2 emissions, millions of metric tons**	5038.88	4478.29	3973.85	3520.91	3115.08	2752.18	2428.3	2139.77	1883.18	1655.36	1631.4	1607.55	1583.82	1564.49	1549.41	1538.45
	Reduction in CO_2 relative to moving trajectory, million metric tons	804.186	1449.81	2040.6	2581.24	3076.13	3529.48	3945.23	4327.07	4678.43	5002.5	5124.23	5247.39	5372	5493.79	5612.97	5729.67
	Economic Rent, $ millions (rounded to nearest hundred million)	8616000	8129900	7659300	7205100	6767800	6348200	5946400	5562800	5197200	4849700	5067700	5294700	5531100	5793000	6082900	6403800

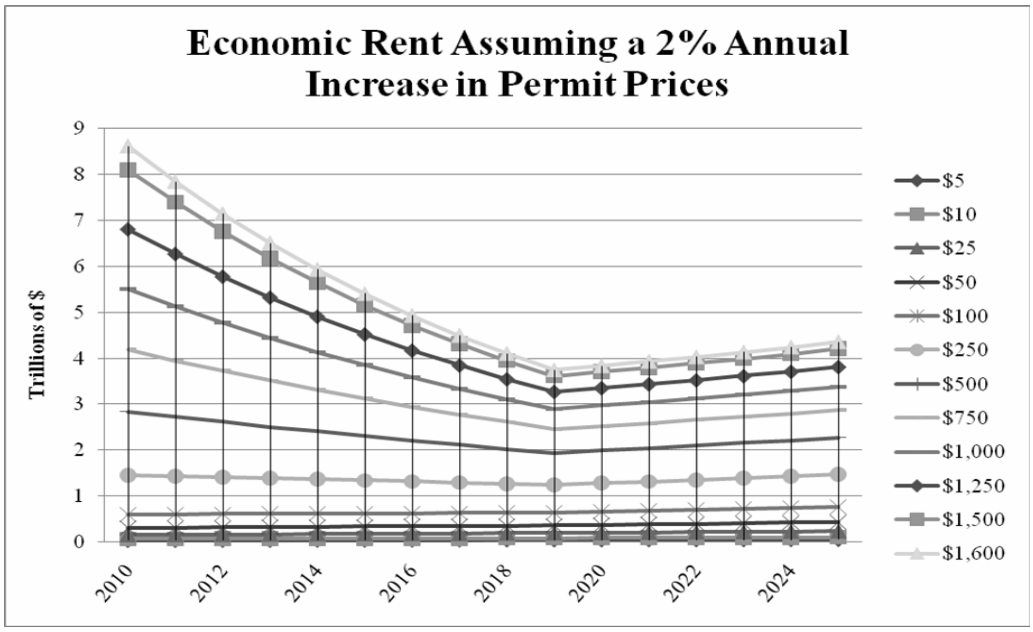

Figure 7 *Economic Rent From a 2% Annual Increase in Permit Price*

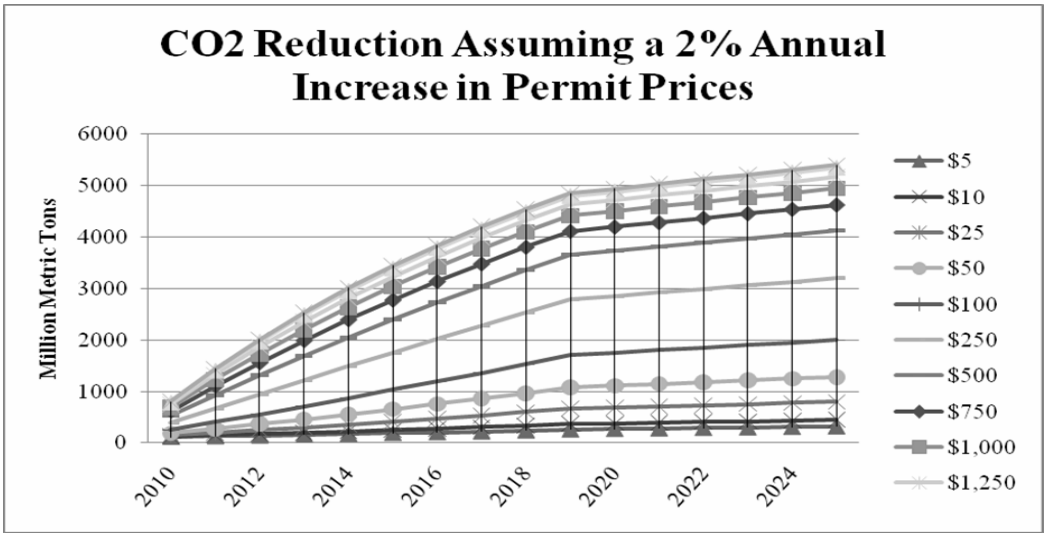

Figure 8 *Reduction in CO_2 Assumes a 2% Annual Increase in Permit Prices*

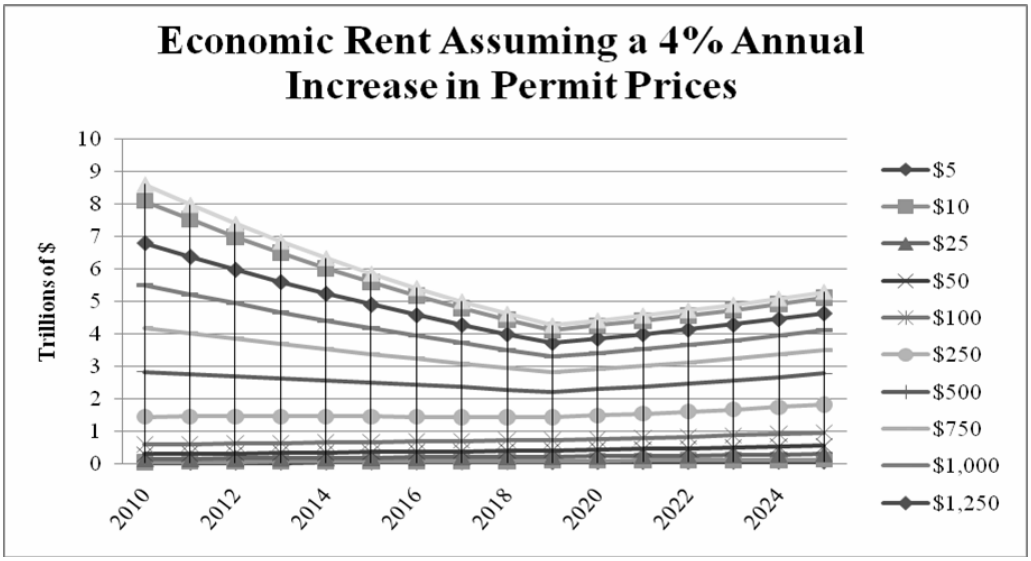

Figure 9 *Economic Rent From a 4% Annual Increase in Permit Price*

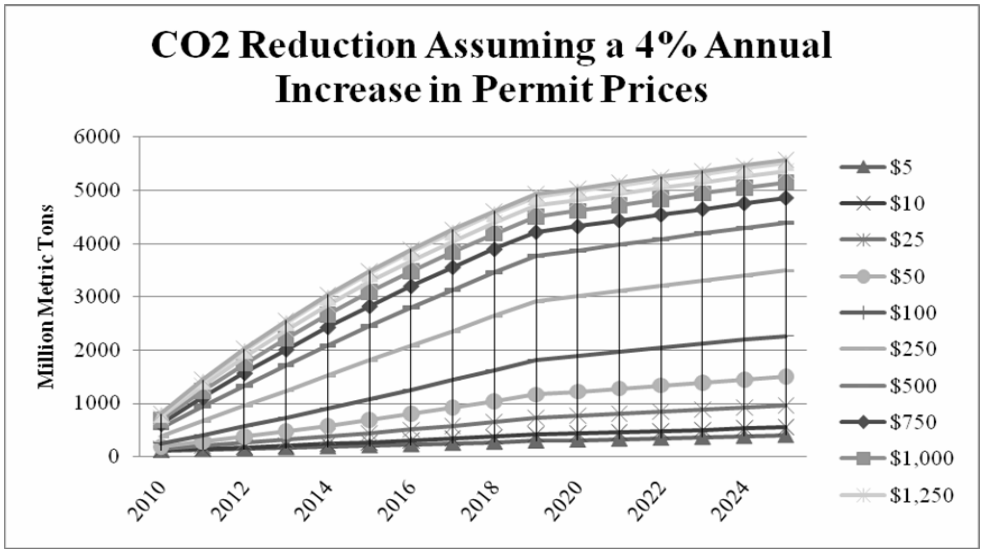

Figure 10 *Reduction in CO_2 Assumes a 2% Annual Increase in Permit Prices*

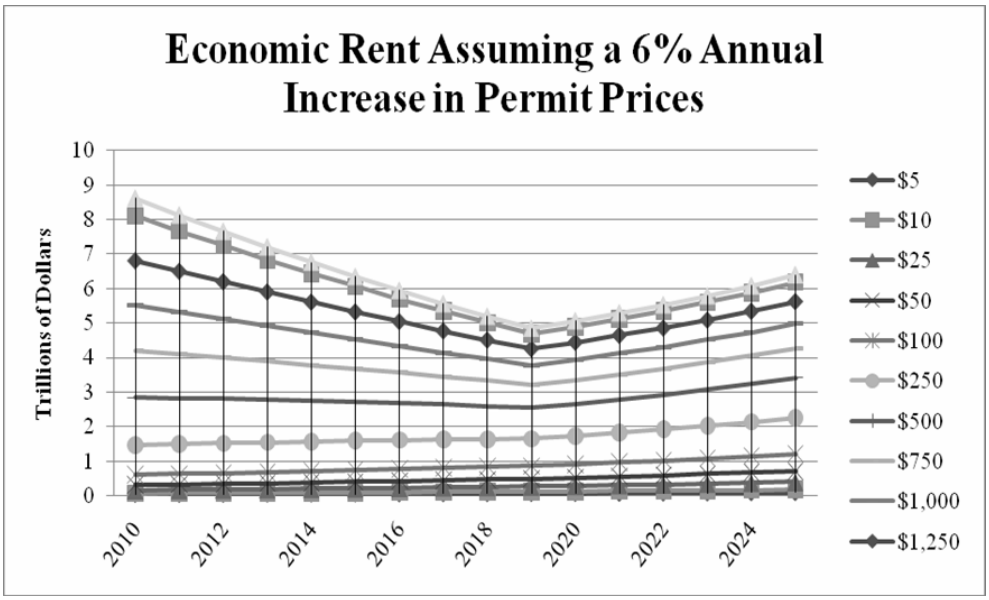

Figure 11 *Economic Rent From a 6% Annual Increase in Permit Price*

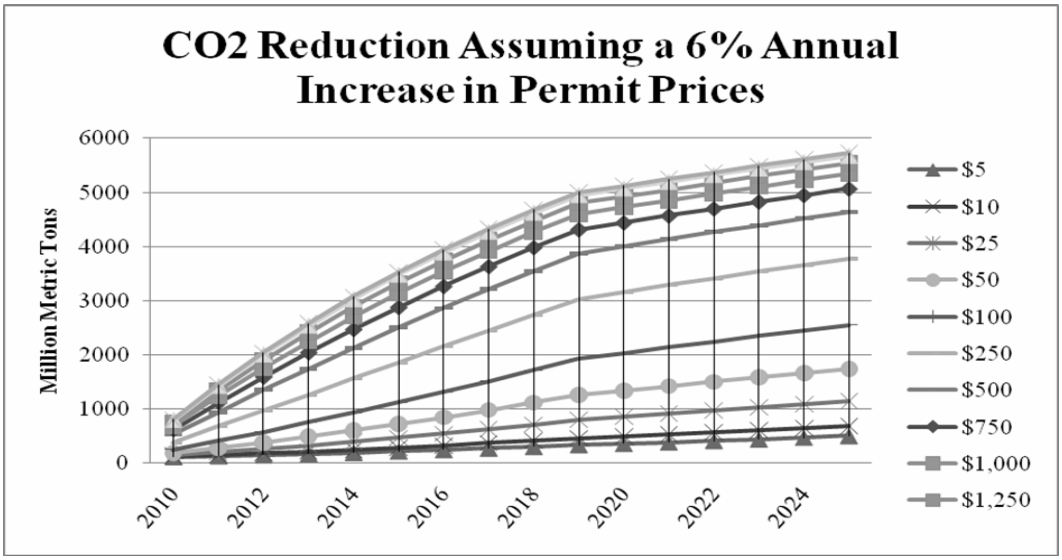

Figure 12 *Reduction in CO_2 Assumes a 6% Annual Increase in Permit Prices*

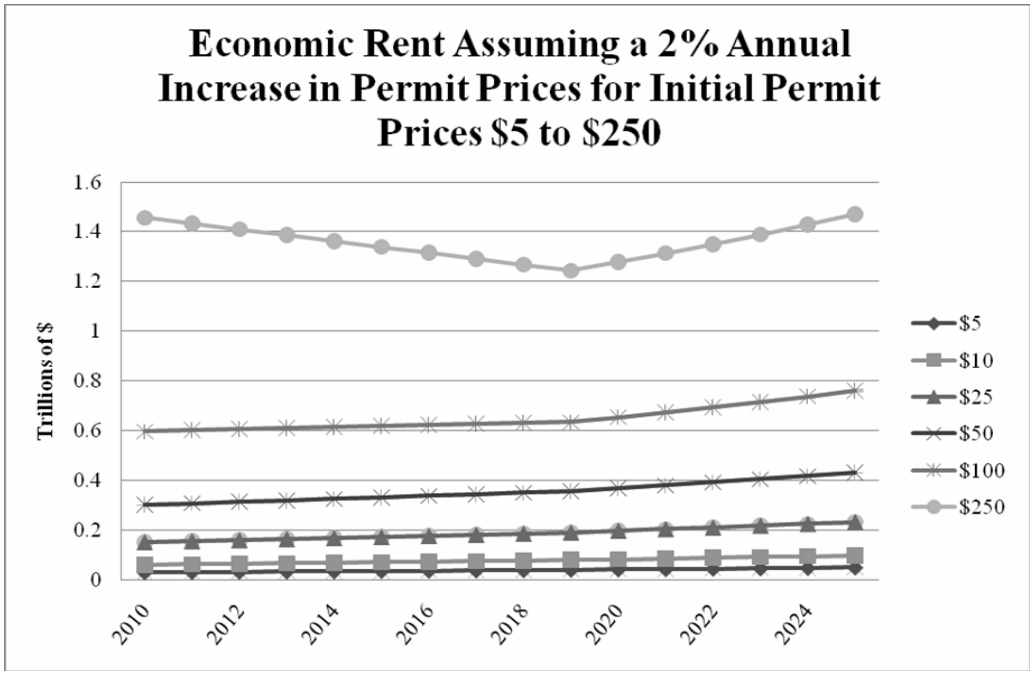

Figure 13 *Economic Rent From a 2% Annual Increase in Permit Price ($5 to $250)*

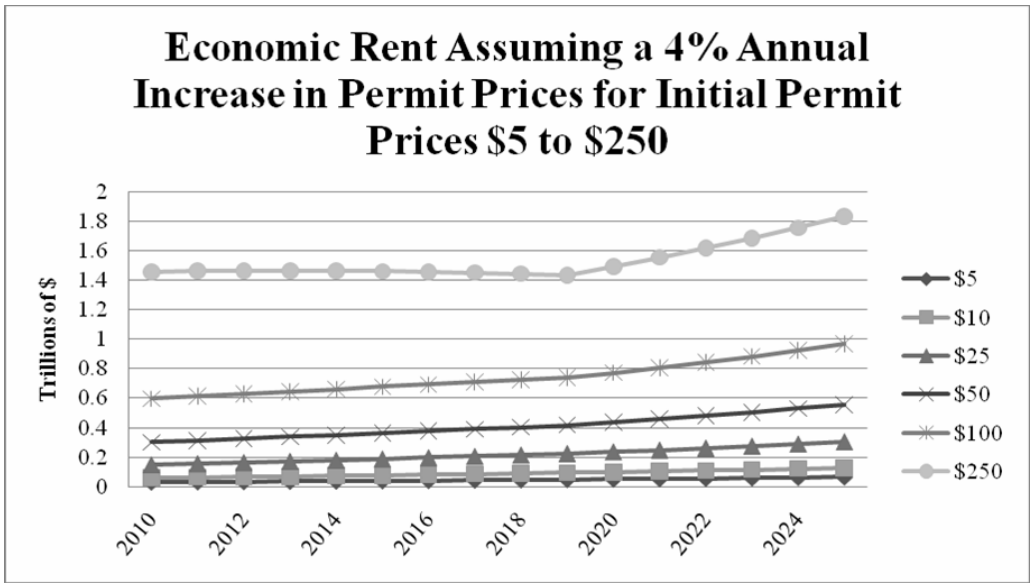

Figure 14 *Economic Rent From a 4% Annual Increase in Permit Price ($5 to $250)*

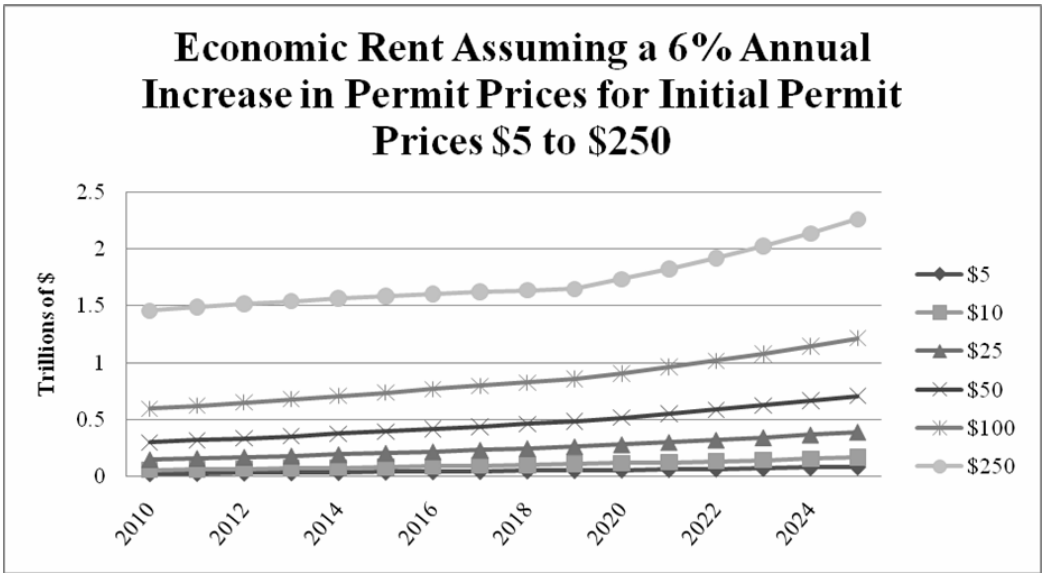

Figure 15 *Economic Rent From a 6% Annual Increase in Permit Price ($5 to $250)*

7. DISCUSSION

While the exact calculations are difficult to obtain because of a lack of specific information, such as the individual firm elasticities of demand, the potential economic rent from carbon abatement policies, specifically cap-and-trade and carbon taxes, are substantial. Despite these shortcomings, the findings presented in this paper are meaningful and robust. The results of the scenario analyses show that the potential economic rent that could be captured from carbon abatement programs is in the order of billions of dollars, and in some scenarios trillions of dollars.

Three different scenarios, a 2% annual permit price increase from the starting permit price, a 4% annual permit price increase, and a 6% annual permit price increase, illustrate how much economic rent is available from CO_2 abatement programs. Not surprisingly, economic rent increases with each annual price increase. However, an interesting result is the corresponding decrease in CO_2 emissions. As shown in the tables, the decrease in CO_2 as a result of the increase in the price of permits initially increases. At some permit price level, however, the reduction of CO_2 emissions reaches an apex and then starts to decrease. This result could be due to a few reasons. First, and the most likely reason, is that firms have shifted to new technologies that reduce their CO_2 emissions. As the price of permits increase, the cost of investment in new technology to reduce CO_2 emissions is cheaper than the cost of the permits. The new technologies will

result in fewer emissions. However, at some point there will be a flood of new technology and additional investment will not be feasible preventing additional reductions in CO_2 emissions. Second, the permits will reduce emissions to a point where further increases in reductions are not possible. Therefore, additional reductions will occur but at a diminishing rate.

As shown in this paper, the two main schemes for CO_2 abatement are carbon taxes and cap-and-trade. Furthermore, the economic rent that can be captured with the two schemes is nearly identical if the calculations are made based upon carbon emitted instead of the carbon content of the energy. The economic rent would be similar if the calculations were made on the carbon content of the energy, although the rent would likely be higher. Thus, a cap-and-trade program that auctions all of the abatement permits can obtain the economic rent levels estimated in Table 4, Table 5 and Table 6. Despite the benefits of a cap-and-trade program, many people favour carbon taxes over a cap-and-trade program. The reasons for this preference are that taxes are predictable and the increased prices would be expected by firms and consumers, while cap-and-trade auctions are volatile in their price ranges and cannot be anticipated by actors in the market place. Furthermore, cap-and-trade auctions could potentially be manipulated by firms to keep the prices of the permits low, whereas carbon taxes are set per ton of CO_2 by a regulatory agency.

Despite some drawbacks, the results presented in this paper suggest that either carbon taxation or a cap-and-trade scheme that auctions all the abatement permits can work. Furthermore, the findings indicate that applying the principles of collecting economic rent from the commons can be an effective method for reducing environmental degradation. The rent captured can then be redistributed back to society to ensure that the abatement policies are, at worst, tax neutral and not regressive. As Barnes (2001) argues, treating environmental assets as commons and making those that pollute pay, the redistribution of the captured economic rent is an equitable method of reducing environmental degradation.

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OPERATIONAL EFFICIENCY IN THE U.S. AIRLINE INDUSTRY: AN EMPIRICAL INVESTIGATION OF POST-DEREGULATION ERA

Richard A. AJAYI[*], Seyed MEHDIAN[**], Vitaly S. GUZHVA[***]

Abstract: *The purpose of this paper is threefold: (1) to examine the operational efficiency of U.S. airlines after the deregulation of 1978; (2) to investigate whether operational efficiency is associated with changes in financial position of firms in the industry and (3) to study if there is an observable pattern in the efficiency measures for large and small airlines. The results indicate that small U.S. airlines record higher scores than large U.S. airlines in four out of five efficiency measures examined. The exception is in the category of allocative efficiency where large airlines exhibit more optimal input mix of resources that their smaller counterparts. This superior mix of resources is consistent with cost minimization. In addition, the analysis shows that higher overall efficiency measures are associated with higher net profit margins of the airlines in the sample, while higher allocative efficiency seems to correlate with higher return on equity.*

Key words: U.S. airlines, efficiency, performance
JEL: L60, C14

I. INTRODUCTION

The airline industry is a service industry that is very capital and labour-intensive. Through the years, U.S. airlines have earned net profit margins that are consistently below the average for U.S. industry as a whole (ATA, 2010). A competitive industry would be expected to earn its cost of capital, but most airlines have been unable to do so (Pearce, 2006). According to the U.S. Department of Transportation Form 41 Financial

[*] Richard A. AJAYI, College of Business, Department of Finance, University of Central Florida, Orlando, FL 32816-1400, Phone: 407-823-5908, rajayi@bus.ucf.edu
[**] Seyed MEHDIAN, School of Management, University of Michigan-Flint, Flint, MI 48502, Phone: 810-762-3318, seyed@umflint.edu
[***] Vitaly S. GUZHVA, College of Business, Embry-Riddle Aeronautical University, 600 S. Clyde Morris Blvd. Daytona Beach, FL 32114-3900, Tel: 386- 226-7946, vitaly.guzhva@erau.edu

Data, from 1977 through the third quarter of 2007 U.S. airlines combined generated $55 billion in operating profits, but experienced net combined losses of more than $13 billion. Also, the average operating and net margins of U.S. airlines for the same periods were 1.97% and - 0.17% respectively. The geometric mean of accounting Return on Equity (ROE) calculated as income before tax over equity over the same period was only 0.21%. Clearly, the U.S. airline industry has failed its long term investors as it has not been capable of sustaining profitability. As presented on Figure 16 and Figure 17, U.S. airline industry operating profits and margins have been very volatile.

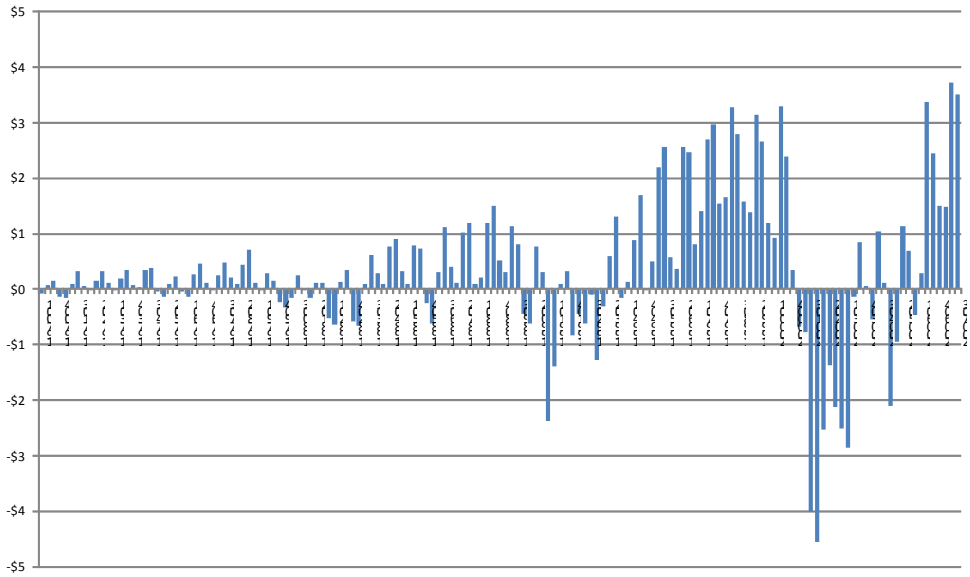

Figure 16 *U.S. Airline Industry Quarterly Operating Profit (Loss) in $ Billion from Q1 1977 to Q3 2007*

Source: Form 41 Financial Data of the U.S. Department of Transportation

During the late 1970's and early 1980's the U.S. airline industry experienced dramatic changes. The 1978 Airline Deregulation Act stimulated competition in the previously highly regulated airline industry. The legislation initially allowed fare reductions of up to 70% without the approval of the Civil Aeronautical Board (CAB), and permitted automatic entry of new airlines into existing routes. The Act phased out the regulatory authority of the CAB and eliminated the agency altogether in 1984. A new regulatory and competitive environment should enhance the ability of the airlines to adjust to price changes in their input and output markets and reduce losses from incorrect service level and price combinations. In regulated industries, such as airlines, public interest considerations dictate that structural changes should be managed to protect the

viability of the airline transportation system while encouraging competition and promoting productive efficiency. With U.S. airlines unable to generate sustainable profits since deregulation, their production efficiency has to be improved to enable them to survive in an increasingly competitive and global environment.

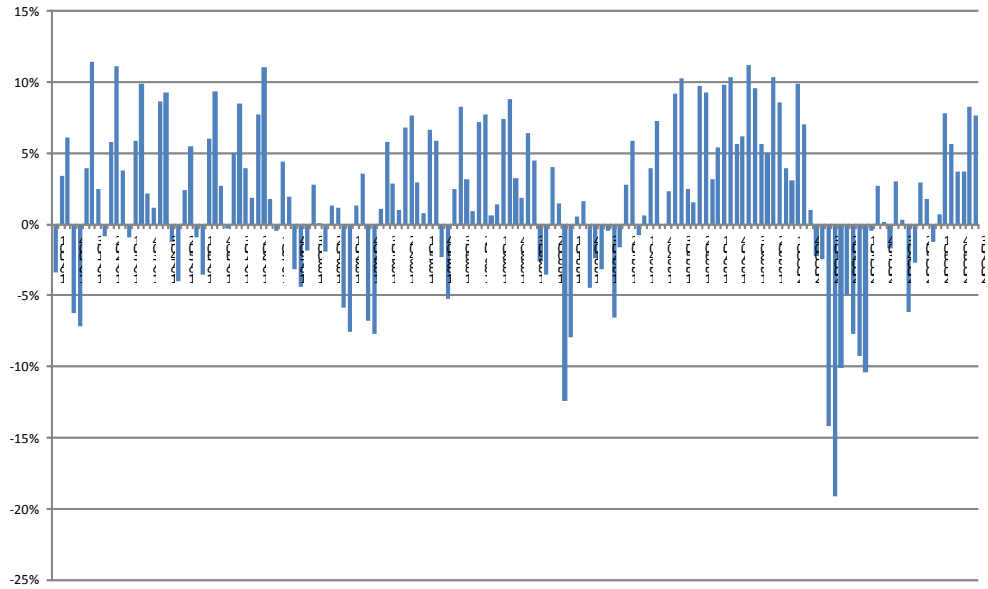

Figure 17 *U.S. Airline Industry Quarterly Operating Margin from Q1 1977 to Q3 2007*

Source: Form 41 Financial Data of the U.S. Department of Transportation

A number of studies investigate various aspects of productivity in the airline industry (Atkinson and Cornwell, 1994; Sickles, Good, and Getachew, 2002; Kumbhakar, 1992; etc.). Sickles, Good, and Johnson (1986) analyze departures from efficient resource allocation in the U.S. airline industry during the period 1970-1981 using a model of allocative distortions. Their results support the fact that deregulation reduced both the total cost and relative level of allocative distortions. Adrangi, Chow, and Raffiee (1996) study passenger output and labour productivity of the U.S. airlines using a generalized Fuss normalized quadratic profit function. Their findings provide evidence on the differing abilities of the airlines to enhance their passenger output and alter employment numbers after deregulation and suggest that the effects of deregulation on the airline industry are complex. Alam and Sickles (2000) employ time series analysis of airline efficiency measures to examine an empirical relationship between technical efficiency and market forces and find that competitive pressure enhances efficiency and they also report less dispersion in firm efficiency over time. The above studies are not

directly comparable due to differences in model specification, time periods, and productivity measures.

A number of studies (e.g., Barth, Beaver, and Landsman, 1998; Lev, 1989; Lev and Thiagarajan, 1993, etc.) report a weak relation between stock prices and accounting earnings of firms and argue that firm-specific characteristics and various financial ratios should be added to a model in order to strengthen the relation. Cebenoyan (2003) utilizes an efficiency measure estimated using stochastic frontier methodology in addition to earnings, accounting ratios, and firm-specific variables and finds that the efficiency measure explains some of the previously reported differences in the relevance of earnings to stock returns.

In this paper we employ non-parametric approach to estimate several efficiency indices to assess operational performance in the US commercial airline industry. We also investigate whether efficiency measures are correlated with financial characteristics or profitability ratios.

The rest of the paper is organized as follows: section II explains the data and methodology, section III presents and discusses the empirical results, and section IV concludes the paper.

II. DATA AND METHODOLOGY

A. Data

To estimate inputs and outputs for efficiency measures and financial ratios for U.S. airlines, we use Form 41 Financial Data of the U.S. Department of Transportation. Form 41 contains financial information on large U.S. certified air carriers including balance sheets, income statements, cash flows, aircraft inventory, operating expenses, revenue passenger miles (RPM), yield, available seat miles (ASM), costs per ASM, etc. The sample consists of 151 quarterly observations for 16 U.S. airlines from the first quarter of 1977 to the third quarter of 2007. Several individual airline observations contains fewer quarters due to the fact that those airlines were not in existence over the whole sample period. To compute efficiency indices, we use 5 inputs and 3 outputs. The inputs are denoted by x, the output by y and they are defined as follows: x1 measures number of aircraft seats available to carry passengers, x2 indicates number of employees, x3 measures fuel in gallons per period, x4 represents the total value of flight assets in dollars, x5 stands for the total value of non-flight assets, y1 indicates total number of revenue passenger miles per period, y2 represents total passenger revenues, y3 measures total mail and freight revenues, and, finally, total cost of operation is used as observed total cost incurred.

B. Methodology

To examine the efficiency of US airline companies, we use non-parametric order to estimate several efficiency indices for the companies. In this approach a set of "best practice" frontiers is constructed by solving several linear programming models and employing observed data on inputs utilized and outputs produced by airlines included in the sample. Specifically, we first compute each company's cost efficiency by solving the following linear programming model to estimate the potential minimum total operating cost of each company:

$$\begin{aligned} C_i^* &= \min \quad p \times x \\ y_i &\leq zY \\ x_i &\geq zX \\ z &\geq 0 \end{aligned} \qquad \text{(LP1)}$$

Where

C_i^* is the potential minimum total cost of production of company i and p is a vector of input prices.

y_i is a vector of outputs produced by company *i* of dimension (1, m)

x_i is a vector of inputs utilized by company *i* of dimension (1, n)

Y is a matrix of observed outputs of all companies in the sample of dimension (m, N)

X is a matrix of observed inputs of all companies in the sample of dimension (n, N)

Z is an intensity vector.

N is number of firms in the sample.

Having calculated the potential minimum total cost of production of company i (C_i^*), we then, compute the ratio of C_i^* to the observed total cost, denoted by C_i . This ratio is called overall efficiency (OE) of firm i.

More formally, OE for company i is a ratio defined as follows:

$$OE_i = \frac{C_i}{C_i^*}$$

The second efficiency index that we compute is the overall technical efficiency (OTE). This index measures the technical efficiency of the company under assumption of constant returns to scale (CRS). The OTE can be further decomposed in into two other efficiency indices in order to identify the sources of OTC. One index assesses the company's efficiency relative to a technology that exhibits both CRS and well as variable returns to scale. This index is called pure technical efficiency (PTE) while the other efficiency index is called scale efficiency (SE) which provides information to indicate whether the company operates at optional or at sub-optimal scale. Specifically, we can write:

$$OTE_i = PTE_i \times SE_i$$

where

$$SE_i = \frac{OTE_i}{PTE_i}$$

To estimate OTE of the company i we solve the following linear programming problem (LP) for each company in the sample:

$$\begin{aligned} &\min \ \lambda_i \\ &y_i \le zY \\ &\lambda_i x_i \ge zX \\ &z \ge 0 \\ &i = 1,....., N \end{aligned} \qquad \text{(LP1)}$$

Where all variables are as defined earlier, λ_i is the OTE calculated for firm *i* relative to a technology that is characterized by CRS, and *i* = 1….N.

The above LP is solved for each company in the sample to obtain the OTE for such company. To calculate PTE (denoted by θ_i for firm *i*) - we resolve LP1 for each company in the sample by adding $\sum_{i=1}^{N} z_i = 1$ as an additional constraint. Having obtained the OTE and PTE for company *i*, the scale efficiency index (SE) for the company i is calculated as:

$$SE_i = \frac{OTE_i}{PTE_i} = \frac{\lambda_i}{\theta_i}$$

The company is said to be scale efficient if SEi = 1 and if 0 < SE <1 for a given company, that company is said to be scale inefficient or operating at sub-optimal scale.

Finally, we compute allocative efficiency (AE) which measures the deviation of the operation from the optimal input mix of resources that is consistent with cost minimization. AE is determined as:

$$AE_i = \frac{OE_i}{OTE_i}$$

We summarize the efficiency indices defined above as follow:

$$OE_i = OTE_i \times AE_i$$

then

$$OTE_i = PTE_i \times SE_i$$

and then

$$OE_i = PTE_i \times SE_i \times AE_i$$

We obtain the efficiency indices above by pooling data for all companies for all years. Specifically, we assume that the companies have access to the same technology and are facing common frontiers.

III. EMPIRICAL RESULTS

The summary statistics for the efficiency indices computed relative to the corresponding frontiers for combined years 1977 to 2007 are presented in Table 7. We partition the firms into two sub-samples; one sub-sample is classified as major (large) airlines and includes American Airlines, Continental Airlines, Delta, Northwest Airline, United Airlines, US Airways, and Southwest Airlines. The other sub-sample is classified as non-major (small) airlines and includes Alaska Airlines, Comair, Atlantic Southeast, Frontier Airlines, Hawaiian, Express jet Airlines, American Eagle, and Aloha. We make the distinction between major and non-major airlines based on the total annual 2006 operating revenues (last whole year in the sample). The median figure of annual operating revenues for the airlines in the sample is $2.7 billion. All seven major airlines exceed the median in terms of their annual operating revenues with the largest figure of $22.5 billion for American Airlines and the smallest figure of $8 billion for US Airways. Out of nine non-major airlines in the sample Aloha and Alaska Airlines had the lowest and the highest 2006 operating revenues of $395 million and $2.7 billion respectively. Panel A of this Table displays the efficiency indices for major (large) airlines in the sample and Panel B shows efficiency indices for non-major companies. Selected revenue and profitability statistics are presented in Table 8.

Table 7 *Summary Statistics of the Efficiency Measures Relative to the Pooled Sample Frontier of Selected Airlines, 1977-2007*

Panel A. Major Airlines

	OE	*AE*	*OTE*	*PTE*	*SE*
American Airlines					
Mean	0.470	0.757	0.620	0.755	0.821
St. Dev	0.098	0.980	0.099	0.088	1.131
Min	0.256	0.594	0.431	0.591	0.729
Max	0.703	0.789	0.891	1.000	0.891
Delta Airlines					
Mean	0.468	0.765	0.612	0.712	0.859
St. Dev	0.120	0.912	0.132	0.106	1.244
Min	0.248	0.589	0.421	0.526	0.800
Max	1.000	1.000	1.000	1.000	1.000
Northwest Airlines					
Mean	0.473	0.741	0.638	0.879	0.726
St. Dev	0.113	0.885	0.128	0.117	1.090
Min	0.249	0.943	0.264	0.299	0.883

	OE	*AE*	*OTE*	*PTE*	*SE*
Max	0.910	0.910	1.000	1.000	1.000
Continental Airlines					
Mean	0.453	0.696	0.651	0.790	0.824
St. Dev	0.116	0.900	0.129	0.143	0.898
Min	0.260	0.639	0.407	0.462	0.881
Max	0.116	0.900	0.129	0.143	0.898
US Airways					
Mean	0.465	0.770	0.603	0.651	0.926
St. Dev	0.118	0.894	0.132	0.142	0.927
Min	0.207	0.600	0.345	0.351	0.983
Max	0.875	0.875	1.000	1.000	1.000
Southwest Airlines					
Mean	0.451	0.717	0.629	0.653	0.963
St. Dev	0.097	1.044	0.093	0.110	0.851
Min	0.285	0.620	0.460	0.466	0.987
Max	0.883	0.883	1.000	1.000	1.000
United Airlines					
Mean	0.493	0.756	0.653	0.807	0.809
St. Dev	0.110	0.829	0.133	0.130	1.029
Min	0.265	0.694	0.382	0.468	0.816
Max	0.731	0.731	1.000	1.000	1.000
All Major Airlines					
Mean	**0.468**	**0.743**	**0.630**	**0.750**	**0.847**

Panel B. Non-Major Airlines

	OE	*AE*	*OTE*	*PTE*	*SE*
Aloha					
Mean	0.504	0.827	0.610	0.690	0.883
St. Dev	0.139	0.879	0.159	0.113	1.406
Min	0.262	0.726	0.361	0.521	0.693
Max	0.886	0.886	1.000	1.000	1.000
Alaska Airlines					
Mean	0.462	0.721	0.641	0.675	0.949
St. Dev	0.116	0.745	0.156	0.141	1.109
Min	0.238	0.672	0.354	0.423	0.837
Max	0.753	0.753	1.000	1.000	1.000
America West Airlines					
Mean	0.508	0.712	0.714	0.768	0.930
St. Dev	0.103	0.823	0.126	0.144	0.872
Min	0.314	0.658	0.477	0.516	0.924
Max	1.000	1.000	1.000	1.000	1.000
Atlantic South-East					
Mean	0.573	0.710	0.807	0.825	0.978
St. Dev	0.094	1.337	0.071	0.074	0.956
Min	0.452	0.694	0.651	0.655	0.994

	OE	*AE*	*OTE*	*PTE*	*SE*
Max	1.000	1.000	1.000	1.000	1.000
Hawaiian Airlines					
Mean	0.480	0.662	0.725	0.770	0.941
St. Dev	0.145	0.695	0.209	0.165	1.266
Min	0.212	0.642	0.330	0.438	0.753
Max	0.817	0.817	1.000	1.000	1.000
American Eagle					
Mean	0.619	0.849	0.729	0.759	0.961
St. Dev	0.113	0.924	0.123	0.124	0.989
Min	0.451	0.859	0.525	0.540	0.972
Max	1.000	1.000	1.000	1.000	1.000
Comair					
Mean	0.410	0.610	0.671	0.675	0.995
St. Dev	0.051	0.873	0.059	0.060	0.974
Min	0.319	0.560	0.570	0.571	0.998
Max	0.445	0.624	0.713	0.717	0.994
Expressjet Airlines					
Mean	0.576	0.616	0.935	0.944	0.991
St. Dev	0.038	0.591	0.064	0.059	1.093
Min	0.498	0.603	0.826	0.834	0.990
Max	0.661	0.661	1.000	1.000	1.000
Frontier					
Mean	0.524	0.584	0.896	0.927	0.967
St. Dev	0.133	1.216	0.109	0.078	1.407
Min	0.185	0.439	0.421	0.726	0.580
Max	1.000	1.000	1.000	1.000	1.000
All Non-Major Airlines					
Mean	**0.517**	**0.699**	**0.748**	**0.781**	**0.955**

Panel C. Aggregate for All Airlines

	OE	*AE*	*OTE*	*PTE*	*SE*
All Airlines					
Mean	0.483	0.730	0.662	0.752	0.880
St. Dev	0.121	0.791	0.153	0.147	1.041
Min	0.185	0.701	0.264	0.299	0.883
Max	1.000	1.000	1.000	1.000	1.000

Table 8 *Selected Revenue and Profitability Statistics*

	Average Operating Income ($ Bln)	*Average Net Income ($ Bln)*	*Average Operating Margin*	*Average Net Margin*	*Geometric Mean of ROE*	*Operating Revenues 2006 ($ Bln)*
American Airlines	6.36	(1.53)	2.10%	0.37%	-2.45%	22.49
Delta Airlines	4.50	(9.48)	2.11%	-1.13%	0.60%	17.34

	Average Operating Income ($ Bln)	*Average Net Income ($ Bln)*	*Average Operating Margin*	*Average Net Margin*	*Geometric Mean of ROE*	*Operating Revenues 2006 ($ Bln)*
Northwest Airlines	5.11	(0.90)	2.29%	0.68%	1.03%	12.55
Continental Airlines	2.59	(0.50)	0.91%	-1.34%	-5.42%	13.01
US Airways	(0.09)	(2.17)	1.78%	0.15%	0.73%	8.08
Southwest Airlines	9.77	6.25	11.28%	7.04%	4.79%	9.09
United Airlines	(0.26)	(4.41)	-0.82%	-1.36%	0.47%	19.33
Aloha	(0.06)	(0.17)	0.64%	-0.55%	4.02%	0.40
Alaska Airlines	0.77	0.46	2.68%	1.92%	3.26%	2.69
America West Airlines	0.15	(1.06)	-0.60%	-3.73%	-2.58%	3.77
Atlantic South-East	1.36	0.22	16.51%	6.60%	6.60%	1.27
Hawaiian Airlines	(0.25)	(0.32)	-3.41%	-2.26%	-3.05%	0.88
American Eagle	0.94	(0.08)	4.15%	-0.64%	7.32%	1.91
Comair	0.32	(1.82)	5.50%	-30.94%	-15.55%	1.20
Expressjet Airlines	0.95	0.54	9.34%	5.04%	-8.22%	1.67
Frontier	0.10	0.04	-2.14%	-2.63%	-1.80%	1.13
All Airlines	55.06	(13.19)	1.97%	-0.17%	0.21%	116.82

The estimated efficiency indices are somewhat counterintuitive. It seems that four out of five efficiency indices are higher for non-major airlines than for major airlines. Specifically, we observe that the average overall efficiency for major airlines is 46.8% compared to an average of 51.7% for non-major airlines. This suggests that if all major airline companies had been fully overall efficient, they could have potentially saved 53.2% of costs, on average; over sample period while smaller airlines could have potentially saved 48.3% of costs on average. In addition, we note that this relative cost "inefficiency" for large airlines is primarily caused by low overall technical efficiency of 63.0% compared to 74.8% for small airlines. Suboptimal "input-mix" contributes less to this overall inefficiency as major airlines are more allocative efficient at 74.3% compared to 69.9% for small airlines

Comparing the efficiency of major airlines with non-major, the results suggest that only allocative efficiency index (AE) is higher for major than non-major airlines suggesting that major airlines have more optimal input mix of resources consistent with cost minimization than non-major airlines. Furthermore, while one would expect larger airlines to be more scale efficient than their smaller counterparts, surprisingly, scale efficiencies (SE) are better for smaller airlines (at 95.5%) than for larger airlines (at 84.7%). These results suggest that policies that encourage mergers and acquisitions in the

airline industry might not be justified on the basis of technical efficiency enhancement but are justified on the allocative efficiency ground. It is suggested that this issue should be re-examined after a number of years following recent mergers and acquisitions in the airline industry.

A closer look at the panels of large and small airlines separately, shows that United Airlines has higher overall efficiency (OE) and above average pure technical efficiency (PTE) than other major airlines. While all of the major airlines are very similar in terms of overall technical efficiency (OTE), Northwest does better with respect to pure technical efficiency (PTE) but worse with respect to scale efficiency (SE). Southwest, on the other hand, is the best among major airlines with respect to SE, but does not do well in terms of PTE. US Airways is very similar to Southwest in terms of PTE, and SE.

The small airline panel of Table 7 also presents some mixed results. While American Eagle seems to be the best among small airlines with respect OE and AE, other airlines are leading with OTE (Frontier), PTE (Expressjet Airlines), and SE (Atlantic South-East).

Since we do not have enough observations for a traditional statistical analysis, we conduct a simple correlation analysis to identify efficiency measures that are associated with profitability and size in the airline industry. The results of correlation analysis are presented in Table 9.

Table 9 *Correlations between Efficiency and Profitability Measures and Airline Size*

	OE	*AE*	*OTE*	*PTE*	*SE*
Operating Margin	0.29	-0.06	0.24	0.00	0.40
Net Margin	0.45	0.33	0.13	0.24	-0.15
ROE	0.42	0.69	-0.19	-0.15	-0.11
Major	-0.47	0.31	-0.59	-0.18	-0.70
Non-Major	0.47	-0.31	0.59	0.18	0.70

As discussed above, positive correlations between AE and large airline group variable confirm that large airlines in the sample have higher allocative efficiency than small airlines. Positive correlations between five other efficiency measures and small airline group variable confirm that small airlines in the sample are more efficient.

The correlations between efficiency measures and profitability ratios are presented in Table 9. As can be seen for this table, while the overall efficiency index has positive correlations with all three profitability ratios, it seems to contribute to Net Profit Margin the most (correlation of 0.45). The allocative efficiency index has a low negative correlation with Operating Profit Margin (-0.06) and positive correlations with Net Profit Margin (0.33) and ROE (0.69). OTE is positively correlated with Operating Profit Margin (0.24) and Net Profit Margin (0.13), and negatively correlated with ROE (-0.19).

Other efficiency measures also produce mixed results with PTE producing zero correlation with Operating Margin, positive (0.24) with Net Margin, and negative (-0.15) with ROE. SE seems to contribute more to Operating Margin (correlation of 0.40). Generally, these findings provide evidence to suggest that there exists some relation between accounting measures of performance and efficiency measures of performance in the airline industry.

IV. CONCLUSIONS

In this paper we examine the operational efficiency of U.S. airlines after deregulation of 1978 and investigate whether the observed efficiency and technological progress are associated with changes in financial position of the firms in the industry. In addition, we also check for any observable pattern in the efficiency measures for large and small U.S. airlines. The results indicate that U.S. large airlines do not demonstrate higher efficiency than small airlines. In fact, small U.S. airlines record higher scores than large U.S. airlines in four out of five efficiency measures examined. The exception is in allocative efficiency where higher measures recorded for large airlines suggest that they have superior optimal input mix of resources than smaller airlines. Superior optimal input mix of resources is consistent with cost minimization. Surprisingly, the analysis does not show any advantage in scale efficiency for large airlines over their smaller counterparts. Nevertheless, correlation analysis of efficiency measures with profitability measures suggests that higher overall efficiency measures are associated with higher net profit margins for the airlines in the sample, while higher allocative efficiency correlates with higher return on equity for the airlines.

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THE GENERAL FRAMEWORK FOR FOREIGN DIRECT INVESTMENTS ATTRACTION IN CENTRAL AND EASTERN EUROPEAN COUNTRIES

Mihai MUTAŞCU[*], Roxana HETEŞ[**], Oana MIRU[***]

Abstract: *In the context of globalization, FDI is the engine of economic development and a unique way for connecting to the free market economic system, the creation of effective promotion policies proving to be useful amid increased competition. The purpose of this paper is to present national policies on foreign direct investment regime in Central and Eastern Europe, with a special interest for Romania, Bulgaria, Hungary and Slovenia, focusing on several fundamental issues: (1) What are the mechanisms and instruments used to support a policy around FDI? (2) What are the rationales for a policy that is promoted to attract foreign direct investment? (3) What is the impact on FDI?*

Keywords: *foreign direct investments, active and passive policies, privatization, tax incentives, promotion agencies, guarantees*

JEL Codes: *F21, F30, H20, C21*

1. INTRODUCTION

Foreign direct investment (FDI) constitute currently one of the most dynamic component of international economic flows, through the fact that they affect and change the essence level of international economic integration, links to production processes, as well as competitiveness relationships between firms and national economies. Given that in the contemporary global economy, both trade and production of goods and services experienced a significant process of globalization, foreign investment's use to fund and implement national economic policies has become widespread.

[*] Mihai MUTAŞCU, West University of Timişoara, Faculty of Economics and Business Administration, J.H. Pestalozzi str., no. 16, 300115, Timişoara, România, mmutascu74@yahoo.com

[**] Roxana HETEŞ, West University of Timişoara, Faculty of Economics and Business Administration, J.H.Pestalozzi str., no. 16, 300115, Timişoara, România, rhetes@yahoo.com

[***] Oana MIRU, West University of Timişoara, Faculty of Economics and Business Administration, J.H.Pestalozzi str., no. 16, 300115, Timişoara, România, miru_oana@yahoo.co.uk

The way in which FDI benefits can be used, the degree of involvement in the receiving economy, essentially depends on the policies pursued. As part of the "locations" source, **the types of policies** aimed at attracting foreign direct investment define two broad categories, namely passive and active. The difference between them is that passive policies are limited to creating an attractive business environment, while active policies aim at the use of specific tools and levers to achieve a harmonization of investors' interests with overall development objectives of the host country.

Viewed in an analytical manner, the measures associated with *passive policies* are meant to create a friendly, attractive environment to foreign investors, without offering particular advantages. In this regard, a number of *safeguards* (related to the free movement of capital, the existence of a competitive environment, the free movement of goods, etc.) are provided to encourage investors to locate projects on a certain territory. *Involvement of foreign investors in privatization of state's assets* is another passive tool to promote foreign direct investment, meaning that the privatization process is able to entail a range of opportunities for acquisitions in favour of foreign investors.

The best way to attract FDI and multiply their benefits is not always passive liberalization. Attracting foreign investment in a highly competitive market requires major location advantages and more targeted promotional efforts. In this direction work ***active policies***, in which overall FDI promotion is done by providing incentives and through the activities of agencies established for that purpose.

The purpose for providing *incentives* is to ensure increased profitability of foreign direct investment, and reduce uncertainty and risk (associated with information asymmetry) to which foreign investors are exposed. The most common are *tax incentives* aimed at reducing the overall tax burden on foreign investors and occur widely, through exemption from taxation of benefits, turnover, value added tax on imports or exports, etc. Another category of *incentives*, namely *financial incentives*, that act as direct grants, preferential loans, public capital participation, insurance at preferential rates, etc., have developed fast in the recent years, particularly in developed countries (EU and U.S.A). In practice, with active policies there may also be associated *other incentives* as well, in general, all economic measures meant to increase revenues and return on investment through non-financial means such as grants for infrastructure access, subsidized services mediated by investment promotion agencies, advantages in terms of market access, etc..

FDI promoting agencies' work, associated with active policies aim at promoting foreign investment in a given territory in order to create jobs and stimulate economic development in general. This basic objective may as well be extended in other directions, such as accelerating the transition to a market economy, promoting technology and know-how transfer, industrial revitalization, strengthening the local supply, environmental protection activities by capturing unpolluted activities.

It is important to note, however, that beyond all these types of incentives, which take various forms, the most important incentive for a foreign investor is the existence of dynamic economies, where local entrepreneurs are able to flourish and diversify their businesses. Basically, a foreign investor may not be placed under a glass bowl, isolated from the rest of that economy. Therefore, no matter how many incentives would a country in recession give to foreign investors, they will not come if local entrepreneurs, who will be their business partners, are not in good economic shape.

2. SPECIFIC DIMENSIONS OF FDI POLICIES IN CENTRAL AND EASTERN EUROPEAN COUNTRIES

2.1 Guarantees for foreign investors

- ***Guarantees for capital free movement***

Capital account liberalization in the countries of Central and Eastern Europe[2] can be considered as having taken place in a highly accelerated pace since the beginning of transition. The wish of becoming EU members, played a key role in shaping this trend, as long as the regulations provide for the free movement of persons, goods and capital within the European Union. In this respect, acceding countries had to undertake full capital account liberalization until integration, conducted in two phases: the liberalization of medium and long term capital flows in a first stage, and the liberalization of short term capital flows in a second phase.

As the economic freedom index[3] built the Heritage Foundation, the liberalization of capital flows in Romania, Bulgaria, Hungary and Slovenia is not final, is oscillating developments in three of four cases, but this exceeds 50% in all cases (Figure 18).

Hungary seems to be, in the last decade, the only country to maintain the liberalization of investment at a constant level (70%) level which is interpreted through a policy of encouraging foreign investment, neutral treatment, the existence of a foreign investments code characterized by simplicity and transparency, as well as an efficient bureaucracy. However, there are still kept a number of restrictions on foreign investment in certain sectors such as utilities or national security. With a more oscillating trend, ***Slovenia*** has achieved today, like Hungary, the threshold of 70%, which makes clear the action to remove restrictions on free movement of capital, especially after the moment of EU integration in 2004.

[2] The country sample comprise of Romania, Hungary, Bulgaria and Slovenia.
[3] The index is represented by the simple average of 10 individual liberties, appreciated on a scale from 0 to 100, where 100 represents absolute freedom.

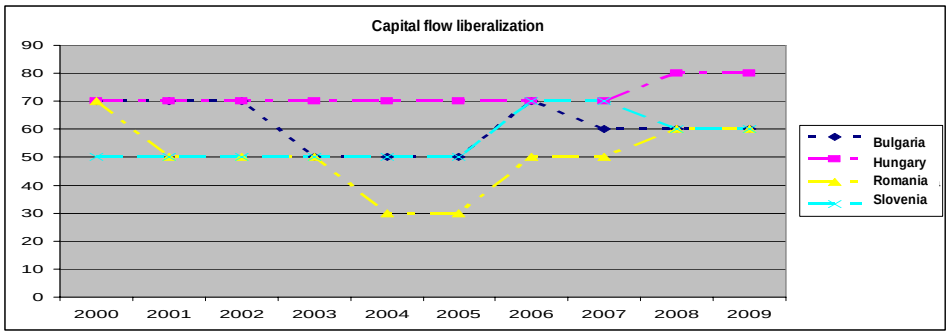

Figure 18 *Liberalization of capital flows in Romania, Bulgaria, Hungary, Slovenia*
Source: Heritage Foundation, Index of Economic Freedom, 2000-2009

With a level for the freedom of investment of 60%, ***Bulgaria*** does not guarantee the application of the bureaucratic treatment, law opacity and restrictions on capital transfers. As regards ***Romania***, the dynamics of the index on freedom of investment is at least unexpected, figures showing an increase, after the year 2000, of restrictions on the free movement of capital. However, in 2009, it stands at 60%, which means that there are still some restrictions on land acquisition, there are bureaucratic impediments, corruption, partially restricted access to exchange, international payments and capital transfer.

- ***Ensuring a normal competitive environment***

Legislative framework on competition policy in East European countries mainly follows lines drawn by European Union legislation, trying to protect, maintain and stimulate competition and a normal competitive environment. Such a framework promotes the interests of consumers and creates conditions for economic evaluation based on uniform principles, while its provisions must be followed by all foreign companies that invest or acquire other companies.

A major coordinate of a normal competitive environment is given by the absence of price controls; there is a consensus among economists that market efficiency is undermined by price controls. This element is shown together with the inflation rate in the construction of the "Monetary Freedom" index, performed by the same Heritage Foundation. For the sample of countries considered, there can be observed a convergence to a degree of liberalization of about 80%, with Romania and Bulgaria seeing more regulation failure (Figure 19).

- ***Ensuring market access for investment projects***

This aims to guarantee foreign investors the opportunity to enter the markets of Central and Eastern European countries by setting up entities that can take various forms, in accordance with the regulations of each host country. In ***general***, at the immediate reach of foreign investors are the following legal forms starting a company: companies

with limited liability, joint stock companies, joint companies, limited or unlimited partnerships, branches of foreign companies, these options enabling a wide range of activities. Of these, limited liability companies are preferred, due to the greater flexibility and simplified procedures, while joint stock companies are more strictly regulated meant for big business, with many investors.

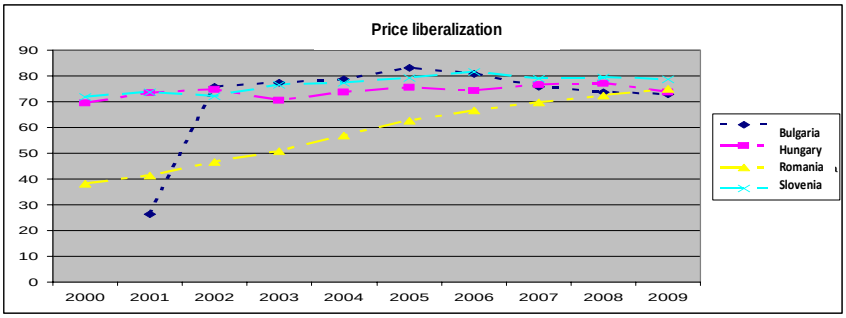

Figure 19 *Price liberalization*
Source: Heritage Foundation, Index of Economic Freedom, 2000-2009

The freedom in the conduct of businesses is captured through one suggestive indicator underlying the economic freedom index developed by the Heritage Foundation. "Business freedom" is a quantitative measure of the ability to initiate, conduct and liquidate a business. On a scale of 0-100, 100 designates a truly open business environment[4]. With a much higher degree of freedom in the conduct of business during the transition, Slovenia and Hungary are caught from in the last period by Romania and Bulgaria. So today, all four countries are characterized by an open business environment in almost 80% (Figure 20).

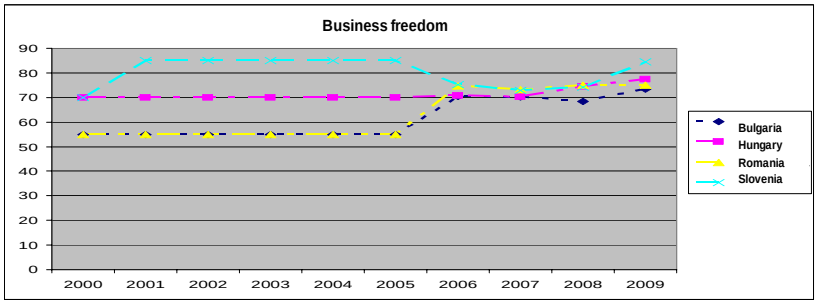

Figure 20 *Business freedom*
Source: Heritage Foundation, Index of economic Freedom, 2000-2009

[4] The following elements concur in an equal proportion to the construction of the indicator: number of procedures, number of days to conduct a procedure, cost and minimum capital necessary to launch a business or obtain a license, and the time, cost and rate of return on business liquidation.

- ***Free movement of goods guarantees***

The liberalization of commercial transactions carried out by Romania with the exterior began in 1990 and has gradually evolved, being now in line with EU directives and international treaties to which Romania is party. The guarantee of the right to conduct foreign trade operations for any company was further completed by progressively eliminating excessive requirements for approval and raising customs duties. Romania Association Agreement with the European Union, which came into force in 1995, had an important contribution to further trade liberalization[5].

Although aligned with the World Trade Organization requirements on liberal regime for foreign trade, and despite a customs procedure based on the EU Customs Code, ***Bulgaria's*** external transactions are subject to administrative control more pronounced than that observed in Romania. Thus, a special permit entitles the trading of certain goods such as radioactive substances, nuclear materials and explosives, pharmaceuticals, military products, etc. Moreover, there are banned the exports of goods like products from burned wood, and transactions involving substances that endanger the environment.

In this matter as well, Hungary recorded a better position, generally speaking, Foreign Investment Law adopted in 1988, guaranteeing full protection and security for business conducted by non-resident investors (including foreign trade operations)

As indicated by the extent of trade liberalization formulated by the Heritage Foundation, which takes into account both tariff barriers and non-tariff barriers, as the developments are more or less oscillating, the degree of trade liberalization in the four countries approached each other, hovering between 80% -90% (Figure 21).

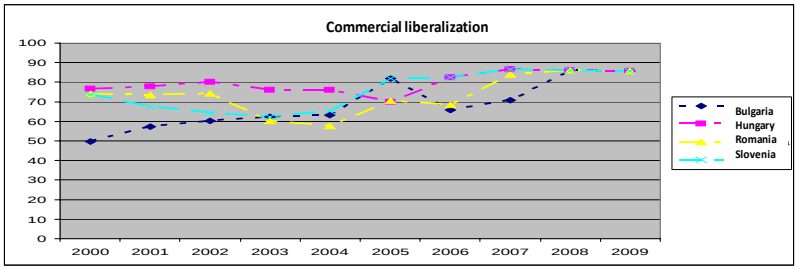

Figure 21 *The extent of liberalization in Bulgaria, Hungary, Romania and Slovenia*
Source: Heritage Foundation, Index of Economic Freedom, 2000-2009

[5] An important contribution to this process has had the entrance of Romania as part of a series of agreements such as CEFTA (Central European Free Trade Agreement - 1997), WTO (World Trade Organization - 1999), Global Trade Preferential System (1989) General System of Preferences (preferential treatment by some countries like USA, Canada, New Zealand, Japan, Russian Federation, Belarus and Kazakhstan).

To highlight and quantify the links between foreign direct investment flow (F) business freedom (B) commercial freedoms (T), investment freedoms (I) and monetary freedoms (M) at the level of the four countries considered (Bulgaria, Hungary, Romania, Slovenia), in the period 1996-2008 (available data), we have built **a regressive "pool" model**, with fixed effects (at the cross-section and period level), with the following form:

$$F_t = \alpha + \beta_1 x I_t + \beta_2 x B_t + \beta_3 x T_t + \beta_4 x M_t + \varepsilon_{it} \quad (1)$$

Where,

F_t - dependent variable F (source - U.N.C.T.A.D);

α - free term;

β_i - coefficients of the independent variables;

I, B, T, M_t - independent variables (source - Heritage Foundation, *Index of Economic Freedom*);

ε_{it} - random term;

$\overline{1,4}$ - the number of cross sections (four - Bulgaria, Hungary, Romania and Slovenia); t – the period (1996-2008).

Statistical tests' results for modelling liberties' impact in business, commercial freedoms, investment liberties and monetary freedoms on net FDI flows are illustrated in Table 10.

Table 10 *Statistical tests' results regarding the modelling of guarantees' impact on net FDI flows*

Dependent Variable: F?				
Method: Pooled EGLS (Cross-section weights)				
Total pool (balanced) observations: 52				
Linear estimation after one-step weighting matrix				
Period weights (PCSE) standard errors & covariance (d.f. corrected)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2677.299	3330.536	-0.803864	0.4274
I?	-40.23860	19.43675	-2.070232	0.0466
B?	185.7441	38.68704	4.801196	0.0000
T?	-109.3234	25.66969	-4.258853	0.0002
M?	59.69742	14.19610	4.205199	0.0002
Fixed Effects (Cross)				
BULGARIA--C	1541.620			
UNGARIA--C	699.7272			

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROMANIA--C	3208.725			
SLONENIA--C	-5450.072			
Fixed Effects (Period)				
1996--C	-1229.219			
1997--C	-825.0557			
1998--C	-1271.777			
1999--C	-606.6432			
2000--C	-268.2073			
2001--C	-1308.555			
2002--C	-1945.757			
2003--C	-2716.714			
2004--C	-925.9354			
2005--C	889.2030			
2006--C	2227.795			
2007--C	3527.349			
2008--C	4453.517			
	Effects Specification			
Cross-section fixed (dummy variables)				
Period fixed (dummy variables)				
	Weighted Statistics			
R-squared	0.939916	Mean dependent var		3426.740
Adjusted R-squared	0.904240	S.D. dependent var		4024.438
S.E. of regression	1245.364	Sum squared resid		49629830
F-statistic	26.34650	Durbin-Watson stat		1.489664
Prob(F-statistic)	0.000000			
	Unweighted Statistics			
R-squared	0.914769	Mean dependent var		3215.594
Sum squared resid	50691492	Durbin-Watson stat		1.373127

We observe that most statistical tests lead to the conclusion that the model can be successfully used to quantify the relationship between FDI flows (F) and business freedoms (B) commercial freedoms (T), freedom of investment (I) and freedoms

Monetary (M) at the four states considered (Bulgaria, Hungary, Slovenia and Romania), in the period 1996-2008 (available).

In addition, model validation is also given by the fact that most *unit root* tests of residual values shown in Table 11, confirm its stability and representativeness (with one exception, the Hadri Z-stat test).

Table 11 *Unit-root test results for the residual values*

Group unit root test: Summary Series: RESIDBULGARIA, RESIDUNGARIA, RESIDROMANIA, RESIDSLONENIA Exogenous variables: Individual effects Automatic selection of maximum lags Automatic selection of lags based on SIC: 0 Newey-West bandwidth selection using Bartlett kernel Balanced observations for each test				
Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.00817	0.0223	4	48
Breitung t-stat	-1.48844	0.0683	4	44
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.01626	0.0219	4	48
ADF - Fisher Chi-square	16.9151	0.0310	4	48
PP - Fisher Chi-square	17.9416	0.0217	4	48
Null: No unit root (assumes common unit root process)				
Hadri Z-stat	1.94301	0.0260	4	52
** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.				

In conclusion, according to the model, can make the following ***remarks***:

- from the four factors, the one considered most important is freedom in business, followed by commercial freedom, monetary freedom and investment freedom;
- increase of freedoms of trade and investment leads to a compression of net FDI flows in the considered countries, which is attributed to market saturation (investment and commercial);

- increases in business and monetary freedoms boosting generates an increase in the net flow of foreign direct investment in the considered countries, which is explained by the existence of significant barriers in business development, and also in the price formation mechanism.

2.2 The importance of foreign participation in the privatization process

The privatization process has emerged as a real need in the transition process of countries of Central and Eastern Europe to a market economy, which differ from one country to another due to the start for the privatization process, sequence and scale. Adopted forms of privatization and restructuring of the ownership was strongly influenced by structures inherited from the old political system, degree of centralization, the policy of opening to foreign capital, skill level, ability to assimilate and interests of the public, the attitude of the international community.

Romania has gone through two stages of privatization, first privatization (MEBO and PPM) and the second privatization (direct sale). MEBO has not incurred substantial capital flows due to blockage of the sale of shares initiated by managers or reluctance of investors to invest in companies in which ownership was represented by employees. PPM has allowed the distribution of state assets through certificates of ownership, without delivering extra revenues from the central budget and without encouraging shareholders whose inactiveness was explained by wide dispersion of ownership. Direct sales, at prices negotiated with the government, allowed the accumulation of foreign currency resources to finance the current account deficit, but sometimes they have prevented other companies to invest in the post-privatization period due to the first investor-backed monopoly position.

Since 2002, there has been established a series of new measures aiming at privatization: the ability to sell less attractive shares at a symbolic price, debt restructuring through exemption from budgetary obligations, as well as continued implementation of the privatization contracts obligations. National strategies for privatization were replaced by individual strategies tailored to each company or group of companies and approved by the government (the major companies included in the PSAL I[6] and PSAL II[7] programs, or banking and insurance companies) (Moise, 2005:78).

In retrospect, we can say that the evolution after 1990 of the privatization process in Romania and hence the trend of foreign participation in restructuring, was placed under the influence of certain factors such as instability, deficiencies and lack of coherence in the legislation, temporary cancellation of facilities offered to investors,

[6] From 63 companies included in the Private Sector Structural Adjustment Program PSAL I, 54 have been privatized.

[7] From 20 companies included in PSAL II, 9 have been privatized.

government inability to manage arrears of companies with financial problems[8], reduced attractiveness of companies due to the financial blockage and burden, underdeveloped capital markets, frequent failures in partnerships between companies and private investors.

Hungary was, in the early 1990s, the most advanced country in Central and Eastern Europe in terms of progress towards the introduction of market economy and opening to the foreign investors. Direct sales were the primary method of privatization in Hungary, while MEBO and internal sales to other interested citizens ranked secondary. In particular, direct sales program took the form of auction sales (covering strategic partnerships) or public offerings and has proven to be transparent and accessible, ensuring equal opportunities for all investors.

Concerning the privatization in ***Hungary*** in general, several steps can be bounded time: *until 1994*, the State sold the most attractive companies in good condition and negotiable, offering, on a large scale assets to local investors; *since 1995 and until 1997*, privatization of strategic sectors belonging to large companies (public utilities, banks, companies of strategic importance) has been accelerated; *since 1997* capital market transactions and privatization of minor shareholdings have become the priority in the process of privatization; in recent years the government set the objective of completing the privatization (Resmini, 2004:27). At the moment we can say that privatization in Hungary, that started in 1990 by large-scale sales and in 1991 by small sales , is about to be terminated (the private sector in GDP reached 80% while at the beginning the process of restructuring the state sector represented more than 85% of the Hungarian economy) (Szany, 2008:118).

Although privatization regulation exists in ***Slovenia*** since 1992, developments in this respect were not significant, the private sector in GDP remaining low compared with other countries in the region. Access to the distribution of state assets to foreign investors is almost nonexistent, because the preferred methods of privatization are primarily MEBO programs and secondly, certificates of ownership. From a practical way, privatization in Slovenia has experienced two phases. The first phase (the privatization of social property) was officially completed on November 1st, 1998 when the completion of the privatization law was passed: 1381 companies were privatized, and the capital of 129 companies was transferred to the Slovenian Development Company. The second phase, ie the privatization of state-owned institutions, has been postponed (Simoneti / Gregory, 2008:22).

The sequence of privatization methods in ***Bulgaria*** is similar to that in Hungary, without FDI attracted in this way being of the same class: since 1993 direct sales took

[8] In the case of SIDEX Galați privatization in 2001, the state absorbed arrears of 1 billion dollars, while the public revenue due to privatization was of only 65 million dollars.

place at small and large scale, followed by the first delivery of certificates of ownership in 1996 and the second in 1999. By the end of 1998, 39% of the state assets were distributed through certificates of ownership or to other domestic investors, 6% to employees and only 1% to foreign investors. Here we also find the replacement of debt with equity participation (since 1994) and privatization through the stock market (since 1998), as methods of privatization. Since 2002, public offerings and auctions became the approved methods for the privatization process, while negotiations with potential purchasers were suppressed (Bandelj, 2007:54). In recent years, accelerating privatization was possible using the stock exchange mechanisms for public auctions without surveillance, centralized auctions and public offerings put on stand-by.

2.3 The presence of incentives to boost investment

In Romania, the main facilities (incentives) to investors can be grouped, generally, in the following categories: incentives for direct investment with significant impact in economy, incentives for investment in SMEs, incentives for investment in disadvantaged areas, incentives for investment in free zones, incentives for investment in industrial parks.

Facilities for direct investments with significant impact on the economy are given to those investments which exceed the equivalent of $ 1 million, made in any industry (except the financial sector, banking, insurance) and with a positive effect such as, modernized infrastructure and jobs creation, without prejudicing the interests of national security, environmental protection, etc. Facilities enjoyed by these investors, refer to: exemption from VAT payment for the import of industrial machinery, technological equipment, exemption from VAT payment for the import of raw materials and supplies, exemption from customs duties of imported equipment, the ability to recover tax losses from taxable profits in the next five years, etc...

Regarding *facilities for investment in SMEs*, these allow for tax losses to be recovered in an up to five years period, for priority access to assets of autonomous and state-owned companies, the use of accelerated amortization, priority access to public procurement of goods at a discount of up to 50%.

Incentives for investment in deprived areas provide exemption from income taxes for those investments made by legal persons who have obtained permanent investor certificate in a deprived area[9]. Certain restrictions are placed only on the scope of activities in which the investment is made, agriculture, forestry, logging, fishing, construction, trade, mining and industrial processing, etc.

[9] Deprived areas, 32 in Romania, are geographic areas strictly delimitated, constituted on a period of 3 to 10 years, that present an employment degree 3 times lower than the national average, or are either areas with underdeveloped infrastructure, or both.

Another category of facilities, *facilities for investment in industrial parks*[10] is reflected in the exemption from taxes for the change of destination or sealing of land for industrial parks, a deduction from taxable income for a share of 20% of the investment's value, for investment in the construction sector or rehabilitation of buildings, internal infrastructure and network connection to public utilities, exemption from taxes on land and buildings in industrial parks, tax reductions granted by the local authorities for immovable property transferable to the use of the industrial park.

Along with tax incentives investors may have access to other incentives such as free amounts for capital investments, granting of the land necessary for the investment at reduced prices as well as industrial facilities (infrastructure necessary for the investment project). The general trend is to give priority to these types of facilities at the expense of tax incentives (Marinescu, 2007:132).

In ***Bulgaria***, the Law on investment promotion, adopted in 2004, establishes four categories of preferential treatment for investments that meet the following criteria, namely: to result in the acquisition of assets in order to create new production capacities or expansion and modernization of existing ones, to be made in other areas than banking, insurance, investment funds, to help create new jobs and to be implemented within three years. Investment incentives differ among investment classes, set according to the value of the investment project, class 1 representing investments over 36 million EUR, class 2 investments between 20 and 36 million EUR and class 3 investments between 5 and 20 million EUR[11] (Hunya, 2006:31).

Currently, tax incentives, focus on: the possibility of applying accelerated depreciation for new equipment purchases under the new investment projects, tax credit for investment in disadvantaged areas[12], representing 10% of the investment value resulting from the acquisition, modernization or reconstruction of fix assets[13] and

[10] The industrial park can be defined as an area in which take place economic activities, scientific research, industrial production and services, in a special facility regime, in order to value the human and material potential of the area.

[11] The advantage that all these investors have regards the shortening of time for the administrative procedures necessary for the investment plans. *Class 3* of investments can benefit only from information services: informational materials that precede implementation, information on potential partners, as well as information on administrative procedures for the project implementation. The beneficiaries of information are those in *Class 2* as well, which also have the possibility to authorize the Agency for the procurement, on the investor's behalf, of the necessary documents for the project implementation. *Class 1* investments are assisted by the Agency, not only through information and administrative services, but also through assistance in obtaining the property title on the buildings and support through supplying the necessary infrastructure.

[12] With an unemployment level that exceeds with 50% the national average...

[13] One can benefit of the fiscal credit for 5 years, meanwhile the acquired goods cannot be sold.

exemption from corporation tax (for a period of five years) for companies in the manufacturing sector, investing in disadvantaged areas[14] (UNCTAD, 2009:136).

One of the facilities in ***Hungary***, valid for ten years, may reduce the tax by up to 80% as investment tax credit. Criteria for granting such facilities take into account a minimum threshold of investment and its proper funding (25% own resources), appropriate destinations (at least 30% of new facilities or assets, and more than 20% restoration), but localization in strategic regions or investment orientation towards priority areas (environment, internet service, basic and applied research). Additional requirements are imposed on the recipient in the next five years: to increase the number of employees with at least 100 (or 50 in underdeveloped regions) or to increase labor costs at least 600 times the annual minimum wage (or 300 times in less developed regions) or to use SMEs as suppliers in a minimum of 30%. Another feature subject of SMEs taxable income is focused on reducing the amount of taxable profit with the value of the investment in assets, the deduction still being limited to the size of profit before tax and to the amount of 120.000 EUR. Deductible in calculating taxable profits are the investment loans, 40% and limited to 24.000 EUR per year (Hunya, 2007:41).

In the category of direct facilities, two are most important: the EU grants and special packages for strategic investors. Along with the European integration, Hungary had opened access to various grants offered by the Union, and subventions, focused on various development goals (business promotion, development of transports and human infrastructure,) can be obtained on request. Hungary's initiatives have resulted in the two National Development Plans, from which the second, which ensures access to EU funds of about HUF 7000 billion over seven years, is still under evaluation of the European Union [15] *(*Szanyi, 2008:123).

The incentives scheme offered to major strategic investors is tailored to their needs and provides a flexible and transparent framework for the subventions offered to big investors. Minimum investment threshold that determines access to the facility is differentiated between activities: EUR 50 million in the manufacturing sector and 10 million EUR in tourism, for the development of regional service centers for corporations, and research and development centers. Investor contribution is at least 40%. Projects must make an important contribution to the level of employment (100 new jobs for the manufacturing sector) and use recent technologies and equipment. Also important in evaluating the project are the following criteria: appeal to local suppliers, the technology

[14] The access to exoneration is conditioned by the investment of the fiscal credit in fixed assets, in a period of maximum 3 years from the date of the use of the credit.

[15] The following programs are beneficiaries of the EU grants: the one for economic competivity, rural and agricultural development, infrastructure and environment protection, labour and regional development.

and innovation level, the share of training costs, labor qualification, environmental impact and financial impact on the economy (OECD, 2008:128).

Giving incentives for investment, ***Slovenia*** has a pro-active policy both for investors who choose for the first time Slovenia as location, but also for those already engaged in operations here, to expand or improve production capacity. Investment incentives are grouped into three broad categories: fiscal, financial and other facilities.

Among the fiscal incentives there may be mentioned the profit tax rate decreased from 25% to 20% in 2010, and a series of reductions in the taxable base. This can be reduced with 20% of the size of investment in research and development equipment, with the loss brought forward in the next seven years, with 30% of the salary given to those who are at first employment (subject to offering a job for at least two years), with 50% or 70% of the wages given to those with various medical conditions, and redemptions resulting from linear method of depreciation, with established annual amortization rates (UNCTAD, 2009:162).

Financial facilities are the so-called grants scheme, introduced in 2000, in accordance with the national and European legislation on state aid to reduce market entry costs for the manufacturing industry and services, so as to increase competitiveness on international market. Facilities are available for investment in manufacturing industry and services (customer contact centers, distribution and logistics centers, regional headquarters) and research and development. Grants are subject to a minimum investment threshold (between 1 and 4 million), the minimum number of jobs created within 3 years (10-50), and the obligation to maintain premises for five years (Simonet/Gregory, 2008:26).

2.4 The role of foreign direct investment promotion agencies

Established relatively late, until 2002, the ***Romanian Agency for Foreign Investments***[16] (ARIS) is among the few existing agencies at an international level, who keep strictly as business object attraction of foreign direct investments. Subordinated to the government, it is entitled to impose its policy to attain economic growth and prosperity in Romania. Work done is not only a general improvement in the country's image to potential investors, but also a specific, well defined one.

[16] A first tentative for the creation of the institutional framework in the investment area has concretized in the Romanian Agency for Investment Promotion and Economic Assistance, which functioned for a relatively short period of time. Then, followed the Romanian Agency for Development, created to realize the government's agenda through attracting foreign capital. Despite numerous attempts to reorganize the RAD, it had not proven its efficiency in promoting foreign investments; therefore in 1999 its duties were taken over by the department for foreign investor relations of the Development and Forecast Ministry. Without result on investment flows, the promotions action passes as an attribution of the Romanian Agency for Foreign Investments.

Assistance to foreign investors in the implementation of projects, development and expansion, is a more technical one, embodied in providing information on legislation and on possible sites and industrial parks, mediation of contracts with local authorities, identifying potential partners (Moise, 2005:32). To align with the general trend of policy coordination, ARIS sets bilateral agreements with similar agencies in other countries[17].

In the last three years, in order to be prepared for changes to the completion of privatization and integration into the European Union (bringing restrictions in facilities granted to investors), the Romanian Agency for Foreign Investments has concentrated its efforts towards the implementation of pro –active policies, giving priority to Greenfield investments[18]. The actual strategy had focused on two directions: promoting Romania's image and providing specialty assistance, actual actions aiming at consulting the private sector and central and local authorities in devising strategies to promote foreign direct investment, promoting new and more attractive legislation to boost investment, positioning the Romanian Agency for Foreign Investment as a focal point of contact for potential or existing investors (Halmi, 2009:45).

An issue which should not be neglected in the present regards the fact that the relief to investors should be reconsidered in the context of regional competition, given that countries like Poland, Hungary, Czech Republic, Bulgaria offer conditions which exclude Romania from the competition for attracting direct investment. In addition, adherence to European structures and competition commitments prohibit Romania the granting of fiscal incentives, the only permitted incentives being the financial ones. The restrictions imposed by the EU, complemented by competition in the region, drives Romania to seek solutions to maintaining a legislative incentive for large foreign investment projects, which are still in line with European legislation.

The Bulgarian Investment Agency aims to facilitate the identification and implementation of Greenfield investment opportunities, for potential investors and those already existing in Bulgaria. The action carried out to promote investments in Bulgaria is facing the same lines as in Romania, but with a higher focus on highlighting the business sector opportunities and experiences resulting in success. Area presentation contains performance in the field, information about the market, competitive advantages, investment opportunities, and the situation of FDI in the sector, production, export activity, labour costs, and qualified labour in the field. Without attracting particular attention on the facilities available to investors (be they foreign or domestic), these are

[17] An example in this direction are the partnerships with Korea and China. Of importance is not only information availability for partners, on business environment and opportunities, but rather carrying out joint actions to promote foreign investment.

[18] In other words, as a prospect, ARIS no longer wishes to maintain an attitude of waiting and relying on privatization, but it attempts to identify the Romanian economy's needs to directly address investors who can meet the.

presented in the law on investment that complements the legal framework, along with legislation on business environment and that specific to certain sectors (Denuța, 2005:63).

Created in 1993 under the Ministry of Economy and Transport, ***Trade and Investment Development Agency in Hungary***, has as main objective the establishment of relations between foreign business partners and local entrepreneurs, regional and central institutions. This is not merely to explore investment opportunities in Hungary for foreign firms, but seeks to identify opportunities for Hungarian companies, especially SMEs, to penetrate foreign markets either in a direct or indirect manner, seeking potential partners for them. Basic services provided, economic, legislative and market information is free, the rest being available at the customer's demand.

The investment promotion actions particularly aim at creating a single point of contact to support foreign investors in making investment decision in Hungary, to identify local suppliers and subcontractors (a special center was created to develop local supply network), management of regional projects, keeping updated databases on companies and business opportunities, publishing promotional materials, providing information relating the legislation, investment, taxation and finance of Hungary, advice on government programs to support investment decisions, supporting Greenfield investments, Brownfield or joint venture, advice in choosing the territory [19] (Halmi, 2009:47).

The Slovenian Public Agency for Entrepreneurship and foreign investments involves not only in technical assistance given to businessmen and investors, but also in financial assistance to improve economic competitiveness. Being created at the contact point between foreign importers, local exporters and investors, it has close links with central and local authorities but also with trade and professional associations. Services offered to foreign investors are free and include statistics on FDI, information on companies, industries, markets, business opportunities, operating conditions in some areas, site selection consulting, information for the development of investment strategies, achieving contact with authorities and clusters' suppliers (Szany, 2008:131).

3. TRAJECTORY OF THE INVESTMENT REFORM IN ROMANIA: WEAKNESSES VERSUS POSITIVE DEVELOPMENTS

In a retrospective view on the reform of foreign direct investment in Romania, we can say that a long period of time, the main weaknesses that have not allowed for developments and significant results are those that have targeted the governmental

framework. Following the succession of tax laws from 1990, **there can be found some explanation for the low level of FDI attracted in Romania**. Not the absence of appropriate tax incentives scheme has attracted low investments (although temporary exemptions have not proven their efficiency, and other facilities were unsuccessful experiences), but the launch of large privatizations very late (1998) correlated with an unstable regulatory environment. In fact, there wasn't an overlap of the period with significant incentives granted with period of actual opening of the Romanian foreign investment flows.

Thus, in the early '90s, the small privatization offer, excluding public utilities and banks, did not allow to benefit from the stable and even attractive legal framework on FDI[20]. Later in the second half of the '90s and early 2000s, legislative and institutional framework, became extremely unstable, did not favour the participation of investors in the privatization process, then in growth[21]. Investors were cautious because of the economic downturn observed in this period (GDP fell by about 14%, domestic demand contracted public and private investment have been significantly reduced (UNCTAD, 2002:138)), so increases in FDI were not due essentially to new investments, but capital increases to existing investments. Failure to prepare a business plan in an unstable framework which does not allow medium and long term valuations on the profitability of investments in Romania, has directly discouraged investment.

Related to these weaknesses, we can say that in recent years, the **business environment** in Romania has seen **significant improvements**. Thus, prior consultation and transparency of procedures had turned into binding characteristics of the regulatory process, new communication channels are opened with the business community and society as a whole. In addition, the adoption of a comprehensive tax code and a medium-

[19] The whole investment promotion policy is carried around several prime domains that create consistent added value or that necessitate high level expertise: automotive, electronics, information technology, research and development, biotechnology, logistics.

[20] The law 35/1991 modified and supplemented by the law 57/1993 stipulated: exemption from customs duties for the contribution in nature of the foreign investor (raw materials, imported materials), a number of additional facilities for investment in areas of special interest, income tax reductions, and temporary exemptions from corporation tax. These regulations provided a fiscal framework for FDI quite well adapted to the transition that required providing incentives to foreign investors.

[21] In June 1997, urgency ordinance nr.31/1997 replaced Law nr.35/1991, with fewer incentives and only for large investors. Although stating that national treatment is ensured for foreign investors, access to facilities is conditioned by a minimum equity participation of 20% and not more than 350000 USD and a contract of sale of shares with SPF, valued at least one million dollars. Tax incentives are reduced, and national treatment gains. Urgency ordinance 92/1997 deletes the urgency ordinance no.31/1997 and kis modified by Law no. 241/1998. The new regulations expressly specify equal treatment - just and fair - for Romanian and foreign investors, resident or nonresident in Romania.

term fiscal strategy continuously contributes to ensure greater stability and predictability in business decisions.

A strength of the business environment is the application of nondiscriminatory treatment for foreign investments, meaning that foreign investors are allowed to invest in any field, whatever the legal form, may benefit from any existing incentives and income transfer obligation arising out of the investment. Other visible achievements in the field of synthetic investment policy can be viewed on the following lines: establishment of the Romanian Agency for Foreign Investment in 2002, and the creation of a national contact point, ongoing reform on investment policies that continue to cover Romania's transformation into a destination increasingly more attractive, and, not least, participation in global or regional programs of assistance in implementing reforms aimed at attracting investment and improving investment environment (the OECD investment in Southeast Europe[22], the OECD Declaration on international investment and multinational companies, European Charter for SMEs[23]).

A practical assessment of the state of the investment reform at the present time, as well as formulating proposals to improve any adverse developments can be achieved from interpreting the evolution of the ***Investment Reform Index (IRI).*** Designed to measure progress in investment reforms in the countries of Southeastern Europe, its role is to serve both state authorities to encourage reform and investors, by communicating position of a country as compared to other countries and international standard. Preliminary results on the state of the reform framework for investment in Romania, shows four areas where reform is most advanced (the competition policy, investment policy, trade policy and anticorruption) and four areas where reform is less advanced (fiscal policy, human capital, promotion of investment, regulatory reform) (OECD, 2010:310).

Regarding the *competition policy*, one can say that Romania has one of the most advanced competition policies in South - Eastern Europe, in line with international

[22] The Investment Agreement in South-Eastern Europe is an assistance program under the aegis of the OECD, aimed at improving the investment climate and encouraging private sector development in the signatory countries (Romania, Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Moldova, Montenegro, and Serbia). Essentially, the program supports countries in South - Eastern Europe, offering practical ways to increase investment for economic progress, aiming to implement a regional investment strategy for these countries to be able to compete in the global economy.

[23] The charter sets out ten policy dimensions in SMEs that should be enhanced to improve the business environment in which they work: education and training to start business, starting a business with lower cost and in less time, appropriate legislation and better regulation, the availability of skills, improving online access, greater benefits from the existence of the single market, fiscal and financing issues, technological capacity of SMEs, highlighting successful business models and developing a support system for SMEs, a better representation of SME's interests at national and EU level.

standards, accounting substantial progress through the adoption of a coherent competition strategy for 2009-2010. Competition Council has undergone an administrative reform that aimed its budget and hiring appropriate personnel, and, in future, training of personnel required for the efficient administration of competition law and to exercise control in state aid, and also the rigorous application of sanctions for acts contrary to competitive behavior.

Regarding the *investment policy*, national treatment is guaranteed in most sectors by the investment law and by a proper implementation, including settlement of disputes between investors and state. Guarantees exist both for expropriation, and for unrestricted transfer of funds (profits and dividends). Well protected by law, intellectual property rights suffer from inadequate implementation through the lack of support and implementation. Individuals and foreign companies can buy buildings but not land during a transitional period.

Analyzed through the *trade policy*, Romania is relatively open to international trade, eliminating all quantitative restrictions. Free trade agreements are concluded with countries in South - Eastern Europe and the recent integration into the European Union fully liberalized trade within this area. However, the transparency of EU rules on veterinary and phytosanitary standards is not quite full. In addition, the average charges for industrial and agricultural products are still high (28% and 15% respectively). Special attention should be paid to VAT exemptions for imported capital goods for investment purposes. Improvements can still be made in customs administration, reducing the number of days to carry out import-export trade and the number of required documents.

Regarding *anti-corruption policy*, the Ministry of Justice has made significant efforts to ratify international conventions that criminalize acts of corruption (active and passive bribery, money laundering) and to adopt the Code on crime. Being placed on the same line, the fight against corruption in customs has resulted in developing a code of ethics for customs officials, which's strict and transparent implementation imposes appropriate training and effective application of sanctions. Finally it is recalled that an attempt was made to improve the public acquisition system through a strategy and action plan, although, it is equally important that they be supplemented by a rigorous implementation.

Regarding the *fiscal policy*, income tax rate is at a competitive level (16%), but the problem is what puts the overall tax burden for businesses. Although significant improvements have been made to the Tax Code, and tax strategy seeks to reconcile the various tax laws, there are still doubts about the stability of the tax system. The Fiscal Administration is posing the biggest problems, proving burdensome by frequent tax inspections, many requests for the preparation of acts, penalties based on unclear criteria. Added to this is the tense relationship between taxpayer and the Administration

occasioned by errors that occur frequently in the taxpayer's fault, thus imposing a more serious assistance.

Regarding *human capital*, Romania adopted a coherent educational strategy for 2007-2010, with specific objectives and actions, in order to increase quality and employment level, but also care for adult education and vocational training to meet the needs market. Adult training programs initiated by the Ministry of Labour, focused mainly the sectors of construction, textiles, leather and electronics. It is required that skills development programs take into account the country's overall growth strategy, and the labour market to become even more flexible (flexibility in redundancy, training programs, promotions based on merit and not seniority).

Concerning the *promotion of investments*, there are recommendations for expanding the investment promotion strategy for 2007-2010 to include specific programs for priority sectors and encouraging foreign investment externalities to local businesses. The same strategy should be consistent with industrial policies and export encouragement. These developments would allow ARIS to develop marketing campaigns targeted on specific sectors. A special support should be given to Greenfield investors.

Finally, *regulatory/ stabilization reform* provides that annually, the Romanian government adopts action plans for improving the business environment, with specific targets. Regulatory quality has improved lately, especially due to consultations between public and private sectors, and long term strategies. Applied in areas such as competition policy and SMEs, regulatory impact assessments do not follow a rigid mechanism. The Legislative Council is the one that check the compliance of the legislative proposals with the Constitution and other fundamental laws.

4. CONCLUSIONS

In recent decades, globalization and liberalization processes, fundamental to the world economy, had put their print in the field of investment flows, the vast majority of countries introducing measures to liberalize the foreign direct investment framework. This fact offered multinational firms ever wider range of potential locations for investment and have made it more selective and demanding, a very important role being given to promoting policies to attract investors.

The orientation and typology of investment policies are conditioned, in a manner essential to the degree of development of the countries concerned. For the case of developing countries in the attempt to attract foreign investment and increase the benefits induced by them, there was usually preferred a market-friendly, but at the same time, prudent policy. As their market structures are more fragile and development requires more diligence, these countries are more concerned with preserving their national political space for investments that allow the use of tools adapted to their special needs.

Evaluation of investment policies on foreign direct investment for countries in Central and Eastern Europe since the 90s, allows formulating the following general understandings:

- ***Guarantees granted to investors*** cover the entire range of fundamental freedoms, the factors considered most important being freedom of business, followed in order of magnitude of impact by free trade, monetary and investment freedom.
- ***Development of the privatization process*** played an important role in attracting investment flows, the strategy being similar in all countries: we observe at the beginning of transition a preference for attractive companies selling, followed by the sale of large companies with difficulties and finally selling minority packages through the stock exchange. An important share of the companies remained in state ownership, either due to lack of interest from investors, or because of the state option for special treatment.
- ***The use of incentives***, namely tax relaxation schemes, has not proved unquestionably effective, which was shown by the absence of significant investment flows in the first decade of transition. Incentives designed to attract sustainable projects, facilitated short-term projects and the achievement of rapid benefits and facilities, while the benefiting activities were actually those that would have existed without them.
- ***Promotion agencies*** were created in all countries in order to give shape to an attractive environment for foreign investors. As a future perspective, the fact that globalization makes it increasingly difficult to delineate clearly between the two categories of investors, foreign and domestic, determines the agencies in question to extend their activity, hence the former agencies for promoting foreign investments tend to be converted into investment promotion agencies. In addition, interest is increasingly moving towards an organization and network of agencies with a significant representation at regional, local or international level.

For Romania, the process of reform in the field of foreign direct investment has had a tortuous journey from the beginning of the transition, with significant improvements in recent years. In the following period, it can strengthen its role for many multinational companies operating here, regional pole position being conferred mainly by its geographical position, as the EU border country, with opportunities opening up to the Caucasus, Central Asia and the Balkans. To maintain the interest of foreign investors, Romania has yet to improve factors economic performance that are likely to become more attractive to FDI and improve the political factor. Before taking up an active policy of attracting FDI, efforts are needed to ensure the multiplication of their benefits for the economy and increase local capacity to absorb the externalities brought by foreign companies.

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INVESTIGATION OF THE DETERMINANTS OF THE ADJUSTMENT OF LENDING RATES IN MACEDONIA – A SUR APPROACH

Jane BOGOEV*

Abstract: *This paper empirically examines the determinants and differences of the short-run lending rate stickiness among banks in Macedonia by using the Seemingly Unrelated Regression model (SUR). For that purpose, eight bank balance sheet items, two macroeconomic variables and an indicator for the level of concentration in the banking system are considered. The results generally support the hypothesis of aggregation bias in the literature. Namely, the size of the short-run pass-through adjustment of lending rates to changes in the "cost of funds" rate is incomplete and heterogeneous among Macedonian banks where various bank balance sheet items play different role over banks' lending rate setting decisions.*

Keywords: *Interest Rate Pas-through, Monetary Policy, Banks' Financial Characteristics, Banks' Heterogeneous Behaviour, Aggregation Bias*

JEL Codes: *C22, E43, E52, G21*

1. INTRODUCTION

The aims of this paper are to empirically investigate banks' heterogeneous lending rate adjustment to changes in the "cost of funds" rate and to identify what factors affect the lending rate setting decisions of banks in Macedonia. The rationale for exploring these issues in more depth is to provide a fuller picture about the effectiveness of the monetary transmission through the interest rate channel. From the monetary policy-makers' perspective, this is seen as important issue, having in mind the significance of the banking sector to the overall economy. Namely, financial assets in the Republic of Macedonia, as in other similar economies, are bank-dominated combining up to 90% of total financial assets in 2008, with banks' loans as the major source of external finance to the private sector.

* Jane BOGOEV, National Bank of the Republic of Macedonian and Staffordshire University, UK, Address: F.Ruzvelt 4/23, 1000 Skopje, Republic of Macedonia, janebogoev@yahoo.com

In this research we primarily follow the mark-up pricing model of how banks' set their retail rates designed for a non-perfect competitive environment, established by Rousseas (1985) and Ho and Saunders (1981), as well as various empirical methods found in the applied studies (see section 2). According to the existing theoretical and empirical literature, various macro and microeconomic factors are seen to affect banks' pricing policy such as the structure of the financial system, macroeconomic characteristics of the economy and banks' balance sheet items. Thus, the core aim of this paper is to explore how these factors affect the heterogeneous lending rate rigidity among Macedonian banks to changes in the "cost of funds" rate, since the existing empirical evidence indicates that the lending rate pass-through adjustment is incomplete, especially in the short-run.

For example, the existing empirical studies that investigate the interest rate pass-through in the Macedonian banking sector imply that it is incomplete in the short-run (Jovanovski et al., 2005) or both the short- and long-run (Velickovksi, 2006). Moreover, for the reason that these studies are conducted on aggregate bank level data, we argue that their main possible drawback is that they may suffer from aggregation bias (see section 2).

Accordingly, the value added of this paper is as follows: *First*, it investigates banks' heterogeneous retail rate adjustment rigidity and the factors that impede the "smooth" transmission, employing a different and arguably more appropriate estimation method of Seemingly Unrelated Regression (SUR), not currently found in the Macedonian literature as well as for the economies from Central and South Eastern Europe (CSEE). *Second*, the model adopted includes a comprehensive set of eight balance sheet items and it also controls for the impact of the macroeconomic factors. *Third*, this investigation is based on a disaggregated bank-level data set. For example, there is not any existing study that explores the size of the pass-through adjustment in the case of Macedonian banking sector that uses disaggregated bank-level data whereas, the literature conducted for the rest of the world, especially for the CSEE, based on bank-level data is quite limited. The reason for using disaggregated bank-level data set is because it is argued that studies that use an aggregated data may suffer from aggregation bias. Thus, using bank-level data should be the greatest value added of this paper to the overall thesis. *Fourth*, this study focuses only on lending rates denominated in denars unlike the rest of the studies for Macedonia as well as CSEE that use aggregated data set including domestic and foreign currency denominated series.

This paper is structured as follows: section 2 reviews the theory and empirical studies. Section 3 explains the model in detail. The estimation method is explained in section 4. Section 5 describes the data used. Estimation results are presented in section 6, while the final section concludes.

2. THEORETICAL AND EMPIRICAL BACKGROUND

The theoretical model that we primarily follow of how banks set their retail rates is the mark-up pricing model by Rousseas (1985). The author develops a mark-up pricing model for a non-perfect competitive banking sector, since it is argued that banks exhibit some degree of market power. Hence, a starting argument of the mark-up pricing theory is that banks in the loan market are price setters and are modelled to set their retail interest rates as a mark-up margin over their prime costs (variable costs), expressed with the equation:

$$i = k(u) \qquad (1)$$

where:

i is the interest rate on loans,

u represents the unit prime or variable costs and

k is the mark-up margin over the prime or variable costs.

The prime or variable costs according to Rousseas (1985), in the case of the banking sector, are determined from the variations in the costs of funding of their lending activities known as "cost of funds". These costs basically represent the interest rates that banks pay on deposits and/or interest rates on their borrowing in the money market that both of them are taken as exogenous. The rationale for this is that banks in these market segments are price takers due to the relatively high level of competitiveness, which is not the case in the loan market. However, the main weakness of Rousseau's (1985) theory is related with the argument that variations in banks' retail interest rates are mainly determined by the variations in the "cost of funds" rate that fails to specify the extent to which those changes are transmitted.

Based upon the mark-up pricing model of Rousseas (1985), de Bondt (2002 and 2005) has re-defined the retail rate setting equation (1) as follows:

$$i = \beta_1 + \beta_2 u \qquad (2)$$

where:

i is banks' retail rate (deposit or loan rate),

β_1 is the mark-up margin, u is the "cost of funds" rate and

β_2 represents the demand elasticity of deposits or loans, i.e. the size of the pass-through adjustment coefficient.

According to this equation, variations in retail rates are again determined by the variations in the "cost of funds" rate, but the extent to which those variations are transmitted to banks' retail rates depends upon the size of β_2 coefficient. The β_2 coefficient can be less than one, implying an incomplete pass-through from "cost of funds" rate to banks' retail rates; equal to one, referring to complete pass-through; or higher than one. Consequently, the main field of interest in many of the empirical studies, as well as in our research, is to explore what factors affect the β_2 coefficient. In the

theoretical literature, various theories provide different explanations. For example, Niggle (1987) argues that the loan demand elasticity may be important factor for the banks in setting their loan interest rates, especially for those borrowers who have access to other external sources of finance. Stiglitz and Wiess (1981) argue that the size of the β_2 coefficient may depend upon the informational frictions on the loan market caused by the moral hazard and adverse selection problems. Klemperer (1987), Sharpe (1997), Lowe and Rohling (1992), Petersen and Rajan (1994) and Boot (2000) indicate that the size of the β_2 coefficient may be determined by the existence of switching costs and related to that, the so-called relationship lending activities between the bank and its customers; or as Weth (2002) refers to as the "hausbank" phenomenon. Hannan and Berger (1991) suggest that the size of the pass-through adjustment may depend upon the "menu costs", i.e. the costs of changing the retail rates. Additionally, other theories and models, such as the ones by Ho and Saunders (1981) and Angbazo (1997), suggest that the size of the β_2 coefficient may depend on some general macroeconomic factors, market structure in the banking sector and some banks' specific characteristics. The empirical studies that examine the factors that affect the size of the β_2 coefficient in equation 2, are discussed in what follows.

One of the pioneering studies that empirically applies the mark-up pricing model in examining the determinants of interest rate pass-through, is by Cottarelli and Kourelis (1994). Based on aggregate bank level data, the authors examine which factors most significantly affect the short-run pass-through multiplier by using a set of structural macro and microeconomic factors for a set of 31 economies around the world. The results indicated that significant determinants of the short-run pass-through multipliers are inflation, market concentration, barriers to entry, private ownership of the banking system and the volatility of the money market rate; while GDP per capita did not have any significant impact.

Another study based on aggregate bank level data conducted for a set of six euro-zone economies is by Mojon (2000). The author explores the possible structural factors that may affect the short-run pass-through adjustment of banks' retail rates, including: inflation, money market rate volatility, the level of competition in the banking system, banks' operating and funding costs. The estimates regarding the loan interest rates indicate that all of the aforementioned factors, except funding costs, significantly affect the short-run pass-through.

The analyses of Sander and Kleimeier (2004, a) based again on aggregate bank level data investigate the fundamental factors that affect the interest rate pass-through in 10 euro-zone economies. The results suggest that significant determinants are estimated to be inflation, GDP growth, the level of financial intermediation, money market volatility and a composite index for the effectiveness in the banking sector.

Based on the same econometric methods and by using a similar structural indicators, Sander and Kleimeier (2004, b) investigate the structural determinants of interest rate pass-through in the eight new EU member states from CSEE. According to the results, the variables that significantly affect the long-run pass-through multiplier of lending rates are inflation and money market volatility, while unlike the euro-zone economies, GDP growth and the level of financial intermediation did not have any significant impact on the pass-through multipliers. The most influential characteristics of the banking sector that significantly affect the short-run pass-through multipliers of loan interest rates are estimated to be the level of competitiveness and the credit risk exposure in the banking sector. In contrast, foreign ownership entered with a contrary sign from what was *a-priori* expected for which no detailed explanation is given.

The research of Sorensen and Werner (2006), conducted again on aggregate bank level data, explores the structural factors (up to 20 indicators[24]) that may affect the speed of adjustment of interest rate pass-through for a set of 10 EMU economies. According to the estimates, the basic fundamental factors that determine the speed of adjustment of banks' retail rates are: GDP growth, portfolio diversification and credit risk exposure positively; and concentration, interest risk exposure, the level of liquidity, capitalisation and the extent of portfolio diversification in the banking sector negatively.

Based on individual bank level data, de Graeve et al. (2004) explore the fundamental determinants of interest rate pass-through in Belgium. The results indicate that one of the most influential factors that affects the short- and long-run pass-through multipliers of both lending and deposit rates is the capitalisation ratio. Interest rate risk exposure and the level of concentration in the banking system play a significant role only in determining only the loan but not the deposit rates.

Lago-Gonzalez and Salas-Fumas (2005) attempt to explore the structural factors that determine the speed of adjustment of retail rates to changes in the "cost of funds" rate among Spanish banks. Among the structural factors considered, the estimates suggest that the two commonly used macroeconomic factors, i.e. GDP and inflation, have (as expected) a positive impact on the adjustment speed of both lending and deposit rate. Regarding the bank specific characteristics, the results indicated that higher credit risk exposure results in a faster speed of adjustment of banks' retail rates, while higher concentration in the banking sector and higher asset size leads to a lower speed of adjustment of banks' retail rates; a finding consistent with the study by Sorensen and Werner (2006).

Gambacorta (2005, a) explores the structural determinants of the short- and long-run pass-through multipliers and the speed of adjustment of banks' retail rates in Italy. The most significant factors that negatively affect the speed of adjustment and short-run

[24] For details of these indicators see Sorensen and Werner (2006) p.41.

pass-through multipliers of both lending and deposit rates were estimated to be the liquidity and capitalisation of banks, the level of non-deposit funding and the existence of relationship banking. The size of Italian banks was positively associated the short-run pass-through multipliers. Nevertheless, the results in respect of the size of the banks are not robust because their significance varies with different model specifications.

Weth (2002) investigates which of the four financial characteristics (size, non-deposit funding, maturity miss-match between long-term loans and deposits and banks' involvement in relationship banking) affect the size and speed of adjustment of lending rates among banks in Germany. According to their results, larger bank size, higher non-deposit funding and maturity miss-match between long-term loans and deposits lead to a faster and more complete speed of adjustment of lending rates to changes in the "cost of funds" rate. In contrast, higher bank involvement in relationship lending (the "hausbank" phenomenon) leads to a more rigid short-run adjustment of lending rates.

In a similar manner, Chmielewski (2004) investigates what determines retail rate setting decisions among banks in Poland, by considering the following three different financial characteristics: profitability, credit risk exposure and capitalisation ratio. The results indicate that more profitable banks and/or banks with higher credit risk exposure adjust their retail rates faster and more fully to changes in the "cost of funds" rate, while more capitalised banks exhibit higher adjustment rigidity.

One of the main possible weaknesses of some of the reviewed studies, i.e. Cottarelli and Kourelis (1994), Mojon (2000), Sander and Kleimeier (2004 a and b), Sorensen and Werner (2006); is related to the data sets used. Namely, the afore-mentioned studies are based on aggregate bank level data. This approach has some disadvantages and may lead to biased estimates. More precisely, according to de Graeve et al. (2004), estimating the pass-through multipliers with aggregate bank level data may lead to aggregation bias arising from the heterogeneous nature of the data. For instance, the aggregate bank level data are composed of data series obtained from each individual bank, which have heterogeneous behaviour and market strategies. By aggregating the data, this heterogeneity is suppressed and may result in inconsistent estimates. Consequently, de Graeve et al. (2004) suggest that more efficient pass-through estimates may be obtained by using individual bank level data. This argument is empirically supported in their paper that argues that, in the case of Belgium; the pass-through estimates based on aggregate bank level data were downward biased compared to the same estimates estimated on individual bank level data. Consequently, testing if this hypothesis holds in the case of the Macedonian banking system is actually one of the core aims of this research.

Another possible drawback regarding the studies that use bank-level data and partially the studies that use aggregated data for the same group of economies, i.e. EMU

and CSEE economies; may be related to the estimation method used. More precisely, the studies based on time series cointegration methods like: error correction method - ECM (Mojon, 2000; Sander and Kleimer, 2004 a and b) and Panel Cointegration (de Graeve et al., 2004; Weth, 2002 and Chmielewski, 2004) may provide inefficient estimates because they do not control for the cross-sectional correlation among the units. This may be especially pronounced for the studies based on panel cointegration methods because the estimators employed are based on the assumption of no cross-sectional correlation among the units. However, some studies have tackled this issue using the SUR model (Sorensen and Werner, 2006 and Lago-Gonzalez and Salas-Fumas, 2005) that has been specifically developed for that purpose (see section 4). Hence, controlling for the cross-sectional correlation among the units in the case of our example is seen as a major value added of this research.

3. THE MODEL

This model aims to explore the determinants of the short-run pass-through adjustment of banks' lending rates to changes in the "cost of funds" rate, mainly using bank level data. The model is designed to take into account the impact of various banks' specific and macroeconomic control factors that, according to the theoretical predictions and the empirical studies assessed in the previous section, are seen to affect banks' retail rate reaction function to changes in the "cost of funds" rate.

In order to capture the short-run dynamics of the interest rate series, the model is estimated in first differences. With this model specification we attempt to investigate the size and the factors that affect the pass-through multiplier within one-month (1-month impact multiplier). Another possibility is to estimate a model within an error correction model (ECM). However, the mark-up pricing theory which is designed for non-perfect competitive pricing environment implicitly precludes the possibility that there may be a long-run equilibrium relationship between the "cost of funds" rate and banks' retail rates. Namely, majority of the studies assessed in section do not even test for the existence of a cointegrating relationship (Mojon, 2000; Sorensen and Werner, 2006; Weth, 2002 and Chmielewski, 2004) or fail to find a cointegrating relationship for some of the retail rate series and the "cost of funds" rate (Sander and Kleimer, 2004 a and b and de Graeve et al., 2004). Additional argument for estimating the model in first differences is to avoid the problem of spurious regression when some of the variables, i.e. interest rate series, contain a unit root[25].

There are several reasons why we are primarily interested in investigating the short-run variations in the interest rates to changes in the "cost of funds" rate. *First*,

[25] Unit root test are available from the author upon request.

according to the mark-up pricing theory, in an imperfect competitive pricing environment, rigidity of prices should be more pronounced in the short- rather than in the long-run. More precisely, in the case of the banking sector, banks are faced with a downward sloping loan demand curve, which is usually more inelastic in the short-run. In the long-run, depending on the financial structure of the economy, the loan demand curve may become more elastic because the economic agents (households and especially firms) may find alternative sources of finance. Hence, this may ultimately force banks in the long-run to adjust their lending rates more fully to changes in the "cost of funds" rate (Cottarelli and Kourelis, 1994). *Second*, according to the "menu costs" theory (Hannan and Berger, 1991), banks may decide to adjust their retail rates only if the marginal gain from changes in retail rates is higher that the costs incurred in changing their interest rates. However, the longer the lending rate is kept unadjusted to the changes in the "cost of funds" rate, and then the one-off costs of not changing the lending rate become higher due to the forgone multi-period benefits. This implies that banks are more likely to exhibit higher adjustment rigidity in the short- than in the long-run.

In the model presented it is assumed that, in the-short run, banks are agents with heterogeneous behavioural functions. Consequently, in order to investigate if this assumption holds, we have selected an estimation method that allows us to test if the slope coefficients statistically differ between the units. However, in the literature there are pro- and contra-arguments if various banks behave differently in the short-run. Whether this assumption holds or not, it is still not very clear in the theoretical as well as in the empirical literature. In the case of the Macedonian banking sector there are some possible *a-priori* theoretical arguments (explained in the following paragraph), as well as some *a-priori* empirical indicators based on simple eyeball analysis of the 1st differences of the loan interest rate series for each bank separately (see appendix 1). Whether this conclusion statistically holds or not and what are the possible factors causing it, is the subject of more comprehensive econometric analysis in section 6.

According to the theoretical literature, in the case of imperfect competition, there are some supporting arguments explaining why banks may have different price setting strategies and consequently, may have different sizes and speeds of short-run adjustment. One of the possible factors that may affect the optimal pass-through adjustment of banks, and thus affect the slope coefficients among them, are the different price elasticities of loan demand in the various loan market segments in which banks operate. For example, some banks prefer granting more consumer loans while others favour real estate loans. Some banks are more specialised in granting loans to the corporate sector while others concentrate on the household sector. Hence, this implies that various banks are faced with different loan demand elasticities. Bearing in mind that disaggregated interest rate series by sectoral structure and according to different types of loans by purpose are not

available (see section 5), then unequal loan demand elasticity among different loan market segments may be another non-modelled factor causing banks to have heterogeneous slope coefficients. Another possible factor that may determine banks' heterogeneous retail rate setting behaviour in the short-run could be financial market imperfections and changes in certain regulatory requirements imposed by the monetary authorities by which banks are obligated to adjust their balance sheet items (Ho and Saunders, 1981; Angbazo, 1997 and Cottarelli and Kourelis, 1994). These may not affect all banks equally, i.e. making some banks better off and others not, depending upon their financial performances.

The assessed empirical literature in section 2 implies that there is no straightforward and commonly accepted empirical model. It can be noticed that there is a large variation among the empirical models used, both in respect of the variables included and the estimation methods employed. Having in mind the complexity of this whole area, in our model specification we attempt to deal with the following aspects. *First*, to investigate the determinants of the short-run lending rate adjustment to changes in the "cost of funds" rate by considering a comprehensive set of bank balance sheet items as well as some macroeconomic control variables. *Second*, we attempt to explore if the slope coefficients differ among the units and consequently, to directly test if the assumption that banks are agents with heterogeneous behaviour, conditional on the controls, holds in the case of Macedonia. *Third*, we take into account the contemporaneous cross-sectional correlation among the units.

The basic model specification that allows for different slope coefficients for each cross-sectional unit, based on a common equation structure is as follows:

$$\Delta i_{tj} = \beta_{0j} + \beta_{1j}\Delta m_{t-1} + (X_{t-1j}\Delta m_{t-1})\beta_{2j} + (\Phi_{t-1}\Delta m_{t-1})\beta_{3j} + (\Pi_{t-1}\Delta m_{t-1})\beta_{4j} + \varepsilon_{tj}; \; i = 1, \ldots, N \quad (3)$$

Where:

β_0 is the intercept term;

i is banks' lending rate;

m is the "cost of funds" rate (MBKS rate);

X is a vector of bank specific characteristics (size, liquidity, capital, NPL ratio, maturity-mismatch, relationship lending, operational efficiency and portfolio diversification);

Φ is a vector of macroeconomic characteristics (inflation and economic growth);

Π is a vector of variables measuring the level of concentration in the banking sector (Hirschman-Herfindhal index - HHI and HHI^2);

ε is the error term;

t and j refer to time and bank specific subscripts;

Δ is a first difference operator;

β_{1i} is a parameter to be estimated;

β_{2i} is a vector of parameters to be estimated of the interaction terms between the change in the "cost of funds" rate and each bank specific characteristic respectively;

β_{3i} is a vector of parameters to be estimated of the interaction term between the change in the "cost of funds" rate and macroeconomic variables (inflation and economic growth);

B_{4i} is a vector of parameters to be estimated of the interaction term between the change in the "cost of funds" rate and HHI indices.

The independent variables in the model 1.3 are included with one period (month) lag. The rationale for this, instead of including their contemporaneous values, is that there may be some adjustment inertia of lending rates to changes in the "cost of funds" rate. This inertia may be caused by the existence of some "menu costs" and the time-lag caused by the decision-making process. Using a one period time lag is also preferable for the balance sheet items and the macroeconomic control variables. Moreover, bearing in mind that bank's interest rate series reported are those for the end of each calendar month, and that the "cost of funds" rate or changes in balance sheet items and/or macroeconomic variables may take place near the end of the calendar month, then using the current month reduces the possible reaction time considerably.

According to the mark-up pricing theory, all independent variables included in model 3 such as, the "cost of funds" rate, bank balance sheet items, macroeconomic indicators and market concentration variables are taken to be strictly exogenous. If for some of the bank balance sheet items this might be arguable; however their inclusion with one period time lag may partially reduce the possibility of violation of the non-strict exogeneity assumption by imposing the contemporaneous exogeneity assumption (see section 4). As Gambacorta (2005, a) argues, "…..bank-specific characteristics should refer to the period before banks set their interest rates." p.13.

In the model the vector parameters β_{1i}, β_{2i}, β_{3i} and β_{4i} cannot be directly interpreted on a ceteris paribus basis by isolating the impact of the rest of the variables. This is because the equation contains interaction terms, which makes the interpretation of the results more complicated. Our main interest is to analyse their statistical significance and sign from which we may be able to draw a conclusion on whether there is any impact of the independent variables over the size of the pass-through adjustment and if there is, in what direction they affect the pass-through adjustment.

To obtain the partial effect of the changes in the "cost of funds" rate to the pass-through adjustment of lending rates, we do a first order differentiation of equation 3 in respect of "cost of funds" rate by giving a certain value of the rest of the variables that contain the interaction terms such as their mean value[26]. The same procedure holds if we aim to investigate the impact of a bank's specific variables, macroeconomic variables and

[26] For details see Wooldridge (2002), p.190.

the impact of the concentration in the banking sector over the pass-through adjustment. All coefficients, as indicated by equation 3, are estimated for each cross-sectional unit separately.

The economic argument for each regressor and the expected *a-priori* sign of the parameters (Table 12), is discussed in what follows.

The "cost of funds" rate is included to measure the size of the pass-through adjustment of banks' lending rates. The expected sign of β_1 coefficient is positive. In selecting the "cost of funds rate" we have selected the weighted average monthly money market (MBKS) rate. The rationale for selecting the MBKS rate is for the reason that banks' short-term borrowing takes place at the money market rate and accordingly, it represents the financing costs of their lending activities.

Bank size, measured by total assets, is included in order to estimate how the asset size affects the pass-through adjustment and whether the differences in the adjustment between banks depend on their asset size. According to the "menu costs" (Hannan and Berger, 1991) theory, larger banks should exhibit lower interest rate rigidity because their "menu costs" of adjusting the retail rates represent a smaller proportion of total bank's costs, leading the larger banks to adjust their retail rates more fully to changes on the "cost of funds" rate. In contrast, the bank lending channel theory predicts a contrary impact of banks' size. More explicitly, in periods of monetary policy tightening, bigger banks have greater access to, and can more easily raise, non-deposit funds in order to offset the monetary policy measures, which makes them less dependent on changes in the "cost of funds" rate. Hence, according to the arguments presented, the expected sign of size variable is ambiguous.

The variables measuring the levels of bank liquidity and capitalisation serve as proxy variables for liquidity and the insolvency risk of banks (Angbazo, 1997). The rationale for their inclusion in the model, according to the bank lending channel theory, is that banks with more liquid assets and/or better capitalised banks are seen as less risky in the financial market and therefore they may more easily raise external funds in order to meet new loan demands or deposit withdrawals. Consequently, the expected sign of these two variables is negative. However, in the case of liquidity variable, this theoretical rationale may not apply due to the structural surplus liquidity of the Macedonian banking system that may bias the results.

The non-performing loans (NPL) ratio is a proxy variable for the credit risk exposure of the banks and their risk averse behaviour (Angbazo, 1997). According to the mark-up pricing theory, those banks with higher credit risk exposure, in order to compensate for the lost income of borrowers' default, are expected to charge higher lending rates and to set-up higher interest margins compared to banks with lower credit risk exposure (Rousseas, 1985 and Ho and Saunders, 1981). Thus, those banks, till

certain threshold level of NPLs, are expected to increase their lending rates proportionately more than the "cost of funds" rate in order to compensate for the lost income of borrowers' default. This implies to a positive sign of the coefficient. However, after a certain threshold level of NPLs, the banks may instead decide to ration credit and adjust their lending rates less fully to changes in the "cost of funds" rate due to their higher intolerance of incurring additional risks caused by the adverse selection and moral hazard problems (Stiglitz and Weiss, 1981). In the opposite case, when the "cost of funds" rate decreases, those banks with higher NPL ratio are expected to reduce their lending rates proportionally less in order to maintain their higher interest rate margins. Consequently, the theory of Stiglitz and Weiss (1981) predicts a negative sign of the coefficient.

The maturity-mismatch variable indicates the maturity gap between long-term loans and long-term deposits and is taken as a proxy variable for the interest rate risk that banks face and the stability of financing the long-term loans (Allen, 1988; Angbazo, 1997; Weth, 2002 and Sorensen and Werner, 2006). In other words, this variable seeks to measure what proportion of long-term loans is financed by long-term deposits and thus, the extent of interest rate risk exposure of banks on the money market. More precisely, when the maturity-mismatch ratio is low, it implies that a higher proportion of long-term loans is financed by long-term deposits, making banks less dependent on money market borrowing and hence, less sensitive to changes in the "cost of funds" rate and vice versa (Ho and Saunders, 1981). In the case of Macedonia, the stability of long-term loans is additionally secured by subordinated deposits that foreign owned banks obtain from their parent banks from abroad and/or long-term deposits that the rest of the banks borrow from other foreign banks or companies. Thus, in this study this variable is modified by including the subordinated deposits. The expected sign of this variable is positive.

The ratio of long-term loans over total loans, as suggested by Berger and Udell (1992) and Weth (2002), is an indicator of the relationship lending activities between the bank and its borrowers. The rationale for including this variable, according to the relationship lending theory (Boot, 2000 and Weth, 2002), is that when the bank is more engaged in relationship lending activities with its borrowers, then the higher will be the interest rate smoothing. Accordingly, when the proportion of long-term loans is higher relative to total loans, then it is considered that the bank has more long-term commitments with its borrowers and the reverse. In this way the bank can more closely monitor the borrowers and obtain more proprietary information and thus, smooth the interest rates. Therefore, the sign of this variable is expected to be negative.

The ratio of operating costs to total costs is a used as a proxy measure for banks' operational efficiency. Namely, operating costs such as staff costs and other administrative costs, according to mark-up pricing theory, are considered as a relatively

rigid part of banks' total costs that do not vary much with the level of lending activities (Rousseas, 1985). Hence, when the operating costs are lower, it implies that the bank has higher operational efficiency and can more easily pass-through the "cost of funds" changes to its lending rates. Therefore, the sign of this variable is expected to be negative. Regarding the case of Macedonia, some banks were formerly state-owned and privatised during the transition period, while others were established as greenfield banks, both groups of banks have different starting points in their management efficiency. For example, the former had to employ more educated workers and to fire under-educated workers due to the inherited over-employment that was typical of the former regime. In contrast, the greenfield banks did not have to go through the transformation process and have directly employed appropriately skilled workers exactly as much as they needed. Accordingly, this indicator for the operational efficiency for both types of banks may differ and may indicate different processes which may bias the results.

The ratio of non-interest income to gross income indicates the degree of portfolio diversification of the bank. Accordingly, it indicates that banks that have a higher share of non-interest income to total income ".....do not only rely on traditional banking activities such as granting loans and taking deposits....." (Sorensen and Werner, 2006). Thus, those banks have more diversified portfolio structure and are engaged in other activities in the financial market, perhaps including: insurance, investment banking and/or activities on the foreign and stock exchange markets. This implies that those banks are less dependent on the money market borrowing, leading them to smooth the interest rates over the business cycles (Sorensen and Werner, 2006 and de Graeve et al., 2004). Moreover, high inflation indicates higher perceived risk for the overall macroeconomic environment, which is likely to induce banks to adjust their retail rates faster and more fully to changes in "cost of funds" rate. Hence, this variable is expected to enter with a negative sign.

The rate of growth of industrial production index (IPI) and the level of inflation are included as macroeconomic control variables. Inflation is included in the model to control for the price changes in the economy. Because the interest rate series are in nominal terms, then including inflation in the model should indicate the extent of nominal indexing of interest rates to changes in the price level and how this indexing affects the pass-through adjustment. For example, in high inflationary environments it is expected that banks will adjust their retail rates more frequently and thus, more "easily" to pass-through the changes in the "cost of funds" rate to their borrowers, compared to periods with stable and relatively low inflation (Cottarelli and Kourelis, 1994; Mojon, 2000 and Egert et al., 2006). This variable is expected to enter with a positive sign.

The rate of growth of IPI is included as a control variable for the economic cycles and the level of loan demand in the economy. The rationale for including this variable is

that in periods of economic growth when the loan demand rises, it will be easier for the banks to pass-through the changes in the "cost of funds" rate to their lending rates (Egert et al., 2006). Moreover, this variable may also indicate the level of overall risk faced by the banks. When the economic growth is relatively high households' income is likely to be increasing and firms are likely to have higher profitability and hence banks may perceive a better financial environment with a lower risk of borrowers' default. Therefore, they may more easily pass-through the "cost of funds" rate changes. The expected sign of this variable is positive. However, in the case of Macedonia, economic growth and IPI as the proxy measure were severely affected by the transition process and this loan demand control variable may also be capturing other factors related to the process of transition. For example, loan demand may be affected by the political instability and financial instability in the country, especially in the initial period of transition which was characterised by banking failure, with another failure of saving houses in a later period. Therefore, the sign and size of this variable should be interpreted with caution.

The inclusion of the variables measuring the overall level of concentration in the banking sector is to give an estimate of the effect of banks' market power on the size of the pass-through adjustment. According to the mark-up pricing theory, banks operate in non-perfect competitive environment with entry and exit barriers and thus, exhibit some degree of market power (Rousseas, 1985 and Ho and Saunders, 1981). Consequently, in more concentrated markets, where banks have some market power, they are able to charge non-competitive prices (interest rates) in order to maximise their profit. Consequently, the banks are expected to adjust their retail rates more sluggishly to changes in the "cost of funds" rate, indicating to a negative sign of the coefficient. These theoretical predictions of the mark-up pricing theory, where market power of the banks is taken to be exogenous, are according to the structure-conduct-performance hypothesis (CSP). In contrast, the predictions of market-efficiency (ME) hypothesis by Demsetz (1973) refer to an inverse relationship between market concentration and the pass-through adjustment. More specifically, this theory assumes that firm's efficiency is exogenous. Consequently, more efficient banks in the loan market set their lending rates according to money market conditions and adjust their lending rates more fully to the changes in the "cost of funds" rate in order to acquire a higher share of the market. This implies to a positive sign of the coefficient. In measuring the level of concentration in the banking sector, as it is usual in the literature, we have decided to use the Hirschman-Herfindhal index (HHI).

In the literature it is also argued that a non-linear relationship between market concentration and pricing may exist, i.e. a "V" shaped behaviour. Namely, firms in concentrated markets may charge higher monopoly prices, but after a certain threshold

level of concentration, due to the threat of new entrants in the market, firms may start charging more competitive prices in order to maintain their market share (Cottarelli and Kourelis, 1994). In order to control for this possible effect, we have included squared value of the concentration index, whose coefficient is expected to be positive.

Table 12 *Expected sign of each of the parameters of the model 3*

Variable:	Expected Sign	Variable:	Expected Sign
"Cost of funds" rate	+	Operational efficiency	-
Bank size	+ / -	Portfolio diversification	-
Liquidity	-	Inlfation	+
Capital	-	Economic growth	+
NPL ratio	+ / -	HHI	- /+
Maturity-mismatch	+	$(HHI)^2$	+
Relationship lending	-		

4. ESTIMATION METHOD

The selection of the estimation method is primarily done in order to fulfil the aims and objectives outlined in section 1 and to enable us to empirically test if the theoretical expectations derived in the previous section hold in the case of the Macedonian banking sector. We have also taken into account the specific nature of the data and the cross-sectional units.

Given the aims and objectives of this paper, we needed to select a method that is able to estimate the determinants of banks' short-run retail rate adjustment to changes in the "cost of funds" rate. We also had to select a method that enables different slope coefficient estimates for each cross-sectional unit and that will allow us to test if those coefficients statistically differ between the units. We aim to test for this, although the existing literature does not currently provide a clear answer about this issue, nevertheless as mentioned in section 3, we have some arguments on *a-priori* basis why the slope coefficients might be statistically different among the units.

According to the assessment of the applicability of the various estimation methods in the empirical studies, the specific nature of the data series and the phenomenon of contemporaneous correlation among the banks, we have selected Zellner's (1962 and 1963) Seemingly Unrelated Regression (SUR) model. The rationale for selecting this model is based upon several reasons. *Firstly*, in the case when there is contemporaneous correlation among the disturbances that are by nature heteroskedastic, then the SUR model based on a Feasible Generalised Least Squares (FGLS) estimator provides more efficient estimates compared to OLS, by using the information of the variance-covariance matrix of the error terms. *Secondly*, it is designed for samples with large time dimension

(T) and small or finite cross sectional dimension (N) where one of the major requirements is T to be substantially greater than N, which is the case with our data (T=96; N=15). *Thirdly*, it may estimate different slope coefficients for each cross-sectional unit that allows testing for their cross-sectional equality.

Nonetheless, the SUR model has some limitations and requires certain assumptions to be fulfilled. The main assumptions are the exogeneity of the regressors and a normal distribution of the residuals, mainly for the Maximum Likelihood Estimator (MLE). In respect of the exogeneity assumption, the strongest form is the strict exogeneity assumption where all regressors from each equation are uncorrelated with the respective equation's error terms for all time periods:

$$E = (u_t \mid x_1, x_2, x_3 \ldots x_t) = 0 \qquad (4)$$

However, Wooldridge (2002) argues that this assumption may be relaxed by assuming a contemporaneous exogeneity, i.e. no correlation between the regressors and the error terms in the same time period, presented below:

$$E = (u_t \mid x_t) = 0 \qquad (5)$$

5. DATA ISSUES

The data period ranges from 2001:M1 to 2008:M12 and we have 96 monthly observations per bank. The reason for restricting the time period is because before 2001 the interest rate series for each bank were not available. The restriction to the end of 2008 is because at the beginning of 2009 a new accounting methodology was applied which distorts comparisons with the rest of the data series used in this analysis.

Throughout the sample period we work with a balanced panel comprising 15 banks that have been operating continuously over the sample period. The SUR model is conducted on balanced panel data; although there are some recent developments in SUR methods for unbalanced data, these are still in the process of development.

The sample has been adjusted for mergers and acquisitions. The adjustment of banks' balance sheet items has been done by backward aggregation of the data series before the merger or acquisition occurred. Although this is the most commonly used approach in the literature (Ehrmann et al., 2001; Gambacorta, 2005, b and Benkovskis, 2008) and no other approach appears preferable, we have to be aware that this may bias the data because changes in the management of the merged bank and any gained know-how are not controlled for.

Regarding the adjustment of interest rate series, in the case of merger we aggregate the data backwards as a weighted average of the value of the stock of loans and the respective interest rate of both entities. In doing this we have assumed, in the case of merger, that the management of both entities has also been merged and no single entity's retail rate setting strategy is taken as a dominant one. This may be problematic in that

after the merger the new entity may apply a completely different price setting strategy. Nevertheless, due to the relatively small cross-sectional sample and the need to work with balanced panel data, we think that this is the "second" best solution. In the case of acquisition, we have kept the lending rates of the acquiring bank before the acquisition has occurred, instead of backward aggregating the series as in the case of mergers. We argue that after the acquisition has occurred, the acquiring bank is likely to have maintained its previous retail rate setting strategy and has not changed or adopted the strategy of the acquired bank.

All variables in the model are expressed in nominal terms, except for the industrial production index which is in real terms. Some of the balance sheet items such as total assets, total loans, long-term loans, gross deposits and liquidity have been seasonally adjusted by using the census X-12 additive method.

In examining the determinants of banks' lending rate rigidity, we use the interest rates series on banks' outstanding loans for each bank separately. Regarding the currency structure, we use an interest rate series denominated in denars. Regarding the sectoral structure, the interest rate series include both sectors: corporate and household. Another limitation of the interest rate series is that they include all types of loans, no matter their purpose because disaggregated data according to the type of the loan by purpose are not available.

Detailed description of each data series is presented in Table 13

6. RESULTS

The estimation strategy goes from a general (unrestricted) model as presented with equation 3, to a more specific version in order to select the most parsimonious model. The aim of this specification search was to capture better the determinants of cross-sectional variation in the pass-through adjustment of lending rates among Macedonian. In order to select the most parsimonious model we have performed a number of preliminary regressions.

Starting from the most general model, given the theoretical arguments previously discussed, we have obtained the following results:

Regarding the variable that controls for the possible non-linear relationship between the level of concentration and the pricing behaviour of the banks, i.e. the squared value of the Hirschman-Herfindahl Index (dmbkshhi2) it was is jointly insignificant at 5% level of significance[27].

[27] The results are available from the author upon request.

Table 13 *Data description*

Variable:	Description:	Value:	Source:
Lending rate	Weighted average monthly loan rates for each bank separately	In %, annualised	NBRM
"Cost of funds" rate	Weighted average MBKS rate	In %, annualised	NBRM
Bank size	Log of total assets	Nominal	NBRM
Liquidity	Ratio of liquid over total assets. Liquid assets include: cash in vault at the NBRM+short term deposits in accounts in banks abroad+CB bills and treasury bills with maturity up to 1 year + cash in vaults in domestic banks+short term restricted deposits in accounts in domestic banks+short term loans granted to domestic financial institutions (banks and saving houses).	Nominal	NBRM
Capital	Ratio of equity plus reserves to total assets.	Nominal	NBRM
Credit risk exposure	Ratio of NPL to total loans.	Nominal	NBRM
Maturity-mismatch	Ratio of long-term loans to long-term deposits and subordinated deposits.	Nominal	NBRM
Relationship lending	Ratio of long-term loans to total loans.	Nominal	NBRM
Operational efficiency	Ratio of administrative costs to total costs.	Nominal	NBRM
Portfolio diversification	Ratio of non-interest income to gross income.	Nominal	NBRM
Price changes	Annual rate of inflation, measured by CPI.	In %	SSO
Economic growth	Annual rate of growth of IPI.	In %	SSO
Market concentration	Log of HHI and $(HHI)^2$	Index	Author's own calc. upon the data from NBRM

Source: NBRM and SSO.

Given the theoretical rationale for inclusion of this variable (explained in section 3), and the fact that the average loan market share of the three largest banks during the sample period was around 65%, we decided to include it only for the three largest banks in the sample. The reason for doing this is because we think that the three largest banks may be price leaders. However, this variable was again jointly insignificant for all the three of them at the 5% level of significance[28]. A possible explanation for the insignificant impact of the squared concentration index variable is on the basis that the threat of probable entry of outside competitors in the Macedonian banking sector is not considered as a serious factor in setting the lending rates. Namely, there are still relatively high entry barriers in this market, i.e. relatively high entry and exit costs, despite the change in the banking law in June 2007[29]. For example, new entrants into the banking sector have to fulfill strict regulatory requirements as well as deposit relatively high funds at the central bank.

Another variable with a questionable theoretical rationale for inclusion in the model given the specific nature of the Macedonian banking system, is the operational

[28] *idem*

[29] For more details see Official Gazette of the Republic of Macedonia No. 67/2007.

efficiency variable (see section 3). By performing an F-test for the joint significance of this variable, the results pointed that it is jointly insignificant at 5% level of significance[30]. Thus, we decided to exclude this variable from the model and proceed with a more parsimonious specification. This solution was based on two arguments. Firstly, the economic rationale presented in section 3, which implies that this variable may not be expected to significantly affect the size of the pass-through adjustment in the case of the Macedonian banking sectors. Secondly, this omission was due to statistical reasons given the joint insignificance of this variable.

The results from the final model specification are presented in Table 14 and Table 15, which indicate that the model can significantly explain the pass-through variations in lending rates for almost all 15 banks in the sample. The results for the overall significance of the bank-specific equations, apart from the equations for banks 7 and 10, indicate that they are statistically significant at 10% level of significance (see Table 14). To double check if the model is correctly specified, we have performed an F-test for the joint significance of each independent variable in each cross-sectional equation. The results indicated that all regressors in the model are jointly significant at 5% level of significance (see Table 15).

In order to examine if there is some efficiency gain from employing the SUR method, we performed the Breusch-Pagan test that tests if the contemporaneous covariance between the error terms from each equation is equal to zero. The results indicated that at 1% level of significance we can reject the null hypothesis of zero contemporaneous covariance between the residuals from each equation, implying that there is indeed some efficiency gain from employing the SUR method[31].

6.1. Interpretation of the Results

To assessment of the size of the pass-through adjustment of lending rates to changes in the money market rate, as explained in section 3, has been done by first order differentiation in respect of the change in the money market rate (dmbks), and evaluated at the mean value of the rest of the variables over the sample period. As presented in Table 14, there are large differences in the size of the estimated pass-through adjustment of lending rates to changes in the money market rate between banks.

As expected, for almost all banks, except for banks 7 and 14, the pass-through coefficient is positive and below 1. The pass-through coefficient is negative and statistically insignificant for bank 7, implying that the current model specification cannot explain the price setting behaviour of this bank. For bank 14, the pass-through coefficient

[30] The results are available from the author upon request.

[31] The results of the Breusch-Pagan test of independence are as follows: chi2(105) = 305.253, P-value: = 0.0000. The correlation matrix of the residuals is available from the author upon request.

is negative again but statistically significant. This may be partially explained by the specific history of this bank[32]. For the rest of the banks, the size of the pass-through coefficient ranges from 0.02 (bank 1) to 0.39 (bank 9). The pass-through coefficient can be interpreted as a one percentage point increase in the money market rate in the previous month, leads on average from a 2 up to 40 basis points increase in the lending rates in the current month on a ceteris paribus basis, given the mean value of the rest of the variables[33].

Table 14 *Size of the pass-through adjustment of lending rates for each bank separately*

	DMBKS
Bank 1	0.02***
Bank 2	0.10***
Bank 3	0.11*
Bank 5	0.33***
Bank 6	0.13***
Bank 7	-0.15
Bank 8	0.19***
Bank 9	0.39***
Bank 10	0.03
Bank 11	0.07*
Bank 12	0.17***
Bank 13	0.09*
Bank 14	-0.35***
Bank 16	0.20***
Bank 27	0.09***

*** p<0.01, ** p<0.05, * p<0.1

Source: Author's own calculations.

Regarding the rest of the variables included, i.e. the balance sheet items, macroeconomic control variables and the banking concentration index variable, as already discussed in section 3, we can only interpret their sign and statistical significance directly, given that these are interaction terms. From Table 14 and Table 15, it can be noticed that there is a huge variation of the significance and sign and of the same variables among the banks. This implies that the same variables do not have equal importance or even the same direction of impact on the pass-through adjustment process of the lending rates. In other words, these results support our hypothesis of aggregation bias in the literature, which has mainly used aggregated data (see section 2).

[32] The details for this bank are not provided in order not to reveal the anonymity of the data due to their confidentiality.

[33] Further details about each individual bank are not provided in order not to reveal the anonymity of the data due to their confidentiality.

Table 15 *Estimated signs of the rest of the independent variables in the model presented for each bank separately and the F-test for their joint significance*

VARIABLE:	Assets	Liquidity	Capital	NPLratio	Mat-mismatch	Rel. lending	Portdiv.	Inflation	IPI	HHI
Bank 1	+	–	–	+	+	+	+	–	–	–
Bank 2	+	+	+	–	+	–	–	–	–	+
Bank 3	–	–	–	+	+	+	–	–	–	–
Bank 5	+	+	+	–	–	–	–	–	–	+
Bank 6	+	+	–	+	+	–	–	+	–	–
Bank 7	+	+	+	–	+	–	+	–	–	+
Bank 8	+	–	–	+	+	–	–	+	–	–
Bank 9	–	–	–	+	+	+	–	–	–	–
Bank 10	–	+	+	+	+	+	+	+	+	+
Bank 11	–	+	–	+	+	+	–	–	–	–
Bank 12	–	+	–	–	–	+	+	–	+	–
Bank 13	–	+	–	+	+	–	–	–	+	+
Bank 14	+	–	+	+	+	+	–	+	+	+
Bank 16	–	–	–	+	–	–	+	–	+	+
Bank 27	+	+	–	–	+	–	+	–	+	–
F-stat for joint signiicance of the variable:	6.91***	4.80***	5.36***	5.42***	4.47***	2.99***	1.87**	3.76***	2.61***	3.55***

*** p<0.01, ** p<0.05, * p<0.1

Source: Author's own calculations.

The results in Table 14 imply to a lack of synchronisation of the pass-through adjustment process among various banks in the Macedonian economy. Moreover, the results in Table 15 indicate that the relationship between the size of the pas-through adjustment and the rest of the coefficients in the model differs considerably to the extent that their sign is not consistent among the cross-sectional units. This confronts the results of most of the literature that explores the determinants of the pass-through adjustment in various economies around the world by using aggregated data set (see section 2). Namely, in using aggregated data banks' heterogeneous behaviour, their different decision-making processes and price-setting strategies are suppressed. This may also be the case with the studies that explore the size and speed of pass-through adjustment in Macedonia (Jovanovski et al., 2005 and Velickovski, 2006) that are again based on aggregate data and do not taking into account for heterogeneous behaviour.

One of the possible reasons for banks' heterogeneous behaviour in the case Macedonia may be due to the transition process not affecting all banks equally. Namely, the bank balance sheet structure of various banks may have undergone a long-run adjustment process in order to reach some optimum level and/or structure in order to maximise their utility. For instance, those banks that were formerly state owned and were privatised, had different starting grounds compared to greenfield banks. More precisely, the state owned banks may have been overcapitalised, had relatively high NPL ratio and/or had insufficient liquid assets due to the policy of soft budget constraints. Hence, by the process of privatisation those banks may have had to adjust their balance sheet

items in order to maximise their rate of return. Another possible explanation for their heterogeneous behaviour, as mentioned in section 3, is that divergent movements in their balance sheet structures may have been affected differently by changes in the regulatory requirements. These above results, indicating aggregation bias, are in line with the results of de Graeve et al. (2004) for the case of Belgium (see section 2).

This heterogeneity among banks' behaviour can be examined in more detail if we analyse the impact (the sign) of each variable (see Table 15). For example, asset size has a positive impact on the size of the pass-through adjustment at 8 banks, consistent with the "menu costs theory". In contrast, for the rest of the banks, asset size has a negative impact which is in line the bank lending channel theory.

A similar different impact can be noticed for the rest of the balance sheet items. For example, the NPL ratio has a positive impact on the size of the pass-through adjustment in 10 banks in the sample, which is consistent with the mark-up pricing theory. These banks may have attempted to compensate for the lost income due to the borrowers' default by adjusting their lending rates more closely to the "cost of funds" rate. However, for the rest of the sample banks, this variable has a negative impact on the size of the pass-through adjustment, which is line with the theory of asymmetric information and lending rate stickiness. In other words, these banks have probably reached some threshold level of NPLs in their portfolio structure so they do not adjust their lending rates closely to the "cost of funds" rate in order not to attract additionally risky borrowers.

The maturity-mismatch variable, indicating the interest rate risk that banks face, affects positively the size of the pass-through adjustment at 12 banks which supports the theoretical expectations. More precisely, those banks that have lower coverage of their long-term loans with long-term deposits, are forced to borrow more frequently on the money market and thus, to adjust their lending rates more fully to changes in the "cost of funds" rate.

The similar conclusions for the banks' heterogeneous behaviour can be drawn if we assess the impact of the two macroeconomic control variables and the concentration index variable. For instance, inflation is estimated to have a positive impact at 4 banks, whereas its impact is negative for the rest. The different impact of price changes on the size of the pass-through adjustment may be explained by the various forward looking approaches that banks have in their lending rate adjustment. For instance, some banks may have perceived a stable inflation in the future and decided not to fully pass-through the "cost of funds" rate changes to their lending rates, while others have perceived the reverse.

The concentration index variable (HHI), has a negative impact on the size of the pass-through adjustment at 8 banks which is consistent with the predictions of the mark-

up pricing model for the non-perfect competitive pricing environment. Namely, these banks use their market power and hence, by not adjusting fully their lending rates to changes in the money market rate they extract higher monopoly profits. For the rest of the banks, this variable has a contrary impact, which may imply that those banks are adjusting their lending rates more fully to changes in the money market rate in order to get higher market share.

6.2. Robustness Check[34]

A robustness check of the existing model has been undertaken in the following two ways. *First*, as mentioned in section 4, when after a sufficient number of iterations in estimating the coefficients and their variances for each cross-sectional unit converge; then the FGLS estimator equals the MLE. Hence, in this way we compare if the estimates already reported in section 6 estimated by FGLS estimator are in line with the ones calculated by MLE. However, as discussed in Green (2008), whether MLE provides some efficiency gains in small samples is uncertain. *Second*, if any of the system equations is miss-specified, then all coefficients in each equation will be inconsistently estimated. Therefore, for a consistency check, it is argued that the results should be compared with the ones estimated with the OLS conducted on equation-by-equation (Moon and Perron 2006).

For the first type of robustness check, i.e. estimating the model with MLE, we can summarise that the estimates are very similar to the ones obtained by FGLS estimator. The overall significance of the equations for each bank separately as well as the individual and joint significance of each regressor in the model in the MLE estimation are very similar to the ones estimated by FGLS estimator. Regarding the estimated size of the pass-through coefficients they are again quite alike with the ones reported in Table 14. The main difference appears with bank10, where the size of the pass-through adjustment is now estimated to be negative. However, the pass-through adjustment for this bank is statistically insignificant, as it was the case with the FGLS estimator. Regarding the signs of the rest of the coefficients in the model, they are broadly in line with the estimates obtained by FGLS estimator.

According to the second type of robustness check, i.e. OLS equation-by-equation, the estimates in respect of their size and sign are generally in line with those of the FGLS estimator. More precisely, the estimated size of the pass-through coefficient for each bank individually is similar to the ones obtained by FGLS estimator. An exception is bank3 where now the size of the pass-through coefficient is estimated to be higher at 0.24. Regarding the estimated sign of the rest of the coefficients, they are similar to the

[34] The results discussed in this section have not been reported due to the length limitation. They are available from the author upon request.

ones previously discussed in section 6.1. The efficiency gain by employing the SUR model can be noticed if we compare the standard errors of both types of estimators, i.e. SUR with FGLS estimator and OLS equation-by-equation. According to the results, the standard errors estimated by the SUR model are lower than the ones estimated by OLS equation-by-equation, implying to some efficiency gain by employing the SUR model.

7. CONCLUSIONS

The aims of this paper were to explore the short-run variations in the size of the pass-through adjustment of lending rates to "changes in the cost of funds" rate among banks in Macedonia as well as to investigate what factors affect their different lending rate setting behaviour. In other words, this paper attempted to investigate what determines banks' short-run heterogeneous lending rate setting behaviour. For this purpose we have used a set of up to eight bank balance sheet items, two macroeconomic control factors and a banking concentration index variable.

In order to fulfill the aims, we tried to tackle some of the weaknesses found in the existing empirical literature for Macedonia as well as part of the literature for the developed economies and CSEE. More precisely, all of the studies conducted for the Macedonian banking system as well as part of the studies for CSEE and developed economies are based on aggregate data that may suffer from aggregation bias (see section 2). Another drawback in the empirical literature is that majority of the studies conducted for both for the CSEE and developed economies that use bank-level data (see section 2), do not control for contemporaneous cross-sectional correlation among the disturbances.

Accordingly, in this paper we attempted to deal with the problem of aggregation bias by using disaggregated bank-level data set. In order to consider the contemporaneous cross-sectional correlation among the disturbances we have applied the SUR model. Moreover, we have used disaggregated bank-level lending rates denominated in domestic currency only.

The main findings of this paper are that in the short run, various banks adjust their lending rates differently to changes in the "cost of funds" rate. This can be concluded from the estimated size of the pass-through adjustment coefficients that are considerably different between the banks. Another finding of this paper is that various factors including bank-specific characteristics, macroeconomic control variables and the banking concentration index variable affect the lending rate setting behaviour of banks differently. Both of these findings support the hypothesis of aggregation bias in the literature. The robustness of these results has been checked by using different estimation methods; SUR estimated with MLE and simple OLS equation-by-equation.

Overall, the presented empirical findings in this paper indicate that the size of the short-run pass-through adjustment of lending rates to changes in the "cost of funds" rate

is incomplete and heterogeneous among the Macedonian banks. Moreover, it is estimated that various factors may affect differently banks' lending rate setting decisions. These findings indicate that the short-run pass-through adjustment process among banks in Macedonia lacks synchronisation. This may imply that the interest rate channel may still not have an important role in the monetary transmission.

Appendix 1

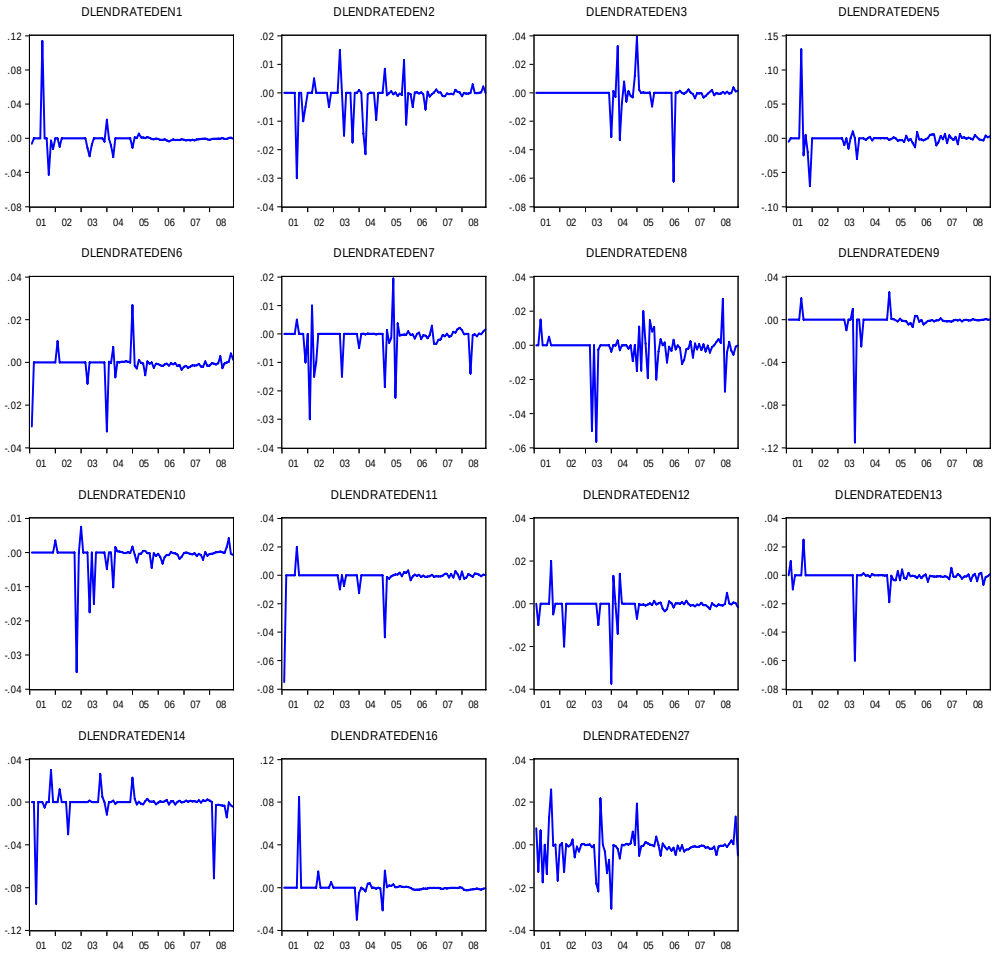

Figure 22 *Figures of 1st differences of the loan interest rates of the Macedonian banks for the period 2001-2008*

Source: author's own calculation based upon the data from NBRM.

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CONTROVERSY OVER SUSTAINABILITY OF INDIA'S FAST ECONOMIC GROWTH: FOUR FACES OF THE DEBATE

Mazhar SIRAJ*

Abstract: *The Indian economy has grown by more than 8 percent per year since 2003-04. This achievement has triggered a debate around the question: Is the fast economic growth of India based on a sound foundation that will ensure its sustainability in the future? This paper reviews varied arguments within this debate and concludes that scepticism seems to outweigh optimistic perspectives. This perception emerges because the Indian labour force is growing at 2 percent per year which is even faster than that of China. A majority of this labour force will be absorbed in agriculture and informal sector which have low productivity. The services sector is booming, but it cannot absorb major proportion of the growing low- and unskilled labour force. India needs to take benefit of its advancement in the IT sector to increase productivity of its agriculture and informal sector for maintaining the fast growth of economy.*

Keywords: *India, economic growth, unemployment, demographic dividend, services*

JEL Codes: *O14, O16, O17, O41, O43*

1. INTRODUCTION

During the last two decades, India has attained a spectacular outlook on its economic performance that compares well with the fastest growing countries of the world. Breaking with an average annual growth rate of 3.6 percent during the first three decades since its independence, the Indian economy has expanded at an average annual growth rate of 5.6 percent and 6.4 percent during the 1980s and the 1990s, respectively (Table 16). The growth rate has exceeded 8 percent in every year since 2003-04 (Government of India, 2008a:1). This fast growth has reduced the doubling time of

* Mazhar SIRAJ, Save the Children UK (Pakistan Program), House 97, Main Double Road, F-10/1, Islamabad, Pakistan, Postal Code: 44000, sirajmazhar@hotmail.com

average per capita income to one decade along with a gradual increase in domestic consumption (Government of India, 2008a; Rodrik and Subramanian, 2004b).

The remarkable transformation of the Indian economy has spurred a debate among the informed observers in general, and acclaimed economists in particular,[35] on whether or not the country will be able to sustain its fast growth rate in the future. This debate became more relevant in the face of expected downward trends in the economy due to the global financial and economic crisis. In this context, this paper discusses the academically based debate on the view that the fast growth of the Indian economy during the last two decades is soundly based and entirely sustainable, and that the country will be able to cope very well with the current world economic crisis. The paper relies mainly on the recent literature that represents the case for and against this view. It uses the latest data on India's economic indicators to situate the debate in the proper analytical and empirical contexts.[36]

The paper is organized as follows: The next section looks at the recent literature to identify the varied opinions and perspectives about sustainability of India's economic growth. Based on a careful review of the literature, the paper places the viewpoints in two analytical categories namely, "optimism" and "scepticism". These categories represent, respectively, the case for and against the view that the fast growth of the Indian economy during the last two decades is soundly based and entirely sustainable. The section defines these categories as they are applied in the paper. The third section explains main elements of the debate about sound basis and sustainability of India's fast growth by delineating the controversy between the optimists and the sceptics. The fourth section draws conclusions.

2. OPTIMISM VERSUS SKEPTICISM

A careful review of the recent literature reveals that remarkable differences exist in the body of informed opinions about the future prospects of the Indian economy. However, it may be noted that there is no considerable difference on capacity of the country to grow at a rate of 7 percent per year or lower; the real controversy is centered on sustaining the fast growth rate of more than 7 percent per year.[37] We can identify two broad categories of the controversy in the literature, namely "optimism" and

[35] See, for example, Rodrik and Subramaninan (2004a, 2004b), Kelkar (2004), Acharya (2004), and Dasgupta and Singh (2005, 2006).

[36] The analysis in most papers that address the topic of the paper is based on data up to 2003-04. The data have been updated in the paper up to 2007-08 based on the latest statistics of the Central Statistical Organization (CSO) as reproduced in Annual Reports of the Reserve Bank of India (2006 to 2008), and Economic Survey (2008), Government of India.

[37] Earlier, the debate on India's fast economic growth was centered on sustainability of a rate of 6 to 7 percent per year (see Acharya, 2004; Rodrik and Subramanian, 2007b). Given the growth acceleration in recent years, the debate has now turned on sustainability of a growth rate of 8 percent or higher.

"scepticism". Accordingly, the economists representing these viewpoints are considered as the "optimists" and the "sceptics", respectively.

In this paper, the term "optimists" is used for those who believe that the Indian economy's fast growth during the last two decades is soundly based and sustainable based on their analyses of different dimensions of the economy. Some of them have almost no doubt that the Indian economy can grow at a rate of 7 percent or higher in the medium- and long-term, provided no serious crisis takes place. Ahluwalia (2002), Joshi (2004), Rodrik and Subramanian (2004a, 2004b), Kelkar (2004) and Balakrishnan (2006) are placed in this category. In contrast, the "sceptics" are those who question the optimistic claims. Although they do not necessarily reject the claims, they have considerable doubts about the sustainability and sound basis of India's fast economic growth. DeLong (2001), Acharya (2004), Dasgupta and Singh (2005, 2006), Sinha and Tejani (2004), Panagarya (2004) and Kohli (2006a, 2006b) are placed in the category of sceptics.

The debate on spectacular growth of the Indian economy during the past two decades presents a wide range of optimistic as well as sceptic claims about strong basis of this growth. While it is generally accepted that India has been able to maintain a high growth rate so far, doubts about long-term sustainability of this growth can hardly be ignored. The main reason is that the Indian labour force is growing at about 2 percent per annum which is faster than that of China and other competitor countries. A majority of this labour force is going to be absorbed in the informal sector which has low productivity. The services sector is booming, but it cannot help much to absorb the growing low- and unskilled labour force. India needs to take benefit of the advancement in IT sector to modernize its informal economy for increasing its productivity and to create more jobs for maintaining the fast growth of economy.

Before we proceed further, three important caveats need to be made. First, the works listed above do not indicate an exhaustive body of scholarship on the growth optimism and scepticism. Due to limitations of space, these works have been selected keeping in view the diverse range of perspectives they offer. Secondly, construction of the categories of the optimists and the sceptics is based on the authors' viewpoint that emerges out *predominantly* from a careful reading of their works. This means that the optimists and the sceptics do not represent a monolithic or consensual viewpoint, as shall be explained in the next section. Therefore, the value of these categories is only indicative and analytical. Thirdly, some important works provide important insights into the debate on India's economic growth, but it is difficult to clearly identify any degree of optimism or scepticism in these works. Those include, for example, Chakraborti and Nunnenkamp (2008) and Virmani (2004). The paper capitalizes upon these works to explain the viewpoints of the optimists and the sceptics.

3. SUSTAINABILITY OF INDIA'S FAST ECONOMIC GROWTH: FOUR FACES OF THE DEBATE

This section looks at the main arguments made by the optimists and the sceptics about the sound basis and sustainability of India's fast economic growth over the last two decades. The debate that emerges from these arguments has four broad faces or dimensions: (a) economic reforms and outward orientation of the economy, (b) changes in the patterns of economic growth and employment challenge, (c) demographic dividend, and (d) institutional strengths. These faces are analytically interrelated, but for the sake of discussion, we shall look at each of them separately.

3.1 Economic Reforms and Outward Orientation of the Economy

The outlook of the Indian economy remained ordinary during the first three decades since independence. As Table 16 shows, the economy expanded at an average rate of 3.6 percent per year between 1951-52 and 1980-81. This outlook has changed entirely because the growth rate has more than doubled during the last two decades, which has placed India among the fastest growing countries of the world (Kohli, 2006a; Rodrik and Subramanian, 2004a). In 2007-08, the Indian economy expanded at a growth rate of 9 percent (Table 16). While this turnaround is a remarkable achievement for a country as large as India, it also raises a crucial question: Is this turnaround based on a sound foundation that will ensure sustainability of the fast growth rate of the Indian economy in the future?

Table 16 *Growth of GDP and Major Sectors in India*
(Average annual growth, percent per annum)

	1951-52 to 1980-81	1981-82 to 1990-91	1992-93 to 1999-00	2000-01 to 2006-07	2007-08
GDP	3.6	5.6	6.4	6.9	9.0
Agriculture	2.5	3.6	3.8	2.5	4.5
Industry	5.3	7.1	7.2	7.0	8.1
Services	4.5	6.7	7.7	8.6	10.7

Sources: (a) Reproduced from Acharya (2004) for the period 1951-52 to 1999-91;
(b) CSO data as reproduced in Annual Reports of the Reserve Bank of India, 2007 and 2008, for the period 1992-93 to 2007-08.

India's fast growth rate is believed to be the result of economic reforms that were introduced in 1991 in the aftermath of the balance of payment crisis. This belief is predicated upon the empirical data, which establishes that the growth rate exceeded 6 percent per year only after the 1991 reforms, as Table 16 indicates. DeLong (2001) contested this viewpoint and argued that the post-reform liberalization had actually little impact on the growth because the break in trend growth rate had occurred during the "license raj" in the early 1980s. The analytical papers published after 2001 also noted the

break in trend growth rate in 1980-81 (see, for example, Sinha and Tejani, 2004; Rodrik and Subramanian, 2004a; Panagarya, 2004; Virmani, 2004), but DeLong's (2001) view that the post-reform liberalization had little impact on fast growth rate was contested by some optimists. Rordrik and Subramanian (2004a) argued that the reforms had actually begun in the early 1980s during the governments of Indira Gandhi and Rajiv Gandhi. They distinguished between the two waves of reforms in that the reforms in the 1980s were *pro-business,* as opposed to *pro-market* reforms introduced since 1991.[38]

Taken together, the two waves of reforms have changed fundamental structure of the Indian economy through elimination of quantitative controls on imports of industrial machinery, reduction in tariffs on imports of capital goods, modest tax system rationalization, reduction in number of industries subject to government licensing, increase in foreign direct investment[39], expansion of the role of private sector, dismantling of import controls, lowering of customs duties, flexible exchange rate, and foreign investment, and a restructuring of government's role in the Indian economy.[40]

Rodrik and Subramanian (2004b) questioned DeLong's (2001) viewpoint by arguing that the post-1991 reforms had increased labour productivity and competitiveness of the Indian economy, which ensured sustainability of the growth rate of the 1980s; otherwise, this growth will have been unsustainable due to external debt. This is evident from the fact that the economy was much less volatile in the last two decades (Kelkar, 2004). The structural changes introduced in the economy have laid the foundation for India to grow at a rate of 8 per cent a year or higher because "the cumulative change brought about is substantial" (Ahluwalia, 2002:87).

The coincidence between the economic reforms and the fast growth rate has convinced the optimists that the Indian economy can easily grow at a rate of 7 percent per year or higher, if the reforms are continued (Rodrik and Subramanian, 2004b). This optimism has been questioned in a number of analytical papers. Dasgupta and Singh (2005) have argued that the projections made by Rodrik and Subramanian (2004b) are based on growth accounting exercises, which do not take into account demand side factors. They argue that sustainability of fast growth rate might be affected due to a mismatch between supply and demand of labour.

Kelkar (2004) believes that the productivity will substantially increase if reforms are continued in four major areas, namely globalization, infrastructure, privatization, and the financial sector. Acharya (2004) makes a case against this optimism by examining the reforms outlook in each of these four areas. He argues that the progress towards tariff reductions has been very slow, as compared to the standards of developing countries. In

[38] For the debate on *pro-business* and *pro-market* reforms, see Rodrik and Subramanian (2004a:2-3).

[39] The FDI increased from effectively negligible in the 1980s to $ 5 billion annually by the mid 1990s. For a fuller analysis of the role of FDI, see Chakraborti and Nunnenkamp (2008).

his view, the fact that India accounts for only 0.8 per cent of total world exports and about 0.4 per cent of total foreign direct investment is convincingly inadequate to label India as a "winning globaliser", to use Kelkar's (2004) cliché. The approach towards progress in areas of privatization, physical infrastructure and development of small-scale industries has also been slow.

If we look at the trends after these papers were written, it becomes clear that India has been able achieve a growth rate of 9 percent in 2007-08 (Table 16), which is higher even than the projections made by the optimists. However, the criticism of Acharya (2004) and Dasgupta and Singh (2005) is still relevant in respect of the possibility of employment deficit, which can affect the economic growth in the future. We shall discuss this issue in detail below.

3.2 Changes in the Patterns of Economic Growth and Employment Challenge

A notable characteristic of the Indian economy, which distinguishes it from a number of fast growing economies such as China, is that its fast growth is led by the services sector.[41] As Table 17 indicates, the share of services in GDP has steadily increased from 30 percent in 1960 to 62.9 percent in 2007-08. Conversely, the share of agriculture has reduced from 50 percent to 17.8 percent of GDP during the same period. The share of industry in GDP increased from 20 percent in 1960, and plateued around 26 percent to 27 percent in 1980 and 2000, respectively. However, its share has decreased to 19.4 percent in 2007-08.

Table 17 *Shares of Agriculture, Industry and Services in GDP (Value added as percentage of GDP)*

	1960	1980	2000	2007-08
Agriculture	50	37	27	17.8
Industry	20	26	27	19.4
Services	30	37	46	62.9

Sources: (a) Reproduced from Dasgupta and Singh (2005) for years 1960, 1980 and 2000;
(b) CSO data as reproduced in Annual Report 2008 of the Reserve Bank of India, Government of India (2008b) for 2007-08.

The optimists believe that India has attained its fast growth rate, largely due to faster growth of services led by a boom in the software exports (Balakrishnan, 2006). It is

[40] For the debate on reforms, see DeLong (2001), Alhluwalia (2002) and Kohli (2004a, 2004b).

[41] This is important to note, however, that a faster growth of services than manufacturing has been observed in a number of low- and middle-income countries in Asia and Latin America. See World Development Report (2004) in Dasgupta and Singh (2005).

believed that India is going to pioneer a new development path in which services may replace manufacturing as the engine of growth in other developing countries as well (Joshi, 2004). Moreover, the Indian labour force is expected to grow at a faster rate than China and other competitor countries, which would lead to a faster output growth (Rodrik and Subramanian, 2004a).

The critical perspective on this viewpoint has come from Dasgupta and Singh (2005, 2007) who argue that India's growth is diverging from historical pattern of growth in which manufacturing has been the engine of growth for the developing countries at the level of India's per capita income. Their analysis of Kaldor's laws[42] reveals that in India's case, the services sector as a whole is much like manufacturing as far as GDP growth is concerned; expansion of either will lead to productivity growth. However, their concern arises from the fact that the faster growth of the services sector is leading to a phenomenon of "jobless growth" in the organized manufacturing as well as the services sector when the labour force is increasing at 2 percent per annum. This means that much of the excess labour in agriculture will either remain in agriculture or will have to be absorbed by the low-productivity informal sector. This viewpoint is shared by Ghose (2009) whose estimates indicate that the growth of employment in the formal sector has been negative between 1999-2000 and 2004-05 (Table 18).

Table 18 *Average Annual Growth (Percentage) of Informal and Formal Employment (1999-00 to 2004-05)*

	Informal	**Formal**	**Total**
Agriculture	1.7	-0.2	1.7
Industry	6.6	-0.6	5.7
Manufacturing	6.0	-2.2	4.8
Services	4.7	-0.1	3.7

Source: Estimates of Ghose (2009) based on data provided in the *Report on Definition and Statistical Issues relating to Informal Economy, 2008*, National Commission for Enterprises in the Unorganized Sector, Government of India.

Dasgupta and Singh (2005) further note that the fast growth of the information technology (IT) sector has indeed limited value as far as employment is concerned. First, it employs less than one million people in total labour force of 450 million. How much additional labour can it absorb, given that it constitutions less than 1 percent of GDP. Secondly, the unique nature of IT services requires only education and skilled people which constitutes a minor proportion of the total labour force. Only 5 percent of India's relevant age group receives college education (Joshi, 2004 in Dasgupta and Singh, 2005). Other services such as hoteling, transport, real estate, restaurants and community services

[42]The Kaldorian approach divides the economic activities into agriculture, industry and services, and considers the manufacturing industry as the main engine of growth. For a detailed analysis, see Dasgupta and Singh (2005:12-13).

could have absorbed unskilled labour, but evidence suggests that they did not register any acceleration in growth in the 1990s (Dasgupta and Singh, 2005). This implies that India's fast growth rate is sustainable as far as the pattern of growth is concerned, however, it may be infeasible socially and politically due to increase in employment deficit in the future.

3.3 Demographic Dividend

The employment challenge discussed above also stands out distinctively in the academically based controversy on projections about India's demographic dividend. Rodrik and Subramanian (2004a) claim that the total factor productivity growth (TFPG) in the Indian economy is expected to double in the near future due to economic reforms and other factors from its base rate of 2-2.5 percent in 1980-2000. They believe that India's labour force will grow rapidly coupled with declining fertility. As a result, the labour force will comprise of relatively young population with a growth rate of nearly 2 per cent per year for the next 20 years. This will also result in a decline of dependency ratio from 0.62 in 2000 to 0.48 in 2025 (Rodrik and Subramanian, 2004a). The underlying assumption is that this demographic change will stimulate a faster growth of labour input, which will lead to faster output growth.

One criticism on this projection has come from Dasgupta and Singh (2005), which has been discussed in the previous section. Acharya (2004: 4538) has also questioned this projection because in his view, "there is no *guarantee* of such a happy outcome" for three reasons: First, labour demand has grown far slower than supply in India. For example, between 1993-94 and 1999-2000, the India economy grew at 6.5 per cent plus, but employment increased hardly by 1 per cent despite that the labour force was growing at more than 2 per cent a year. Second, India's labour laws are very rigid. As a result, organized sector avoids hiring new workers because it would be difficult to lay off the workers in a downturn. Thirdly, there are remarkable disparities in the demographic profiles of the states. Acharya (2004) observed that nearly 60 per cent of India's population increment would be concentrated in Haryana and the undivided states of Uttar Pradesh, Madhya Pradesh and Bihar. Given that these four states are already populous, poor and underdeveloped in terms of education, governance and physical infrastructure, the additional labour supply is likely to transform into a major employment deficit, instead of potential strength for the economy.

Apart from labour, demographic dividend also draws on capital formation. From the Harrod-Domar type growth perspective, if the rate of increase in savings is sustained, it could result in a long-term increase in the rate of economic growth (Sinha and Tejani, 2004). The optimists argue that the composition of labour force supply will favour higher rate of savings in India. According to the population projections, India's population will increase in the age group of 15 to 64 years, coupled with an increase in the savings rate.

Rodrik and Subramanian (2004a) estimate that the decline in dependency ratio will translate into rise in private and aggregate savings up to 39 percent of GDP.

Acharya (2004) contends that the actual trends do not fully support the optimism about the aggregate savings and investment. He argues that the household savings and private savings increased by 6 and 8 per cent of GDP, respectively, between the late 1990s and 2002-03, but the public savings declined by 4.6 per cent of GDP due to rising revenue deficits of the Central and the State governments (Table 19). Ahluwalia (2002) also noted that public savings declined from +1.7 per cent of GDP in 1996-97 to -1.7 per cent in 2000-01 while the fiscal deficit rose to 9.6 per cent of GDP. Thus, the increase in private savings was substantially offset by the fall in public savings. Acharya (2004) asserts that the problem of high fiscal deficit is likely to affect the provision of public and quasi-public goods with adverse effects on India's economic growth prospects.

Table 19 *Savings, Investment and Fiscal Deficit for Selected Years (As percent of GDP at current market prices)*

	1 GDCF	2 GDS	3 Public Savings	4 Private Savings	5 Household Savings	6 Corporate Savings	7 Fiscal Deficit *
1985-90 Average	22.7	20.4	2.4	18.0	16.0	2.0	-
1990-91	26.3	23.1	1.1	22.0	19.3	2.7	9.4
2000-01	24.4	23.7	-2.3	26.1	21.9	4.1	9.6
2001-02	24.3	23.5	-2.0	25.5	22.1	3.4	9.9
2002-03	22.8	26.4	-0.6	27.0	23.2	3.9	9.6
2003-04	25.2	29.8	1.1	28.7	24.4	4.4	8.5
2004-05	28.2	31.8	2.2	29.6	23.0	6.6	7.5
2005-06	32.2	34.3	2.6	31.7	24.2	7.5	6.7
2006-07	35.5	34.8	3.2	31.7	23.8	7.8	5.6

Notes: GDCF: Gross Domestic Capital Formation; GDS: Gross Domestic Saving
*: It represents combined fiscal deficit of the Central and State Governments.

Sources: (a) Columns 1-6 reproduced from Acharya (2004) up to 2000-01; (b) Column 7 reproduced from Ahluwalia (2002) up to 2000-01; (c) CSO data as reproduced in *Economic Survey 2006-07* and *Annual Report* of the Reserve Bank of India (2006 to 2008) for the period 2001-02 to 2006-07.

Looking at the trends after Acharya's (2004) paper was published; we find that the fiscal deficit has been reduced considerably from 8.5 percent in 2003-04 to 5.6 percent in 2006-07. The Gross Domestic Capital Formation has also increased substantially from 25.2 percent in 2003-04 to 35.5 percent in 2006-07. These changes tend to favour the projections made by Rodrik and Subramanian (2004a). However, the possibility of

reversal in these upward trends cannot be ruled out in face of the current world economic crisis, which we shall discuss in the next section.

3.4 Institutional Strengths

The current theories of development economics consider the institutions as the most important 'deep' determinants of economic development (Dasgupta and Singh, 2005:2). The optimists, particularly Kelkar (2004) and Rordik and Subramanian (2004a, 2004b) point out that India has achieved a reasonably high quality of key institutions including democracy, rule of law, and property rights. This quality has strengthened India's "resilience in handling shocks". As a result, even minor changes in the policy environment can produce a large growth impact (Rodrik and Subramanian, 2004:3). This optimism is based on the observation that variation in growth rates was the lowest in terms of both the standard deviation and the coefficient of variation between 1980 and 1999. During this period, India outperformed all regimes, including East Asia, in terms of the stability of growth.

Empirical evidence on the relationship between political institutions and economic growth is found in Rodrik and Subramanian (2004). They conducted regressions of income on the deep determinants of income with an Indian dummy. The results indicated that India had not fully exploited the potential of its well developed economic and political institutions. In 1980, India's level of income was about a quarter of what one may have expected based on the strength of its economic institutions. Similarly, if the political institutions are considered long-term determinants of income, the income level was just 15 percent of what one may have expected based on the quality of political institutions. This means that India was far away from its income possibility frontier. This factor facilitated a large productivity response when the Congress governments in the 1980s demonstrated an attitudinal shift in favour of business. This positive assessment is one of the greatest sources of growth optimism.

Acharya (2004) presents an opposite view based on works of Ahluwalia (2002) and others, which have documented the gradual deterioration of key institutions including the elected legislatures, the judiciary, the bureaucracy and the police. He supports this view with anecdotal evidence about the decline in quality of public administration, lack of technical and specialized knowledge apt for modern governance, and inadequate capacity for reforms in economic governance. This scepticism indicates that there is not dispute on the present strength of the Indian institutions, but trends of deterioration in their quality might undermine the growth process. This view, however, has to be ascertained through empirical research.

4. CONCLUSIONS

The debate on spectacular growth of the Indian economy during the past two decades presents a wide range of optimistic as well as sceptic claims about strong basis of this growth. While it is generally accepted that India has been able to maintain a high growth rate so far, doubts about long-term sustainability of this growth can hardly be ignored. The main reason is that the Indian labour force is growing at about 2 percent per annum which is faster than that of China and other competitor countries. A majority of this labour force is going to be absorbed in the informal sector which has low productivity. The services sector is booming, but it cannot help much to absorb the growing low- and unskilled labour force. India needs to take benefit of the advancement in IT sector to modernize its informal economy for increasing its productivity and to create more jobs for maintaining the fast growth of economy.

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THE EFFECTS OF INTERNATIONAL PARTNERSHIPS ON DEVELOPING DYNAMIC CAPACITIES IN THE LOCAL FIRMS OF THE EMERGENT MARKETS

Sonia Ben SLIMANE*

Abstract: *As widely acknowledged, the international joint ventures are considered as providing a potential of innovation capabilities and technological capacities. In the case of emerging markets the IJV offer for the recipient partner the possibility to prove its ability to learn, acquire and absorb the external technologies. Nevertheless, the transfer is not systematic. It is conditioned by a combination of factors that influence its success. We propose to measure the performance of the transfer for the Tunisian case at the level of perception of the managers and at the level of the type of supports made by the parent. Then we extend the analysis by measuring the potential absorptive capacity, which have an influence in terms of improving the performance effects of the IJV. Finally, we test the influence of the initial profiles characteristics of the firms, on moderating the IJV' effects, before concluding and underlying the limits of this study.*

Keywords*: International joint venture, learning capacities, developing countries, Absorptive capacity*

JEL Codes: *F23, L24, L25, O33*

1. INTRODUCTION

The evolution of the co-operations between firms has permitted a plentiful literature around the conception of the firm and its frontiers and has placed the specificity of competencies and innovation in the heart of the firm analysis (Schumpeter, 1934, Coase, 1937, Williamson, 1991). The evolution of the firm is thus observed according to the technological opportunities and its own competencies (Nelson et Winter, 1982, 1987, Teece, 1987, Foray and Lundvall, 1995). In this context, the international alliances and specially the joint ventures are considered as one of main sources of technology transfer

* Sonia Ben SLIMANE, IMRI/ Researcher, Institut pour le management de la recherche et de l'innovation (IMRI), Place du Marechal de Lattre de Tassigny, 75775 Paris cedex 16, France, Sonia.benslimane@dauphine.fr

and as a dynamic channel for providing a higher potential of innovation performance capabilities (Inkpen, 1998, Lin W B, 2003) and improving and increasing technological capabilities (Kumar, Kumar and Persaud, 1999). In the case of IJV between firms belonging to countries with different levels of development, these contractual relationships are a mode of acquisition of technological capacities and a catalyst of development (Bellon, 2000), as they offer to the recipient partner the possibility of acquisition new technical knowledge (Hendrickx, Catin and Bernard, 1998) and contribute to its performance in terms of learning (Lane, Salk and Lyles, 2001). However, the technological transfer is not systematic and its success is not guaranteed in advance, mainly in the case of asymmetric assets between partners. The success of the technological transfer is conditioned by a combination of factors that could influence the type and the quality of the transfer (Inkpen, 2000). The extent and the type of technologies that are being transferred to the host partner, in terms of tacit and explicit knowledge are influenced by the existence of prior core knowledge (Kumar, Kumar, Madanmohan, 2004). More specifically, the challenge for the recipient partner is not only to prove its ability in operating and maintaining the machineries at the production level but it also its ability to learn, acquire, absorb and apply new external technologies those are integrated in tangible assets, production, processes and management capabilities (Davenport, and Prusak, 2000). Considering this, we propose to measure the performance induced by the transfer inherent from the joint ventures on the recipient partners for the Tunisian case. For that purpose we based the analysis on responses to a questionnaire sent to the managers in the different sectors in year 2005 and including two types of firms, with a discriminant variable, the IJV. The purpose of this study is to test the implications of the IJV on enhancing the potential absorptive capacity of the local partner with a condition of having already a combination of factors that influence the quality and the type of the transfer inherent from the IJV. We describe first the sample selection and the methodology of the analysis. Then we test the type of effects induced by the IJV on the recipient partner. In the section 2, we test the potential absorptive capacity (PACAP), which could have an influence in terms of the efficiency of the expected effects of the IJV. The results show a correlation between the considered dimensions of the potential ACAP- the evolution of the R&D expenditure, the R&D unit and the qualifications- and the evolution of knowledge and learning. In the section 3, we test the influence of the profile variables, on moderating the previous results. Finally we conclude the study and underline its limits.

1.1 Sample selection and methodology

A questionnaire was sent to two types of firms. Those that have operated in an IJV, and those not. The questionnaire was declined in three parts related to the characteristics of the firms before the alliance, the evolution after the alliance as well as

the strategy planned for the future. Many considerations are retained when selecting the sample. First, when choosing the type of alliances, we didn't consider the firms that have participated in any out sourcing activity. Our choice was explained by the biases that could be induced in the answers. The most of the asked persons didn't evoke an evolution in their activities related to outsourcing, when we made a sample test. They just mentioned the renewal of machines to satisfy the requirement of the order. This criterion had a consequence on reducing the size of the initial sample. More over, and due to the problems of confidentiality of some information for the most of the firms, we couldn't have the exact amount of the turnover for many cases and consequently the proportion of the R&D expenses. Finally, many questionnaires were returned blank or incomplete, so 87 responses were finally considered useful. We note that despite the small size of the sample the results are not affected, since the statistical criterion of meaning of the size is respected. Furthermore, a test of homogeneity related to the distribution of sample according to the control variables is operated on the qualitative variables (sector, main activity and type of export) and verified by the Chi-square test. And a test of comparison of the averages and the variances is applied to nominal variables formed by the combination of the parameters: Turnover, Size and Age. The analysis of distribution of both sub samples as well as the study of the variance shows similar averages. The only exception concerns the Size, among which the average and the standard deviation are not similar in both sub samples. To avoid the way that could influence the results afterward, a test of Student is operated. The results show that both sub samples present the same characteristics towards the considered quantitative variables. The structure of the sample is thus homogeneous. In the extent of the analysis, the sample is then divided into profile's groups, with the method of the two steps clusters in order to identify the firms according to a combination of their initial characteristics and test the their effects on moderating the results of the analysis, which will be concerned in the last section.

1.2 The measurement of the alliances effects on developing the capacities

The purpose of this subsection consists on testing the type of effects inherent form alliances for the host partner. The effects of the alliances are appreciated at two levels. First, at the level of the perception of the asked managers, tested through a question related to the main implications of the IJV ,measured through a 10 items scale of Likert items in the following areas: the evolution of the activity of conception, the Evolution of the qualifications, the Acquisition of new explicit knowledge, the training of the employees, the Acquisition of new machinery and product material, the Access to new technology, the evolution of the profitability, the optimization of the delivery deadlines and finally the Cost control. The results of the descriptive statistics show three main significant correlations:

Table 20 *Results of the PCA analysis*

	axis 1	axis 2	axis 3
Evolution of the activity of conception	,891		
Evolution of the qualifications	,688		
Acquisition of new explicit technological knowledge	,683		
Training of the workforce	,612		,520
Acquisition of new machinery and product material		,957	
Access to new technology	,502	,720	
Evolution of the profitability		,683	
Optimization of the delivery			,863
Cost control			,719
Evolution of the product quality			,476

The first axis results from the correlation between the following items: the evolution of the activity of conception, the increase of the qualifications levels, the training of the employees, the access to the new technologies and the acquisition of explicit knowledge. The new constructed variable is called: the *evolution of explicit knowledge and learning*. The second axis results from the correlation between the variables: Acquisition of new machinery and product material and Accessing to new technology. The new constructed variable is: the *increase of the tangible assets*. The third axis is explained by the items: decrease of the costs and the delivery deadlines. These variables express: *the improvement of the organizational capacities* that could indicate the existence of a learning process within the firms, despite the fact that these last effects are not specifically technological but a part of the core capabilities (Dosi, 1988, Nelson R, 1991), those are exclusive to each firm, not easily transferable and they cannot be patented (Chandler A, 1992). The second level of measurement of the effects of alliances is tested through the results to the question related to the type of support made by the foreign parent. The question is a six item scale and concerns the following areas: support in terms of engineers training, technology access (material and equipment), financial support, management support, training and qualification of the workers and the support in R&D activity. The results show two main axes that are retained:

Table 21 *Contribution to the factorial axis signification*

items	**Discrimination measurement**	
	Axis 1	Axis 2
support in terms of engineers training	,232	,073
technology access (material and equipment	,003	,792
financial support	,190	,075
management support	,001	,267
training and qualification of the workers	,648	,036
support in R&D activity	,668	,038

The first axis is formed by the correlation between the support in terms of training the workers, the support in the R&D activity and with lesser importance in the training of the engineers. We specify that the support in terms of R&D activity doesn't means the joint R&D activity, because the foreign partners would not transfer or share their technological knowledge for many reasons (competition, confidence, ..) but mainly the support in challenging the recipient partners to enhance their efforts in the R&D activity. The new constructed variable is called: *the development of the technical learning*. The second constructed variable results mainly from the correlation between the support at the level of the machines and equipments in the renewal of the machines and the equipment, and it's named: *the evolution of the tangible capacities*. Thus, we obtain five new constructed variables corresponding to the main effects of the IJV. These new constructed variables are then used in the second step, to test whether the existence of the specific initial competencies allow the improvement of the performance induced by the transfer.

2. THE ROLE OF THE RELATIVE ABSORPTIVE CAPACITY ON ENHANCING DYNAMIC CAPACITIES

Most of the research dealing with the IJV has assumed that they enhance the firm's absorptive capacity. We note that the concept of ACAP has been extensively developed in theoretical and empirical studies. Cohen W and Levinthal D (1990) define this concept as "the firm's ability to recognize the value of new external information, assimilate it and apply it to commercial ends". Zahra S and George G, (2002) introduce the potential capacity as one of two parts composing the ACAP. The potential ACAP includes the dimensions of knowledge acquisition and knowledge assimilation. The second part of the ACAP concerns the realized ACAP and it is formed by the dimensions of knowledge transformation and knowledge exploitation capabilities. For the study case, we measure the potential ACAP as the success of the inter-firm technological transfer, is conditioned not only by the substantial amount of technology transferred but also the level of technological capacity of the local firms to absorb, assimilate, improve and further develop the newly acquired technology (Kumar V, Kumar U, Madanmohan T, 2004).This means that understanding and assimilating complex organizational knowledge requires the active engagement of both parties as well as certain structural and cognitive preconditions (Lane P and al, 2001). In this context, we note that there's no widely accepted a definite measure of absorptive capacity. Many empirical studies propose complementary factors for testing the PACAP. The firm's ability to exploit external knowledge is considered as a sub product of its R&D activities (Cohen, Levinthal, 1990). This means, that the ability of the firms to assimilate and to acquire knowledge is

evaluated through the firm's efforts in innovation activities, as R&D intensity (Stock et al, 2001) and the existence of a formally established R&D structure within the firm (Veugelers R, 1997). The number of patents hold by the firm are also considered as part of the ACAP measurement (Nicholls-Nixon C, 1993) as the highly educated and technically qualified staff those are more receptive to assimilating and transforming available external knowledge (Leiponen A, 1999, Vinding A, 2000). In other words, firms whose employees are highly educated and trained will have higher levels of absorptive capacity. Considering this, we propose to test the existence of a potential absorptive capacity within the sample and more specifically, to see if the IJV contributes to the development of the potential absorptive capacity. We test the evolution the R&D activity, related to the R&D expenditure and the existence of an R&D unit and the evolution of the proportion of the qualifications. We note that the indicator of the patents is not taken into account, because of its limitation to a few companies, which cannot be generalized to the entire sample.

2.1. The R&D unit

We propose in this subsection to test the IJV performance on one of the dimensions of potential absorptive capacity, measured through the existence actually of a unit for the R&D activity, which can be considered as a structure for codification and learning of knowledge. Empirically, a multivariate analysis is first operated in order to verify the existence or not of a difference within the sample (Bray HJ, Maxwell E S, 1985) according to the giving variable. The results in the Table 22 show a difference across the dependant items within the sample:

Table 22 *Multivariate tests criteria and F approximations for the hypotheses of no overall effect*

Multivariate tests	Value	F	Num DF	Pr>F
Pillai`s Trace	0,552	3,533	9,000	0,001
Wilks`s Lamda	0,482	4,267	9,000	0,000
Hotelling-Lawley Trace	1,007	4,884	9,000	0,000
Roy`s Greatest Root	0,932	14,604(b)	3,000	0,000

Then we test whether, the dependent variables are significant with the parameter "R&D unit". We made four situations related to this variable: the existence of an R&D unit before and after the IJV, an R&D unit before but not after the IJV, an R&D unit only after the IJV and finally an R&D unit neither before nor after the IJV. The aim is to see if the IJV has an effect on enhancing the R&D activity or not. If the results are significant in the case of having an R&D unit before and after the IJV, this could show that the company has created a learning structure (Lyle and Salk, 1996), which could be more efficient with the IJV. In fact, the existence of an R&D unit before and after the IJV can

express the engagement of the local firm in a learning process allowing it, the ability to absorb new knowledge and improve its potential absorptive capacity (Zahra and Georges, 2002). Moreover, the R&D activity is not the only considered as a factor of measuring the ability of the firm to assimilate the foreign knowledge, but it is as important as the internal factors that are the organizational knowledge and the formalization. If we find that the local firms haven't an R&D activity any more after the IJV, we can deduce the position and the strategy of the local firm toward the learning process. Giving this, we estimate the coefficient β (and its sign) for each variable: when the coefficient β is positive, it means that there's a correlation in the same way between the dependant variables and the variable "R&D unit", which is confirmed by the T test and its signification. The following table shows the results:

Table 23 *Parameters Estimates*

Dependent item	Parameter	Coef ß	standard error	'T'- test	Sig
Evolution of explicit knowledge and learning	Constant	-0,604	0,233	-2,587	0,013
	R&D before and after alliance	1,491	0,352	4,238	0,000
	R&D only after alliance	0,585	0,294	1,993	0,052
	R&D before but not after alliance	0,172	0,660	0,261	0,796
	No R&D unit before or after alliance	0(a)			
Evolution of tangible assets	Constant	-0,748	0,240	-3,124	0,003
	R&D before and after alliance	1,078	0,361	2,985	0,004
	R&D only after alliance	1,079	0,301	3,581	0,001
	R&D before but not after alliance	0,205	0,677	0,303	0,763
	No R&D unit before or after alliance	0(a)			
Evolution of organisational capacities	Constant	0,247	0,272	0,906	0,369
	R&D before and after alliance	-0,382	0,411	-0,931	0,357
	R&D only after alliance	-0,320	0,343	-0,935	0,355
	R&D before but not after alliance	-0,350	0,770	-0,454	0,652
	No R&D unit before or after alliance	0			

The results show the importance of the R&D unit before the IJV within the firms on enhancing the IJV effects in terms of the evolution of explicit knowledge and learning. The IJV seem to be a good channel for stimulating the development and the improvement of initial capacities. Furthermore, the evolution of the tangible assets is more appreciated when there is already an R&D unit before the IJV, which could facilitate the assimilation of new technology. These challenges were mentioned by some of the managers asked. Knowing that, the acquisition of new equipments require among others, the training of the staff that uses the technology. In order to confirm this hypothesis, we'll verify later, whether the training of the staff is directly correlated to the IJV or it is already well integrated in the strategy of firms before it. Thus, the results of the multivariate analysis show that the appreciation of the effects of the IJV and the success of the transfer are more observed when there's already of existent potential absorptive capacities, those can be valued and enriched by the IJV. We suppose that the existence of an explicit structure of technological learning as the R&D unit contribute to the evolution of the learning process, expressed through the evolution of the potential ACAP. In order to verify this hypothesis, we first test if there's a difference between the firms of the whole sample towards the variable of the R&D unit. The tests are significant and show a correlation between the IJV and the evolution of the R&D activity. The second step consists testing the contribution of the IJV in explaining this difference. Thus, a non-parametric test is applied for the dependent items in comparing the situations before and after the IJV according to the variable "R&D unit ". The McNemar test show an evolution in terms of the R&D activity thanks to the IJV, which means that the IJV contribute to the commitment of firms in a way of technological conversion. Even if the technological skills exist before the commitment, the relationship contributes to develop these capacities within an formal research unit. Nevertheless, due to the luck of information related to the patent for the whole sample, we cannot confirm the existence of a real research activity. We try to value the percentage of the R&D expenditures in order to see if there's a difference within the sample toward the IJV. We propose in the following subsection to test the second dimension of the R&D activity through the analysis of the evolution of the R&D expenditure.

2.2. Investment in R&D activity

We consider that the R&D unit is more than a simple outside of picture of the firm. It should be a real structure for assimilating new knowledge, contributing to the evolution of the learning process. The aim of this subsection is to test whether the IJV enhance the R&D activity for the local partner. Empirically, we try to verify whether local firms spend a consequent financial proportion to support the research activity. The managers asked informed us about the existence of a little activity of R&D that consists on adapting some products or services to the local context or in other cases to propose

some new technical part of the product that could be used by the developed firm. One-way analysis of variance (ANOVA) is used for a distributed interval dependent variable in order to test the differences in the means of the dependent variable broken down by the levels of the independent variable:

Table 24 *Difference of meaning in the sample regarding to the dependent variable*

Dependant Variable %R&D/ CA	DF	Mean square	« F » test	Sig: pr>F
Corrected Model	1	113,737	4,498	,037
Constante	1	2138,853	84,582	,000
Sample	1	113,737	4,498	,037
Total	87			

adjusted Model to sig 0,04.

The second step consists on testing whether this difference is directly correlated to the IJV. The signification of the estimated parameters is appreciated through the β coef (and its sign) and the T test:

Table 25 *Parameters estimates*

Dependant parameter	β	standard error	't' test	Sign
Intercept	3,889	0,838	4,640	0,000
firms engaged in IJV	2,331	1,099	2,121	0,037
firms non engaged in IJV	0(a)			

Figure 23 shows that companies engaged in alliances spend on average 6, 25 % of their turnover in the R&D activity, against less than 4 % on average for the other companies that consolidates the hypothesis, according to which the "R&D unit" contributes to create an internal dynamic in a way of a potential absorptive capacity development.

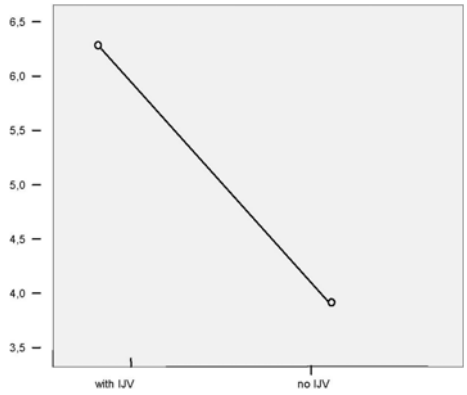

Figure 23 *Marginal mean estimates of the percentage of R&D to the turnover*

We note that we were unfortunately confronted to a problem of confidentiality of the information concerning the amount of the turnover, and consequently the amount of spent in R&D activities before the IJV. Therefore, we can only deduce that firms engaged in IJV show more interest to R&D activity than the other firms of the sample. That doesn't mean that they are engaged in innovation process allowing to radical innovative products, but they are in stage of appropriation of the foreign knowledge and learning, which was underlined by some of the asked managers.

2.3. Evolution of qualifications

Two questions related to the evolution of the professional categories were asked to the managers in the questionnaire. It concerns the distribution in percentage of the socio-professional categories within the firms before and after an IJV experience. Giving the responses, five items are formed. A test of comparison of the averages is operated, which is significant at the level of 5 %:

Table 26 *Independent Samples test*

Variables	t-test for equality of Means.					
	T	Df	Sig	Mean dif	95% wald confidence limits Lower	Upper
Engineers level	11,809	51	0,000	0,74000	0,6141	0,8659
administrative level	5,024	51	0,000	0,34000	0,2040	0,4760
Technical level	6,461	51	0,000	0,46000	0,3169	0,6031
qualified employees level	8,941	51	0,000	0,62000	0,4807	0,7593
non qualified employees level	3,500	51	0,001	0,20000	0,0852	0,3148

The results show an evolution in the human structure at all levels of qualifications. This evolution is mainly observed in the level of the engineers, which is not in opposition with the precedent results. Despite the fact that the firms are not yet engaged in the realized ACAP process, they are active in terms of learning and improvement of the technological knowledge. We see also an evolution in terms of the employees (workers) who are directly in interaction with the equipments and technological machines. These results can express an evolution in terms of complexity of equipments and machines used, and for which, the qualification must be operated for a more efficiency of the equipments use.

3. EFFECT OF CONTROL VARIABLES ON MODERATING THE RESULTS

We suppose that the effects of the IJV cannot be generalized to the entire sample. They vary according to the control variables those could moderate the results. In order to

test this hypothesis, the sample is first divided into three profiles groups with the two steps clusters method. This method allows the classification of the firms according to the combination of the initial characteristics (Kachigan SK, 1982, Everitt B et al, 2001). A test of homogeneity of the variables distributes is operated on the qualitative variables: sector, main activity and type of export and verified by the Chi-square test. In parallel, a test of comparison of the averages and the variances is applied to nominal variables formed by the parameters: Turnover, Size and Age. Many studies have acknowledged the effect of the control variables on moderating the results (Nielson, 2002, Tsang 2002, Lyles, 2003). We thus test the role of the control variables on appreciating the IJV effects. For that purpose, we first classified the sample in profile groups according to the following parameters: sector, turnover, size, age, main activity and percentage of export. Then we measure the influence of these variables on moderating the previous results. We note that giving the little size of the sample, we used a combination of control parameters and see their influence on the IJV effects. Then we operate the same analysis by considering each control variable separately. The following subsection describes the control groups before measuring the correlation between the effects of the IJV and the control profile groups.

3.1. Description of the profile groups

This step consists on making homogenous control groups by using the *Two Step Cluster Analysis method* (Kachigan SK, 1982, Everitt B et al, 2001). It's a generalization of the classic classification methods applied to the simultaneous treatment of a group of variables. We considered two categories of variables for the subsample of the firms engaged in IJV: the structural variables, formed by the age, the turnover and size (the number of employees); Then the activity variables, composed by the sector, the proportion of export (totally or partly) and the activity (conception, or commercialization). We obtain three control groups. The first profile group represents (31, 4 %) of the whole sample and composed by firms belonging to the service sector (100%), the mechanical sector (42,9%) and chemical sector (14,3%). They are medium sized firms (less than 200 employees) and with an age average of 8 years. The turnover is not relatively high. These firms are not entirely exporting and their main activity is the conception. The second group (49% of the whole sample) is composed by old companies (average of 24 years) and belonging to: the Food sector (100%), the chemical sector (85,7%), the mechanic sector (57%) and finally the electric and electronic sector (44,4%). Their activity concerns production of giving products or services and its commercialization. They are large-sized (more than 250 persons) and the turnovers are relatively high. Finally the third profile group represents 19, 6% of the whole sample with an average age of 12 years and composed by the medium-sized companies, belonging to the sector of the textile and electric those have a total export activity. The

second step consists on estimating whether the control variables have an influence on the alliances effects. For that purpose, we test first if there's a difference within the profile group according to the IJV effects. If the tests are significant, we estimate this difference according to the dependant variables. The results of the multivariate test are shown in the following table:

Table 27 *Multivariate test criteria and F approximations for the hypothesis's of no overall effect*

Effect		value	F Test	Df	Pr>F
Profile groups					
	Pillai's Trace	,299	2,754	6,000	,016
	Wilks's Lamda	,707	2,900(a)	6,000	,012
	Hotelling-Lawley Trace	,405	3,039	6,000	,009
	Roy's Greatest Root	,382	5,985	3,000	,002

a Statistic exact

The tests are significant; the null hypothesis is rejected, which means that's there's a difference of the alliances` effects among the profile's groups. Thus, we operate an estimation of the dependant variables that are the effects of the alliances:

Table 28 *Estimation of the parameters*

Dependent parameter	Param	β	Stand error	T	Sign
explicit knowledge and learning	Constant	0,632	0,229	2,766	0,008
	Group 1	-1,123	0,369	-3,048	0,004
	Group 2	-0,840	0,293	-2,870	0,006
	Group 3	0(a)	.	.	.
tangible assets					
	Constant	0,052	0,252	0,205	0,838
	Group 1	-0,387	0,406	-0,954	0,345
	Group 2	0,050	0,322	0,154	0,878
	Group 3	0(a)	.	.	.
organisational competencies	Constant	-0,367	0,246	-1,493	0,142
	Group 1	0,724	0,396	1,829	0,074
	Group 2	0,458	0,315	1,457	0,152
	Group 3	0(a)	.	.	.

The groups for those the results are significant are the first and the second group and the considered control groups are correlated only with the "evolution of explicit knowledge and learning". The results can be explained for the case of the first profile

group by the specificity of the sectors concerned (services and mechanics) those use more technological knowledge for the first one and characterised by the complexity of the equipments for the second one and also the requirement of more qualified persons. Unfortunately, giving the little size of the sample, we cannot confirm definitely this result. We thus test in the following paragraph the effect of the profile parameters considered separately on the results.

3.2. The results

In order to extend the analysis and see whether each profile parameter has an exclusive effect on improving the previous results, we made the same analysis operated on each parameter. The results were significant only for the parameter "sector". Indeed, the other parameters don't interfere to explain the performance registered by firms engaged in IJV. In parallel, the parameter "Sector" is not correlated with "the evolution of organisational competencies". The following table, summarize only the significant results for the correlation between the IJV effects and each of the sectors:

Table 29 *Estimation of the parameters*

Dependent variable	Parameter	β	standard error	T	Sign
explicit knowledge and learning	Constant	-0,594	0,384	-1,547	0,129
	Services sector	1,243	0,463	2,682	0,010
	Chemical	0,695	0,447	1,553	0,127
	Mechanic	1,225	0,503	2,436	0,019
tangible assets	Constant	-0,745	0,418	-1,781	0,082
	Services	0,912	0,504	1,810	0,077
	Electric	1,311	0,521	2,515	0,016

We note the significant results for the service sector compared to the other sectors, as found in other studies (Lyles M, 2003). This confirms that the firms belonging to the service sector have a relatively intensive activity in new technology, in which knowledge should be often up graded. The other control variables are not active to moderate or approve the IJV effects as noted in other empirical studies (Nielson B, 2002). We note that these results cannot be definitely considered due to the little size of the sample.

4. CONCLUSIONS

This analysis contributes in our sense to a better understanding of the effects of the IJV in terms of performances on local firms belonging to developing countries. In this context, the technological dimension is often reduced to the purchase of technological equipment. The contribution of this article is to contribute to more interests to the technological side by considering the evolution of tangible and non-tangible resources in a context of IJV. The development of the human skills is not only limited to the highly qualified skills, but concerns also the category of the workers that use the machines. The extent of the effects of the IJV depends on the potential absorptive capacity, allowing a more understanding, assimilating and improving the technological transfer. We note that while this study provides a number of insights, it has also several limitations. Our data is almost entirely self-reported assessments of the local IJV's managers; we didn't have the appreciation degree of the foreign partner, which could bias the results. . We also note the limit of the study according to the lack of in formations concerning the type of IJV and also the characteristics of the parents partners. The question could be also treated with a more large data base. This study can be also completed by making an extended analysis on the specificity of the service sector, or by making a comparison between firms from two recipient's countries.

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INTERDEPENDENCE AND FORECASTING OF S&P500, OIL, EURO / DOLLAR AND 10-YEAR U.S. INTEREST RATE MARKETS: AN ATTEMPT OF MODELLING THROUGH THE VOLATILITY

Ahmed KSAIER[*], Isabelle CRISTIANI-D'ORNANO[**]

Abstract: *We observe from the late 1990s an increasing phenomenon of volatility on these following markets: Oil (WTI price), Foreign Exchange (nominal Euro/Dollar), Stock Market (S&P 500 Index) and Bond market (U.S.10-Year). After seizing the concept of volatility and overcoming its first definition of risk measure, we have evaluated their interdependencies from a VAR model, we have investigated the presence of long memory phenomenon in these series and we have carried out their forecasted trajectories from FIGARCH model. This paper is presented as follows: Section 1 opens on a definition of the volatility, Section 2 examines the interdependence of the studied markets; Section 3 provides a FIGARCH model in order to capture the dynamics and predict future market volatilities changes and Section 4 concludes.*

Keywords: Volatility, Long Memory, FIGARCH, Forecasting.

JEL Codes: C22, C53, G17

INTRODUCTION

The 2008-2009 financial crisis raised by its size and its economic and social consequences many reactions, questions and concerns in public opinion about both organization and soundness of financial systems. The global financial crisis has seen the biggest drop in global economic activity in the modern era. In 2009, most major developed economies were in a deep recession. Predicting the financial crisis has not been possible by using early warnings models that some economists had developed from several stress indicators. Although these early warning systems have provided important

[*] Ahmed KSAIER, University of Nice Sophia-Antipolis, CEMAFI, 4 Rue Justin Montolivo Bat 1.A 06000 Nice, France, Ksaier.ahmed@gmail.com

[**] Isabelle CRISTIANI-D'ORNANO, University of Nice Sophia-Antipolis, CEMAFI, 8 rue Antoine Gautier, 06300 Nice, France, isadornano@yahoo.fr

and useful information in terms of detection of degree of vulnerability to crises and in terms of crisis occurrence, they were less effective under the 2008 crisis.

Given the shortcomings of early warning indicators models and existing international turmoil, it seems appropriate to understand the concept of volatility on financial markets in order to capture price movements.

Intuitively, the term volatility measures the uncertainty about the future and refers to the concept of risk. According to Galai (1991), volatility measures the standard deviation of the financial asset distribution and is not equivalent to the risk of losing money. It is rather from the deviation that the risk to be below a certain threshold can be measured. Generally speaking high volatility creates in the mind of many people the strong idea that the market functions abnormally, which requires a correction. Moreover, for those which are daily concerned with the phenomenon of volatility, volatility is the crucial indicator on which each investment decision, resource allocation and portfolio construction is built.

Do the increasing trend of volatility and the multiplication of the peaks observed result from cyclic phenomena; belong to the characteristics of the current period (stock market decline, challenging the criteria for assessing the value of assets, high debt companies)? Or do these trends are due to more structural factors, i.e. related to financial markets or management techniques implemented by investors?

The financial innovation and the increasing sophistication of the techniques and instruments at the disposal of actors are regularly suspected of being responsible for the formation of the volatility on financial markets. This suspicion aims, in particular, the assets of optional nature. So, one of the common characteristics to major financial instruments developed during last years is the fact that they integrate, explicitly or implicitly, an optional component (convertible bonds, assets offering a guarantee in capital or a guarantee of performance, contingent bond clauses)

In a general way, volatility refers to the price trend change in an unforeseen period, in response to new information or to an external shock being able to affect the evolution of the fundamental market factors. Volatility measures the degree of increase or reduction in the prices during one short period. It is not defined compared to the price level, but by its degree of variation. High levels of the prices do not mean that the prices are very volatile like the low levels of price can also reveal a strong volatility. In other words, the level of volatility is not influenced by the direction of the prices trend.

On the financial front, one distinguishes two types of volatility: historical volatility and implicit volatility. Historical volatility is founded on the past behaviour, which is to say on the last variations of the financial asset price. It gives the level of volatility reached in the past on the basis of the last trend of the underlying asset price. Implicit

volatility results from market anticipations on the future price variations or from the premium of the underlying asset.

Measurements of volatility are thus regarded as a barometer of the investors' mood. High level of volatility usually indicates a great nervousness of the market whereas a low level corresponds to a weak risk of the market, therefore a taking risk tendency. It is consequently the estimate of this component of volatility that caused various mathematical and econometric methods.

A persistent and high level of volatility is one of the statistical characteristic of the volatility.

In other words, the important variations of the assets price do not suddenly stop after the consideration of important new information, but tend to persist. This dynamics means that the perception of high volatility influences volatility anticipations by actors on markets. Observable phenomenon at the time of the financial crises, within similar markets or between various markets, the transmission of volatility is both a sign and a factor of tensions.

Research in financial market volatility has been concentrating on modelling and less on forecasting. Working on combined forecast is rare, probably because the groups of researchers working on time series models and option pricing do not seem to mix. What has not yet been done in the literature is to separate the forecasting period into 'normal' and 'exceptional' periods. It is conceivable that different forecasting methods are better suited to different trading environment and economic conditions.

Recent literature has shown empirical evidence of an increasing integration degree among stock markets, probably facilitated by rapid transmission of technology. Understanding and measuring these interdependencies is important for portfolio selection, hedging, and accurate assessment of risk in general. In particular, crisis seems to increase the frequency and magnitude of co-movements (joint high gains or joint extreme losses) among stock indexes, risky assets, and economic indicators.

Financial market volatility is known to cluster. A volatile period tends to persist for some time before the market returns to normality. The ARCH (Autoregressive Conditional Heteroscedasticity) model proposed by Engle (1982) was designed to capture volatility persistence in inflation.

Volatility is a key input in many financial applications, including optimal portfolio construction and risk management. In addition, volatility itself is also a tradable asset that has attracted numerous investors. Certainly, correctly modelling volatility has become a crucial task in finance. However, volatility *per se* is not directly observable and it is necessary to employ a reasonable proxy to empirically assess the links. Ever since Engle (1982) introduced the ARCH model to explicitly parameterize the volatility process (including an extension to the GARCH model developed by Bollerslev, 1986), there have

been many empirical investigations into the temporal link between returns and volatility that employ ARCH-type models. In particular, Engle et al. (1987) develop the ARCH-M model to include volatility directly in the return generating process, and thus allow testing the relation between returns and volatility.

Taylor (1987) study was one of the earliest ones to test the predictive power of GARCH. Although this earlier investigation of Taylor, Akigray (1989) is more commonly cited in many subsequent GARCH studies. In the following decade, there were no fewer than 20 papers that test GARCH predictive power against other time series methods and against option using volatility forecasts. The majority of these forecast volatility dealt about stock indices and exchange rates.

Volatility persistence is a feature that many time series models are designed to capture. A GARCH model features an exponential decay in the autocorrelation of conditional variances. However, it has been noted that squared and absolute returns of financial assets typically have serial correlations that are slow to decay, similar to those of an I(d) process. A shock in the volatility series seems to have very 'long memory' and impacts on future volatility over a long horizon. The integrated GARCH (IGARCH) model of Engle and Bollerslev (1986) captures this effect, but a shock in this model impacts upon future volatility over an infinite horizon and the unconditional variance does not exist for this model.

Both the historical volatility models and the ARCH models have been tested for fractional integration. Baillie, Bollerslev and Mikkelsen (1996) fitted FIGARCH to US dollar–Deutschemark exchange rates. Bollerslev and Mikkelsen (1996, 1999) used FIEGARCH to study S&P500 volatility and option pricing impact, and so did Taylor (2000). Vilasuso (2002) tested FIGARCH against GARCH and IGARCH for volatility prediction for five major currencies. Vilasuso (2002) finds that FIGARCH produces significantly better results on 1- and 10-day-ahead volatility forecasts for five major exchange rates than GARCH and IGARCH. Zumbach (2002) produces only one-day-ahead forecast and finds no difference among models performance.

In this study we emphasize the leading volatility in the problem of financial crises forecasting, which implies the necessity for modelling volatility in order to understand its dynamics and try to predict its future trajectories. This allows avoiding pressure and stress on the financial market going to lead to a crisis.

The remainder of the paper is organized as follows. Section II examines the interdependence of the studied markets; Section III provides a model FIGARCH in order to capture the dynamics and predict future market volatilities changes and Section IV concludes.

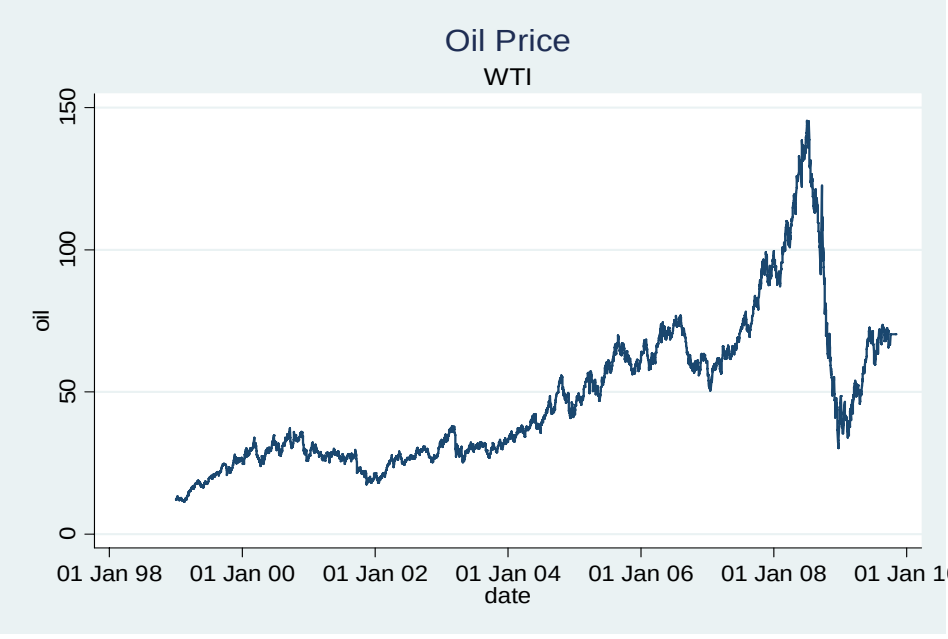
INTERDEPENDENCE

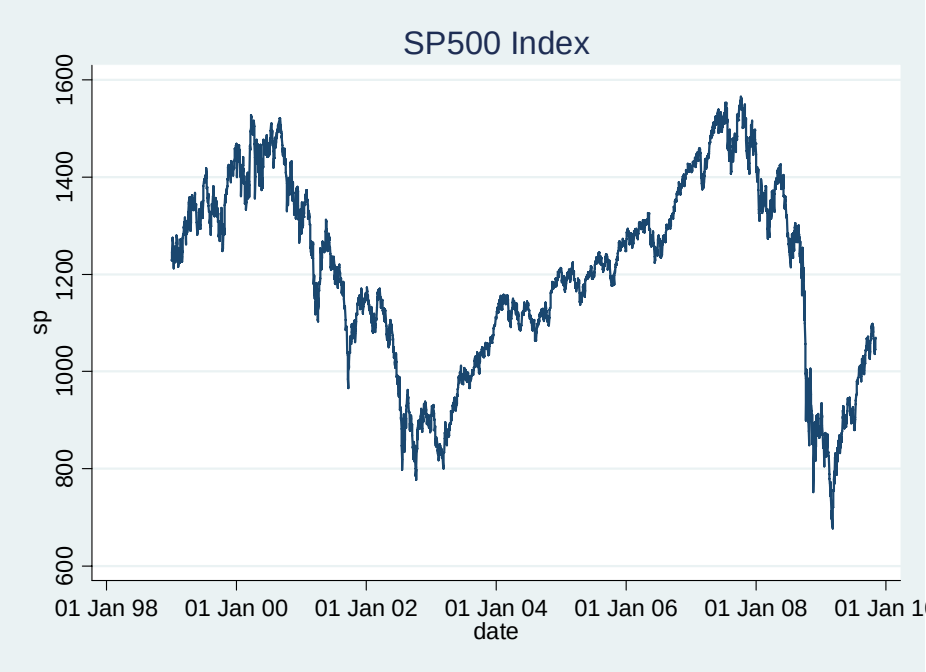
Data

These data relate to the financial market (S&P 500 Index), the oil market (price of the WTI), the bond market (10-Year Treasury constant maturity rate) and the foreign exchange (nominal Euro/Dollar) from January 1st, 1999 to November 6th, 2009. For these last data, our daily data resulting from Federal Reserve.

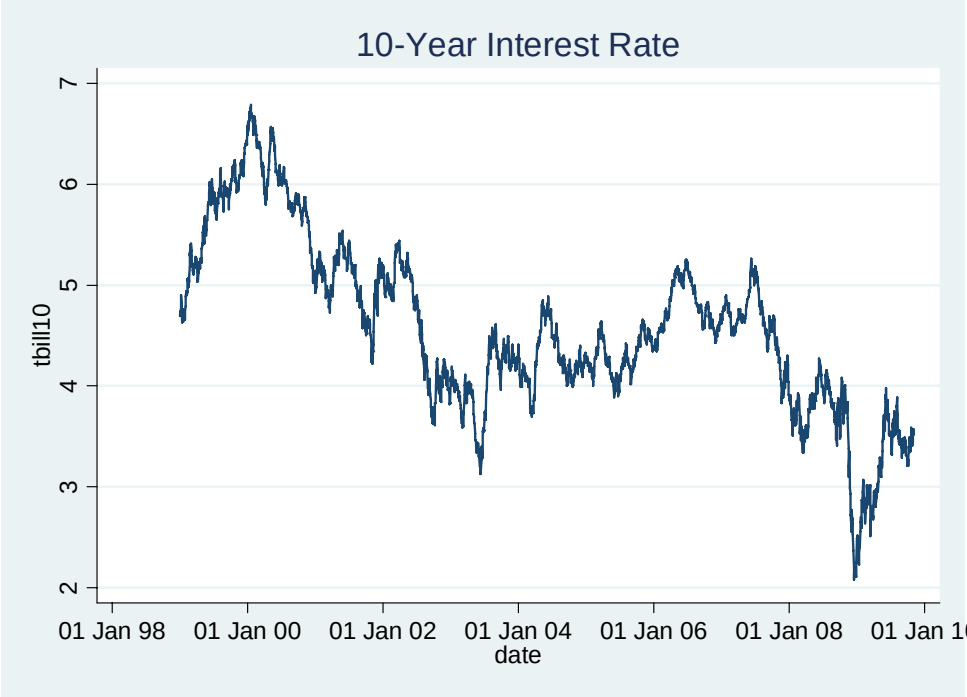
The oil price rise has been fed by the strong world economic growth (in particular Chinese one) during the years 2004- 2007, the strongest growth for four decades. Its evolution is however closely related to the dollar and a negative correlation is observed between these two variables (Bénassy-Quéré, Mignon and Penot 2005). The investors taking note of this correlation reinforced it by their actions on the market by using oil as cover against the fall of the dollar. Strong monetary creation also fed the rise in the crude oil prices, and then the latter very strongly fell since August 2008, thus accompanying the sharp appreciation of the dollar.

- **Historical observations on the four markets:**

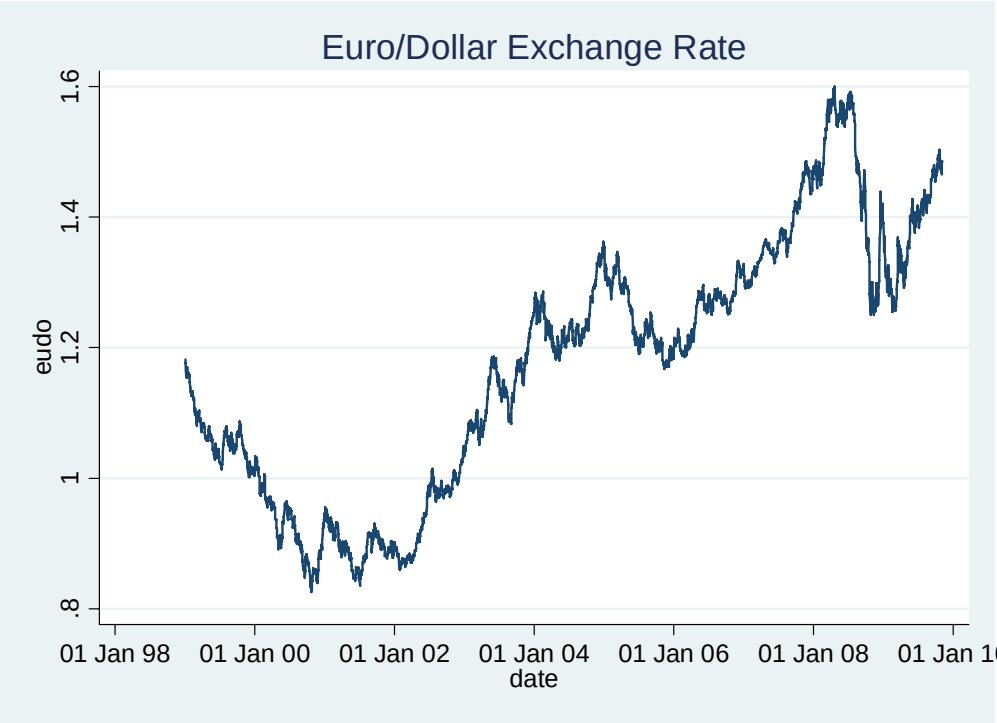




The SP500 Index became very volatile since the birth of the Internet bubble until it's bursting on August 2000, which caused a fall of the prices of the stock market until the beginning of the year 2003. These prices regained and even exceeded the same peaks in 2007 before starting a new decline in July 2007 caused by the crisis of the subprimes in the United States. These banking and financial crises were transmitted to the real sphere in the second half year of 2008, which saw the slump of many great banking institutions and the fear of the systemic risk occurrence . In view of these risk and increased fall of the stock market, the Central banks - which had already largely intervened- have adopted unconventional monetarist policy like quantitative easing. The ECB, on its own, supports States, which do not belong to its area. These insurances offered by the Central banks as well as the abundant liquidity allowed the increase of stock market starting from the beginning of March 2009.



The evolution of the yield of the 10-Year Treasury bill is both naturally function of the Fed Fund rate and inflationary expectation of agents. After reaching nearly 7% at the beginning of the year 2000, following the inflationary pressures in the United States, this interest rate started to decrease following expectations of economic deceleration. This latter was caused by the inversion of yield curve, which announced the slump of 2001. The recession involved the decline of this interest rate and conversely its rise accompanying the strong increase of inflation since 2004. Strong global monetary creation limited interest rate rise. However, during this same period, the Federal Reserve applied its restrictive monetary policy, and then induced a new inversion of the yield curve, announcing by this way the recession of 2008. It's very strong width, the deflationary risk at the end of 2008 and especially quantitative easing led the 10-Year interest rate at its historical low levels.



The Euro launched in 1999 whereas the dollar knew one period of strong appreciation since the mid-90's. This appreciation was mainly explained by a favourable differential of productivity in the United States. Nevertheless, the acceleration of the American current account deficit growth beyond the threshold of 3% of the GDP led the American authorities to take measures to obtain from markets a depreciation, which became effective from March 2002. This depreciation is fed until 2007 by the strong increasing U.S. current account deficit, punctuated by some phases of appreciation, in particular during 2005, at the time of an increasing differential of interest rate in favour of the United States. The strong appreciation of the dollar during the second half of 2008 is consecutive with the increasing concern of the crisis contagion to the worldwide economy, which involved a phenomenon of flight to safety in favour of the American dollar. On December 2009, we observed both Dubai default fear and the downgrading of the Greek debt.

Statistical characteristics

- **Descriptive statistics**

All data (oil, S&P 500, 10-Year U.S. interest rate and the Euro/Dollar) are converted into nominal daily series of return (in %):

$$r_t = 100\ln(Sti_t / Sti_{t-1}) \text{ for } t = 1, 2, \ldots, T,$$

in which

r_t is the return at the time *t*,
S_t the current price in t and
Sti_{t-1} is the previous price.

The daily volatility (variance) is measured by the daily squared return r_t^2.

Table 30 *Descriptive statistics*

Series	S&P 500	OIL WTI	EURO DOLLAR	10-Y US Interest Rate
Mean	1201.312	47.80692	1.172816	4.581535
Skewness	-.310026	1.199994	.0318605	.1513097
Kurtosis	2.234317	4.261557	2.032923	2.999809

It arises from the analysis that except the volatility of the oil price, other volatilities are "normally" distributed.

- **Test of stationarity**

All the return series are subjected to the two unit tests, ADF (Augmented Dickey Fuller) and Philips-Perron one in order to determine if the stationarity, the integration and the fractional parameter of integration can be considered in these daily data .

Within the framework of these ADF and PP tests, the null assumption (HO) stipulates that the time series contains a unit root, that is to say I (1). The empirical results presented in the Table 31 show in all cases the existence of high negative values, which translates a rejection of the null assumption for a level of significance of 5%. These series are thus significantly stationary.

Table 31 *Stationarity Tests*

	ADF		PP	
	Intercept	Intercept and trend	Intercept	Intercept and trend
S&P 500	-25.066 (-2.86)	-25.054 (-3.41)	-47.138 (-2.86)	-47.121 (-3.41)
Oil Price	-24.852 (-2.86)	-24.839 (-3.41)	-42.10 (-2.86)	-42.08 (-3.41)
Euro/Dollar	-22.561 (-2.86)	-22.571 (-3.41)	-41.091 (-2.86)	-41.118 (-3.41)
10-Year US Interest Rate	-27.24 (-2.86)	-27.21 (-3.41)	-41.857 (-2.86)	-41.831 (-3.41)

- **ARCH Test**

ARCH (Autoregression Conditional Heteroscedasticity) models make it possible to modelize chronicles (financial among others), which have the characteristic to have an instantaneous volatility (variance) belongs to the past. From where the possibility of carrying out a modelling of the chronicle in term of mean and variance; this test rests either on a test of Fisher or on a test of Lagrangian multiplier (LM).

- **Test of Lagrange Multiplier in order to determine ARCH effects**

ARCH Model has the form of an autoregression one. Engle (1982) proposes the test of the Multiplier of Lagrange (LM) in order to test the existence or not of an ARCH behaviour within the regression. The statistical test is given by TR^2, where R^2 is the coefficient of determination and T is the sample size. The null assumption (HO) stipulates that there are no ARCH effects and its distribution asymptotically follows a Chi-square distribution with p degrees of freedom.

If LM > $\chi 2$ (p) with p degrees of freedom to a threshold $\alpha = 0.05$, then HO is rejected, from where the justification of an ARCH (p) model.

Table 32 *Lagrange Multiplier Test*

	RSP	ROIL	REUDO	R10Y-T
LM	32.246	2.036	2.277	6.748
Significance level	**0.00000629**	**0.00054779**	**0.04832632**	**0.00019326**

The results post a level of significativity Q = 0.0000, from where the indication of the existence of ARCH effects in all series.

- **Detection of the long memory by the exponent of Hurst**

Fractal geometry helps us to see the economic world from a different point of view. This mathematical approach considers that a shape is composed of a basic pattern which is multiplied at infinite scale. The fractal dimension is directly related to the Hurst exponent: a small Hurst exponent has a higher fractal dimension (a rougher surface) whereas a larger Hurst exponent has a smaller fractional dimension (a smoother surface). These Brownian walks can be generated from a defined Hurst exponent. Our interest in the Hurst exponent is motivated by its power for estimating forecasting in financial time series.

In its "Rescaled Range Analysis" (R / S Analysis) Hurst discusses the analysis of extended standard range where R series are centered and integrated: $R = (\max X(t, \tau) - \min X(t, \tau))$ with $1 \leq t \leq \tau$. R is divided by its standard deviation S (t, τ). Hurst shows that this normalized range R / S is relative to the interval considered by the relationship: $R / S = (a\tau)^H$ where a is a constant, τ expresses some multi-year period and H the Hurst exponent ranging from 0 to 1. So, $0< H <1$. Hurst exponent can justify the existence of

long memory within the time series. In the event of presence of long memory, these series are fractionally integrated. The presence of long memory is attested if $0.5 < H < 1$ i.e. the random walk will be a long memory process.

When $H = 0.5$, i.e: $a\tau = (R / S)^2$, we are in the presence of white noise, a random walk.

When $H > 0.5$, we are witnessing the phenomenon of persistence: the "noise" is not random, and each observation is its memory footprint. This is a fractional Brownian motion. More H approaches 1, more the strength of memory acts. The correlation of long-term reflects the fact that the variation of the series tends to follow the same trend. This means in our study that if a price increases, the probability that it is still growing is strong.

When $H < 0.5$, we are witnessing a phenomenon of anti-persistence. Here, the correlation between long-term observations is negative, reflecting an alternation of positive and negative variations (mean reversion).

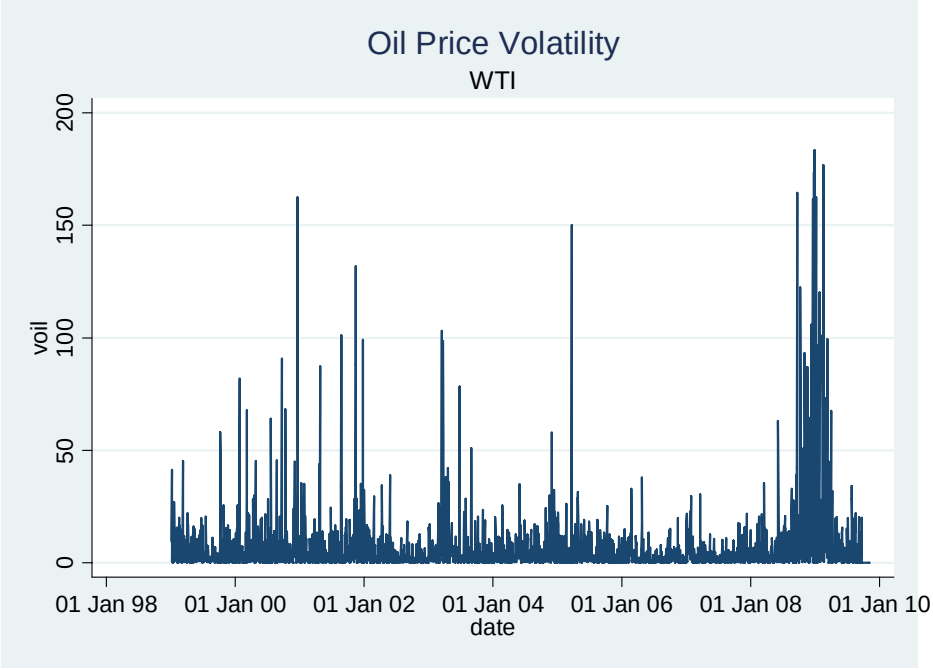
According to our results, Table 33 presents the test of Hurst for the volatility of each market. It appears a phenomenon of high persistence, which translates the existence of an effect of long memory on each market.

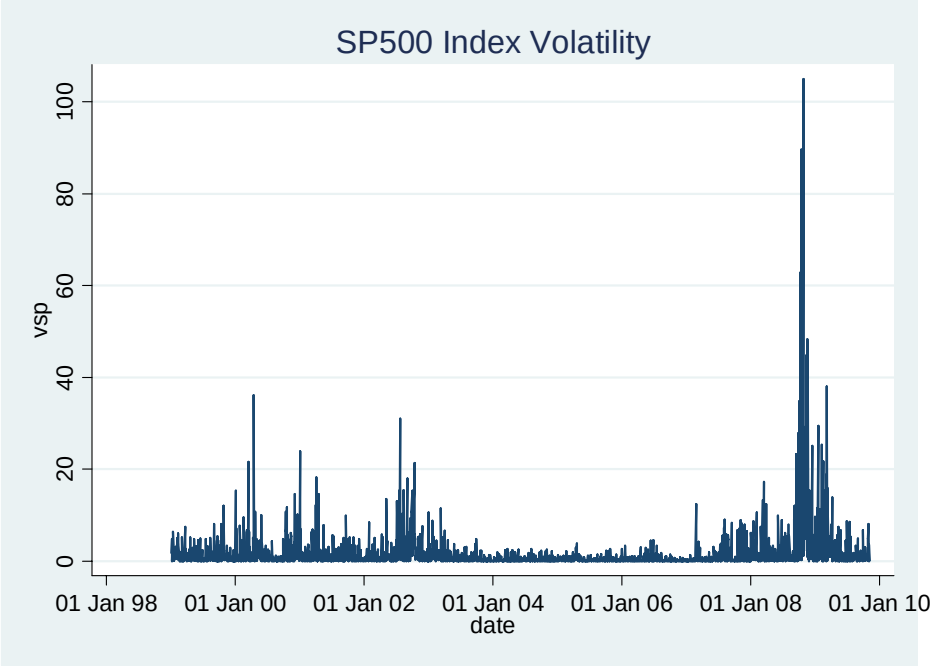
Table 33 *Hurst Test*

	S&P 500 Index	Oil price WTI	Euro/Dollar Exchange Rate	10-Y Interest Rate
Return	**0.60**	**0.53**	**0.65**	**0.57**
Volatility	**0.89**	**0.72**	**0.75**	**0.92**

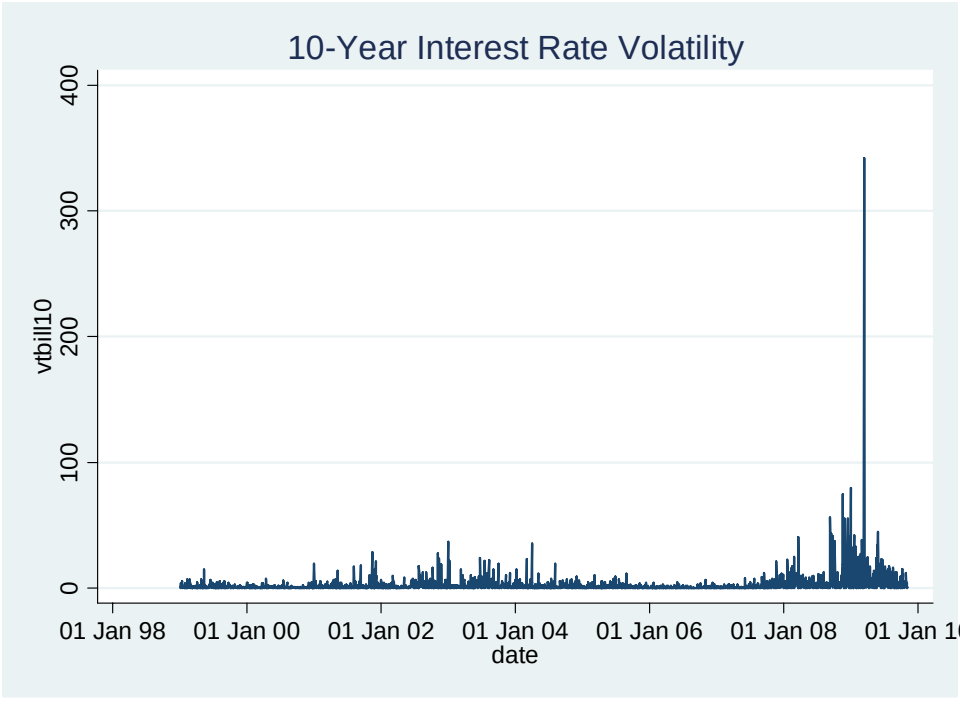
- **Volatility on the four markets**

The volatility of the oil price is, on the end of the studied period, very related to the evolution of the dollar which knew a peak of appreciation at the beginning of August 2008 until the end of October 2008. The reason is due to a flight to safety related to the worry concerning the contagion of the American financial crisis, then economic one, on the worldwide economy. The behaviour of the market operators using oil as cover on the dollar reinforced the opposite correlation between these two variables.

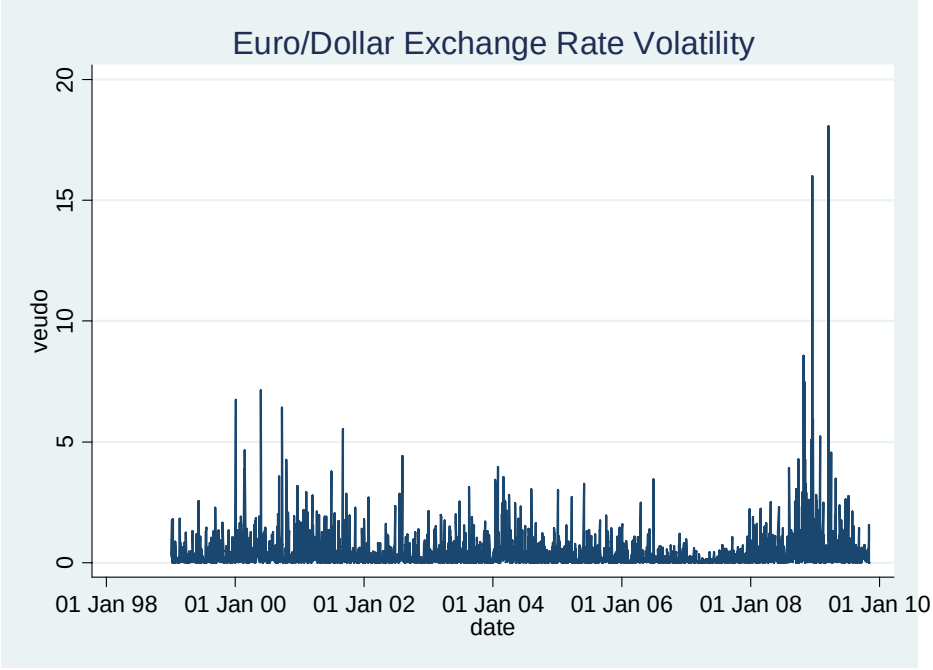

Oil Price Volatility
WTI
voil
0
50
100
150
200
01 Jan 98
01 Jan 00
01 Jan 02
01 Jan 04
01 Jan 06
01 Jan 08
01 Jan 10
date


SP500 Index Volatility
vsp
0
20
40
60
80
100
01 Jan 98
01 Jan 00
01 Jan 02
01 Jan 04
01 Jan 06
01 Jan 08
01 Jan 10
date

On the end of the studied period, the S&P 500 volatility increased at the beginning of the crisis of the subprimes in July 2007 and knew its peaks at the time of the stock market immediately crashed which the followed fall of Lehman Brothers (September 2008). It slowed down after the warning of the G7 on October 2008 to guarantee in particular the interbank loans but is remained high until the central banks - and in particular the ECB - do not possibly provide support to the emergent countries in Europe in the event of a failure. Then, principal fear was the occurrence of a defect into an emerging economy.



The 10-Year US Interest Rate volatility became extremely strong at the time of the Lehman Brothers bankruptcy in September 2008 with a decrease of the return due to a strong concern on the economic situation and due to the fear of deflationary risk in this end of 2008. The bond market sharply moved on December 16th, 2008 when the Fed announced its intention to apply a quantitative easing policy. The peak of volatility was reached on March 18th, 2009 when the Federal Reserve announced that it decided, rather than to anticipate by the markets, to buy for $300 billion of longer-term Treasury securities over the next six months to improve conditions on private credit markets.



The Euro/Dollar volatility, over the last period, is much related to that of Treasury Bond. Indeed, the principal peaks occurred on December 16th 2008 when the Fed announced that it was going to follow an unconventional monetary policy of quantitative easing and on March 18th 2009 when the Fed surprised the markets by the timing and the width of this quantitative policy.

VAR Estimate

We use the VAR approach in order to evaluate interdependencies and impacts between these four markets. The results of estimations are reported in this following table.

Table 34 *Results*

		Oil price WTI	S&P 500 Index	10-Y US Interest Rate	Euro/Dollar Exchange Rate
Oil price WTI	Lag 1	0.099*	0.012*	0.026*	**-0.000**
	Lag 2	0.051*	-0.006	0.019*	**0.001**
S&P 500 Index	Lag 1	0.213*	0.087*	0.027	**0.011***
	Lag 2	0.171*	0.315*	0.089*	**-0.000**
10-Y US Interest Rate	Lag 1	0.231*	0.126*	0.083*	**0.010***
	Lag 2	0.109*	0.000	0.061*	**0.036***
Euro/Dollar Exchange Rate	**Lag 1**	**0.791***	**0.203***	**0.229**	**-0.051***
	Lag 2	**2.230***	**0.293***	**0.114**	**0.094***

It appears from the VAR study that:

- The volatility of the oil price (WTI) is influenced by itself and by those of the other markets (S&P 500), interest rate (10-Years) and exchange rate (Euro/Dollar).
- The volatility of financial market (S&P 500) is nourished by all other volatilities except by those related to oil market and those of the 10-Year US interest rate on the second lag.
- The volatility of the 10-Year US interest rate is fed by itself, by that of the oil price and by that of the financial market on the second lag. Conversely, the volatility of the Euro/Dollar price does not have any influence on it.
- The volatility of the Euro/Dollar price is caused by itself, by 10-Year interest rate and on the first lag by the financial market. For as much, the volatility of this last does not act on the second lag and the volatility of the oil price never acts.

- **Study of causality**

According to the Granger causality tests, we obtained the following results:

- The volatility of the oil market WTI is caused overall by the three markets which are financial market (S&P 500), interest rate market (the 10-Year US) and the foreign exchange (Euro/Dollar).
- The volatility of the financial market is influenced by the three other markets but is not directly by the oil market. It appears that it there are not any causal relations between volatilities of the financial and oil markets.
- The volatility of the 10-Year interest rate is influenced by those of the three other markets but unilaterally is not by the volatility of the Euro/Dollar. In addition this volatility influences the three other volatilities.
- As for the volatility of Euro/Dollar, it seems that causal connections are overall established and in particular starting from the interest rate market but there is no unilateral source starting from the oil and financial markets.

It arises from our results that the oil, financial, interest rate and the exchange rate markets are all interdependent.

MODELLING

Empirical modelling

By considering the existence of the phenomenon of long memory, it is then necessary to measure the relevance of the FIGARCH model in order to modelize the volatility of the following series: S&P 500, WTI, 10-Y US. Interest Rate and Euro/Dollar.

- **FIGARCH Modelling**

FIGARCH (Fractionally Integrated Generalized Autoregression Conditional Heteroscedasticity) Model will enable us to modelize the volatility observed on the whole selected data because it has the property to post periods of high (low) volatilities which tend to be followed by similar sequences. In fact, FIGARCH model enables us to take into account the characteristics of the long memory.

Baillie and al. (1996) showed that FIGARCH (p, d, q) model posts an hyperbolic decrease in the process of volatility:

$$\Phi(L)(1-L)^{d}\varepsilon_t^2 = \omega + [1-\beta(L)]v_t$$

Where $\omega > 0$, $0 < d < 1$, $\Phi(L) = [1-\alpha(L)-\beta(L)](1-L)^{-d}$ and all roots of $\Phi(L)$ and $[1-\beta(L)]$ are located outside the unit circle. Alternatively, the expression of the conditional variance can be specified in the following way:

$$h_t = \omega(1-\beta(L))^{-1} + \left[1-[1-\beta(L)]^{-1}\Phi(L)(1-L)^{d}\right]\varepsilon_t^2$$
$$= w + a(L)\varepsilon_t^2$$

With $w = \omega(1-\beta(L))^{-1}$ et

$$a(L) = \sum_{i=1}^{\infty} a_i L^i = 1 - [1-\beta(L)]^{-1}\Phi(L)(1-L)^{d}$$

where d is the fractional parameter of differentiation. *(0≤d≤1)*

After tests that we do not post here, it appeared that FIGARCH model offers a greater flexibility to model the conditional variance than models GARCH (when d= 0) and IGARCH (when d=1) because the persistence of the shocks in the conditional variance or the degree of long memory is measured by the fractional parameter of differentiation d.

In this case: *0<d<1,* so FIGARCH offers a sufficient elasticity to take into account the intermediate degree of persistence to shocks.

Results

The estimated parameters by FIGARCH model are summarized in the below table:

Table 35 *Results*

FIGARCH				
	WTI	SP500	Euro/Dollar	10-Year US. Inerest Rate
ω	0.09 (0.002)	0.0055 (0.000)	0.0014 (0.000)	0.0063 (0.000)

	WTI	SP500	Euro/Dollar	10-Year US. Inerest Rate
β	0.443 (0.000)	0.332 (0.000)	0.371 (0.000)	0.457 (0.000)
ψ	0.291 (0.000)	0.266 (0.000)	0.124 (0.000)	0.240 (0.000)
d	0.237 (0.005)	0.273 (0.001)	0.187 (0.002)	0.161 (0.002)
D	7.28 (0.000)	7.68 (0.000)	9.39 (0.000)	7.38 (0.000)
LB(20)	15.85 (0.066)	18.60 (0.048)	20.29 (0.037)	23.36 (0.022)
LB²(20)	28.01 (0.18)	15.95 (0.653)	25.22 (0.153)	25.81 (0.135)
ARCH(4)	3.09 (0.014)	1.21 (0.03)	1.80 (0.012)	0.41 (0.07)
JB	694.49 (0.000)	469.94 (0.000)	107.57 (0.000)	277.26 (0.000)

The autoregressive parameter of the conditional variance, β, is significant for all daily series, which lets think that FIGARCH modelling seems to be the most suitable one to describe the volatility of the daily return of our four assets.

The fractional parameter of integration d is significant, which translates the fact that volatilities of the daily series are of long memory. FIGARCH modelling succeeded in taking into account the temporal dependence in the conditional variance because the statistics of Ljung Box of the squared residuals are nonsignificant.

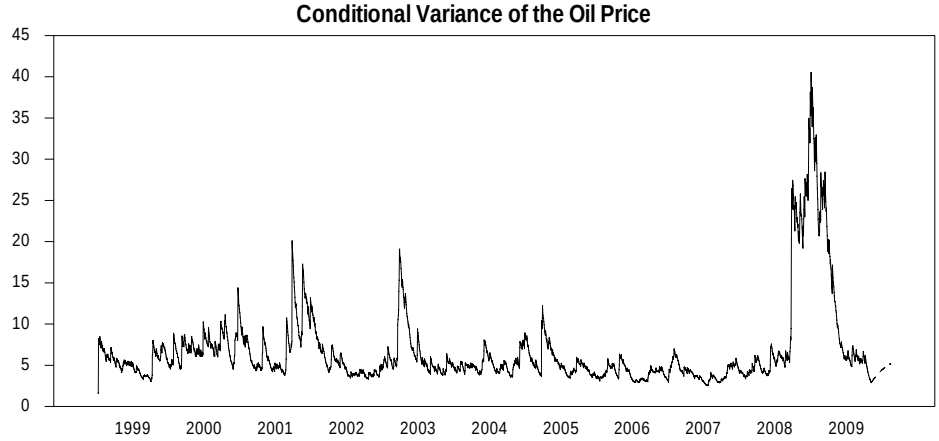
All the parameters d, ω, α and β, are statistically significant with the threshold of 5%.

All parameters d in FIGARCH range between 0 and 0.5, which translates a persistence of volatility.

The choice of the distribution of Student is confirmed by the high value of D, since this degree of freedom is significant for all the studied series.

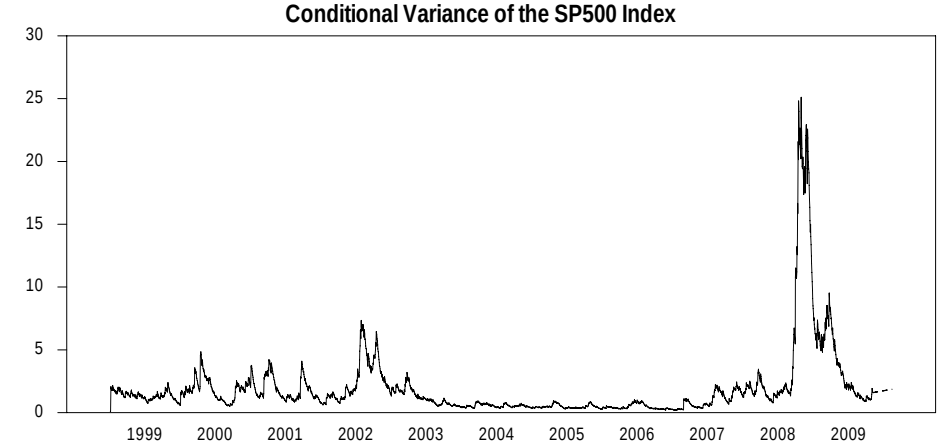
One of the stylized facts that marked the volatility of several financial series is the presence of a component of long memory in the conditional variance. This property, if it is correctly modelled, should make it possible to improve the forecast of future volatility.

In this case, it is now advisable to anticipate the trajectories in terms of volatility of the studied series by using FIGARCH modelling and this, at a 20 days horizon taking into account the dimension of short term of these markets.



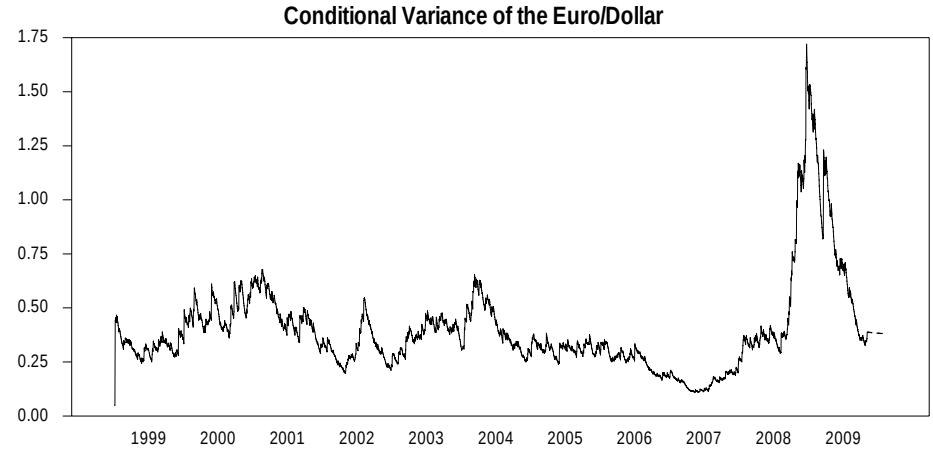
It arises from the chart that since the mid-2008 peak, volatility (measured in terms of conditional variance) recorded successive falls (that appeared by a fall of the oil price from 147 dollars per barrel in July to 30 dollars at the end of December 2008).

Our forecasting represented in dotted line underlines an upturn of volatility, but at a less pace than in the past, and which appeared simultaneously in parallel with an increase of the prices (the price of oil displayed on November 6th, 2009 : 77.4 dollars/barrel, on December 16th : 80.2 dollars/barrel and on December 1st : 78.4 dollars/barrel).

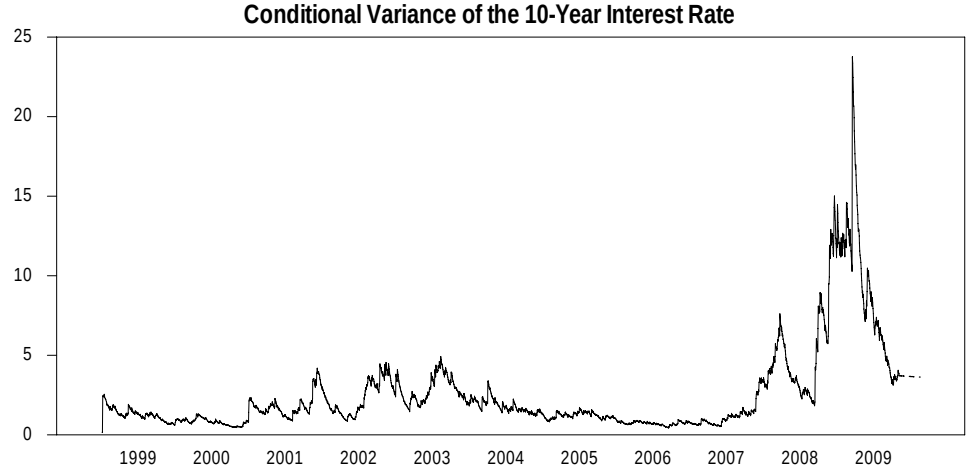


The conditional variance of the S&P 500 Index informs us of a stabilization of the volatility over the period November 6th - December 1st, 2009 (either 20 days, except weekend).

Our anticipation is *a posteriori* validated on our horizon of forecast because a stabilization around 1100 points is really observed on this market at this period.



Our forecast announced stabilization around 1.48 dollars per euro over the period November 6th - December 1st, 2009. This foresee ability is also confirmed because the parity was contained in a range going from 1.48 to 1.50.



This conditional variance also indicated a stabilization of the volatility of the 10-Year U.S. interest rate around 3.40% on our forecast horizon. This prediction was also

carried out in the facts because this rate posted respectively: 3.54% on November 6th and 3.30% on December 1st , 2009.

CONCLUSIONS

The aim of this paper was to show which can be the interdependences, the causal links and the forecasting in terms of volatility on the following markets: Oil (WTI price), Foreign Exchange (nominal Euro/Dollar), Stock Market (S&P 500 Index) and Bond market (U.S.10-Year).

According to the results of VAR modelling, it arises that the four studied markets are interdependent in terms of volatility. From where a simultaneous study which requires to analyze the dynamics of the variations of these four markets, so to understand their volatilities.

The modelling of many statistical properties (normality, leptokurtic distribution, presence of phenomenon of heteroscedasticity, dependence of long run within volatility) of these series requires the use of a suitable model which can consider these characteristics in order to seize their dynamics as well as to minimize the risks of forecast errors. In fact, by considering these properties, the use of the FIGARCH model seems to be the most relevant one in terms of forecasting. So, by applying this FIGARCH model we carried out 20 days horizon forecasts. It appears that our four anticipated conditional variances were validated *a posteriori* over the period from November 6th to December 1st, 2009.

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THE EFFECTS OF EXCHANGE RATE VOLATILITY ON SWAZILAND'S EXPORTS

M.D MTEMBU*, G.R. MOTLALENG**

Abstract: *This investigation assesses the effects of exchange rate volatility on Swaziland's total exports. The paper employs exports quarterly time series data ranging from 1995Q1 to 2005Q4. A Vector Error Correction Model (VECM) approach is used to study the relationship between exports and their determinants. The findings of the study suggest that exchange rate volatility is detrimental to Swaziland's exports.*

Keywords*:* exchange rate volatility, Swaziland's exports, Vector Error Correction Model

JEL*:* E37, F47

I. INTRODUCTION

The objective of this paper is to investigate whether exchange rate volatility of the Lilangeni, positively or negatively affects exports in Swaziland. The research uses a Vector Error Correction Model (VECM) to analyse the effects of exchange rate volatility on Swaziland's total exports. Quarterly time series data ranging from 1995Q1 to 2005Q4 is used. This study adds to the evaluation tools of assessing Swaziland's membership in the Common Monetary Area (CMA). It is done by looking at whether the impotence of exchange rate policy negatively or positively affects Swaziland's total exports. Even though a major portion of the country's exports are destined for South Africa, Swaziland's goods are becoming less competitive because of the inflation differentials between the two countries.

One of Swaziland's policies for economic growth is the promotion of export goods for international markets. Therefore, this paper evaluates whether such an

* M.D MTEMBU, Department of Economics, University of Swaziland. differmthembu@yahoo.com
** G.R. MOTLALENG, Department of Economics, University of Botswana. P/Bag 0022, Gaborone, Botswana. motlaleg@mopipi.ub.bw

endeavour can be successful or not. This is because Swaziland has no independence over her exchange rate policy, which is a key ingredient for an export led growth. Arize (1997) states that knowledge of the degree to which exchange rate volatility affects trade is important for the design of both exchange rate and trade policies. Furthermore, there has been limited research which incorporates econometric modelling which has been done on the impacts of the volatile exchange rates on Swaziland's exports. So, this investigation contributes by using a VECM approach in modelling the effects of the volatility of the exchange rates on Swaziland's total exports. The ambiguity of the literature on the effects of exchange rate volatility on export volumes also prompted the researchers to undertake this study.

The paper proceeds as follows. Section II reviews the economic and export structure of Swaziland. Previous studies are outlined in section III. Section IV presents the method of analysis. Empirical findings are discussed in section V, while the last section concludes the study.

II. ECONOMIC OVERVIEW AND EXPORT STRUCTURE IN SWAZILAND

Being a landlocked country Swaziland has a limited domestic market. Swaziland relies heavily on export based on agricultural commodities and industries. As a result, growth and development are influenced by climatic conditions, global trends and commodity prices. In recent years, the pace of economic growth has slowed down considerably. Real GDP began its downward slide in the mid 1990's. This was due to the increased competition following the improvement in political and business environments in neighbouring Mozambique and Republic of South Africa.

Swaziland's economy is export oriented. Exports amount to an average of 70% of GDP. The major exports are sugar, sugar based products, wood pulp and timber products, meat and meat products, soft drink concentrates, citrus and zippers. The main destinations for Swaziland's exports are: Republic of South Africa (RSA), the European Union (EU) and the United States of America (USA) ((CBS Annual Report, 2007/08)).

For many years the EU has been buying about 30 % of Swaziland's sugar exports at a preferential price of about three to four times the world market price. Recently there has been a major development whereby the EU is reforming its internal sugar market resulting in a drop in the price that the EU pays for Swaziland's sugar by 36 % by 2009/10. Additionally, there are less guarantees on the preferential market access. Such a move poses a threat to Swaziland's sugar industry as revenues will drop drastically. The Swaziland Sugar Association Journal (June 2007) reports that by the time the EU sugar price has been cut by the 36 %, exchange rates will play a major role in determining the viability of the sugar industry in Swaziland. Therefore, the most important policy

variables in the paper are the Lilangeni exchange rate volatility, foreign income and multilateral real exchange rate.

Key export industries in Swaziland are, the sugar, wood pulp, soft drinks concentrates and canned citrus fruits industries, and are outlined below.

2.1 Sugar Industry

The sugar industry in Swaziland accounts for around 9% of total export earnings, 59% of agricultural output, 35 % of agricultural wage employment and 18% to the country's total output (SSA[43] Annual Report 2007). The sugar industry's pivotal role in the development of the country over the years has gained it the status of being called "*the real Swazi gold"*. There are three mills that produce sugar in Swaziland which are Simunye, Mhlume and Illovo in Big Bend. Total production of these mills in 2007 was about 650 000 tonnes of raw and white sugar. All sugar produced in Swaziland is solely marketed and distributed by the Swaziland Sugar Association (SSA). The industry's market of sugar can be categorised as follows, Southern African Customs Union (SACU), the EU, and the USA. The EU market accounts for about 30 percent of total sugar exports but the sales revenue received from the EU account for about 50 percent of total revenue received (http://www.ssa.co.sz).

Even though the price of sugar has been guaranteed in the EU market, exchange rates have been playing a major role in determining the revenue received. For example, in 2002 the value of the EURO against the Lilangeni had fallen by 37% and so this meant that, in Emalangeni terms, for every tonne of sugar sold in the EU market, Swaziland received 37% less than was the case in the previous year. The manufacturing of sugar in Swaziland receives its primary input from some newly established small holder farmers in addition to the mill's own plantations. Therefore, the decline in the revenue received in exports meant that the mills paid less for sucrose to these farmers. This situation led to a lot of these newly established small holder farmers going bankrupt at the end of 2002.

2.2 Wood Pulp

The Wood pulp industry is one of the key export sectors in Swaziland. The largest pine grower in the country is the Usutu Forest. It cultivates 66,000 hectares of pine trees and is considered to be one of the biggest man made forests in the world. These trees are used to produce Unbleached Kraft Pulp when they are just 16 years as compared to the 40 years in the Northern Hemisphere. This is a source of considerable comparative advantage for Swaziland in the production of unbleached pulp.

The Sappi-Usutu Mill situated in Bhunya, processes softwood pulp and supplies approximately 5% of the world market for unbleached Kraft pulp. Total production has

[43] SSA – Swaziland Sugar Association

been fluctuating over the years, recording 180,590 Mt, 172,495 Mt, 160,654 Mt and 170,400 Mt from 2004 to 2007 respectively. The market for the pulp is predominantly RSA, the Far East, European Union (EU) and the United States of America (USA). The depreciation of the Lilangeni against major currencies played a major positive role on export earnings expressed in Emalangeni terms. Exports earnings increased by 61.5% in 2007 (CBS 2007).

2.3 Canned Citrus Fruit

Canned citrus fruits are produced by Swaziland Fruit Canners (Swazican) situated in the Malkerns valley of Swaziland. Swazican is one of the leading producers of canned pineapple, canned oranges and grapefruit, juice concentrate, fruit cup and jars. Production is dominated by canned fruit which accounts for more than 70% of total production. Pineapple grown by the company is supplemented by pineapple grown by contracted growers and local farmers. The major markets for cannery products are RSA, EU, USA, Australia and UK. The UK is one of the largest buyers with Swazican supplying over 25% of that country's canned grapefruit market. Production has been falling over the years due to the limited availability of land for fresh fruit cultivation. However, though production slightly fell, export earnings increased by 10% in 2007 due to a surge in citrus prices and also a highly favourable exchange rate.

2.4 Soft Drink Concentrates

Soft drinks concentrates are produced in Swaziland by Conco Limited Company. It is a subsidiary of the world renowned Coca Cola group. The soft drinks concentrate is supplied to several African countries, with RSA taking the lion's share. The company is strategically placed in Swaziland by the Coca Cola Company because of the plentiful availability of sugar being the major ingredient.

III. REVIEW OF PREVIOUS STUDIES

Literature on the impacts of exchange rate volatility on a country's exports has evolved over time. Early thinking was that volatility of exchange rates is the source of exchange rates risk. Therefore, in the absence of any mechanism to reduce this risk, volatility has a negative impact on the volume of international trade, and consequently on the balance of payments. Hooper and Kohlhagen (1978), state that higher exchange-rate volatility leads to higher cost for risk-averse traders, and therefore to less foreign trade. This is because the exchange rate is agreed on at the time of the trade contract, but payment is not made until the future delivery actually takes place. Therefore, if changes in exchange rates become unpredictable, this tends to create uncertainty about the returns to be made and so reduces the benefits of international trade. For most developing

countries, exchange rate risk is generally not hedged because forward markets are not accessible for all traders or rather too expensive to do so. This theoretical proposition can be applied to many of the developing nations where well developed financial markets simply do not exist.

However, further research revealed that the effects of exchange rate volatility could be expected to have either negative or positive effects on trade volume. De Grauwe (1988) stressed that the dominance of income effect over substitution effect can lead to a positive relationship between trade and exchange rate volatility. The substitution effect decreases exports, because an increase in exchange rate volatility induces agents to shift from risky export activities to less risky ones. On the other hand, the income effect induces a shift of resources into the export sector when expected utility of export revenues declines as a result of the increase in exchange rate risk. Therefore, if the income effect dominates the substitution effect, exchange rate volatility will have a positive effect on exports

Harris and Zilberfarb (1993) provided a theoretical basis for the positive effect that exchange rate volatility has on exports. Their argument is that nominal unhedged exports contracts can be considered as standard risky assets, which can be analysed in a conventional asset portfolio model. Whether there is an increase in the riskiness of the return on these assets, an increase in the volatility of the exchange rate, increases or decreases export flows. This they argued will depend on the risk aversion parameter of the model.

According to Harris and Zilberfarb, the nature of the utility function for the exporter plays an important role in the resultant effect of exchange rate volatility on exports. For example, if the utility function is of the constant relative risk aversion family, then an increase in riskiness decreases the volumes of exports if and only if the coefficient of risk aversion is less than unity. The intuition of this result stems from the fact that exports are an investment and the exchange rate is the return. Therefore on the one hand, an increase in risk can make the consumer less inclined to expose their resources to the possibility of a loss hence a decrease in export. On the other hand, higher riskiness can make it necessary to commit more resources. i.e., export more, in order to ensure that revenues do not fall. So the resultant effect of exports depends on the degree of risk aversion.

Recently, there have arisen models of hysteresis in international trade. These models consider the sunk costs of entering an export market to be of more importance in determining the volumes of exports than exchange rate volatility. Campa (2000) show that sunk cost hysteresis in the entry and exit, is an important factor in determining export market participation. However, it is unrelated to exchange rate uncertainty. So if the sunk

costs of entering the market are larger than the costs of exiting the market, then exchange rate volatility will have no significant effect on exports.

Most of the studies that have been done on the impacts of exchange rate volatility on exports volumes have concentrated on developed nations. Kenen and Rodrik (1986) examined short-term volatility in the real effective exchange rates of industrial countries (United States, Canada, Japan, Belgium, France, Germany, Italy, Netherlands, Sweden, Switzerland and United Kingdom), and its impact on their exports. One of their major finding is that, volatility of real exchange rate appears to depress the volume of international trade.

Koray and Lastrapes (1989) used a vector autoregressive (VAR) model to investigate the impact of real exchange rate volatility on USA bilateral trade with the United Kingdom, Canada, Germany, Japan and France. Koray and Lastrapes findings suggested a weak relationship between real exchange rate volatility and trade. However, they found that the impact of volatility on imports increases from the fixed exchange rate regime to the flexible rate regime.

Chowdhury (1993) examined the impact of exchange rate volatility on the trade flows of the G-7 countries in the context of a multivariate error-correction model. He found that once the non-stationary behaviour of the variables are taken into account then the error-correction results indicate that exchange rate volatility has a significant negative impact on the volume of exports in each of the G-7 countries. Therefore this implies that if market participants are risk-averse, then exchange rate uncertainty causes them to reduce their activity.

Sercu and Uppal (2003) analysed the relation between exchange rate volatility and the volume of international trade. This was done through a stochastic general-equilibrium economy with international commodity markets that are partially segmented because of shipping costs. The authors argued that because both trade and exchange rate volatility are endogenous quantities, it is therefore misleading to relate one to the other as if one of them was exogenous. So the conclusion from the research was therefore that the relation between exchange rate volatility on trade volumes could either be positive or negative depending on the source underlying the increase in exchange rate volatility.

Arize et al. (2000) investigated the impact of the real exchange rate volatility on the export flows of thirteen less developed countries over the quarterly period 1973 – 1996. Following Koray and Lastrapes (1989), Arize et al. used a time varying measure of the exchange rate volatility to account for periods of low and high exchange rate uncertainty.

Based on their results, Arize et al. concluded that there was a negative and statistically significant long-run relationship between export flows and exchange rate volatility in each of the thirteen LDC's. Using results of the error correction model (EC),

they found that in most of the countries, exchange rate volatility has a short-run effect on export flows. Furthermore, there was substantive causal relationship in which changes in exchange rate volatility Granger-cause changes in real exports.

Matlanyane (2006) in the case of Lesotho looked at the growing export-oriented manufacturing sector and how it was affected by the high volatility of the Rand-Dollar exchange rate in recent years. As a proxy for measuring exchange rate volatility, she used the moving sample standard deviation of the growth of real exchange rate. The results for the ECM showed that exchange rate volatility is not only detrimental to real exports in the long-run but also negatively affects exports in the short-run. The paper further found that Lesotho's exports are sensitive to changes in world demand and relative prices in the long-run, though with low elasticities.

It is evident from the literature that the effect of real exchange rate volatility on exports is ambiguous. On one hand the empirical studies support the common hypothesis that exchange rate volatility reduces exports. This is because greater uncertainty in real exchange rate imposes an additional cost on risk-averse firms that would respond by preferring domestic trade to international trade. However, there have also been some studies that have argued that the impact of the exchange rate volatility could actually be favourable to international trade (Sercu and Uppal, 2003). According to these studies, trade can be considered as an option held by firms and the value of this option will rise with exchange rate volatility. So this ambiguity is the one that compels researchers to resolve the issue on empirical grounds.

IV METHODOLOGY

According to economic theory, export demand depends primarily on the price of a country's exports relative to the foreign price of similar goods and on the level of world income (Thirlwall 1999). So if the price and income elasticities of demand for exports are assumed to be constant, then the export function may be written in the following multiplicative way as:

$$X = \left(\frac{P_d}{P_f E}\right)^{\eta} Z^{\mu} \qquad (4.1)$$

where:

X - measures the quantity of exports

P_d - is the average price of exports

P_f - is the foreign price for similar goods

Z - measures world income

η - is the price elasticity of demand for exports

μ - is the income elasticity of demand for exports.

This study uses the same format of the export demand function as presented by Thirlwall (1999) with the addition of an exchange rate volatility variable as in Chowdhury (2005). The volatility of the exchange rate against trading partners' currency also determines the amount of exports that exporters are willing to sell due to the fact that export contracts are characterised with future payments. If the exchange rate is highly volatile, then risk-averse traders might reduce exports.

So the export demand function with exchange rate volatility (V) becomes:

$$REXP_t = (RGDP_t)^{\delta_0} * (P_t)^{\delta_1} * (V_t)^{\delta_2} \quad (4.2)$$

Taking natural logs of the export function so that the coefficients represent elasticities, and adding an error term yields the following:

$$lnREXP_t = \delta_1 lnRGDP_t + \delta_2 lnP_t + \delta_3 lnV_t + \varepsilon_t \quad (4.3)$$

where:

$REXP_t$ - Swaziland's real exports.

$RGDP_t$ - real GDP of the importing country

P_t - the real exchange rate; $\left(\frac{P_d}{P_f E}\right)$

V_t - exchange rate volatility variable.

ε_t - is the error term.

Since a higher real income in the importing country leads to higher imports, then we expect $\delta_1 > 0$.

The multilateral real exchange rate (MRER) is defined as:

$$MRER = \prod_{i=1}^{n} \left[S_i * \frac{CPI_t^{Importer}}{CPI_t^{Swaziland}} \right]^{w_i} \quad (4.4)$$

Where Π is the product operator, w_t is the relative export weight of country i at time t. S_t is the nominal exchange rate measured as the number of Emalangeni per unit of foreign currency, and CPI is the consumer price index. Since the depreciation of a country's currency increases its competitiveness, then we expect $\delta_2 > 0$. The coefficient for exchange rate volatility is ambiguous ($\delta_3 \gtrless 0$) since empirical evidence provides no consensus on its effect on exports.

This paper uses a Vector Error-Correction Model (VECM) to measure the effects of long-run and short-run effects of exchange rate volatility on export volumes in Swaziland. A VECM develops from a vector autoregressive (VAR) model.

A VAR describes the dynamic evolution of a number of variables (k), from their common history. If we consider a system with two variables, Y_t and X_t, (k=2), then the VAR consist of two equations. A first order VAR is specified as:

$$Y_t = \delta_1 + \theta_{11} Y_{t-1} + \theta_{12} X_{t-1} + \varepsilon_{1t} \quad (4.5)$$

$$X_t = \delta_2 + \theta_{21} Y_{t-1} + \theta_{22} X_{t-1} + \varepsilon_{2t} \quad (4.6)$$

Where ε_{1t} and ε_{2t} are two White noise processes (which are independent of the history of Y and X) that may be correlated. So if for example, $\theta_{12} \neq 0$, then it means that the history of X helps in explaining Y. In matrix format, the system can be expressed as:

$$\begin{pmatrix} Y_t \\ X_t \end{pmatrix} = \begin{pmatrix} \delta_1 \\ \delta_2 \end{pmatrix} + \begin{pmatrix} \theta_{11} & \theta_{12} \\ \theta_{21} & \theta_{22} \end{pmatrix} \begin{pmatrix} Y_{t-1} \\ X_{t-1} \end{pmatrix} + \begin{pmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \end{pmatrix} \quad (4.7)$$

The general VAR (p) model is specified as:

$$X_t = A_1 X_{t-1} + \cdots + A_p X_{t-p} + \varepsilon_t, \quad (t = 1, 2, \ldots) \quad (4.8)$$

$$X_t = \sum_{i=1}^{p} A_i X_{t-i} + \varepsilon_t \quad (4.9)$$

Our export function model (4.3) in VAR presentation, matrix format becomes:

$$\begin{pmatrix} REXP_t \\ RGDP_t \\ MRER_t \\ V_t \end{pmatrix} = \begin{pmatrix} \delta_1 \\ \delta_2 \\ \delta_3 \\ \delta_4 \end{pmatrix} + \begin{pmatrix} A^1_{11} & \cdots & A^1_{14} \\ \vdots & \ddots & \vdots \\ A^1_{41} & \cdots & A^1_{44} \end{pmatrix} \begin{pmatrix} REXP_{t-1} \\ RGDP_{t-1} \\ MRER_{t-1} \\ V_{t-1} \end{pmatrix} + \begin{pmatrix} A^2_{11} & \cdots & A^2_{15} \\ \vdots & \ddots & \vdots \\ A^2_{41} & \cdots & A^2_{44} \end{pmatrix} \begin{pmatrix} REXP_{t-2} \\ RGDP_{t-2} \\ MRER_{t-2} \\ V_{t-2} \end{pmatrix} + \cdots + \begin{pmatrix} A^4_{11} & \cdots & A^4_{14} \\ \vdots & \ddots & \vdots \\ A^4_{41} & \cdots & A^4_{44} \end{pmatrix} \begin{pmatrix} REXP_{t-4} \\ RGDP_{t-4} \\ MRER_{t-4} \\ V_{t-4} \end{pmatrix} + \begin{pmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \\ \varepsilon_{4t} \end{pmatrix} \quad (4.10)$$

where:

A_i – is a (k x k) matrices of parameters, all of which are non-zero

ε_t – column vector (k x 1) of random disturbance values, which may be contemporaneously correlated with one another but are assumed to be non-auto correlated over-time.

Based on equation (4.10), the error-correction model is obtained by subtracting X_{t-1} from both sides of the equation and then rearranging terms:

$$\Delta X_t = \Pi X_{t-1} + \Gamma_1 \Delta X_{t-1} + \Gamma_2 \Delta X_{t-2} + \cdots + \Gamma_{k-1} \Delta X_{t-(p-1)} + \varepsilon_t \quad (4.11)$$

$$\Delta X_t = \Pi X_{t-1} + \sum_{j=1}^{p-1} \Gamma_j \Delta X_{t-j} + \varepsilon_t \quad (4.12)$$

In matrix format our export function becomes:

$$\begin{pmatrix} \Delta REXP_t \\ \Delta RDGP_t \\ \Delta MRER_t \\ \Delta V_t \end{pmatrix} = \Pi \begin{pmatrix} REXP_{t-1} \\ RGDP_{t-1} \\ MRER_{t-1} \\ V_{t-1} \end{pmatrix} + \Gamma_1 \begin{pmatrix} \Delta REXP_{t-1} \\ \Delta RGDP_{t-1} \\ \Delta MRER_{t-1} \\ \Delta V_{t-1} \end{pmatrix} + \Gamma_2 \begin{pmatrix} \Delta REXP_{t-2} \\ \Delta RGDP_{t-2} \\ \Delta MRER_{t-2} \\ \Delta V_{t-2} \end{pmatrix} + \cdots + \Gamma_{p-1} \begin{pmatrix} \Delta REXP_{t-(p-1)} \\ \Delta RGDP_{t-(p-1)} \\ \Delta MRER_{t-(p-1)} \\ \Delta V_{t-(p-1)} \end{pmatrix} + \begin{pmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \\ \varepsilon_{4t} \end{pmatrix} \quad (4.13)$$

where

Δ - is the first difference operator

$\Pi = -(I - A_1 - \ldots - A_p)$ and $\Gamma_j = -(A_{i+1} + \ldots + A_p)$, for i=1,…,p-1

Π and Γ are (n x n) coefficient matrices. Π gives information about the long-run relationships between X_t Variables. The number of linearly independent combinations of the variables indicates the rank of Π. This rank can be obtained using the Trace or the maximum eigen-value (λ_{max}) statistics.

V EMPIRICAL RESULTS

This section presents the empirical findings of the effects of exchange rate volatility on Swaziland's total exports. The results of the unit root test presented in Table 36 show that the variables are not stationary at levels. However, the variables become stationary when differenced.

Table 36 *Results of Unit Root Test for Stationarity*

Variables	Unit Roots				Likely Degree of integration
With Intercept Only	Augmented Dickey-Fuller				
	Levels	1st Diff	2nd Diff	0.05 Critical Value	
lnexportsr	-1.3387	-2.0497	-65.8578**	-2.93899	I(2)
lnworldinc	-1.6882	-2.0873	-40.5934**	-2.93899	I(2)
lnMRER	-1.5829	-6.2910**	-10.5199**	-2.93899	I(1)
lnVOL	-1.3279	-1.8624	-8.8314**	-2.93899	I(2)
With Intercept and Trend	Augmented Dickey-Fuller				
lnexportsr	-1.9875	-2.2149	-64.9872**	-3.54033	I(2)
lnworldincr	-1.5768	-2.3363	-40.0101**	-3.54033	I(2)
lnMRER	-1.5820	-6.2320**	-10.3841**	-3.54033	I(1)
lnVOL	-1.5892	-2.0062	-8.6050**	-3.54033	I(2)

***indicates stationarity at 1%. *indicates stationarity at** *5% level*

Table 37 shows the results of the trace test and the maximum eigenvalue test for Swaziland's total exports. The variables tested for cointegration are total Swaziland's exports (lnexportsr), world income (lnworldincr), real exchange rate (lnMRER) and volatility (lnvol or volatility).

Table 37 *Unrestricted Cointegration Rank Test (Trace) and Maximum Eigenvalue*

Hypothesised No of CE (s)	Moving Average Standard Deviation Measure			GARCH Measure			0.05 Critical Value
	Eigenvalue	Trace Statistic	Prob. *	Eigenvalue	Max Eigen	Prob.*	
r = 0	0.596827	57.71499	0.0045*	0.493017	54.54226	0.0104*	47.85613

Hypothesised No of CE (s)	Moving Average Standard Deviation Measure			GARCH Measure			0.05 Critical Value
	Eigenvalue	Trace Statistic	Prob. *	Eigenvalue	Max Eigen	Prob.*	
r = ≤ 1	0.294270	20.47101	0.3915	0.315572	26.69185	0.1094	29.79707
r = ≤ 2	0.108549	6.181603	0.6741	0.175307	11.14582	0.2027	15.49471
r = ≤ 3	0.035230	1.470490	0.2253	0.076058	3.243328	0.0717	3.841466

**Denotes rejection of null hypothesis at the 5% level*

From the results of the trace test, the null hypothesis of no cointegration (r = 0), is rejected at the 95% critical values for both the moving average standard deviation and GARCH measures of exchange rate volatility. This means that there exist long run relationship between exports, world income, real exchange rate and volatility.

The existence of a cointegration relationship between exports, world income, real exchange rate and volatility implies that there is a long run relationship between these series and the residuals obtained from the cointegrating vectors are stationary at their levels, i.e.I(0).

For the MASD measure, one cointegrating equation is obtained among the variables as reported by the trace and maximum eigenvalue test results. This cointegrating equation is presented by Table 38 below.

Table 38 *Cointegrating Vector (Total Exports MASD)*

Cointegrating Equation(s):	Log likelihood	57.27116

Normalized cointegrating coefficients (standard error in parentheses)

LNEXPORTSR	LNWORLDINCR	LNMRER	LNVOL
1.000000	-1.686933	0.708718	0.227409
	(0.10287)	(0.36708)	(0.05082)
	[16.399]	[1.931]	[4.475]

The cointegrating vector is obtained by normalizing total exports, whereby the estimated coefficient of exports is set to -1 and the cointegrating vector is divided by the negative of this coefficient. The cointegrating vector in Table 38 can be rewritten as the long run function for Swaziland's total exports using the MASD measure of exchange rate volatility.

$$lnexportsr = 1.686933 lnWorldincr - 0.708718 lnMRER - 0.227409 lnVol \quad (5.3)^{44}$$

(16.399) (-1.931) (-4.475)

World income has the expected sign and is statistically significant. The real exchange rate variable has an unexpected negative sign. This result may be due to the fact that Swaziland exports a limited number of agro-processed products, which their

demand may not be as a result competitiveness. For example, most of Swaziland's sugar earnings are derived from the EU market, which buys a certain quota of the sugar at a preferential price, irrespective of the country's competitiveness. Also, the demand for soft drinks concentrates is mainly affected by the demand in Coca Cola soft drinks. This is because Conco Limited is the only company licensed by the Coca Cola Company to supply this concentrate to most of the countries in the Southern African region. Interestingly the exchange rate volatility variable is negative and significant. This gives the indication that exchange rate volatility is detrimental to Swaziland's exports in the long run.

Table 39 outlines the cointegrating vector for total exports when the GARCH measure of exchange rate volatility is used.

Table 39 *Cointegrating Vector (Total Exports GARCH)*

Cointegrating Equation(s):		Log likelihood	364.0774
Normalized cointegrating coefficients (standard error in parentheses)			
LNEXPORTSR	LNWORLDINCR	LNMRE R	VOLATILITY
1.000000	-2.021114	-5.070988	123.6081
	(0.10603)	(1.68919)	(32.1300)
	[-19.062]	[-3.002] [3.847]	

$$lnexportsr = 2.02\ lnWorldincr + 5.070988\ lnMRER - 123.6081\ Volatility \quad (5.4)$$

[19.062] [3.002] [-3.847]

When using the GARCH measure of volatility, the real exchange variable has the expected sign. The volatility variable is significant and large, and this implies a high sensitivity of the Swaziland's exports to exchange rate volatility in the long-run when using the GARCH measure of exchange rate volatility.

5.4.2 Vector Error Correction Model (VECM) Results

Table 40 show results of the vector error correction model (VECM) of Swaziland's total exports, using MASD measure of exchange rate volatility. The results show that only the error correction terms for exports and volatility have the correct negative sign and are statistically significant. About 64% of the adjustment of Swaziland's total exports towards long run equilibrium takes place per quarter. This is a relatively very fast rate of adjustment. According to the dynamics of the total exports equation (equation 1), only world income and exchange rate volatility have short run

[44] Note that the signs of the coefficients change when taken to the right side of the equation.

effects on Swaziland's total exports, in addition to the long run effects. So in the short run real exchange rate appear not to affect Swaziland's total exports.

Table 40 *ECM Results for Total Exports (MASD Measure)*

	Equation 1 Δ(LnExports)	Equation 2 Δ(LnWorldinc)	Equation 3 Δ(LnMRER)	Equation 4 Δ(LnVol)
Δ(LnExports (-1))	-0.437907* [-2.12065]	-0.472592 [-1.55874]	0.072593 [0.37286]	-0.996558 [-0.48288]
Δ(LnExports (-2))	-0.499476* [-2.41915]	-0.659195 [-2.17451]	-0.040520 [-0.20815]	0.115981 [0.05621]
Δ(LnExports (-3))	-0.441577* [-2.12000]	-0.601065 [-1.96539]	-0.026477 [-0.13482]	1.299356 [0.62417]
Δ(LnWorldinc (-1))	-0.463745* [-2.37452]	-0.419664 [-1.46352]	-0.013052 [-0.07088]	0.944584 [0.48393]
Δ(LnWorldinc (-2))	-0.355303 [-1.82029]	-0.200799 [-0.70065]	0.083126 [0.45169]	1.633590 [0.83740]
Δ(LnWorldinc (-3))	-0.367106 [-1.88508]	-0.211914 [-0.74114]	0.054699 [0.29790]	-1.487517 [-0.76427]
Δ(LnMRER (-1))	-0.169707 [-0.70417]	0.326170 [0.92177]	-0.035218 [-0.15499]	-1.888706 [-0.78414]
Δ(LnMRER (-2))	-0.213444 [-0.86058]	0.169370 [0.46510]	-0.065535 [-0.28025]	-0.090737 [-0.03661]
Δ(LnMRER (-3))	-0.180621 [-0.73535]	0.396338 [1.09899]	-0.095736 [-0.41340]	-2.393263 [-0.97492]
Δ(LnVol (-1))	0.029439 [1.35759]	-0.006543 [-0.20550]	0.002019 [0.09874]	0.301616 [1.39171]
Δ(LnVol (-2))	0.088245* [4.15573]	0.050583 [1.62241]	0.002857 [0.14272]	0.134352 [0.63306]
Δ(LnVol (-3))	0.049800* [2.07819]	0.028674 [0.81497]	-0.002878 [-0.12736]	-0.008780 [-0.03666]
C	0.073029 [5.64534]	0.075763 [3.98884]	-0.007395 [-0.60633]	-0.131562 [-1.01758]
ECT	-0.637807* [-3.95238]	-0.188549 [-0.79578]	-0.025245 [-0.16592]	-3.244383* [-2.01163]
R-Squared	0.970736	0.936602	0.082127	0.638650
Adj. R-Squared	0.955519	0.903635	-0.395167	0.450748
Sum sq. Resids	0.141726	0.305528	0.125989	14.15649
S.E. Equation	0.075293	0.110549	0.070990	0.752502
F-Statistic	63.79143	28.41044	0.172068	3.398850
Log Likelihood	54.20112	39.22228	56.49636	-35.57752
Akaike AIC	-2.061596	-1.293450	-2.179300	2.542437
Schwarz SIC	-1.464420	-0.696274	-1.582125	3.139613

Table 41 outlines results of the VECM for Swaziland's total exports, using the GARCH measure of exchange rate volatility. Only the error correction term for total exports has the correct negative sign and is statistically significant. The adjustment rate of total exports per quarter towards equilibrium is about 71%. According to the dynamics of

equation 1, only world income exhibit short run effects on Swaziland's total exports in addition to the long run effects.

Table 41 *ECM Results for Total Exports (GARCH Measure)*

	Equation 1 Δ(LnExports)	Equation 2 Δ(LnWorldinc)	Equation 3 Δ(LnRelPrice)	Equation 4 Δ(Volatility)
Δ(LnExports (-1))	-0.395570 [-1.90120]	-0.388450 [-1.33984]	0.090999 [0.48598]	0.088594 [0.47243]
Δ(LnExports (-2))	-0.487135* [-2.17832]	-0.468465 [-1.50335]	0.054087 [0.26875]	0.054413 [0.26996]
Δ(LnExports (-3))	-0.486953* [-2.24173]	-0.526552 [-1.73960]	0.029517 [0.15099]	0.029598 [0.15118]
Δ(LnWorldinc (-1))	-0.522494* [-2.54859]	-0.511574 [-1.79076]	-0.037358 [-0.20248]	-0.034746 [-0.18804]
Δ(LnWorldinc (-2))	-0.445819* [-2.02634]	-0.450027 [-1.46792]	-0.010774 [-0.05441]	-0.011112 [-0.05604]
Δ(LnWorldinc (-3))	-0.468609* [-2.19867]	-0.404127 [-1.36075]	-0.001230 [-0.00641]	-0.001290 [-0.00671]
Δ(LnMRER (-1))	14.02851 [0.40525]	-19.26543 [-0.39939]	-17.72271 [-0.56888]	-18.62714 [-0.59701]
Δ(LnMRER (-2))	7.377847 [0.16210]	-18.65802 [-0.29418]	-0.405838 [-0.00991]	-0.360556 [-0.00879]
Δ(LnMRER (-3))	-13.36661 [-0.40393]	39.14118 [0.84884]	16.66674 [0.55964]	16.58937 [0.55621]
Δ(Volatility (-1))	-7.011339 [-0.20490]	23.83458 [0.49986]	18.52790 [0.60164]	18.49347 [0.59962]
Δ(Volatility (-2))	-14.06338 [-0.40414]	41.33462 [0.85244]	17.88183 [0.57099]	17.80290 [0.56762]
Δ(Volatility (-3))	-0.065169 [-0.24071]	0.380317 [1.00811]	0.186764 [0.76652]	0.188463 [0.77233]
C	0.124518 [8.02028]	0.101283 [4.68173]	-0.004885 [-0.34965]	-0.004797 [-0.34279]
ECT	-0.710334* [-4.22542]	-0.444331 [-1.89681]	-0.091944 [-0.60773]	-0.092995 [-0.61376]
R-Squared	0.969948	0.941361	0.141228	0.588125
Adj. R-Squared	0.954321	0.910869	-0.305333	0.373949
Sum sq. Resids	0.145541	0.282594	0.117876	0.118230
S.E. Equation	0.076300	0.106319	0.068666	0.068769
F-Statistic	62.06891	30.87213	0.316257	2.745998
Log Likelihood	53.68317	40.74385	57.79420	57.73570
Akaike AIC	-2.035034	-1.371479	-2.245857	-2.242857
Schwarz SIC	-1.437858	-0.774303	-1.648681	-1.645681

5.4.3 Impulse Response Analysis

Impulse response analysis is used widely in the empirical literature to uncover the dynamic relationship between macroeconomic variables within vector-autoregressive (VAR) models Mitchell (2000). Impulse responses measure the time profile of the effect of a shock, or impulse, on the (expected) future values of a variable. An impulse response

function traces the effect of a one standard deviation shock to one of the innovations or error terms on current and future values of the endogenous variables

Figure 24 and Figure 25 present impulse responses of Swaziland's total exports to shocks in exports, world income, relative prices and exchange rate volatility. These results are for the MASD and GARCH measures of exchange rate volatility, respectively.

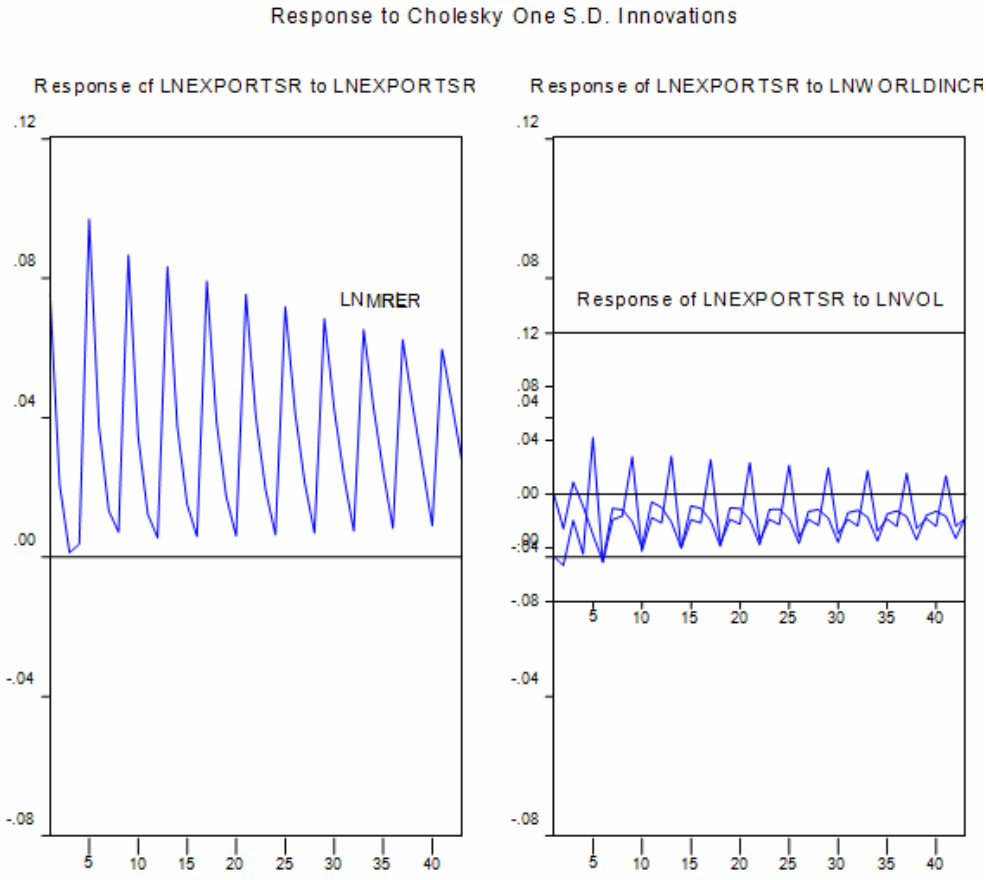

Figure 24 *Impulse Responses to Total Exports (MASD)*

Figure 24 shows that the effect of a one standard deviation impulse response to Swaziland's total exports on itself, results in a positive wobble from the first quarter and lasting for the entire horizon. A shock to world income tends to have no effect on the first two quarters and then positively affect total exports for the whole period. A shock to relative prices also positively affects total exports slightly in the first year (first four quarters) and then the effect increases, lasting for the entire horizon. Lastly, a shock to exchange rate volatility shows that from the fifth quarter, the effect is negative for the entire period.

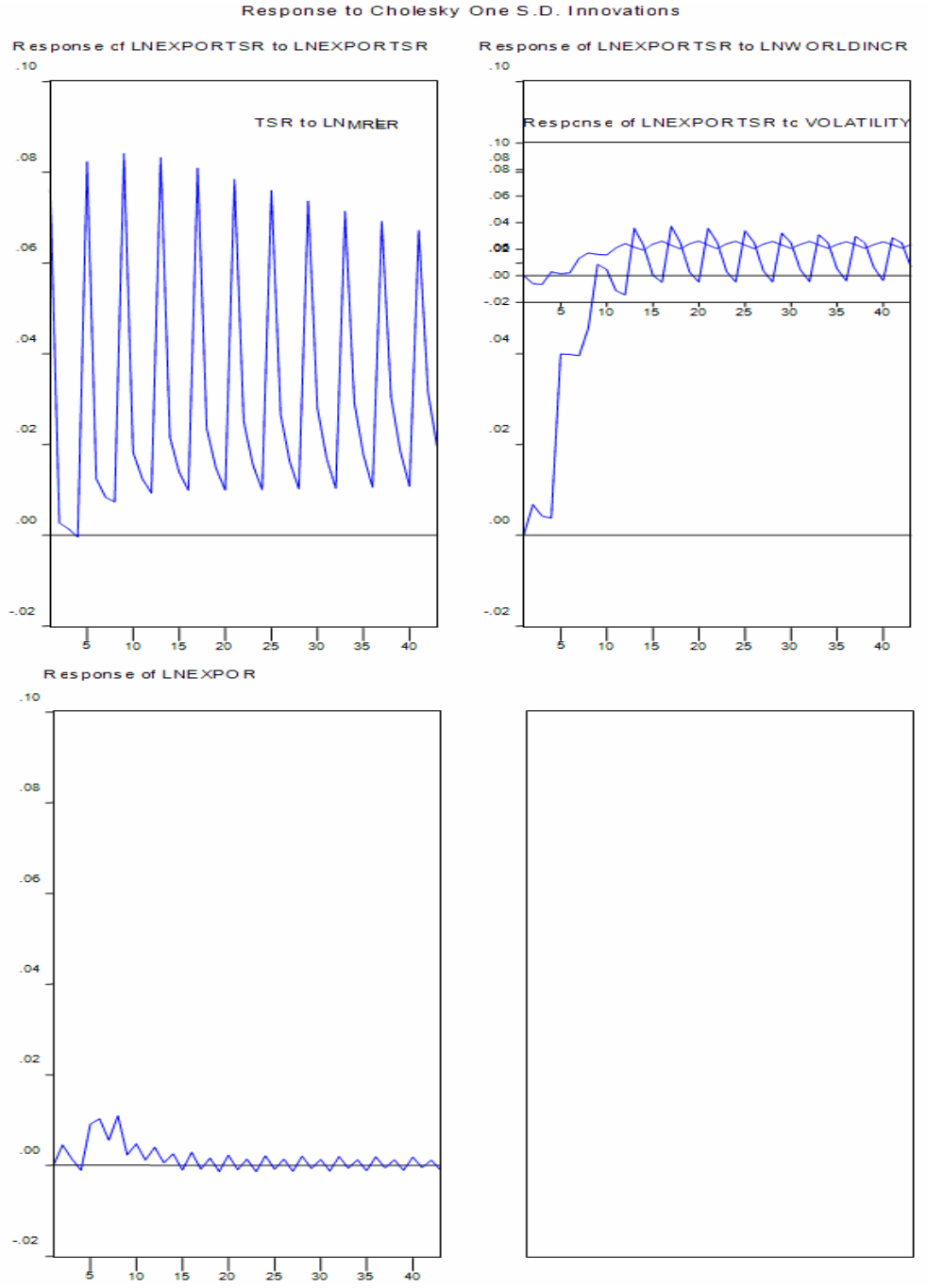

Figure 25 *Impulse Responses to Total Exports (GARCH)*

Figure 25 shows impulse responses of Swaziland's total exports for the GARCH measure of exchange rate volatility. The effect of a shock to total exports results in positive movement up and down to exports throughout the horizon. A shock to world income becomes evident to total exports after the fourth quarter, and then stays positive for the entire period. A shock to relative prices seems not to have an effect on total exports. An upset to volatility results in a negative effect on total exports in the first year (first four quarters), and then becomes positive throughout the entire horizon.

5.4.4 Variance Decomposition

Forecast error variance decomposition is conducted to assess the extent to which the macro variables (world income, exchange rate and volatility) used in the VECM, affect total exports over time. The Tables for variance decompositions are presented in 5 quarter period intervals for the whole horizon of 44 quarters. Table 42 presents results of variance decomposition of Swaziland's total exports using the MASD measure of volatility. The results indicate that the variables in the model explain 42% of the variation in total exports. Relative prices account for more than 20% of the variance in total exports over the entire horizon. Exchange rate volatility explains more than 15%, whilst world income only accounts for about 7%.

Table 42 *Variance Decomposition of Total Exports (MASD)*

Period	S.E.	LNEXPORTSR	LNWORLDINCR	LNMRER	LNVOL
1	0.075293	100.0000	0.000000	0.000000	0.000000
5	0.141611	77.36972	6.396251	7.498925	8.735105
10	0.203461	62.35583	5.710455	16.28299	15.65072
15	0.238266	60.83013	6.223410	17.55844	15.38802
20	0.267543	59.61143	6.443430	18.59151	15.35363
25	0.303359	60.32412	6.785985	18.32983	14.56006
30	0.329939	58.96320	6.576344	19.13654	15.32392
35	0.350101	58.32218	6.632861	19.72665	15.31831
40	0.367995	57.67050	6.672923	20.29613	15.36045
43	0.382549	57.63333	6.677136	20.34664	15.34290

Table 43 presents results of variance decomposition of Swaziland's total exports, using the GARCH measure of volatility. The output indicates that the variables in the model explain about 68% of the variation in total exports. World income alone accounts for about 60% of the variation, whilst exchange rate volatility accounts for about 8%.

Table 43 *Variance Decomposition of Total Exports (GARCH)*

Period	S.E.	LNEXPORTSR	LNWORLDINCR	LNMRER	VOLATILITY
1	0.076300	100.0000	0.000000	0.000000	0.000000
5	0.120325	87.11985	11.51522	0.736610	0.628317
10	0.188751	56.97760	38.96260	1.097154	2.962642
15	0.252041	44.26469	49.62520	0.654695	5.455415
20	0.303791	38.60697	54.06939	0.470689	6.852953
25	0.357244	38.01770	54.54800	0.348364	7.085937
30	0.395907	35.59696	56.68762	0.289981	7.425437
35	0.429726	33.82042	58.14802	0.250866	7.780688
40	0.460462	32.41950	59.24979	0.223020	8.107690
43	0.480996	32.24764	59.45978	0.205542	8.087034

VI CONCLUSIONS

This paper assessed the effects of exchange rate volatility on Swaziland's total exports. It uses exports quarterly time series data ranging from 1995Q1 to 2005Q4. A Vector Error Correction Model (VECM) approach is employed to study the relationship between exports and their determinants. The findings of the study suggest that exchange rate volatility is detrimental to Swaziland's exports. In addition to the exchange rate volatility variable, other variables included in the VECM model are world income and relative prices. Although the impulse response and forecast error variance decomposition results show that exchange rate volatility affects Swaziland's total exports the effect is less than that exhibited by shocks to world income and real exchange rate to exports.

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EMPIRICAL STUDY ON INFLUENCE OF EXTRAVERSION ON CONSUMER PASSION AND BRAND EVANGELISM WITH WORD-OF-MOUTH COMMUNICATION

Pradeep KAUTISH*

Abstract: *Word-of-Mouth (WOM) is recognized as a powerful marketing instrument. Its importance as a communication mechanism has widely explored and established in influencing purchase decision in the consumer behaviour domain (e.g., Gilly et al. 1998; Herr et al. 1991; Wilson 1991). WOM was recognized as an important determinant of consumer's buying behaviour early in marketing literature (Butler 1923), its influence reported as greater than personal selling and advertising (Engel et al. 1969; Feldman and Spencer 1965; Katz and Lazarsfeld 1955) and findings show that more extravert consumers are more likely to be passionate consumers and engage in brand evangelism. For decades, it has received extensive attention from both academicians and practitioners, who demonstrated that WOM communications could not only influence consumers' purchase decisions (Arndt 1967b; Whyte 1954), but also shape consumers' expectations (Zeithaml and Bitner 1996), pre-usage attitudes (Herr et al. 1991), and even post-usage perceptions of a product or service (Bone 1995; Burzynski and Bayer 1977). Researchers have documented the existence of certain types of consumers, opinion leaders and market mavens, who have a personal predisposition to disseminate WOM to fellow consumers (Feick and Price 1987; Lazarsfeld et al. 1944) in an influencing manner. This paper is an attempt to figure out the inter relationship of positive influence of extraversion on consumer passion and ultimately on brand evangelism as a marketing phenomenon in Indian context.*

Keywords*: Word-of-Mouth, Influence, Extraversion, Consumer Passion, Brand Evangelism.*

JEL Codes: *M310*

* Pradeep KAUTISH, Assistant Professor, Jaipuria Institute of Management, Plot No. 1, Bambala Institutional Area, Pratap Nagar, Sanganer, Tonk Road, Jaipur- 302033, Rajasthan, India, Phone: +91-141-2771330-33 Ext.-229, Mobile No: +91-9414398070, pradeepkautish@gmail.com

1. INTRODUCTION

Consumers seek the opinions of other individuals for product advice when they have little expertise in a product category (Gilly et al. 1998; Furse et al. 1984), perceive a high risk in decision-making (Bansal and Voyer 2000; Kiel and Layton 1981), or are deeply involved in the purchase decision (Beatty and Smith 1987). Concerning the question why certain personal sources of information have more influence than others to identify general market-place influencers and use them for more effective product and message diffusion, factors such as source expertise (Bansal and Voyer 2000; Gilly et al. 1998), tie strength (Brown and Reingen 1987; Frenzen and Nakamoto 1993), demographic similarity (Brown and Reingen 1987), reference group influence (Bearden and Etzel 1982) and perceptual affinity (Gilly et al. 1998) have been identified as important antecedents of WOM influence. Consumer behaviour literature provides ample evidence of enthusiastic and highly passionate forms of consumer-object relationships. Wallendorf and Arnould (1988) contended that material objects play many important roles in the lives of consumers which sometime become "favourite things" and serve important psychological functions in private lives. In particular, they situate an individual's character or personality in a context (Goffman 1959; Levy 1959; Mick 1986), thus serve as markers for others to denote personality. We also use objects to convey and extend our self-concept, as a sign of connection or differentiation from other members of society. Favourite or love objects (Wallendorf and Arnould 1988; Ahuvia 2005) reflect deep personal meaning and attachment. As such they are means for self-expression and are often accompanied by highly affective states. It has also been contended that enthusiastic consumers are spreading positive word-of-mouth and engage in convincing other consumers (Ahuvia 2006; Pimentel and Reynolds 2004) and they are subtle brand evangels. Yet, having observed these enthusiastic consumers, we suggest that word-of-mouth as a measurement construct is likely to underestimate the evangelical forms of talking about favourite possessions and the tendency of passionate consumers to convince other consumers. Still, we are aware that not all consumers, not even all brand passionate consumers do try to evangelize others. Building on psychological theory about passion, we try to find out which passionate consumers have an inclination towards evangelism. Baumeister and Bratslavsky (1999) stated that personality has a strong influence on how passionate a person is. Especially extra-version was found to be "particularly associated with passionate aspects of love [. . .] thus, the evidence points to a view of extraversion as more passionate" (pp. 57-58). Therefore, we will look at the influence of extraversion as one personality trait, and of openness as a possible second influencing trait on passion. This article intends to shed light on the relationship between consumers' personality and its impact on consumer passion and the propensity to evangelize. To this end we will first elaborate consumer passion as a psychological construct, as well as evangelism and personality from a theoretical

standpoint. A study among enthusiastic consumers of apparels who has gone through with more than three purchases in a row in two retail outlets of Levi's in Jaipur and Delhi both are in India has been conducted to test our hypotheses to empirically prove these aspects.

1.1 Consumer Passion

In the context of consumption, consumer passion has recently been noticed (Shimp and Madden 1988; Belk et al. 2003), particularly in an interpretive research context. Here, passionate feelings are not directed towards another person as in the case of interpersonal love relationships, but towards a product or a service or a brand. Still, many aspects are very similar and therefore justify the use of the same term. Fournier's (1998) concept of consumer-brand-relationships contains passion as one relevant factor for determining the brand relationship quality disposition. Accordingly, if a consumer is passionate about a brand, he/she will engage in a much more emotional relationship with the brand and even miss the brand or feel loss when the brand is unavailable. Belk, Ger, and Askegaard (2003) show how passion in the form of desire inspires and motivates a big part of contemporary consumption. They also find evidence for the assumption that passion leads to certain behaviours and show that idealization of the object is an immediate consequence of passion. Analogously to passion between two persons, passion for a brand also leads to certain behaviours. The positive, biased perception of the brand's qualities as a partner in a consumer-brand-relationship was detected by Fournier (1998). She also states that the affective grounding of a consumer-brand relationship might account significantly for the loyalty of consumers to their brands. Whang et al. (2004) confirm the relationship between passion and loyalty as follows: "Only the passion component of interpersonal love had an impact on loyalty to their bikes." Ahuvia (2005b) has worked on a conceptualization of brand love which does not only comprise passion for the brand, but also the positive evaluation of the brand, positive emotions towards the brand and declarations of love for the brand extrovertly. In a next step, Carroll and Ahuvia (2006) have tested the relationship between brand love and loyalty as well as between brand love and positive word-of-mouth as possible outcomes of brand love. They have found positive effects of brand love on both behavioural parameters.

1.2 Brand Evangelism

Still, there are hints in theory as well as in real-life that passion for a brand can cause more intense and more extreme acts than just positive word-of-mouth. Pimentel and Reynolds (2004) have shown that truly devoted consumers not only spread positive word-of-mouth but eventually engage in recruiting in order to actively convince others of their beloved brand of any commodity. Rozanski, Baum, and Wolfsen (1999) portray the actions of brand zealots whose extreme loyalty and emotionality towards their favourite brand can inspire them to extreme acts. Based on this evidence, we propose the term

brand evangelism for describing a more active and committed way of spreading positive opinions and trying fervently to convince or persuade others to get engaged with the same brand. By having chosen the word evangelism we would like to emphasize the missionary component of this behavioural outcome of consumer passion. We assume that brand evangelism is an act of preaching the brand's most loved aspects and all positive associations that come with it to people who have so far not acknowledged "the wonder of it." Consumers who evangelize are passionate about their brand and feel the need to share their emotions with others. Therefore, it is hypothesized that:

H_1: Brand passion is positively related to brand evangelism.

1.3 Role of Extraversion & Openness

After decades of disparate theories and equivocal findings, in the last twenty years consensus has emerged that the most salient aspects of an individual's personality can be described with a five-factor model (Big Five) consisting of Neuroticism, Extraversion, Agreeableness, Openness, and Consciousness (Goldberg 1993). These five domains have been identified in numerous empirical studies (Tupes and Christal 1992) constituting the pattern of traits across individuals and are considered the fundamental dimensions of personality (McCrae and John 1992). Numerous researchers from many traditions were able to replicate the findings, thereby sustaining the theory of five basic dimensions of personality. This structure was found across observers (e.g., self- and peer-reports), across methodologies (questionnaires and lexical inventories), across the lifespan, across languages and cultures (John and Srivastava 1999; Saucier and Ostendorf 1999; McCrae 2004). This emerging consensus has led to a revitalization of personality scholarship (Funder 2001). In marketing research, personality traits have been adopted to study a variety of behaviors and emotional responses, such as emotions and customer satisfaction (e.g., Mooradian and Olver 1997; e.g., Matzler et al. 2005), reliance on word-of-mouth (Mooradian and Swan 2006), hedonic and utilitarian shopping values (Guido 2006), and ad-evoked feelings (e.g., Mooradian 1996). In this study, the focus is on two personality traits that are expected to be positively related to brand passion and brand evangelism: Extraversion and Openness to experience. Extraversion is distinguished by venturesomeness, affiliation, positive affectivity, energy, ascendance, and ambition. In psychology, a number of studies have aimed at correlating personality traits with affective states (e.g., Larsen and Katelaar 1991; Rusting and Larsen 1997). It was found that individuals who score high on extraversion are predisposed toward positive affect and prefer interpersonal interaction (Mooradian and Swan 2006). Extraversion was found to be positively correlated to positive emotions in many studies (Costa and McCrae 1980; Watson and Clark 1992). In a marketing context, some studies related extraversion to positive emotions in consumption situations (Mooradian and Olver 1997; Matzler et al. 2005). Guido (2006) found that extraversion is positively related to hedonic shopping values and

purchase intentions. Moreover, as reported above, Baumeister and Bratslavsky (1999) contended that personality has a strong influence on how much passionate a person is in his/her life. Therefore, it is hypothesized that:

H_2: Extraversion is positively related to brand passion.

Openness to experience (which often has been labelled as intellect) is related to active imagination, aesthetic sensitivity, and attentiveness to inner feelings, preference for variety, intellectual curiosity, and independence of judgment (Costa and McCrae 1992). Individuals with high scores on openness to experience have been described as being more curious about both inner and outer worlds. Open individuals are also more willing to entertain novel ideas and unconventional values, and they experience both positive and negative emotions more keenly than do closed individuals (Costa and McCrae 1992). Highly open people display intellectual curiosity/wit, creativity, flexible thinking, and culture (Dingman 1990). The facets of openness are related to fantasy, aesthetics, feelings, actions, ideas, and values.

Due to the higher tendency of open individuals to be curious about both inner and outer worlds, to have experientially richer lives, to experience both negative and positive emotions more keenly than closed individuals, it can be assumed that they develop stronger passion for brands than people who score low on openness to experience. Therefore, it is hypothesized that:

H_3: Openness to experience is positively related to brand passion.

However, due to the more intellectual character of open personalities and their tendency to value independence of judgment (Costa and McCrae 1992), they might be much less prone to evangelize, but rather engage in behaviour that is more aesthetic and creative in nature. In contrast to this, individuals with high scores on extraversion have been characterized as assertive, forceful and socially ascendant, speaking without hesitation. Furthermore, extraverts are cheerful and optimistic individuals hence have a tendency to experience more positive emotions. Low scores, on the other hand, prefer to keep in the background and tend to let others do the talking (Costa and McCrae 1992). Hence, I assume a slight positive direct relationship between extraversion and evangelism as a special form of positive social talk. Therefore it is hypothesized that:

H_4: Extraversion is positively related to brand evangelism.

2. RESEARCH METHODOLOGY

2.1 Samples & Measures

Data collection took place in Jaipur and Delhi basically in various exclusive outlets of apparel brand called Levi's. A self-administered questionnaire was developed and respondents were asked to complete the questionnaire by the P.G.D.M students of

Jaipuria Institute of Management, Jaipur as a part of their credit course in sixth trimester. Two hundred sixty four usable questionnaires were collected. Missing data (less than 10%) have been imputed with the norm procedure (Schafer and Graham 2002). Openness to experience and Extraversion have been measured with Big Five Inventory Model, originally developed by John and Srivastava (1999) and validated using 5-point Likert scales (1 = strongly disagree, 5 = strongly agree). Brand Passion has been measured with statements taken from Sternberg's Triangular love scale (1997), which have been adapted to the product context. The Brand Evangelism scale is partly based on Ahuvia (2006) and adapted to the more extreme brand enthusiasts' language and emotional intensity. Furthermore, according to Schouten and McAlexander (1995), I additionally adapted the scale with regard to the missionary attitude of brand passionate individuals and their engagement in recruiting.

2.2 Results

The proposed relationships among the constructs have been tested using structural equation modelling with SPSS AMOS 6.0. Items with low reliability (< 0.4) have been removed. As a result of the scale purification, openness has been measured with six items, extraversion with five items, brand passion with six items, and brand evangelism with five items. Figure 26 shows the measurement model.

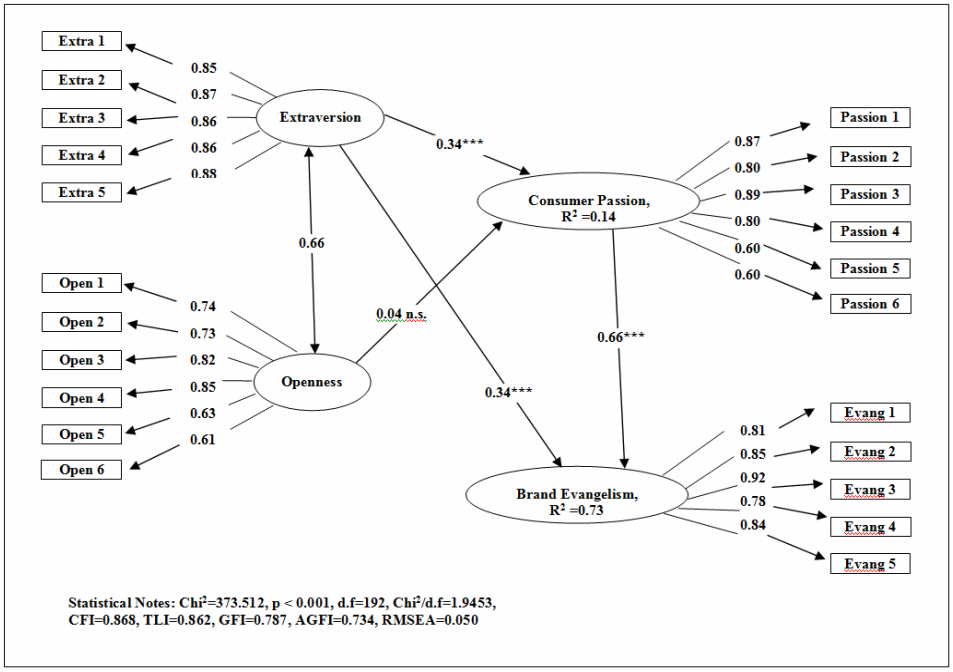

Figure 26 *Statistical Relationships between Extraversion, Openness, Consumer Passion and Brand Evangelism*

2.3 Model Fit

The chi-square value is 373.512 (d.f. = 192, p = 0.000; Chi^2/d.f. = 1.9453). Chi-square, however, is only recommended with moderate samples (Hu and Bentler 1999), e.g., 100 to 200 (Tabachnik and Fidell 1996), as with larger sample sizes as in this case, trivial differences become significant. Hence, other global fit indices are used to test model fit which show very good model fit. The root mean square error of approximation (RMSEA) is 0.050, the goodness-of-fit index (GFI) is 0.787, the adjusted goodness-of-fit index (AGFI) is 0.734, the Tucker-Lewis index (TLI) is 0.862 and the comparative fit index (CFI) is 0.868. Thus, it can be concluded that the model fit is satisfactory.

2.4 Reliability and Validity

Table 44 reports the local fit indices. Indicator loadings, composite reliability, average variance extracted and the Fornell-Larcker Ratio (Fornell and Larcker 1981) indicate satisfactory psychometric properties of the scales. The composite reliability is above the critical threshold of 0.6 for each construct, the average variance extracted exceeds the value of 0.50 in any case and the Fornell-Larcker Ratio is below 1, indicating satisfactory discriminant validity.

Table 44 *Psychometric Properties of the Scales*

Construct/ Property	Selected Item	Indicator Reliabilities	Composite Reliability	Average Variance Extracted	Fornell-Larcker Ratio
Openness	I see Myself as someone who				
	1. Is original, comes up with new ideas	**0.55**	**0.87**	**0.53**	**0.82**
	2. Values artistic, aesthetic experiences	**0.53**			
	3. Has an active imagination	**0.67**			
	4. Likes to reflect, play with ideas	**0.72**			
	5. Is Ingenious, a deep thinker	**0.39**			
	6. Is inventive	**0.37**			
Extraversion	I see Myself as someone who				
	1. Is outgoing, sociable	**0.72**	**0.94**	**0.75**	**0.58**
	2. Talkative	**0.77**			
	3. Is full of energy	**0.75**			
	4. Generates a lot of enthusiasm	**0.74**			
	5. Has an assertive personality	**0.77**			
Consumer Passion	There is nothing as important as my brand	**0.76**	**0.93**	**0.69**	**0.91**
	1. I find myself thinking about my brand only	**0.64**			
	2. I would rather spend time with my brand than with anything else.	**0.79**			
	3. My relationship with my brand is passionate	**0.64**			
	4. Just seeing my brand is exciting to me	**0.63**			
	5. I cannot pass by my brand without touching it	**0.64**			

Construct/ Property	Selected Item	Indicator Reliabilities	Composite Reliability	Average Variance Extracted	Fornell-Larcker Ratio
Brand Evangelism	1. Would make a perfect brand salesperson	**0.60**	**0.92**	**0.70**	**0.89**
	2. I have proselytized several of my friends to my brand	**0.70**			
	3. I try to convince as many as possible of my brand	**0.84**			
	4. I feel the need to tell the world that my brand is the most appealing brand of the world	**0.73**			
	5. If someone tries to decry my brand, I will tell him off unmistakably	**0.66**			

2.5 Regression Paths

Figure 26 displays the results of the analysis. Hypothesis one predicts a positive relationship between brand passion and brand evangelism and is strongly supported by the data ($\beta = 0.67$, $p = 0.000$). Extraversion ($\beta = 0.34$, $p = 0.000$) positively influences brand passion, whereas there is no significant relationship between Openness ($\beta = 0.04$, n.s.) and passion ($R^2 = 0.14$). Hence, hypothesis two is strongly supported but hypothesis three had to be rejected. Extraversion also positively influences brand evangelism ($\beta = 0.34$, $p = 0.000$), supporting hypothesis four.

3. CONCLUSION & DISCUSSION

Passionate consumers evangelize. However, passion is not inherent in the object (Belk et al. 2003) but rather a function of many influencing factors, among which is a consumer's personality. The findings contribute to this contention and have interesting implications for marketers and marketing theory. First, we can support the view that extravert consumers are the most important and effective brand advocates when they feel passionate about a brand. Although loyalty might be expressed in various forms, brand advocacy additionally bears the advantage of credibility and the potential of building strong brand communities. However, as reported by Rozanski et al. (1999), passionate consumers might also be the most passionate opponents when they are disappointed by the brand that we need to understand perfectly. Hence, as Fournier (1998) has suggested, marketers must engage in active relationships with passionate consumers and regularly interact in an adequate and authentic way will surely lead to a mutually beneficial relationship in long run. Second, our findings show that, although extraversion and openness as personality traits are strongly interconnected, openness to experience nevertheless shows no significant effect on consumer passion. Although openness to experience is a highly emotional facet of personality, open personalities seem to refrain from being passionate consumers. We can assume that other, more aesthetic and luxury

consumption contexts could reveal a positive relationship between openness and consumer passion. Hence, more research is needed in different, more luxurious, intellectually stimulating, and aesthetic consumption contexts. Another interesting finding is that extravert consumers, in general, seem to engage more in evangelizing than others. This finding confirms the genuinely talkative character of extravert individuals. Hence, even if an extravert is not passionate, she/he will still engage in word-of-mouth communication. From that we can conclude that extravert consumers are important advocates for any brand. Hence, marketers should spend careful attention to extravert consumers, particularly as they might also be talkative brand opponents.

4. LIMITATIONS AND FUTURE RESEARCH IMPERATIVES

Notwithstanding these important findings, we must also be cautious with regard to generalizations because the study has been conducted in only two cities of the country. Consumer of branded apparels especially of Levi's might be a very peculiar group of young people. Hence, our sample might represent a very specific target group of branded apparel buyers. Other brands of same commodity or different commodity can give varied results in terms of research as well as implications. Like different "objects of love" might attract different personalities and thus result in quite distinct behaviours. Further-more, culture and nationality in general might also make a difference with regard to enthusiast's behaviour. Observing and comparing the behavioural patterns of different countries for instance, can reveal that there can be different possible outcomes of consumer passion. Further research is also needed with regard to the community aspects and the many social factors that influence individuals' passionate feelings and behaviours with regard to brands. Evangelism is by far not the only outcome of brand enthusiasm. Yet, there might be other objects, for which people might not want to publicly expose their passion. The object in question might be a guilty pleasure; or the passionate feelings might be un-wanted or even conflicting with other interests. There is also a lack of insight into the very private facet of consumer passion. As extraverts are likely to evangelize, more introvert individuals might be more likely to worship a brand in a very private manner. Furthermore, future research is needed with regard to individuals who score high on openness to experience in particular. Due to their intellectual aspiration, they might be more passionate about very different objects, like for instance music or artwork or any other commodity. To conclude, we can maintain that there is still much room for further theorizing and research on consumer personality and passion with regard to consumption objects and patterns.

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HOW DO THE DEMOGRAPHIC COMPONENTS INFLUENCE JOB SATISFACTION IN THE HOSPITALITY INDUSTRY?

Derya KARA*

Abstract: *In this research, job satisfaction has been clarified according to different features of employees who work at accommodation establishments by emphasizing conceptual perspective about job satisfaction. Minnesota Satisfaction Questionnaire which evaluates job satisfaction regarding 20 dimensions has been used as a mean of data collection. Application field of the research consists of 397 employees who work at 5 star hotel establishments in Ankara. The data were solved using percent, frequency, mean, standard deviation, t-test, Anova and Tukey analysis. As a result of this research; it has been seen that, there is no statistical difference about job satisfaction level of employees work at hotel establishments considering their gender and marital status. Besides, it has been understood that, there is a statistical difference about job satisfaction level of employees considering their ages, education levels, incomes, and length of time in tourism sector.*

***Keywords*:** job satisfaction, demographic components of employee's, accommodation establishments.

JEL Codes: *J28, L83*

INTRODUCTION

Nowadays establishments which are active in high competition environment, manage their activities based on providing high value to customers and presenting quality products which are produced with minimum cost. This is only possible by the existence of productive employees with high job loyalty and high performance who arise as a result of effective human resources management. To develop a team consists of these kind of employees requires high job satisfaction (Cranny et al., 1992).

Job satisfaction is generally determined according to how outcomes meet or exceed expectations. For example, if employees' feel that they are less rewarded even

* Derya KARA (Phd, Visiting Scholar), Affiliation : Virginia Polytechnic Institute and State University, Department of Hospitality and Tourism Management, Blacksburg, Virginia, USA

though they work much more than other employees from the same department; they may develop a negative attitude against their jobs, colleagues and managers (Soyer and Can, 2007). Behaviors related to job satisfaction have some effects on work life and apart from work life. These are employees' health (physical, psychological, and mental health, life period, fatigue, drug and alcohol addiction), apart from work behaviors (family life, marriage, rest, happy life) relationships in work behaviors and productivity (organizational citizenship behaviors, work performance), and behaviors effecting work productivity (work delay, irregular attendance at work, employee's turnover rate, to sabotage work) (Ezzedeen, 2003). According to tourism research findings, the majority of hospitality and tourism employees leave the industry as a result of low job satisfaction, poor working conditions and absence of motivating factors (Kuslavan and Kuslavan, 2000). High turnover rate is very important component in the tourism industry and it ultimately produces higher overhead costs and lower quality customer service (Kuruuzum et al, 2009). This also brings the need for hiring a highly qualified and dedicated staff (that will stay with the company); and the need for overcoming the unique aspects of managing employees in the tourism and hospitality sector. If employee has the feeling that his/her expectations are not faced; job dissatisfaction occurs. Job dissatisfaction causes employee's labor force productivity to affect negatively, employee's work dependence to decrease and voluntary labor turnover to increase (Miner, 1992). Managers desire employees to have high jobs satisfaction levels so, according to their experiences, they make an effort to provide job satisfaction and increase it (Akinci, 2002).

In hospitality industry, like in many other industries, employees' decisions about their labor force participation reasonably depend on job satisfaction. Consequently, analysis of job satisfaction may provide insight into employees' perceptions of certain aspects of the nature of the hospitality and tourism sector (Clark, 1996). Therefore, this present study is designed to address employee job satisfaction using data from five-star hotels in Ankara, Turkey. This present study has been clarified according to different features of employees (gender, marital status, age, education level, income and length of time in the tourism sector) who work at accommodation establishments by emphasizing conceptual perspective about job satisfaction.

JOB SATISFACTION AND DEMOGRAPHIC COMPONENTS

Job satisfaction is determined not only by the employees' objective working situation, but also by their subjective perceptions about their job (Mora and Ferrer-i Carbonell, 2009). Hagedorn (1996) has determined job satisfaction as person's evaluation about his/her job considering individual and personal values (Hagedorn, 1996). Locke (1969) has determined job satisfaction as "pleasurable emotional state

resulting from the appraisal of one's job as achieving or facilitating the achievement of one's job values" (Locke, 1969).

Among the components of employees' attitudes toward their jobs, researchers specifically have been interested in with job satisfaction. Determinants of job satisfaction identified by so many researchers. For example, DeSantis and Durst (1996) identified four major determinants on job satisfaction and these are monetary and nonmonetary rewards, job characteristics, work environment characteristics, and personal characteristics. Ellickson and Logsdon (2001) have been categorized the determinants of job satisfaction into two major groups as environmental antecedents (work-related factors) and personal factors (Jung et. al, 2007).

It can be seen with a literature review that, various researchers examined different components such as gender (Mora and Ferrer-i Carbonell, 2009; Okpara et al., 2005; Clark, 1997; Kim, 2005; Jung et al, 2007; Kelly, 1989; Koyuncu et al, 2006; Eskildsen et al, 2003; Donohue, 2004; Al-Ajmi, 2006; Frye and Mouth, 2007), marital status (Inlow, 1951; McDonald and Gunderson, 1974; Saiyadain, 1985; Bures et al, 1996), age (Lee and Wilbur, 1985; Reiner and Zhao, 1999; White and Spector, 1987; Rhodes (1983) and Doering, 1983; Kacmar and Ferris, 1989; Eichar, Norland, Brady and Fortinsky, 1991; Warr, 1992; Clark et al, 1996; Lord and Farrington, 2006), educational level (Glenn et al, 1977), income (Nash and Stephen, 1975; Clark and Oswald, 1996), length of time (Hutchinson, 1963; Ronen, 1978; Stemple, 2004) and job satisfaction.

Gender. Research results which states relation between job satisfaction and gender differences. According to Hickson and Oshagbemi (1999) the findings about gender differences related to job satisfaction have been inconsistent from the 1950s to date (Al-Ajmi, 2006). For example, some studies (Mora and Ferrer-i Carbonell, 2009) find that males show more satisfaction in their job than females. Yet, other studies (Okpara et al., 2005; Clark, 1997; Kim, 2005; Jung et al, 2007) indicate that females have more satisfaction than males. Kelly (1989) found that women are significantly different from men in their job satisfaction level, but this differences is small (Kelly, 1989). However, other studies (Koyuncu et al, 2006; Eskildsen et al, 2003; Donohue, 2004; Al-Ajmi, 2006; Frye and Mouth, 2007) found no significant gender differences in job satisfaction. Under these conditions, this particular study proposes the following hypothesis:

H_1: There is a statistical difference in job satisfaction levels considering gender of employees.

Marital status. Marital status is one of the components of the job satisfaction determinants. According to some researchers (Inlow, 1951; McDonald and Gunderson, 1974) there are positive relationships between marital status and job satisfaction. However, Saiyadain (1985) has claimed that there is no relationship between marital status and job satisfaction. Bures et al. (1996) found that spousal support lead to greater

job satisfaction and this may be important for women. It can be seen that female employees continue to bear primary responsibility for home and child care despite their increased role in the workplace (Testa and Mueller, 2009). Thus, next hypothesis is:

H_2: There is a statistical difference in job satisfaction levels considering marital statuses of employees.

Age. There are so many contradictory explanations about job age and job satisfaction. Some studies (Lee and Wilbur, 1985; Reiner and Zhao, 1999) have showed that there is a positive assocation between age and job satisfaction. The positive relationship between age and job satisfaction is suggested that older employees may have more realistic expectations about their jobs and a stronger sense of achievement (with their longer tenures) than younger employees do (Jung and et al, 2007). White and Spector (1987) found that there is a positive linear relationship between age and job satisfaction. The findings suggested that older workers were more satisfied with their jobs due to greater job congruence, locus of control, salary and longer tenure (Bowling, 2007). Rhodes (1983) and Doering (1983) examined the relationship between job satisfaction and age and found that job satisfaction was positively and linearly related with age (Oshagbemi, 2003). Lam and et. al., (2001) investigated employees' job satisfaction in Hong Kong Hotels and determined that wages were the most important category contributing to job satisfaction. However, employees, in general, are not satisfied with their monetary rewards (Lam et al., 2001). However, other studies (Kacmar and Ferris, 1989; Eichar, Norland, Brady and Fortinsky, 1991; Warr, 1992; Clark et al, 1996) have found U-shaped relationship between age and job satisfaction This suggests that satisfaction increases with age through a mid-career stage and then levels off or decreases in later work years. Conversely, the study was done by Lord and Farrington (2006) found that there are no significant differences between older and younger workers on job satisfaction (Feng Kuo and Show Chen, 2004; Testa and Mueller, 2009). Addressing these issues; this particular study proposes the following hypothesis:

H_3: There is a statistical difference in job satisfaction levels considering age of employees.

Educational Level. Service organizations may be able to meet or even exceed the expectations of highly educated employees (Sharma and Jyoti, 2009). Glenn et al. (1977) suggest that education is has a negative effecct on job satisfaction. Because increased the employees education related with higher expectations and, employees may become dissatisfied with routine tasks required for most jobs (Oshagbemi, 2003). Gallardo et al (2010) reported that well-educated hotel employees are less satisfied with their jobs than those with lower educational levels. Employees who have higher educational profiles would expect more from their jobs than those with lower profiles (Gallardo et al, 2010). Hence, the next hypothesis is:

H_4: There is a statistical difference in job satisfaction levels considering educational level of employees.

Income. Another demographic component to related job satisfaction is income. Nash and Stephen (1975) investigated relationship between income and job satisfaction and income has been found to have a positive correlation with job satisfaction. Parasuraman and Futreel have also examined job satisfaction related to demographics such as age, tenure, educational level and income. Among the demographics income has the largest number of significant positive associations with the satisfaction (Parasuraman and Futrell, 1983). Clark and Oswald (1996) researched satisfaction and comparison income using data 5,000 British workers and they found two findings. One of them, workers' reported satisfaction levels inversely related to their comparison wage rates. Other one, holding income constant, satisfaction levels are strongly declining in the level of education (Clark and Oswald, 1996). Under these conditions, this particular study proposes the following hypothesis:

H_5: There is a statistical difference in job satisfaction levels considering income level of employees.

Length of time. Hutchinson (1963) investigated job satisfaction levels of teachers in North America and found that overall job satisfaction increased with length of service (Jabnoun and Fook, 2001). Also, Ronen (1978) investigated the relationship between job satisfaction and length of employment in a particular job and found that length of the sevice is related to job satisfaction and dissatisfaction (Oshagbemi, 2003). However, Stemple (2004) in his study regarding the job satisfaction level of high school principals in Virginia reported that there was no significant difference in job satisfaction with total years of experience as a high school principal (Bowling, 2007). Addressing these issues, this particular study proposes the following hypothesis:

H_6: There is a statistical difference in job satisfaction levels considering length of time in tourism sector of employees.

In accommodation establishments which are parts of labor-intensive tourism sector, labor force is more important than other sectors. In this sector which service presenting employee and service receiving customer are face to face, as it is not possible for employees with low job satisfaction level to present satisfactory service and provide customer satisfaction, it is necessary for employees to be job satisfied for customers to roost with high satisfaction level (Akinci, 2002). Job satisfaction is desired by managers as it provides positive working conditions, while low job satisfaction can bring organizational efficiency loss and disciplinary problems (Davidson et al., 2010).

Analyzing job satisfaction in establishment provides management an idea about general satisfaction levels and explains employees' feelings about their jobs, which aspects of their jobs are related to these feelings and whose feelings are point at issue. For

this, job satisfaction analyzes are fundamental means of diagnosis about perspective in employee problems (Taşlıyan, 2007). The main aim of the research consists of stating job satisfactions of employees work at hotel establishments.

MEASURES

Survey method is used as a mean of data collecting to clarify job satisfaction of employees working in accommodation establishments, in Ankara.

Data collection took place during the months of September 2009 through February 2010**.** Since 5- star hotels tend to have a larger number of employees, these hotels were selected as a sample. These hotels also meet the rating requirements of five stars hotels as outlined by the Ministry of Culture and Tourism. The study used a proportional stratified random sampling based on the number of 5-star hotels and their total number of employees. According to a survey "Hotel and Tourism Industry Labor Force Survey", conducted by the Ministry of Culture and Tourism (1989), the number of staff per bed is 0.59 in the 5-star hotel establishments. Moreover, according to data obtained from the Ministry of Culture and Tourism (2009), the total number of beds in the certified tourism business is 19.401 in Ankara. Based on this information, the total survey population is estimated by multiplying the number of beds by the number of staff per bed, which resulted in "11.446". Hence the limit of the universe was taken as 11.446 and following the sample size calculation as suggested by Yamane (2001), the appropriate sample size was 371.

In the first part of the survey, there are some statements about demographic features of employees working in accommodation establishments. As for the second part of survey, "Minnesota Satisfaction Questionnaire" which evaluates job satisfaction regarding 20 dimensions and developed by Weiss et al. (1967) is used to clarify job satisfaction of employees. The questionaire form is composed of the twenty items as ability utilization, achievement, activity, advancement, authority, company policies and practices, compensation, co-workers, creattivity, independence, moral values, recognition, responsibility, security, social service, social status, supervision,- human relations, supervision-technical, variety and working conditions (Weiss et al., 1967). A five-point response scale was employed, ranging from 1 (very dissatisfiedl) to 5 (very satisfied). Survey data taken from 397 employees to clarify job satisfaction of employees working in accommodation establishments considering their demographic features, analyzed using appropriate statistics program (SPSS 15.0). General reliability level of job satisfaction measure used in research is determined as Cronbach Alpha 0.93.

FINDINGS

4.1. Demographic Components of Respondents

It has been seen that employees included in research are 58,9% male, 41,1% female and most of them are distributed between 21–30 (52,95%) age group, most of them single (% 58.7), 47,1% of them belong to high school education group; majority of them (67,5%) belongs to 1500 TL and less income group and more than 62.0% have worked in the tourism sector five years or less. Findings gained in the result of research are presented in tables as follows.

Table 45 *Distribution of Employees' Job Satisfaction Averages Considering Gender and Marital Status*

		Group satistics			Test statistics		
		n	**mean**	**s**	**t-value**	**df**	**sig.**
Gender	Male	234	,1775	,03869	,470	395	,639
	Female	163	,1757	,03468			
Marital Status	Married	164	,1806	,03746	1,730	395	,084
	Single	233	,1741	,03661			

A research was made to determine if there is a statistical difference in job satisfaction levels considering genders and marital statuses of employees included in research (Table 45). According to this, as a result of t-test made between employees' genders and marital statuses, it has been seen that there is no statistically significant difference ($p<0,05$).

Table 46 *Distribution of Employees' Job Satisfaction Averages Considering Different Parameters*

		Group satistics			Test statistics		
		n	**mean**	**s**	**f**	**df**	**sig.**
Age	20 and less	39	,1587	,03884	6,184	3–393	,000
	21–30	210	,1758	,03608			
	31–40	103	,1787	,03508			
	41 and over	45	,1926	,03823			
	Total	397	,1768	,03706			
Education Level	Primary Education	28	3,7714	,69141	9,934	4–392	,000
	High School	159	3,3060	,70308			
	Önlisans	90	3,5044	,79872			
	Lisans	91	3,8621	,62193			
	Lisansüstü	29	3,6362	,72971			
	Total	397	3,5354	,74116			
Income	1500 and less	268	,1682	,03609	32,940	2–394	,000
	1501–2500	99	,1881	,03239			
	2501 and over	30	,2158	,02305			
	Total	397	,1768	,03706			

		Group satistics			Test statistics		
		n	mean	s	f	df	sig.
Length of time in tourism sector	2 or less	156	,1706	,03656	10,589	3–393	,000
	3-5	131	,1738	,03279			
	6-8	61	,1780	,03862			
	9 and over	49	,2029	,03728			
	Total	397	,1768	,03706			

A research was made to determine if there is a statistical difference in job satisfaction levels considering ages, education levels, income levels and work periods in sector of employees included in research by using Variance Analysis test (Table 46). According to this;

It has been determined that, there is a statistically significant difference between ages and job satisfaction of employees ($p<0,05$). Afterwards, to determine the age group causing this difference; a research was made with Tukey HSD test which is one of Post Hoc tests. As a result of this research, it has been determined that there is not a statistically significant difference between answer averages of employees belonging between 21-30 and between 31-40 age groups; while dual differences between answer averages obtained from other age groups are statistically significant.

It has been determined that, there is a statistically significant difference between education levels and job satisfaction of employees ($p<0,05$). Afterwards, to determine the education level group causing this difference; a research was made with Tukey HSD test which is one of Post Hoc tests. As a result of this research, it has been determined that there is a statistically significant difference between answer averages of employees belonging primary- college and graduate and associate-college and graduate education groups; while dual differences between answer averages obtained from other education groups are not statistically significant.

It has been determined that there is a statistically significant difference between employees' incomes and job satisfactions ($p<0,05$). Afterwards,to determine the income group causing this difference; a research was made with Tukey HSD test which is one of Post Hoc tests. As a result of this research, it has been determined that dual differences of answer averages of employees in all groups are statistically significant.

It has been determined that, there is a statistically significant difference between length of time in tourism sector and job satisfaction of employees ($p<0,05$). Afterwards, to determine the length of time causing this difference; a research was made with Tukey HSD test which is one of Post Hoc tests. As a result of this research, it has been determined that dual differences of answer averages of employees belonging 2 or less/9 and above, between 3–5/9 and above and between 6–8/9 and above length of time groups; are statistically significant.

CONCLUSIONS

Employees who work at hotel establishments, which are fundamental members of accommodation establishments; to obtain a better service to their customers, it is essential to employ job satisfied employees. Job satisfied employees will be able to be more efficient on establishment's success. As job satisfaction refers to employees' positive and negative feelings to their jobs, job satisfied individuals will be able to contribute establishment's success. In this context, the main aim of the research consists of stating job satisfactions of employees work at hotel establishments regarding different parameters (gender, marital status, age, education level, income level, length of time in tourism sector) in Turkey using a job satisfaction scale adopted from Minnesota Satisfaction Questionnaire.

In the research, satisfaction level of employees who work at hotel establishment is analyzed observing different parameters. As a result of the research; it has been seen that, there is no statistical difference about job satisfaction level of employees work at hotel establishments considering their gender and marital status. H1 and H2 hypoteses weren't support. Some study results was done by researhers (Koyuncu et al, 2006; Eskildsen et al, 2003; Donohue, 2004; Al-Ajmi, 2006; Frye and Mouth, 2007) supports current study.

Nevertheless, it has been seen that there is a statistical difference about job satisfaction level of employees considering their ages, education levels, incomes and length of time in tourism sector ($p<0,05$). According to research results, H3, H4, H5 and H6 hypoteses were support. Considering their ages, it is clarified that, the difference between answer averages of employees whose ages are between 21–30 is not statistically significant, while the dual difference between answer averages which are obtained from other age groups is statistically significant ($p<0,05$). Compared to their younger colleagues, an older employee seems more satisfied. This may originate from their expectations. Considering their education levels, it has been determined that the answer average difference between employees belonging primary- college and graduate and associate-college and graduate education groups is statistically significant ($p<0,05$). Considering their incomes; it has been stated that the dual difference of answer averages of employees in all income groups are statistically significant ($p<0, 05$). When their income level raise, their job satisfaction increase. Considering their length of time in tourism sector; dual differences of answer averages of employees belonging 2 or less/9 and above, between 3–5/9 and above, between 6–8/9 and above length of time groups are statistically significant. This results consistent previous studies (Hutchinson, 1963; Ronen, 1978). Research results show that; ages, education levels, incomes and length of time in tourism sector of employees work at hotel establishments, are effective on their job satisfaction level.

From a theory building perspective, the main contribution of this research to our existing knowledge is the clarified according to different parameters of employees who work at accommodation establishments by emphasizing conceptual perspective about job satisfaction. In other words, it is through accounting for the variables that are routinely present in the hospitality work environment that can generate useful and actionable pragmatic information. Employees who are satisfied with their jobs will be able to be more efficient, so they will be able to contribute to increase establishment's performance. Employees can be unsatisfied with their jobs because of many different reasons; as a result, individual and organizational problems might occur. Considering these problems may bring heavy costs to establishment, it is essential for accommodation establishments which are also service establishments, to provide individuals with job satisfaction.

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ENTREPRENEUR PSYCHOLOGICAL TRAITS AND PERFORMANCE: IMPLICATIONS FOR NIGERIAN NON-OIL SMES EXPORTING COMPANIES

Omotayo Joseph OYENIYI[*], Anthonia Adenike ADENIJI[**]

Abstract: *The purpose of this paper is to investigate the impact of psychological traits on performance of small and medium sized (SMEs) exporting firms in a developing country. The study made of survey method to reach one hundred and twenty three firms. Descriptive and inference statistics were used to test the hypotheses. The results showed that the psychological traits tested (need achievement, locus of control and self-efficacy) are related among themselves and positively related to performance of the studied firms. Subjective measures were used to test performance. The findings are in line with some other studies using similar variables. The major contribution of this paper is it's the relationship between entrepreneurial psychological traits and performance in a developing African country like Nigeria.*

Keywords**:** *Psychological traits; need achievement; locus of control; self-efficacy; performance*

JEL Codes: *L25, L26*

INTRODUCTION

The growth of most economies depends essentially on the vibrancy of the entrepreneurship. Entrepreneurship has been found to create employment, offering unlimited opportunities to the people, development of pool of skill and semi-skilled workers and helping them to generate income. According to Chen, Tzeng, Ou and Change (2007) most industrial nations were built by entrepreneurial individuals. A number of these entrepreneurial individuals started their business ventures through sole proprietorship or small and medium-sized enterprises (SMEs). SMEs are seen as the

[*] Omotayo Joseph OYENIYI, Department of Business Studies, Covenant University, Ota, Ogun State, Nigeriaomotayooyeniyi@yahoo.com

[**] Anthonia Adenike ADENIJI, Department of Business Studies, Covenant University, Ota, Ogun State, Nigeria, anthoniaadenike@yahoo.com

engine of growth of any economy. They play a vital role in the global economy (Kropp, Lindsay and Shoham, 2006). However, the perception of African entrepreneurship among scholars and researchers on SMEs differ considerably. This is because of seemingly lack of technical entrepreneurial talent in the establishment and management of manufacturing industries (Adegbite, Ilori, Irefin, Abereijo and Aderemi, 2007). The lack of technical entrepreneurship has been proven in African continent because of glaringly lack of meaningful development and economic advancement in sub-Sahara Africa (Okpara and Kinmbiadis, 2008). The promotion of SMEs according to Kazeem and van der Heijden (2006) is one of the best strategies to achieve national development and high level of competition.

The development of SMEs is significant in developing countries like Nigeria that suffers from high level of unemployment, lack of investment, balance of payment deficit, high level of poverty etc. This is because the growth of SMEs provides solutions to some of the complex economic and developmental problems of these countries (Beugelsdijk, 2007). The development of SMEs is a function of depth and availability of entrepreneurs. Entrepreneurship is a decisive factor for a country to attain a reasonable level of competitiveness. SMEs are the driving force for the achievement of economic development and creation of jobs and contributing to personal development of both employees and the owners. Moreover, SMEs are used as vehicles of establishing business enterprises in developing countries like Nigeria.

Entrepreneurship is multidimensional process that requires further research studies. This is because existing literature is filled with inconsistent definition of entrepreneur and the relevance of personality traits on the success of the entrepreneur (Beugelsdijk, 2007; Jaafar and Abdsul-Aziz, 2005). More importantly, most of the researches in this area were conducted in developed countries particularly USA and European Countries (Adegbite, et. Al 2007). There are a number of studies in literature that had suggested a relationship between personal attributes of an entrepreneur and the success of the firm (Adegbite, et al., 2007). These attributes are described with different adjectives and synonyms. Kasheed (2002) identified need for achievement, creativity and initiative, risk taking and objective setting, self confidence, internal locus of control, energy, commitment and persistency as salient features of successful entrepreneurs. From the above discussion, this study attempts to bridge the research gap of inadequate study on the effect of entrepreneurs' psychological traits on firm outcome in a developing country like Nigeria. The objectives of this study therefore, include determining the extent of influence of the entrepreneurs' psychological traits on firm performance in Nigerian non-oil SMEs exporting sector.

In Nigeria, SMEs account for about 80% of the industrial sector, in terms of number of employees and enterprises. SMEs also account for 10% of manufacturing

output and meager 1% of gross domestic product (GDP) (Adegbite, et. al, 2007; Nigeria Investment Promotion Commission, 2003). Parts of the challenges faced by SMEs despite its contributions include inadequate technical entrepreneurial talent, persistent low level of technology, shortage and inadequate entrepreneurial skill of operators and absence of an effective management technique (Adegbite, et. al 2007; UNIDO, 1994). This makes it difficult for SMEs to compete effectively in technologically driven, knowledge based and export oriented global market. The present study attempts to assess the relationship between technical entrepreneurial characteristics and firm level behaviour and performance of SMEs in Nigeria.

LITERATURE REVIEW

The entrepreneur is the individual that identifies opportunities, gather necessary resources, creates and is ultimately responsible for the performance of the firm (Adegbite, et al. 2007). The above definition did not account for the entrepreneur characteristics as well as the effect of social, cultural, psychological, political and economic contextual factors. The model for the influence of characteristics of the enterprise, comprise of thoughts, ideas or dreams of the individuals, particularly of the founding individual (Tonge, 2001). Other important characteristics factors for the success of the entrepreneur include the need of achievement (McClalland, et al. 1989); risk taking propensity (Brockhaus, 1980); locus of control (Markman and Baron, 2003) and desire for personal control of business (Sexton and Bowman, 1983). More importantly, other background factors have been identified to be related to characteristics of entrepreneur. These background factors include previous employment, family background, age and gender, education and religion (Storey, 1982; Adegbite, et al. 2007).

The concept of entrepreneur in literature has no acceptable definition. Rasheed (2002) suggested certain basic attributes of an entrepreneur, these attributes include need for achievement, creativity, initiative, risk taking, self confidence, internal locus of control, need for independence and autonomy, commitment and persistency. However it is important to note that some authors had argued against the use of disposition attributes of the entrepreneur as a useful predictor of organizational success (Visser, Corning and de Smit, 2005). While on the other hand some researchers are in favour of the use of dispositional attributes as useful tools in theories of behavior in organization (Visser, Corning and de Smit, 2005)). It is worthy of note that failure of previous research to identify acceptable set of characteristics for profiling an entrepreneur has led some scholars to shift attention to entrepreneurial behavior (Poon and Aiunddin, 2006). Therefore, a number of studies have used an individual level of analysis; recent research however has focused on the firm level of behavior to explain entrepreneurial performance.

In the opposite direction other stream of researches, however, contend that without the entrepreneur there is no entrepreneurship and it is important to study entrepreneurship at the individual level using trait based approach (Johnson, 1990). However, the use of only dispositional characteristics may not be enough to explain firm-level outcome and for complete understanding of the entrepreneurship process. Few studies have examined how personality traits and firm-level behavior are related particularly in Nigerian business environment.

The need for achievement trait has been linked empirically to entrepreneur activity which is defined as the tendency to choose and persist in activities that hold a moderate chance of success without undue risk of failure (McClelland, Koestner, and Weinberger, 1989). It has been established in literature that people with a strong motive for achievement have a strong desire to be successful, accept responsibility, seek objective performance feedback, set achievable goals and are willing to take calculated risks (Poon and Aiunddin, 2006). Therefore individuals with strong desire to succeed are likely to exploit entrepreneurial opportunities and perform better than those with a weak desire to succeed (Share and Venkataraman, 2000). This model has been more pronounced in entrepreneurs than non-entrepreneurs (Ahmed 1985). Achievement motive has been shown to predict entrepreneurial performance and success in both western (Miner, Smith, and Bracker, 1994) and non-western countries. Thus we propose:

H_1: Achievement motive will be positively related to firm performance

Locus of control refers to people believing that the success they achieve in life is determined by their own traits or behavior (internal locus of control) or that their success is determined by external factors such as fate (external locus of control). As obtained in literature people with high locus of control exert more effort and persist towards achieving valued outcomes (Poon and Aiunddin, 2006). Empirically it has been proven in literature that greater efforts and perseverance generally lead to higher performance (Markman and Baron, 2003). For example, locus of control has been found to be associated with academia performance, organizational change and career success (Judge and Boro, 2001). On the basis of this, we propose:

H_2: Internal locus of control will be positively related to firm performance

One other dispositional trait that is belief to affect entrepreneur success is self-efficacy traits. Self-efficacy concept is defined by Wood and Bandura (1989) to refer to 'beliefs in ones' capabilities to mobilize the motivation, cognitive resources and courses of action needed to meet given situational demands'. General self-efficacy expectations refer to people with varied and numerous experiences of success in a variety of situations. Generalized self-efficacy is described by Judge and Boro (2001) as the 'fundamental ability to cope, perform and be successful'. Previous studies had established a link

between self-efficacy and entrepreneurial intentions and actions. On the basis of this we propose:

H_3: Generalized self-efficacy will be positively related to firm performance

Method

This study made use of survey questionnaire to gather data. The study was carried out in Lagos, South West Nigeria. The working universe for this study is a compile list of registered non-oil exporters by Nigerian Export Promotion Council (NEPC). The compilation has the names of registered performing exporting firms, their locations (addresses), exported products, postal and email addresses. There are three hundred and eleven one (311) registered non-oil exporters as at December, 2009. Two hundred and twenty-one (221) of these registered companies are located in Lagos and its environs. The study made use of all registered non-oil exporters in Lagos. This is partly for convenience and partly because of the relative small size of the registered companies in Lagos. According to Asika (1991) the best sample size is a complete census of the population. As such all the elements of the population are expected to be registered non-oil exporters in Lagos. One other justification for limiting the study to Lagos is that over 70% of the total registered non-oil exporting companies are located in Lagos. Lagos is Nigeria's former Federal Capital City and it is the country main manufacturing and commercial centre.

Most of the registered non-oil exporting companies are small scale business. Small scale businesses are defined by Central Bank of Nigeria (2001) and Bankers Committee as those businesses with capital outlay of between N1 million and N50 million, excluding the cost of land and employing between 10 to 50 full-time workers. Structured questionnaire was used to gather data for this study. The respondents were entrepreneurs of registered SMEs involved in non-oil exporting sector. To ensure good response rate and to overcome the challenge of delayed postal services common in Nigeria, a drop-off and pick-up method was used. One main advantage of this method is that it ensures reliable distribution and collection procedures which are systematic and controlled by the researcher. A total of 123 usable out of 221 copies of questionnaire distributed were retrieved which provide a response rate of 56%.

Measures

A number of the items in the questionnaires were adopted from previous studies. For example, achievement motive was measured using a three item, 7-point Likert type scale that was originally developed by Edward (1959) to measure achievement motivation. Question items for need for achievement include: I will accept responsibility for my own performance, I want to know how well am doing. The reliability scale of the items is 0.75. Rotter (1966) original 4-item measures were used to measure internal locus

of control. The items were originally developed to measure generalized expectations. They have tested to have high reliability and validity in a number of studies (Boon and Debrabander, 1993; Boon, Debrabander, and van Vitteloostuijn, A.. 1991). The four items adopted for this study are; (a) many unhappy things in peoples' lives are partly due to bad luck; (b) peoples' misfortune result from the mistake they make; (c) most employees do not realize the extent to which their actions are influenced by accidental happenings; (d) becoming a success is matter of hard work, luck has little or nothing to do with it. The reliability of the scale is 0.79. Generalized self-efficacy was measured using 5- item taken from Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs, and Rogers, (1982). The question items used in this study include failure makes me try harder; I feel insecure about my ability to do things. The reliability of the scale is 0.81.

Within the Nigeria business environment, owners are usually reluctant to reveal business financial records and request on this may elicit low or no response. As such subjective measures of performance are used. The use of subjective, self-reporting measures of performance is consistent with past research (Smart and Conant, 1994; Poon and Aiunddin, 2006). More importantly, empirical evidence has shown that there is a high level of correlation between subjective views of managers' perception of their firms' performance and the actual performance as indicated by objective measures (Wall, Michie, Patterson, Wood, Sheehan, Clegg, and West, 2004). The respondents were asked to assess both growth and functional performance of their firms. Eight-item performance scale ranging from very poor (1) to very good (5) was used. The Cronbach alpha of this scale is 0.83

Results

Principal component factor analysis was calculated for the question items. Factor extraction resulted in single factor loading in each of the four scales ranging from 0.75 to 0.83. The component factor analysis and Varimax rotation produced Eigenvalue greater than 1.0 and factor loading greater than 5.0. The four variables used to measure psychological traits are highly loaded.

Table 47 *Principal Component Factor*

Variables	Items	Factor Loading
Need Achievement	4	0.75
Internal Locus of Control	4	0.79
Generalized Self-Efficacy	5	0.81
Performance	7	0.83
Eigenvalue = 2.43		
Variance explained = 61.3%		

Mean scores psychological traits and performance is indicated in Table 48. In all the variables tested, the mean scores range from minimum of 3.78 (internal locus of

control) to 4.53 (generalized self-efficacy), while need achievement and performance have 3.81 and 4.51 respectively. Analysis of Table 48 shows the relationship between psychological traits (need achievement, internal locus of control, generalized self-efficacy and performance). The table indicates that the three psychological traits tested have positive relationships among themselves and performance some at 0.05 while others are at 0.01. For example, need achievement is positively related to the other two psychological traits test: internal locus of control ($r=0.61$, $p<0.05$) and generalized self efficacy ($r=0.68$, $p< 0.05$). The three psychological traits are also positively related to performance: need achievement ($r=0.66$, $p< 0.01$); internal locus of control ($r= 0.58$, $p<0.05$) and generalized self-efficacy ($r=0.64$, $p<0.05$). This result supports our hypotheses and it is consistent with earlier studies (Mostafa, Wheeler, and Jones, 2006).

Table 48 *Descriptive Statistics and Correlation Analysis for the Study*

	Mean	SD	1	2	3	4
Need Achievement	3.81	0.68	1			
Internal locus of Control	3.78	0.72	0.61*	1		
Generalized self-efficacy	4.53	0.80	0.68*	0.52*	1	
Performance	4.51	0.73	0.66**	0.58*	0.64*	1

*p<0.05; **p<0.01

The regression results in Table 49 show the impact of need achievement on performance. The impact of need achievement obtained is R= 0.285 (28.5). This shows a strong relationship between need achievement and performance. The explanatory power of the relationship is R^2= 0.250 (25%). The implication of this is that 25% of the performance of the studied organization can be traced to need achievement. The other percentage 75% is explained by other factors aside from need achievement. The F-ratio is 0.000 which is statistically significant, while the t-ratio indicates the significance of need achievement to performance.

Table 49 *Regression Analysis of Need Achievement and Performance*

R	**0.285**
R2	0.250
Std error	0.576
Dw	1.353
F	13.394
Sig. F	0.000
Beta coefficient	0.344
t-cal	0.317
Sig t	0.00

The result of the analysis of inverse relationship between internal locus of control and performance is shown in Table 50. The result showed similar trend with the earlier

analysis. The R value is 0.275 (27.50%) and its explanatory power R^2 is 0.253 (25.3%). This can be interpreted to mean that 25.3% of performance is due to internal locus of control. F-ratio is statistically significant at .000 and the t-ratio showed that internal locus of control of the studied firms has significant impact on its performance. Therefore, from the above it can be interpreted that there is strong relationship between psychological traits and performance. The performance of the studied firms is also strongly influenced by the level of psychological traits of the owners.

Table 50 *Regression Analysis of Internal Locus of Control and Performance*

R	0.275
R2	0.253
Std error	0.506
Dw	1.870
F	19.022
Sig. F	0.000
Beta coefficient	0.492
t-cal	10.981
Sig t	0.002

DISCUSSION

The purpose of this study is to investigate the relationships between entrepreneur psychological traits and the level of performance of SMEs in Nigerian non-oil export sector. The variables used for entrepreneur psychological traits are need achievement, internal locus of control and generalized self-efficacy. Performance was measured with subjective variables as it may be difficult to obtain objective measurements. In this analysis of the relationship, it was discovered that psychological traits have positive relationships among themselves. Need achievement have strong positive relationship with both internal locus of control and generalized self-efficacy. Internal locus of control also has positive relationship with need achievement and generalized self-efficacy. Similarly is the relationship between generalized self-efficacy and need achievement and internal locus of control. This result is at variance with the findings of Poon and Aiunddin (2006).

Internal locus of control is significantly related to firm performance. This indicates that the higher an entrepreneur was on internal locus of control, the better is the performance of the firm. The relationships among the psychological traits of entrepreneur may be interpreted to be both additive and interactive. However, the effects of specific self-efficacy on performance need to be explored. This is because the relationship between self-efficacy and firm performance is more complex than a simple generalized relationship. The need to identify characteristics that predispose an entrepreneur to succeed is of great importance in a developing economy like Nigeria.

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ESSAY

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THE ECONOMIC DEVELOPMENT OF BUKOVINA (I) THE FIRST PERIOD OF AUSTRIAN RULE: 1774 - 1849

Liviu-George MAHA[*], Gabriel DONICI[**], Sorin-Ştefan MAHA[***]

Abstract: *The annexation of Bukovina by the Habsburg Empire was a decisive moment for its economic and social evolution. The measures taken by the new administration, right after 1775, created the basis for a rapid economic development, which had positive effects on the standard of living and the quality of life in the region. The administrative reform, the transformation of the legal system, the investments in infrastructure, the new fiscal rules, as well as all the other economic policies which were promoted, generated a considerable economic progress. However, we shouldn't omit the contribution of the human factor, the period analyzed in this paper being characterized by deep demographic transformations. Economically, after the occupation of the province, Bukovina underwent spectacular transformation, stimulated by the development of infrastructure and by the influx of specialists from other parts of the empire, as well as by the new opportunities offered by the market and the State's policies promoting certain fields of activity. Industry recorded the most spectacular growth, the most dynamic industries being breweries, distilleries, milling, logging, the production of glass and paper etc. At the same time, the discovery of some pitch pits, salt water springs and peat deposits spurred the development of other industries.*

Keywords: *economic growth, reforms, immigration, values, mentalities, integration, economic development*

JEL Codes: *F15, F22, N13, N33, N43, O14, O52*

1. INTRODUCTION

For Bukovina, the period 1775 – 1848 was one of great social and economic changes, but, despite the huge changes[45], Bukovina was still far from what has made her

[*] Liviu-George MAHA, PhD, Lecturer, Affiliation: „Al. I. Cuza" University of Iaşi, Faculty of Economics and Business Administration, mlg@uaic.ro

[**] Gabriel DONICI, PhD Student, Affiliation: „Al. I. Cuza" University of Iaşi, Faculty of Economics and Business Administration, donici@gmail.com

[***] Sorin-Ştefan MAHA, PhD Student, Affiliation: „Al. I. Cuza" University of Iaşi, Faculty of Economics and Business Administration, sorin.maha@gmail.com

famous at the end of the XXth century. The province was still marching towards social and economic autonomy, multiculturalism, multi-ethnicity and multi-confessionalism.

The area known world wide as Bukovina, has a name with uncertain origins (German, Romanian, Ukrainian or Polish), which supposedly refers to the high number of beeches. Bukovina refers to various things like a specific historical place, a cultural and a geographical area, a law concept (Ehrlich's *"*Global Bukowina*"*), a land of tolerance etc.

The position of Bukovina in the Austrian Empire has varied in time. During the first eleven years of occupation the region was under military administration. The act of July 6th 1786 established the incorporation of Bukovina in Galicia. Later on, between 1849 and 1918, Bukovina was an autonomous duchy, although there were some conflicts with the Galicians in the first years of autonomy. Finally, in November 1918, Bukovina became a part of Romania.

2. THE FIRST YEARS

Historical aspects.

At the end of the XVIIIth century the European political context made possible the annexation of Bukovina by the House of Habsburg, in 1775. Before 1774, this area was the northwestern extension of Moldavia[46] into Poland and Russia (Clark, 1922). At that time, the region was considered a real "apple of Discordia" between the great regional powers: Russia, the Austrian Empire and "the young wolf of Europe" – Prussia.

The events that determined the fate of Bukovina were the Russo-Turkish War (1769-1774) and the First Division of Poland in 1772 (Bukovina Handbook, 1919).

In order to obtain this region, the Austrians used all sort of methods along the time, like mapping the territory or searching for arguments to prove Bukovina's membership in the Polish Pocutzia and even bribing the high officials of the Ottoman Empire and the Field-marshal Romatiev, the head of the Russian army.

Finally, on 1st of October 1774 the Austrian army entered the region and, one year later, the Ottomans recognized the annexation of Bukovina (at that time also known as Arboroasa) to the Austrian Empire. Thus, the Austrian Empire was the main beneficiary of the Russo-Turkish War.

The Empress had occupied this region with the Turks' acquiescence, during the negotiations for the peace of Kagniardji, as a compensation for preserving Moldavia and

[45] E.g.: the increase of the number of inhabitants; Meyer's Conversations-Lexikon 1843 stipulates that such a increase can be found only in the North American Free States

[46] The XVIII-th century Moldavia included today's Moldavia, Basarabia, Bukovina and the Herța region.

Wallachia. Although, in a first stage, the Habsburg Empire proposed a border between Hotin and Cernăuți, in 1775, it was left "undetermined". (Bukovina Handbook, 1919).

At the Convention of Palamutca (2nd of July 1776), there had been established the localities included in and the borders of the annexed area. The area had included the cities Suceava and Siret together with 226 villages and 52 parishes. Bukovina had 71.750 inhabitants and 10.441 square kilometers surface that corresponds to the nowadays adjacent area of the cities Suceava, Câmpulung, Rădăuți, Siret, Vicovul de Sus (from Romania) and Cernăuți, Vijnița and Storojeneț (from Ukraine).

Bukovina in 1775.

Although it's inappropriate to speak about Bukovina before 1775, we can make an analysis of the original territory and inhabitants. The Romanian Principalities had, in the XVIIIth century, an undeveloped economic structure based on the agrarian sector, the extensive exploitation of the resources and a cumbrous fiscal system. The political dependence to the Ottoman Gate and the high taxes were the main obstacles for the socio-economic development.

This part of Moldavia was in the same situation. Some of the early writings (1716) regarding to the area of Bukovina are the ones noted by Prince Dimitrie Cantemir in his book Descriptio Moldaviae. His notes about the development of the area are these:

- The region of Cernăuți stretches along the border with Poland. The most important fair is Cernăuți, situated on the north bank of the river Prut (Cantemir, 1973: 31).
- Rădăuți is a small fair and the seat of a bishop (Cantemir, 1973: p. 32).
- There are 3 great places for grazing in Moldavia, 2 of them being on the territory of Bukovina: in the Russian Câmpulung, on the river Putna, and in Câmpulung, on the river Moldova (Cantemir, 1973: 58).
- In Suceava and Cernăuți there are two judges ("*pârcălabi*"), because these are significant fortresses, and, also, there is a "*pârcălab*" in Câmpulung (Cantemir, 1973: 192).
- Câmpulung is one of the 3 places from Moldavia which has a large degree of autonomy. The area has 15 villages, each of them with its customs and its judgments (Cantemir, 1973: 224).

Talsky (1956) noted that, in 1775, there were only two cities in the region: Suceava and Siret. Cernăuți was an unimportant fair which was transformed into town in 1776 and became in 1779 the capital of the new province, reaching at the beginning of the XIXth century a population of 5.000 inhabitants. Shortly after being recognised as the capital of Bukovina, Cernăuți had become the largest city of the province.

According to the information of 1774-1775, most of the securities and real estates from Bukovina were owned by the 34 monasteries and hermitages . Wealth gained from

numerous donations was composed of 267 agricultural lands (scattered in the territory, from the Carpathians to the river Dniester), mountains, forests, forests reserves, hayfields, pastures, villages with workers (clăcaşi), Tartar and Gypsy slaves, mills, malt deposits, shops, inns, warehouses, lakes, fish rivers, vineyards etc.

Austrian measures.

After the occupation of the province, the new administration applied a number of reforming measures and politics. The first ones were those concerning the administrative and territorial organization.

The Habsburg Empire created an autonomous province "Bukovina", with Romanian the official language, in which established a military administration. This administration lasted until 1786 when Bukovina was incorporated into Galicia. On 19th of September 1790 an imperial decree had restored the province's autonomy. According to the decree, "Bukovina shall, under this name, be always considered and treated as an autonomous province...". Unfortunately, after the Napoleonic wars, Austria reverted to the innitial plan.

On 30th of December 1779, General Carol von Ezenberg, the governor of the province, submitted to Wien a comprehensive program. In his opinion, Bukovina had to be divided into five districts leaded by military managers who spoke Romanian.

For a more efficient administration in the region, he set up in Cernăuți, a central hall, the first legal instance of Bukovina (1781), introduced stamps for the villages (1783) and official emblems with heraldic significance (1787). These measures gave administrative roles to the villages.

În the village administration three villagers could run for the function of mayor ("jude"). After election, the mayor was exempted from taxes and his land was worked, through drudgery (corvee), by the other villagers. The administration had set the bounds between the land of the corvee workers and the ones of the great laity and clergy (1787), created the institutional framework for protection against fire (1786) and established night guards and alarm systems fires (Drăguşanul nd).

Another direction of action which was approached by the new authorities was restricting the power of the church. Of the 25 monastic establishments, 22 were removed, remaining in service only the monasteries Putna, Sucevița and Dragomirna - but their activity was also, limited. At the same time, authorities have removed the Bishopric of Rădăuți, respectively the Bishopric of Bukovina, from the jurisdiction of the Metropolitan Church of Moldavia. First, it was declared "Exempt Bishopric" and, later, it was put under the jurisdiction of the Serbian Metropolitan of Karlowitz.

On 27th of December 1781, Emperor Joseph II had approved the memoir of General Ezenberg regarding the inventory of the monastic estates and fortunes. The

measure was completed two years later, when *The Orthodox Fund of Bukovina*[47] was founded. The fund included all the sources of income of the churches and monasteries[48] and the movable and immovable assets. The Fund had been passed in the propriety of the Rădăuți Bishopric and, later, of the Cernăuți Bishopric[49].

Therefore, through the secularization of monastic possessions (excepting the three monasteries which weren't closed) by the imperial ordinance of 19th of June 1783, there has been created a huge economic trust, which held at that time 63% of the surface of Bukovina, along with a large number of estates[50] located in Moldavia.

An important step was the reform of the judiciary system. Until the annexation, in Bukovina, there was no *codex legum*. Solving of processes was done without lawyers, with the assessment of the local rulers („staroşti" and „ispravnici"), which formulated their judgments only *ex conscientae*. In special cases, was requested the advice of the Iaşi bishop, which had a legal code called "pravilă".

In 1786, there were developed two fundamental laws:

- *The Clerical Regulation* (Geistlicher Regierungsplan) through which the huge heritage of the Rădăuți bishopric has been moved under state administration "for the benefit of clergy and schools", „for the sake of the clergy, the religion and the humanity". Revenues were destined to cover all the expenses of the church and schools (29th of April 1786)
- *The forest trim for Bukovina*, which was the first Romanian forest code (1786).

These laws had made possible a legal framework suited to economic development. We can mention the most important laws: Circular of July 1791 which established the legal framework for the supply of the meat market in the country and in the capital, the fiscal provisions emitted in 1810 regarding a 10 percent "land tax" from the inherited domains, lead stamp patent for transit shipments (1810), *Mills Disposition* from the 1st of December 1814, the patent of 17th of November 1817 on charges for any charters, letters, policies, trade cards, tickets, calendars, newspapers, Customs regulations from 1818 concerning the export of "glass sheets", silk, cotton, wool, fur, leather, etc., Imperial patent of 8th of December 1820 "for discoveries and industry improvement", which allowed every manufacturer to acquire certain guarantees of protection from the state, Circular of 16th June 1821 regarding the quantum of royally roads customs, bridges customs and river passages customs, Order of July 25th 1828 on the rights and obligations of craftsmen, Circular of 15th of February 1833 for beer producers, Act of 3rd of

[47] Creating this fund was officially under the Regulation of 1786, "payment of expenses required for maintenance of church staff, schools, clergy sake of religion and humanity."
[48] 110 villages with 7.316 peasant families
[49] After moving the Bishopric headqurter to Cernăuți from Rădăuți
[50] They had a total area of 118,433 "*fălci*" of land.

November 1841 establishing a "credit cooperative", a bank for the farmers (Drăguşanul, nd).

We can say, therefore, that the Austrian legislation had contributed to the economic development of the region, being encouraged free trade, market economy and capitalist trade relations.

3. THE ECONOMIC DEVELOPMENT OF THE REGION AT THE BEGINNING OF THE XVIIITH CENTURY

In 1775, in the whole Bukovina, there were about 28.000 houses (Cantemir, 1973: 32), 34 monasteries and hermitages (and the adjacent buildings), 2-3 fortresses, some administrative buildings and a few mansions. Probably, the architectonic fund was higher at the beginning of the XVIIth century, but the "abandonment process", after moving the capital from Suceava to Iaşi, determined a strong migration.

The Habsburg economic policy aimed to maintain Bukovina the *agricultural and forestry "hinterland" of the empire* (Cocuz and Cucu, 1999: 21), and, therefore, the Austrians practiced, in the case of Bukovina, a social and economical discrimination against the other provinces of the Empire regarding the funds allocated from the state budget and the investments promoted.

Agriculture

In the memoir addressed to the Wien Aulic War Council in 1780, the Romanian boyar Vasile Balş presented the situation of agriculture in Bukovina: *Agriculture is in the worst condition because the peasant usually cultivate only as much as they need until next year. The region is characterized by an agriculture to cover the producer's consumption; the rotation of crops is not realized, each household produces only for its own consumption, without making trade with vegetable or animal products to other provinces.*

In 1775 most agricultural land was in the possession of monasteries and hermitages in the region, which they exploited with the peasants corvee and their villages of slaves. Also, especially due to lack of manpower in the region[51], a part of the estates were given on lease by the monasteries.

Because, until 1775, agriculture was practiced extensively and crops weren't rotated the long-term production was affected. Few plants were cultivated (corn, broomcorn millet, flax and hemp) with primitive techniques. The culture of Mulberry and the production of silk were achieved on the valleys of Pruth and Suceava. The producers in the area weren't familiar with wheat, barley, rye and other plants, which have been

[51] The density of the population was small (7 inhabitants on a square km).

brought later by the settlers, which also introduced the culture of potatoes (especially the Germans and Hungarians).

In the first part of the XIXth century, the interest for the cultivation of cereals: wheat, oats, barley and rye has increased; also the cultivation of potatoes has expanded. In the same period farmers started to use crop rotation, natural fertilizers, agricultural machinery, selected seeds and new agro technical methods of work.

With the annexation of the Bukovina to the Habsburg Empire, agriculture was given special attention because of its huge potential, and because Maria Teresa and Joseph II, the Austrian suzerains shared most of the physiocratic vision and philosophical doctrine. As a result, the Austrians have resorted to a series of reformist policies in this sector of activity.

Until 1786, peasants paid through statute labor and tithe their right to work the land and to use its products.

The measures imposed by the new administration included: the dislodging of the peasants property over the hayfields, plough lands and other grazing places (1786) was prohibited, cadastral measurements of the region were made (1818-1820), and the corvee and the tithe were dissolved (1848).

The replacement of oxen with horses and the introduction of steam agricultural machinery were also stimulated

In 1787, the peasants' lots of land were separate from those of the boyars; in a first phase, the lots were transferred into the ownership of communes and village council, and from 1835, the lots of lands used by peasants become their property.

Table 51 *The structure of rural property after the Revolution of 1848*

Owners	Percentage
The private propriety (large parcels)	19%
The domains of the Orthodox Found	26%
The public propriety	2%
The private propriety (small parcels)	45%
The communal propriety	8%

Source: Bucovina 1861-1918: Aspecte edificatoare pentru Europa Unită?: 2002: 85

Raising livestock

Based on an extensive exploitation of resources by 1775, breeding was not an important source of income for farmers.

Until 1774 Bukovina was mainly an agrarian area, where animals were grown extensively. The great amount of hay and pastures facilitated the growth of cattle, sheep's and horses. The variety of cattle was mediocre, a great amount of the produced milk being used for feeding the calves. The oxen were small, with little horns, but they were

strong and heavy. Usually cattle were grown in individual country households and rarely in farms or herds.

The same happened with sheep's, because of their small number the exploitation of pastures was not made at the maximum capacity; that's way in the district of Cîmpulung every year there were received thousands of sheep's from Transylvania and Moldavia. The small sized horses (which were resistant and very muscular) were present especially in the monks' troops. The Armenians, the Poles and the Tartars had troops with large sized horses. They were brought especially during summer for feeding.

It became significant in economic terms only after it started to acquire an intensive character. During Austrian occupation, the primary sector was focused on rising cattle because the pastures of Bucovina were considered the best in Europe.

Although Bukovina had a rich wild fauna we can not speak about organized hunting, the only ones who had this occupation were the shepherds.

The purchase of high horse, from outland, for military service and traction (up to 1775, in Bukovina, the horses had a mean size of about 105 cm) was carried out starting with the first years of occupation. Initially, the troop was founded, by the new administration in Văşcăuți (1788) in order to increase the number of horses for military purposes, and in 1792 it was moved to Rădăuți.

To ensure the troop with a necessary ground the Austrian Army has leased 9 810 hectares of land with 12,257 Florins and 21 Kroner from The Orthodox Found of the Bukovina. When it was established it had 1,400 horses, with the Moldavian, Russian, Polish or Turkish origins.

Industry

At the end of the XVIIIth century and at the beginning of the XIXth century the main industries in the Bukovina were: the extracting industry, the alcohol industry, skin processing industry (made in primitive ways by the inhabitants) and the timber industry.

Extracting industry

In the first years of Austrian occupation, the dominant industry in Bukovina was the exploitation of the iron, copper and salt mines. The most important soil resource was salt, but there were also deposits of copper, manganese, iron, etc. The ground for the Austrian extracting industry did not appear suddenly, in Bukovina being previously certified documentary mining baths in the valleys of Moldavia, Bistrița and Dorna.

In 1796, Anton Mantz of Mariensee started a modernization of the facilities from Iacobeni iron mine. He also acquired land for mining on the Bistrița and Moldavia river valleys.

Another representative iron mine was the one from Stulpicani, opened in 1801. There were also mines in the Baia area, from where they extracted plumb, gold, silver and iron ores.

Salt

Salt exploitation in the area was known for hundreds of years, but it was made in a primitive way. In 1775, salt was extracted from salt springs and fountains in Pârteşti and Solca. Also in the area people used three fountains with salty water (in Vijnița, Solonitza Valley and Putna). In 1775, recrystallized salt was brought from Galicia to Bukovina and rock salt from Târgu Ocna.

The Imperial Court of Wien, through the Military Administration of Bukovina, acted to provide alimentary salt for the inhabitants of the new province. In 1784, *The Office for Salt Testing*, opened in Solca and started operations to detect possible deposits in the areas of Solca, Pârteşti, Crasna and Voitinel.

Six years later, *The Office for Salt Testing* found salt deposit in Cacica, and a year later started the industrial extraction by cutting the rocks and by evaporation of the brine obtained after washing the minerals.

The extraction of salt started in Cacica in 1791, under the patronage of imperial authority, here being brought Galician specialists in extracting salt from brine and specialized workers from the slatterns Swirsk, Wieclizcka and Bochnia.

Beer industry

Josef Weineck, Julius Beill and Georg Meixner founded at the beginning of the Austrian rule beer plants in Cernăuți, Siret (the first beer plant in Bukovina) and Suceava. Later appeared the breweries of Ioniță Archip (1793), Berl Moldauer (with an estimated value of 6.263 florins in 1802), next to those from Rădăuți (1789), which was founded through the subvention of the Administration of The Orthodox Fund in 1789, and Solca (1810).

To encourage consumption, the Austrian administration granted a series of temporary tax exemptions for the production and distribution of beer in Bukovina, creating conditions for building the first factory. In 1786, the chief of the military administration, General Enzenberg, recorded in Bukovina the existence of 10 productive factories, a few others being in construction. Data on beer production in December 1834 stipulate that it was 244 barrels, the cost of a barrel being 29 Kreutzer (Cosovan, 2007).

Forestry and timber industry

Even in 1774 this district ("Upper Moldavia") was one the most richly wooded of the Moldavian provinces. The existent forests in the region have been a prime factor for the development of this industry. Since ancient times, Turkish merchants bought wood

from the Dorna region, which they carried on the river Bistrița to Galați, and further on to Chilia and Constantinople.

Due to the fact that in 1775 almost the entire forest was the property of monasteries, hermitages or individuals, we can not speak of an effective exploitation of them.

General Spleeny, military governor of Bukovina, issued on July 2nd 1776 the first *Forestry Ordinance* which provided disciplinary actions in the field, including the passage of all forests in the province under the imperial administration. General Enzenberg, the new governor of Bukovina installed in 1783, decided to employ German clerks in the forestry sector, to prevent the wood exploitation by locals.

In 1786 began the professionally administration of the forestry fund, and in 1818 the Austrian government forced even the private owners to leave the forests to be exploited by forest specialists.

Transport routes

The new administration started a system of transportation, used initially to supply military troops stationed in different parts of the region (a military government was often considered more effective than a civil one, which explains the military regime established at the beginning of the period after annexation).

The construction of roads has been ponderous; the Austrians have used carriage obligations, manual labor performance, supplies of goods for military and high fiscal obligations.

First of all, there were built the roads from Cernăuți to the adjacent localities. Thus, between 1786 and 1809, was built the military road from the border with Galicia (Northern boundary) to the one with Moldavia (Southern border). Construction of the road allowed the development of wood industry, the export being simplified.

Because of difficulties involved in transporting the wood, the Austrian administration tried to develop alternative infrastructures of transportation. At the beginning of the XIXth century, there was no railway infrastructure and the road was poorly developed, therefore they acted to develop the navigable channels.

This initiative was, however, hampered by the Moldavian refusal to accept her passing of any raft loaded with wood. Moldavia renounced to this attitude only in May 1842 (Aurelianu, 1876: 50). It's not a mistake to say that the timber industry had actually begun when timber was first floated down to Galatz and Constantinople for ship-building.

Commerce

Even if it belonged to the Habsburg Empire, in the early years of annexation, Bukovina was still bounded organically to the Romanian commercial space. Traders

engaged into a transit trade, which included the large weekly fairs in Bukovina and Romania.

In 1775 trade was practiced mainly by the Jews and Armenians, which bought local products (agricultural products, livestock, wool and timber) and sold them at a higher price in regions like Silesia, Poland and Turkey.

The balance between export and import products was positive, fact explained by the low imports of products - consisting mostly of luxury goods.

The positive difference could have been even higher, if peasants in Bukovina would have made the export activity, but the common practice was to sell the products to the Armenian and Jewish merchants.

Another proof of an active balance is that the peasants paid in time their tribute, which proves that the value of the capital input in Bukovina was higher than the output.

The internal production of cattle was insufficient and it was completed through trade, especially, with Moldavia, which was under the suzerainty of the Ottoman Empire. The specific products for trade were: high quality cheese, the Tartar lambs and wool.

Other trade branches present in the area were the ones with pigs, skins, furs and, especially, honey and wax. The amount of beehives was much bigger than those from the surrounding provinces. The commerce with beech nuts and acorns was well developed because of the numerous oak and beech forests. The forests were so numerous, that the Galician's used to bring their pig herds for fattening.

Tourism in Bukovina

At the beginning of the Austrian occupation there was no touristic sector in the area, though the existence of mineral springs in the Dorna[52] area and the population growth led to its appearance.

The main center of attraction was during that period, as now, the resort town of Vatra Dornei. Dorna has developed since the XVIIIth century, around the resort spas created after the discovery of huge mineral water reserves[53]. Although there were curative baths in Gura Humorului and Solca, the potential of the settlement Vatra Dornei was incomparably greater.

At first, curative baths were made within sick people houses with water from the fountain of John's spring brought by them. Later on, with the increasing touristic activities, started the arrangement of the curative bath, proposed by doctor Plush. The resort was built by engineer Buholzer on the so called Cratzer's property, with technical and material help from the owner of the Iacobeni mines, Manz of Mariensee. The

[52] In the first years there have been identified 2 mineral water springs in Vatra Dornei.

[53] The importance of the mineral springs was recognized in 1805 through the studies of doctor Ignatziu Plusch.

building had six bath tubs, where mineral water was brought through a pipe and continue to run through the gutters.

4. TAXES AND FEES

Some of the first measures of the Austrian administration were the ones destined to remove the cumbrous fiscal system.

Taxes before the Austrian rule

The voivode of Moldavia, appointed by the Ottoman Gate, had to pay various sums of money as a tribute. The money came from taxpayers, the so-called „birnici", in which there were included: small nobles[54], priests, Armenians and other merchants, Jews and peasants.

The *boyars* (high nobility) and their servants, the servants of the judiciary system („*vornici*" and „*vatamani*"), the monasteries and churches were exempted from paying this tribute. Another category which had this privilege was the one of the "*scutelnici*"[55].

The settled gipsies[56] were considered servants of the ruler and had to pay a tax of 2 florins and 30 kroner[57]; the boyar servants under the pretext of being fishermen, hunters or shepherds had to pay only a part of the taxes.

The value of the tax was proportionally to the number of cattle and family members. The collection was made monthly or quarterly during the year and it was called summer or winter "*fumărit*", "*sferturi*" or „*răsură*". The collection was difficult, often being necessary the use of force, beating or imprisoning. The drawing was made by "*vornici*" and "*zlotaşi*", which delivered it to the their chiefs ("*staroşti*"). The effective taxes were drawn for the state and Principe expenses. Their cumbersome nature is proven by their significant number and amount:

[54] Named and „*şleahtici"*, from the Polish word szlachta (properly Schlachtschitz); in Moldavia, they were different from the little nobility; thez were immigrants from Poland, rewarded after the Russo-Turkish War (1769-1744) by the Russian with a noble rank. In Bukovina, their nobility was no longer recognized, so they were not exempted from the tribute payment, as other noble Romanian senior.

[55] To this category belonged the farmers exempted by the voivode from paying tribute as a reward for services brought to a boyar; this exemption made them work even more for the boyar, becoming, somehow, their slaves.

[56] This designation refers to those whose houses were built by the authorities or, most often by the veil.

[57] 2 Guldens = 1 Florin şi 30 Kreuzer = 30 Crăiţari

Table 52 *Fees and taxes imposed before 1775 in Bukovina*

Nº.	**Romanian name of tax**	**Significance**	**Explanation**
1.	*Goştina*	Sheep tithe	The fee was assessed on each foreign or indigenous sheep to 5 kr., being paid both by the peasants, clergy and boyars.
2.	*Desetina*	Pigs and bees tithe	The fee was calculated for each pig and each hive of bees; the peasants were charged with 12 kr. and nobles and clerics with 6 kr. per piece. When the number of pigs or hives was higher than 1,000 pieces, nobles and clerics had to pay 12 kr. per piece.
3.	*Conişa*	Tax for grazing foreign cattle	The fee was imposed in summer and winter; the first was called summer "conişa" each head of foreign cattle was charged with 20 kr.; Winter "conişa" stipulate that each horse or cow that winter in the area was charged with 49.5 kr.
4.	*Căldăritul*	Tax on alembics	Each boiler spirit produced was charged with 5 fl. and 30 kr.
5.	*Camina*	Tax for butcher and beverages from cities	slaughter cow - 15 kr., slaughter sheep - 2,3 kr., 1 beer barrel – 6 kr., 1 bucket of wine – 1 kr., 1 boiler spirit – 3 fl. and 40 kr., 1 wax press – 3 fl. and 40 kr., 1 box of spirit– 3 fl. and 1kr.
6.	*Vama*	Customs duties	Tax for the voivode; the annual quantum for Moldavia was 100.000 fl., and for Cernăuți 12.000 fl.; the custom duties were diverse;
6.1.	*Starostie sau spravnicie*	Tax collected by the ruler of the region/town/village	The ruler received a tax for all goods passing the customs : 1 cow – 5 kr., 1 horse – 15 kr., 1 mare– 10 kr., 1 pig – 1 kr., 1 sheep – 1 kr., 1 cart with goods - 10 kr., 1 cart with imported salt – 6 kr., 1 cart with wine – 15 kr.
6.2.	*Căpetenia de Coşmani*	Tax collected by the border guard captain	1 cart with goods – 2 kr., 1 cart with hay – 3 kr., 1 cow – 2 kr., 1 horse – 2 kr., 1 pig - 0,5 kr., 1 sheep - 0,25 kr.
6.3.	*Vornicia mare*	Tax collected by the chief- marshal of the court (the great "vornic")	1 cow - 4,5 kr., 1 ox - 7,5 kr., 1 horse – 6 kr., 1 sheep - 4,5 kr.
6.4.	*Vornicia mică*	Tax collected by the Botoşani marshal (vornic)	For each cattle that left the country he received 1 kr.
6.5.	*Şătrăria*	Tax collected by the "şătrar" (generalul maistru)	For each cattle that left the country there were perceived 2 kr.
6.6.	*Cotăritul*	Tax collected by the Monastery St. Spiridon from Iaşi	1 large shop – 3 fl., 1 small shop – 1 fl. and 30 kr. For the Armenian trader which made trade from his horse – 1 fl. and 30 kr.
6.7.	*Solăritul*	Gift in salt made to the great chancellor (logofăt)	It was paid by the district of Cernăuți and it had a value of 500 fl.

N°.	Romanian name of tax	Significance	Explanation
6.8.	*Venitul mitropolitului*	Tax collected by the Iaşi bishop	Tax perceived for tolerating the Jews in the city of Suceava by the orthodox church; the Jews had to pay 170 fl. each.
6.9.	*Boieritul*	Tax collected by the great "cupbearer" (paharnic)	Each pub that served wine or spirit (rachiu) had to pay 22,5 kr.

Source: Grigorovici: 1998

Austrian tax reform

Right after the annexation of Bukovina, the Austrian administration changed the fiscal system. They decreased the taxes for imports and the trade with aliments and animal products. The purpose was to stimulate the foreign trade (they eliminated taxes like "*goştina*" and "*desetina*") .

Enzenberg established different yearly fiscal obligations (15 Kreutzer – for a family of peasants; 30 Kreutzer - the „*ruptaşi*" (taxpayer which had to pay only this tax); 40 Kreutzer – the "*mazili*" (small boyars), 1 Florin – Boyars, the Armenian and Greek merchants, 2 Florins - Jews, 400 Florins - priesthood and monastic orders).

Although the number of taxes and their quantum diminished, the budgetary incomes raised, because it was positively influenced by the rhythm of social economic development.

5. SOCIAL ASPECTS

When the Bukovina was occupied by the troops of General Gabriel Baron Spleeny of Mihaldy, there were registered 226 villages and 52 parishes with a total population of 71.750 inhabitants. Of this total there were: Romanian – 52.750; Ruthenians and Hutzuls – 15.000 and Germans, Armenians, Poles, Jews, Hungarians – c. 4.000. So, there were: Romanian – 73, 2%, Ruthenians and Hutzuls – 20, 9% and the others – 5, 9% (Giurescu, 1981: 216).

Features like the size of population and territory placed Bukovina from the beginning among the smallest provinces of the Habsburg Empire. For example, the statistics from 1810 placed the province on the 8th place of 10 in the empire in terms of number of inhabitants.

Table 53 *The inhabitants of the Austrian empire (1810)*

N°.	Country	Inhabitants
1.	Austria Proper	1.708.000
2.	Bohemia	3.022.000
3.	Bukovina	250.000
4.	Carinthia, part of	160.000
5.	Carriola, part of	20.000

Nº.	Country	Inhabitants
6.	Croatia, part of; and Sclavonia	500.000
7.	Hungary, with Transylvania	11.500.000
8.	Galicia, Eastern	3.650.000
9.	Moravia, with Silesia	1.655.000
10.	Styria	860.000
Total		23.325.000

Source: The Edinburgh Encyclopaedia: 1830: 150

Population

Proportion of total Romanian population has been affected because of the region belonging to the Habsburg Empire. This phenomenon was accentuated by the migration to the capital of Moldavia of the noblemen, craftsmen and teachers.

Because Bukovina was a sparsely populated province, with a density of only 7 inhabitants per square kilometer, the Austrian authorities took measures for populating them. The colonization policy consisted in the allotment of each settler that came to Bukovina with 16 to 20 hectares of land.

They also received some other benefits (construction wood, seeds, livestock for breeding, recruitment exemption, fewer days of labor compared with the obligations from other regions of the Empire, various exemptions from taxes etc.) to form homogeneous and stable layers, contributing to the welfare of the imperial treasury.

Immigration from the adjacent territories was encouraged; this brought Ruthenian from Galicia, Romanians from Hungary and Transylvania and some Magyars, Poles, and Germans.

This immigration consolidated the mixed population of Romanians and Ruthenians already in possession so that between 1775 and 1779 the number of families has grown from 11,421 to 29,968, more than 150% in only 4 years.

To improve the agrarian structure and to strengthen the bourgeoisie, the Austrian brought in 1786 peasants, metallurgist workers and miners from South-Western Germany (regions of Baden-Württemberg, Bohemia and Zips). In this way, they managed to obtain from 1774 to 1785 a population growth from about 71,750 to 135,000 inhabitants (more than two times).

Regarding the evolution of Bukovina's population structure in the first 20 years of Austrian occupation (including those 11 years of military administration), the Romanian population has kept broadly the same share, with even a slight increase. The proportion of the Ruthenian population has suffered a slight decrease and that of other nationalities has gained over 3%.

However, in the next 44 years, during which Bukovina was under Galician control, the proportion of the Romanian population decreased significantly (almost 18%), the Ruthenians won 10% and that of other nationalities has almost doubled.

Table 54 *Structure of population in Bukovina*

Year	Total population		Romanians		Ruthenians		Germans, Jews, Poles, Hungarians, Lipovan, Armenians etc.	
Year	Population	%	Population	%	Population	%	Population	%
1774	71.750	100	52.750	73.52	15.000	20.91	4.000	5.57
1778	116.926	100	90.811	77.66	21.114	18.06	5.000	4.28
1786	136.494	100	105.530	77.31	24.372	17.86	6.592	4.83
1804	192.830	100	141.006	73.13	35.296	18.30	16.533	8.57
1848	377.751	100	209.293	55.43	108.907	28.84	59.381	15.73

Source: Nistor: 1918: 206, and personal calculation

Ruthenians have strengthened the position of the Orthodox Church in front of the Catholic one but on the other hand affected the proportion of Romanians in the total population.

Despite the fact that the early years of Austrian occupation were characterized by a high rate of immigration in Bukovina, there was a brief period in which the matter was different.

At the end of military government, for several months, the region experienced a huge rate of emigration compared to the immigration one. Thus, for half a year the number of immigrants was 6,937 and the immigrants were 111 (more than 62 times higher).

Table 55 *Emigrants/immigrants at the end of the military administration*

In the year	In the months	Emigrants from Bukovina				Total	Immigrants in Bukovina				Total
		Men	Women	Boys	Girls		Men	Women	Boys	Girls	
1785	November	206	200	211	227	**844**	1	1	1	-	**3**
1785	December	356	352	342	340	**1390**	-	-	-	-	**-**
1786	January	205	206	211	211	**833**	2	2	5	2	**11**
1786	February	265	255	241	240	**1003**	2	2	2	1	**7**
1786	March	253	248	282	245	**1028**	7	7	6	12	**32**
1786	April	428	434	524	453	**1839**	11	11	24	12	**58**
Total						**6937**					**111**

Source: Nistor: 1918: 160

Schools

The Austrians found a few Romanian schools and one theological seminary in Bukovina when they took over the province in 1774. They closed these institutions and replaced them with German schools, which they declared in 1815 Roman Catholic

confessional schools depending on the Archbishop of Lemberg. That automatically excluded Romanian Orthodox teachers (Clark, 1922).

Until 1775 the region was poorly developed from the cultural perspective. The few existent schools had theological profiles. Almost all of the 71,150 inhabitants were illiterate. This is one of the reasons for which the first German colonists were considered *culture carriers in the country of bears*[58].

A few years after the annexation of Bukovina, in 1783, Emperor Joseph ordered General Enzenberg to establish schools along the region with teachers from Transylvania and Hungary (Aurelianu, 1876: 74). In Cernăuți (1786), there were established a secondary school and nine primary schools. In 1792 the total number of primary schools functioning in Bukovina reached 32. From 1793 Bukovina was under Lemberg's administrative jurisdiction, therefore the establishment of schools became a responsibility of the commune and most of the schools were closed. In 1844 all the country schools (the Romanian ones) have been moved under the administration of The Orthodox Fund of Bukovina. This last one had as an official purpose the goal "to sustain the education in Bukovina".

6. CONCLUSIONS

1. The experience of the first part of the Austrian occupation of Bukovina reveals us the positive effects which appear in the context of the integration of a poor teritory in a more developped one, such as the Habsburg Empire. The free movement of labor and capital, the technology available for the industrial investors, the possibility to sell on a greater market were the premises for an economical development.

2. The multicultural issue played a great role in the development of the region. The Western mentality and the experience in providing social services grew the living standards and the level of civilization. This aspect is highly correlated with the migration flows, which increased the population and changed also the ethnic structure.

3. The investment in industry, trade and tourism joined the mecanization of agriculture, premises for a higher productivity of labor and economical performances, elliminating the dependence on agriculture. New industries are developped and commercial activities, within the province and outside, offer the possibility to exploit the natural resources.

4. Bukovina experienced the use of macroeconomic policies in sustaining economical development, such as the fiscal one, the Habsburg Empire relaxing the tax system and encouraging the economical activities. Also, the funds allocated for

[58] Kulturträger in Bärenland (germ.)

infrastructure were essential for improving the circulation of inputs and outputs, and the educational system contributed to a high labor qualification.

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MEANINGS OF THE NOTION OF CULTURE IN INTERCULTURAL RESEARCH

Angelica-Nicoleta ONEA*

Abstract: *There are many meanings given to the notion of culture. Various contents related to it are delimited according to the specialty field or the investigated area. Moreover, the overlapping or distinction between culture and civilization also occurs. An inventory and an analysis of the aforementioned aspects could be a subject for exhaustive research. We are not aiming at such an approach, our intention is to analyze the philosophies circumscribed to this concept in some of the most important investigations carried out in the field of intercultural management so as to distinguish in a very precise manner the sense given and to focus on the elements that allow us to build a definition with an operational content in this area of research. For this purpose, we also identify the perspectives that allowed us to develop a functionalist-instrumental pragmatic approach.*

Keywords: *culture, intercultural research, cultural determinism, acculturation*

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1. PERSPECTIVES ON THE NOTION OF CULTURE

1.1. The functionalist perspective on culture

In their intercultural studies, researchers Edward T. Hall, Geert Hofstede, Fons Trompenaars and Charles Hampden-Turner emphasize ***the traditional functionalist epistemological perspective on culture*** that highlights ***cultural determinism*** which originates in Bronislaw Malinowski's conception who believes that (Cuche, 2003:56; Bonte, Izard, 2007:399; Geraud et al., 2001:91):

- cultural facts are universal and acquired;
- each culture is a coherent whole: all the elements of a cultural system harmoniously complete each other, hence the equilibrium and functionality of

* Angelica-Nicoleta ONEA, „Al. I. Cuza" University of Iaşi/Faculty of Economics and Business Administration, Bulevardul Carol I, Nr.22, 700506, anonea@uaic.ro

each system; this explains the fact that each culture tends to preserve its specific identity;

- any culture has to be analyzed from a synchronous perspective, starting from the mere observation of its contemporary data;
- the interdependence of social facts is an expression of their functional necessity, hence the importance given to context;
- the constitutive elements of a culture fulfill the function of satisfying man's basic needs; by founding "institutions" that establish common solutions and transmit them, culture becomes the functional answer to human needs (hence the utilitarian aspect).

Although Hall's and Hofstde's constructions are in line with this general approach, yet paying particular importance to history (at least at the level of explaining certain forms of culture), each has a particular conception that we will further present.

The American anthropologist Edward T. Hall sees culture as a ***communication system.*** He proposes a definition of culture with biological and physiological roots. Culture is not a choice, but a set of choices that originate in the biological past. Man cannot escape his own culture for it dictates his behavior in an unconscious manner. *Culture is communication and communication is culture.* Culture is rather regarded through messages than structures and control systems. The world of communication is subdivided into an emergent part, i.e. that of words and into an emergent part which is also more important, i.e. that of "silent" language. Having a hidden sense, culture must be decoded in time, space and cultural context and this is only possible through a comparison between cultures. In the author's opinion, culture is resistant to rapid exogenous change (Hall, 1984:219-220; Hall, 1992:14-20).

Geert Hofstede (1996:19-26), partisan of the same perspective founded on the suppositions of determinism and cultural convergence, understands by (secondary[59]) culture, ***the collective programming of the mind*** *that distinguishes the members of a group from the members of another.* The author acknowledges the limited character of the definition but he argues that he wanted it to be operational as far as his purpose was concerned, i.e. that of highlighting value systems.

Hofstede also illustrates the levels of culture manifestation: the first level has *values* in its centre, while the second one includes *rituals, heroes and symbols* (resumed under the term of practices – identified through external observation, even if the cultural sense given to them is invisible). Regional, ethnic and religious cultures can be described in the same terms as national cultures.

[59] Primary culture, also called „culture in a narrow sense", refers to „civilization" or „refinement of the mind" and to the results of this refinement such as education, art and literature in particular (Hofstede, 1996:20-21).

The ways of thought, feeling and action are often interiorized by the individual through unconscious learning. The culture thus acquired is also projected in the working environment.

We observe that from the definitions and explanations provided by Hofstede and Hall, no pragmatic sense to indicate the possibility of exploiting cultural differences in management results, an aspect followed by us in this research. In his studies, Hofstede rather suggests a negotiation which involves a compromise position.

Fons Trompenaars and Charles Hampden-Turner (2004) approach culture instrumentally, envisaging it as a ***set of universes*** that can be reconciled. They give a deep pragmatic functionalist sense to culture: *culture stands for the answers found by individuals to the problems they are confronted with* (Falk-Bánó, 2002). Thus the final solutions for the problems raised by individuals are given by culture. They often make the distinction between survival and destruction. Culture also distinguished between what an individual can do and what he cannot.

The authors mentioned consider that human intelligence consists in the skill of conceiving two opposite ideas at the same time (reconciliating values, harmonizing *a priori* opposite values), preserving the society's operational capacity, yet allowing individuals from different cultures to create wealth by positively exploiting the differences between them. The answers given by cultures to issues they are confronting with are part of a circular movement in which thought gradually privileges a valuable universe and its opposite because no value is "normal" in itself since it only corresponds to a particular initial choice. The access to various answers involves the exit from one's own culture which gives the possibility to come up with better solutions. Thus, a good knowledge of cultures is an advantage especially by combining the solutions given by opposite cultures (Hampden-Turner, Trompenaars, 2004: XXI-XXXIV). This instrumental construction responds not only to the ideas of cultural relativism and acculturation, but also offers the solution of valuing cultural differences. We consider that it is closer to the aims of intercultural management.

1.2. The perspective of interpretive anthropology

Another acception of the notion of culture originates in the ***perspective of interpretive anthropology.*** Marshall Sahlins, one of its representatives, insists on the arbitrary aspect of cultural phenomena that are by no means an answer to natural phenomena, but a symbolic perception of the world, including nature "as nature is for culture what the constituted is for the constituent. Culture is not only nature expressed under a different shape. On the contrary, the action of nature develops in terms of culture, that is under a shape that does no longer belong to it, but is realized as signification" (Cuche, 2003:91). From this perspective, cultural phenomena are arbitrary and cannot provide answers to natural phenomena, they can only perceive the world and nature

symbolically. Hence the stresses on cultural diversity through which cultures are seen as unique ways of giving a sense to the world. Strengthening this conception, Claude Levi-Strauss sees in culture any "ethnographical set that, from the viewpoint of the survey, is significantly different when compared to others". According to him, culture may be presented as a set of representations and practices ordered symbolically (Cuche, 2003:92; Geraud et al. 2001:93; Bonte, Izard, 2007:331). Clifford Geertz, a representative of symbolic anthropology, goes even further as he reconsiders symbolic forms and their interpretation not as structure as Sahlins and Levi-Strauss did, but as "stylistics", an active that builds sense: "The concept of culture I espouse . . . is essentially a semiotic one. Believing, with Max Weber, that man is an animal suspended in webs of significance he himself has spun, I take culture to be those webs, and the analysis of it to be therefore not an experimental science in search of law but an interpretive one in search of meaning. This is the explanation I seek..." (Bălțătescu, 2004:18-19). For him, culture is "a historically transmitted system of significances embodied in symbols and concepts inherited and expressed in symbolic forms based on which people communicate, perpetuate and develop their knowledge and attitudes towards life" (Dupriez, Simons, 2000:33; Burduş, 2006:83).

Culture is more of an object built than an empirical reality. Some of its rules are explicitly stated as normative, prescriptive, yet culture is also what we unconsciously do. The cultural fact is mainly unconscious because it is fully internalized, incorporated and it cannot be precisely designed as culture. Hence the deduction that what happens at the level of the unconscious is not seen as culturally determined, although it is a part of culture (as action that gives sense). In our opinion, this is a limit as psychologists proved that this is the level of expression for the elements of cultural specificity. We consider that the functioning of culture cannot be compared to a programme as individuals possess cultural categories for formulating original statements that give sense to particular experiences (Geraud, ş.a., 2001:94).

Departing from these reasonings, Philip d'Iribarne approaches culture as a ***system of sense-making*** corresponding to a hybrid theoretical vision of the discipline: associating *ethnography* with an *interpretation model* that gives answers to the history of political cultures and the systems of social organizations. The analysis consists in "balancing the actors' strategies against the sense they give to the situations they are found in and the acts they are likely to accompany" and "conceive culture as a universe of uniform practices so as to understand it as a set of codes in which the diversity of practices acquires sense" (Soussi, Cote, 2006:130-136; Lafaye, 1998:75).

Therefore, culture is an interpreting process by which the individual gives significance to his own reality departing from a referential sense. He shares this system of senses with other members of the community because he elaborates these systems of

senses along history. The individual ***is not determined in his behaviours and values*** that belong to his own personality and history but his reactions to a given situation or action will be according to his interpretations, i.e. with these systems of senses.

Referential systems that organize the forms of social links are also present in working situations. Crossing the historical path, political culture is also integrated in this set. Universal logic is of no interest to us, we are only concerned with the permanent local logic that expresses itself through the global practices that operate within a society.

This perspective on culture is closer to the sense of harmonizing managerial practices with local situations, emphasizing diversity, yet it risks to be treated as superficial by underestimating the determinant role of culture. Furthermore, even though in theory, it gives much more freedom to the individual, it does not suggest anything as far as the manner of transmitting *national traditions* with the possibility to value *sense* differences is concerned.

1.3. A dualist perspective on culture

The conception of Melville Herskovits, another representative of anthropology, could reconcile the two ways of approach presented above, one taking into account the strong determinant character of culture, the other regarding culture as a construct of senses. The solution provided is to envisage culture as an objective reality and remember that the phenomena studied are *built* by the anthropologist, hence the lack of existence in themselves (Geraud et al., 2001:151). His theory is completed by the *reinterpretation principle*: the process through which old significances are given new elements or by which new values modify the cultural significance of old forms" (Geraud et al., 2001:104). This principle provides a theoretical foundation to what we understand by *acculturation*, a process that is closely related to the valuing of cultural differences.

2. DEFINITION OF CULTURE IN INTERCULTURAL RESEARCH

2.1. „Culture" in a pragmatic sense

Starting from Herskovits's ideas and taking into account the practical character of intercultural research, we consider the following definition of culture to be a proper one[60]:

Culture is that supraoganic entity that slowly evolves in normal conditions, acquired and transmitted especially based on tacit learning and which creates a more or less performing and unitary framework for the existence and functioning of the members of the group, which can be ameliorated in cultural contact situations.

[60] We mention the fact that it makes reference to what is understood by culture in the field of intercultural research without being exhaustive. Moreover, the pragmatic sense given comes to support this particular approach.

2.2. Features of culture

The following features result from the definition presented above:

- ***supraorganic entity***[61]: culture exists beyond human-individual limits; individuals are born within it and are transformed by a pre-existing culture that continues to exist after their death;
- culture ***is learned, it is not*** genetically ***inheritable***; cultural elements[62] are transmitted and learned at a ***tacit*** level, in the process of socialization;
- ***acculturation – the dynamic dimension of culture***: a) no culture exists in "pure" state, without any external influences; however *evolution is slow* without any intervention;

b) cultures are sources or "knowledge reservoirs": individuals can acquire elements from other cultures, for the purpose of improving their performances by *cultural contact*;

- ***existential and functional framework***: in a large sense, culture gives the existential and functional framework of a group, helping it to solve its problems according to the specific means it possesses;
- ***collective phenomenon*** – culture is accepted and learned by a group of people that live in a specific social environment (country, region, etc.).

In the analysis of this definition, we point some issues to avoid confusion:

1. *How could something external and supraorganic be learned through tacit knowledge?* As Herskovitz claimed, culture does not have an objective existence, so we cannot speak of an organicist approach because there is no substantial identity between society and individuals. However, the whole, that is society, benefits from an ontological and explanatory primate on the parts. Therefore, what "circulates" in society is felt and interiorized as individuals are parts of it.

2. *Does the learning process comprise answers only given to the "biological"*? Although it is based on the supraorganic conception, our approach does not fully correspond to the functionalist model. This is because we do not consider that culture only meets the needs that send to the biological, natural (not even quoted researchers that carried out intercultural studies shared this vision). We consider that individuals need to give symbolic senses to faith acts, phenomena, etc., meanings that are transmitted to them in the same manner.

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[61] Herskovits (Geraud et al., 2001:151) does not contest its utility as if it had an objective existence because there is no other way for us to understand the diversity of the types of human behavior; but this is just a "construct" used as guide for thought and support in analysis.

[62] We refer to those cultural elements corresponding to the *informal level* described by Edward T. Hall.

3. *Is cultural transmission unidirectional?* The parts can send "signals" to the whole only that in *normal conditions*, signals are weak and can slowly generate change. For a rapid change, actions in its favour must be felt at the level of the entire "body" (i.e. if a reduced number of individuals change their attitudes, the manner of thinking, feeling, etc. it does not mean that they have the capacity to change the overall culture of society) and imply an active participating attitude of the individuals.

4. *How can the culture of a group change* within one society? The contact with other cultures is the most efficient and quick way to cultural learning. Moreover, specific training programmes can support this type of change.

5. *Do all individuals share the same values*? No, because there is no single ontological explanatory "body". There are several "bodies" corresponding to different levels of culture (be it national, regional/ethnical/religious, sectorial, professional or organizational, etc.), with more than one "brain" to master the individual. These levels may harmoniously or conflictually overlap. The more conflictual are the values, the higher the tensions that will lead to the desire of change. Although individuals acquire different values through the contact with certain levels of culture, they also acquire a ground specific to national culture.

6. *How can group performance be ameliorated?* At the level of culture, group performance can be ameliorated by valuing cultural differences.

2.3. Interferences

By adopting the definition proposed, we interfere with another sense given to culture that is closer to what intercultural management aims at, that is to put into play cultural differences: *culture is what gives intelligence the capacity to grow* (Henri-Irenee Marrou, *apud* Zaiț, 2006:42). In this acception, the pragmatic dimension of culture is foreseen with an influence on management efficacy and efficiency. Culture is what constitutes the "framework". What happens within this framework depends on the manager's capacity to exploit it. Different managers reach different results with the same "ingredients". Hence the conclusion that the manager has to take responsibility for rendering cultural specificity valuable. He can do this by employing a specific philosophy and an intelligent creation and development policy for organizational culture.

The capacity to grow refers to the capacity to create or adapt solutions, i.e. to solve any problem that the individual is confronted with, be it biological, moral or spiritual. According to the culture involved, the answer provided can send to more or less efficient or profitable actions which means that individuals from various cultures can learn from each other, having the possibility to review a "portfolio" of solutions and choose the proper one according to *context* (this is what Hampden-Turners and Trompenaars understand by *reconciliation*).

3. CONSEQUENCES AND CONCLUSIONS

For organization management, cultural specificity and intercultural approach are not interesting as such. What is important is what can be achieved through what individuals have as acquisitions, by anticipating their behaviours, mentalities, attitudes and positions towards action. In fact, the research in the field of intercultural management was carried out at the management's "order" as a result of the manager's objective need to know his framework of action so as to exploit it.

The way adopted by us preserves *instrumental vocation*, aiming at a profitable approach for organizations: on the one hand, the knowledge of the individuals' cultures that come in contact leads to positive effects through cultural synergy and culture can be ameliorated in contact situations through acculturation, on the other hand.

In a wide sense, *acculturation*[63] refers to *the phenomenon that results from direct and continuous contact between groups of individuals from various cultures, with changes of the original cultural types of one or both of the groups* – if we have in view two cultures (Geraud et al., 2001:103; Ferréol, Jucquois, 2005:11). Thus, acculturation can be unidirectional or bidirectional. Our purpose here is not to examine the issues related to power rapports (although they occur) because this is not the aim of acculturation for intercultural management. Furthermore, this process would be accepted, made aware of and carried out with the effort of the persons involved. They do not only have to understand another cultural specificity, but also adopt it and this involves a certain amount of rationality. The acculturation occurring at random is one thing while the process organized for a specific purpose (and which should be known by those involved) is another. In the latter case, individuals are much more aware of what happens. It is true that the hidden senses of culture, harder to understand and decode, will be transmitted in an implicit manner, yet they will make a conscious effort to learn and assimilate in an explicit manner many cultural elements. Furthermore, they will try to remain in control, avoiding situations that could generate tensions based on their intercultural knowledge (assuming that individuals will not face intercultural situations without a preliminary training and the personal observations on behaviours, attitudes and positions towards actions adopted by those from another culture. Later on, they will have to be capable to "migrate" from a solution to another according to the situation in question. In the sense described above, acculturation does not trigger the change of the internal logic of the receiving culture/ cultures; therefore it is possible for some solutions not to be taken over as such and only for adaptation to be possible.

From this perspective, the purpose of intercultural management is to identify and analyze elements of cultural specificity, make recommendations and give solutions to exploit cultural differences. In this way, new paths to build competitive advantages are

open to the manager that operates in cultural environments or works with persons from various cultures.

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[63] The prefix "a" comes from the Latin "ad" that indicates an action of proximity (Cuche, 2003, p. 82)

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LABOUR MARKET AND CORRUPTION ISSUES IN CHIANG RAI, THAILAND

John WALSH*

Abstract: *Lack of application of the rule of law in Thailand has various negative impacts on labour market and business environment. Lax policing of minimum wage legislation and unknown numbers of migrant workers contribute to depression of wages as whole and reduced incentives to add value to production. Instead, short-term competitiveness through low labour-cost manufacturing is prioritized. Although individual transactions which may be deemed corrupt are small scale in nature, they appear to be repeated very regularly and therefore have a significant impact upon the income generating possibilities for local workers and for their future prospects, not to mention the overall competitiveness of the country. The corrupt activities also lead to lower levels of safety in the workplace and for such issues as collective bargaining and freedom of association. The paper attempts to identify the major issues involved and some possible solutions.*[64]

Keywords: Labour market, Corruption, Thailand

JEL Codes: J24, D73

1. INTRODUCTION

Corruption is a global phenomenon which flourishes wherever decisions are made in secret and without accountability. While much of the attention on the high levels of corruption in Thailand focuses on the political aspect, albeit from an often unbalanced perspective, less attention is placed on the economic aspects. This is unfortunate since the economic aspect perhaps affects more people and is more pervasive and pernicious in the country. This paper represents a preliminary attempt to try to outline the areas in which economic corruption takes place in Thailand and its impact in a specific context, which is the context of the labour market in the country. In order to achieve these goals, it is necessary to specify the features of the Thai labour market as it now stands and the

* John WALSH, School of Management, Shinawatra University, BBD (Viphavadi), 197, Viphavadi-Rangsit Road, Samsen Nai, Phayathai, Bangkok 10400, Thailand, jcwalsh@siu.ac.th

reasons why it is shaped the way that it is. It is also necessary to specify the spatial environment in which the research took place, which is the northern province of Chiang Rai. This research involved a program of intensive qualitative interviews conducted in Chiang Rai to supplement the analysis of secondary data and analysis of other interviews and statistics.

Thailand has a long and inglorious history of corruption, largely based on unaccountable power for officials and rulers, combined with delegating power for economic growth to foreign interests without consideration of the means by which that growth was delivered. As state absolutism increasingly interacted with capitalism and the internationalisation of the economy, the peasants and slaves of the previous feudal *Sakdina* system became considered to be the commodities from which profits might be extracted. This provided, in an opaque system of governance and mostly subject to unelected and unaccountable administrations, numerous opportunities for corruption to make additional profits. Whether it was the logging of forests, the trafficking of women or the suppression of labour leaders protesting about unsafe working conditions, state and economic actors conspired to exploit the resources available to them. They used portions of the profits to embed systems into society that protected their rights and privileges and restricted the ability of anyone else, notably politicians, to change that system. After a brief period in which politicians' wielded power on behalf of the electorate, the 2006 military coup brought that system back to normal.

The paper will continue with a discussion of the nature and extent of economic corruption in Thailand, followed by consideration of the labour market in the Kingdom. This will be followed by a description of the Chiang Rai region and the characteristics of its labour market. Results and analysis of some research of labour market features in Chiang Rai is then included to help to identify the various contours of economic corruption in the region. A final concluding section indicates some policy implications and highlights the difficulties involved in trying to quantify the effects of corruption in this context.

2. DEFINITIONS OF ECONOMIC CORRUPTION

Transparency International defines corruption as "the misuse of entrusted power for private gain." This is an inclusive definition which covers both private and public sector activities. Power may be entrusted by law or by position and it includes employers, employees and officials in any situation. Transparency International further distinguishes between two types of corruption: "TI further differentiates between "according to rule" corruption and "against the rule" corruption (Transparency Thailand, 2008). Facilitation

[64] Research assistance was provided by Sittichai Anantarangsi. An earlier version of this paper was

payments, where a bribe is paid to receive preferential treatment for something that the bribe receiver is required to do by law, constitute the former. The latter, on the other hand, is a bribe paid to obtain services the bribe receiver is prohibited from providing." These definitions do of course have wide application in a complex modern economy. In many cases, an act of exploitation involves a chain of activities, mostly kept hidden from sight, with various individual acts of according to and against the rule actions. For example, in one of a large number of stories of human trafficking, Burmese women found work in brothels in Thailand and subsequently suffered from hardships and disease, including HIV (Ekachai, 2003). To reach their position, a supply chain of providers, negotiators and facilitators was required to cause the women to move from Burma to Thailand, to conceal their presence while advertising their services and to restrict their ability to leave from their circumstances. Many elements in society combine and conspire to ensure that the system continues, away from scrutiny. In fictional terms, the interlocking nature of society to commit crimes and conceal them is captured by Chart Korbjitti in his short novel The Judgment (1982), which concludes that 'all are guilty." Thailand has a longstanding tradition of economic corruption of this sort. The sources include the extortion of revenue from subjects by mandarins and officials, as well as their appropriation of parts of the public purse (Phonpaichit and Piriyarangsan, 1996), together with the use of local godfathers (*chao por*) and similar individuals to determine a wide range of occasions when resources are distributed among competing interests (see, e.g., Chantornvong, 2000) and, also, powerful local interests have continued to influence political and economic decisions within areas defined as part of their home territory, albeit that there may be conflict with competing interests (e.g. Praditsil and Thinbangtieo, 2008). There is also a lengthy practice of abuse of migrant workers, ignoring or abusing health and safety standards and tolerance of pirated goods and intellectual property violations (e.g. Wai, 2004). Safety abuses continue despite the lessons of the Kader factory fire, in which nearly 200 workers were killed and others seriously injured after being forced to jump from third or fourth storey windows, with doors locked. The problems for investors and government connections came not from the human tragedy (of which there are many examples) but because of the loss of confidence, sunk costs and damage to the country's image (Clifford and Handley, 1993). Economic corruption is inextricably intertwined with violence and has been so throughout Thai history (Anderson, 1990). It has continued with such instances as violence against street vendors at Bo Bae market in Bangkok (e.g. Bangkok Post, 2008), a bomb attack at a Tesco store as part of a squabble between rival security firms which caused the death of one man (BBC News Online, 2001) and the attempted murder of prominent individuals involved in the logging trade (e.g. The Nation, 2009).

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presented at the National Anti-Corruption Commission Conference in Bangkok, 2009.

An additional area of corruption which should be considered here is the role of corrupt union officials, sometimes known as the 'stinking water' officials, who abuse their position and contribute to the suppression of workers' rights by concentrating resources in their own offices and protecting their powerbase rather than conducting their entrusted duties (cf. Ungpakorn, 1999, pp.12-6).

3. THAILAND'S LABOUR MARKET

According to the Report of the Labour Force Survey, 2005, compiled by the National Statistical Office of the Ministry of Information and Communication Technology, Thailand's labour force totalled 36,130,000, which represented 55.5% of the overall population of 65,110,000.[65] Those not in the labour force included 15,290,000 (23.5%) of people under 15 years old and 13,680,000 (21.0%) of people over 15 years old and not in the labour force. The proportion of young people compared to older people has changed, in line with demographic distributions of most developing countries, as will be discussed later. Within the labour force, the majority of 35,260,000 (97.6%) are employed persons, a further 660,000 (1.8%) are unemployed[66] and the remaining 210,000 (0.6%) are members of the seasonally inactive labour force. Although generally declining year-on-year, the agricultural sector still employs 13,620,000 people (38.6%), with the remaining 21,640,000 (61.4%) involved in the non-agricultural sector. Problems within the labour market include continued low productivity and lack of skills overall (see Table 56), as may be seen by the low levels of education attained by the majority of workers. Japanese companies in particular are keen to retain those skilled workers that do exist and to discourage them from the job-hopping practices that are prevalent in some sectors. The Japan-Thailand Economic Partnership Agreement (JTEPA) includes provisions for apprenticeships in Japan sponsored by four Japanese companies and guaranteed by the agreement to complete a long-term contract for that company.

An examination of the investment climate in Thailand by the World Bank "…found that development of the private sector is hampered by deficient infrastructure, as well as a heavy regulatory burden and shortage of skills. Investment in public

[65] The number of unregistered or unofficial migrant workers is, by definition, unknown. The presence of such workers tends to act to depress both salaries and the need to acquire skills and competencies.

[66] This number began to rise substantially in the second half of 2008 owing to the economic crisis emerging in the western countries and spreading across the world and exacerbated in Thailand by the political disturbances caused by the military coup and the anti-democracy movement. Owing to Thailand's reliance upon export manufacturing and the tourism industry, the unemployment figure is anticipated to continue rising throughout 2009 and perhaps beyond, with as many as one million additional job losses projected. The ADB suggests unemployment could reach two million by the end of the year (Asian Development Bank, Regional Outlook 2009 (Manila: ADB, 2009), available at: http://www.adb.org/Documents/Books/ADO/2009/THA.pdf).

infrastructure is needed to maintain the economy's competitiveness in the longer term. Greater private sector participation in infrastructure could be achieved by reforms in the regulatory environment to encourage public-private partnerships. This would reduce the pressure on the budget and free up fiscal resources to address significant shortcomings in education and skills development (ADB, 2009, *op.cit*. p.269).

Table 56 *Educational Attainment of Labour Market Members, 2005*[67]

	THOUSANDS (2005)
None	1,260.6
Elementary	19,934.1
Secondary or equivalent	9,088.9
University	4,795.8
Others	24.7
Unknown	153.2
Total	35,257.2

The proportion of the labour market involved in the tourism industry may be estimated with references to the following two tables, which display industry sectors and occupation categories.

It is not possible to identify exactly how many people are involved in the tourism industry, even if more specific job descriptions were available. This is because some job descriptions include some people who are involved in tourism services and others who are not (e.g. cooks and kitchen hands), while some job categories involved people who spend an unknown proportion of their time involved with tourists (e.g. taxi drivers). The occupations which might be included as part of the tourism industry include: Restaurant and Catering Managing Supervisor; Accommodation and Tavern Managing Supervisor (Hotel/Motel Manager, Caravan Park Manager); Cooks (Supervisors, Cooks, Chef, Qualified Cook and Apprentice Cook); Bar Attendants Supervisors and Bar Attendants; Waiters and Waitresses (Supervisors, Formal Service Waitperson, Drink Waitperson and General Waitperson); Travel Agents (Travel Agents (Commercial) and Tourist Officer); Travel Stewards (Supervisors, Flight Attendant, Marine Steward and Railway Steward); Luggage Porters (Supervisor Luggage Porters and Luggage Porters); Housekeepers (Executive Housekeepers and Domestic Housekeeper); Kitchenhands (Australian Government Productivity Commission (AGPC), 2009, p.247). This level of detail is not available for Thailand and would suffer from the presence of seasonal and unofficial or family workers, as well as unofficial migrant workers.

[67] Data quoted are, if not otherwise cited, drawn from the Year Book of Labour Protection and Welfare Statistics, 2005 and contained in Pocket Thailand in Figures 2007, tenth edition (Nonthaburi: Alpha Research Co. Ltd., 2007).

Table 57 *Employed Persons by Industry, 2005*

INDUSTRY	THOUSANDS
Agriculture, forestry, hunting and fishing	13,617.0
Mining and quarrying	56.6
Manufacturing	5,587.9
Construction, repair and demolition	2,129.4
Electricity, gas, water and sanitary services	106.9
Commerce	5,553.3
Transport, storage and communication	1,108.1
Service	7,050.2
Others	47.9
Total	35,257.2

Research has indicated that certain parts of the Kingdom have significant numbers of unregistered workers (including migrants and non-accredited ethnic minority permanent residents of the country) (Walsh and Anantarangsi, 2009), while studies of tourism sectors in Thailand indicate the importance of both semi-formal employment and the crossover between tourist and non-tourist-based activities (Walsh and Techavimol, 2007). As a developing country, it is not surprising that a great deal of Thailand's labour market is located in the informal sector.[68] The informal sector may, under certain circumstances, manage to cause people to transition into formal employment and a regular job and it is, in any case, a place where businesses can be quite sophisticated and complex, although these remain in the minority (e.g. Maneepong and Walsh, 2009).

The table of occupations of the Thai labour market illustrates the same problems attendant upon the table of industries, in that it is not clear from the categories used to what extent people may be classified as being part of the tourism industry. One thing that is clear is that there is a clear positive correlation between level of educational qualification attained and salary. This situation exists more or less across the entirety of the economy and it means that the government has less scope to use market-based incentives to guide appropriate people into positions for which there is a demand. Indeed, the current situation tends to direct leading candidates into professions which are prestigious but which suffer

[68] Defined thus: "…persons employed in the informal sector were defined as comprising all persons who, during a given reference period, were employed in at least one production unit of the informal sector, irrespective of their status in employment and whether it was their main or a secondary job. Production units of the informal sector were defined … as a subset of unincorporated enterprises owned by households, i.e. as a subset of production units which are not constituted as separate legal entities independently of the households or household members who own them, and for which no complete sets of accounts (including balance sheets of assets and liabilities) are available which would permit a clear distinction of the production activities of the enterprises from the other activities of their owners and the identification of any flows of income and capital between the enterprises and the owners. Hussmans, Ralf and Farhad Mehran, "Statistical Definitions of the Informal Sector – International Standards and National Practices," ILO (n.d.), available at: http://www.gdrc.org/informal/huss0772.pdf.

from over-supply, not to mention difficulty in retaining skilled people who have entered occupations to which they may not be committed. Of course, the prestigious educational institutions involved in sanctioning the high salaries of their graduates will be unwilling to yield their power and, additionally, various class-based institutions and structures exist to make reform of the labour market in this context a contested issue.

There is more scope for reform at lower levels of the economy, with the assistance of entrepreneurs and foreign investors, who should have a lower level of adherence to the existing structures. The attractiveness of working for internationally-owned companies in a number of countries is a well-known phenomenon but the problem exists in Thailand that the educational system is very poor in teaching English to anyone outside of the elite schools and universities and, therefore, the people qualified to benefit from the existing labour market conditions are the same people who will be able to benefit from overseas investment at professional, managerial and administrative levels. Reforming the educational system in Thailand would be an extensive undertaking and require combating the numerous factions that have captured the Ministry of Education and its resources.

Table 58 *Employed Persons by Occupation, 2005*

OCCUPATION	THOUSANDS
Legislators, senior government officials	2,514.1
Professional, technical workers	1,410.5
Administrative, executive and managerial workers	1,443.4
Clerical workers	1,285.6
Sales workers	5,033.8
Farmers, fishermen, hunters, miners, quarrymen and related workers	11,844.3
Craft and related trades workers	4,182.6
Production process operators	2,972.4
Services, sports and recreation workers	4,526.3
Workers not classifiable by occupation	44.2
Total	35,257.2

4. DEMOGRAPHIC CHANGE

Demographic change is having an important and growing impact on the Thai labour market. People are ageing as health care and standards of living improve while, at the same time, the supply of young people declines.

Table 59 *Labour Force Participation Rate by Age Group, 2005*

AGE GROUP	1999 (THOUSANDS)	2005 (%AGE)
13-14	8.7	-
15-19	32.9	30.8
20-24	73.3	70.0
25-29	86.3	87.3
30-34	88.4	89.5

AGE GROUP	1999 (THOUSANDS)	2005 (%AGE)
35-39	90.0	90.2
40-49	88.3	88.8
50-59	78.8	79.7
Over 60	31.4	37.6
Total	68.7	72.5

The changes in the composition of the labour market as measured by age match to a clear extent the predicted changes in the population overall.

Table 60 *Composition of Thailand Population Projection, 2005 and 2025*

AGE GROUP	2005 (%AGE)	2025 (%AGE)
0-14	23.0	18.0
15-24	24.6	19.5
25-44	25.0	21.4
45-59	17.1	21.1
Over 60	10.3	20.0

Source: Population Projection for Thailand 2000-2025, Office of the National Economic and Social Development Board, Office of the Prime Minister, May 2003 (adapted).

The ageing of the labour market will pose certain challenges to the Thai state in the future, including the need to vary expectations of retirement age, of the working career and the pension and welfares available to the aged. It is also notable that the total fertility rate (TFR) in Thailand declined from 4 in 1970-80 to 1.9 in 2005-10, where it is predicted to remain until 2045-50, according to UN figures (Yue, 2008). This is below the replacement rate of 2.1 children and means that, without net positive inward migration, the overall population will eventually decline. Thailand's ageing index also greatly exceeds the ASEAN average and is second only to the rapidly ageing Singapore.

One noteworthy example of what might be achieved in this regard is the so-called Advantage Campaign enacted in Singapore, in which older workers are reintegrated into the labour market and at entry level positions, as required. Using methods of education and social solidarity, the Singaporean government has encouraged people to accept the younger and older workers can work in the same levels without issues of automatic seniority or age-related pay increases. This would be very difficult to achieve in Thailand because social solidarity is thoroughly compromised by the lack of the rule of law (i.e. the spread of bias and corruption) and the double standards exhibited by the principal institutions of the state.

A second aspect of the ageing labour market to consider is the concept of the Demographic Dividend, through which period Thailand is now passing. This concept concerns the proportion of the population active within the labour market and the proportion of dependents. As lifestyles change and standards of living improve, the fertility of women tends to decrease as they have fewer but healthier babies than in the

past. The number of young people who are dependents therefore declines. However, the ageing population means that the number of dependents who are elderly increases and, indeed, will become individually more expensive as new health issues and their treatment emerge. At some point, the down sloping line representing young dependents crosses the up sloping line representing elderly dependents and that point is taken as the period at which the minimum number of dependents upon the active labour market exists. Consequently, active labour market members have the most disposable income proportionately that they will ever have. This income may be disposed of in a number of ways, which are more or less productive. The role of the state is to provide incentives for the people affected to upgrade their own competencies and skills with respect to the job opportunities of the future. To be able to do this, extensive research will be required as a basis for the creation of an evidence-based vision of the future economy of Thailand and the types of workers and their skills necessary to bring it to reality. There is little evidence that any of this has taken place over the past couple of years.

5. THAILAND'S LABOUR MARKET POLICY

Since the 1950s, with the creation of the first National Economic and Social Development Plan, Thailand has embarked upon the East Asian Economic Model (EAEM) for development. This model relies upon export-oriented low-cost manufacturing with competitiveness based on low labour costs and a convenient investment climate for foreign and domestic investors. Wage costs have been kept low because of the presence of a large pool of under-employed subsistence agricultural labour and the attendant effects of supply and demand. At the same time, trade unions, freedom of association and free speech have all been suppressed by military and democratically-elected governments[69] alike. The Board of Investment (BOI) has been mandated to use various techniques to increase inward investment from foreign companies and it has concentrated its efforts on providing incentives for designated locations ('industrial estates') such as tax holidays, reduced costs and access to infrastructure and services. The industrial estates have been quite popular but there is insufficient evidence that this has been investment-creation rather than investment-diversion. Indeed, there have been some suggestions that the provision of incentives has distorted markets such that otherwise unprofitable activities can remain marginally profitable. Studwell summarises the situation thus:

"The great discovery of south-east Asian governments in the late 1960s was that their diverse populations (contrary to colonial myth) were rather uniformly hard-working and would happily toil through the day and night in factories making clothing, shoes,

appliances and electronics. Government needed only to woo investment – most of it foreign – with full ownership rights for production facilities; tax breaks and central bank intervention to keep local currencies undervalued and hence exports cheap. The proposition was irresistible for cost-cutting multinationals and spawned globally competitive, but small-scale local businesses to provide components and contract manufacturing and support services: anything from making models for toy moulds to packaging semiconductors to cleaning multinationals' factories (Studwell, 2007, p.xxiii)."

This is the basis of the 3Ls strategy that has become prevalent in Thailand: low productivity, low wages and long hours. Generations of factory workers have worked lengthy shifts on repetitive tasks for profits which will be sequestered by the foreign investors. Much of the investment has come from Japan and other East Asian countries and partly as a result of this and partly as a result of not having been colonised, Thailand has tended to adopt the East Asian Labour Model (EALM). There are three basic labour models used around the world:

- the Anglo-Saxon US/UK model places the emphasis on training and improvement upon workers themselves and provides very little assistance. The government makes company start-ups easy, thereby creating new jobs but with little security;
- the Scandinavian/European model places the emphasis on the state's provision of training and passive labour market policies.[70] Companies are encouraged to keep workers in position as long as possible and the state provides resources to upgrade skills and competencies where required;
- the Japanese/East Asian model places the emphasis on the companies, who receive state resources to train individuals as they require. The private and public sectors act together in national economic and social development. Companies have a strong incentive to retain employees as long as possible (Walsh, 2008).

Thailand's adoption of the third of these approaches, such as it is, has come about because of the importance of East Asian investment in the Thai economy, the unwillingness and inability of the state to provide expensive education and training for the working classes and certain cultural factors. The education system was designed to provide suitable factory workers for the majority of people while retaining university opportunities for the children of the elites and middle classes. A seniority system and pay system based on educational qualifications ensured that economic relations between the classes remained stable.

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[69] Most democratically-elected governments have had limited ability to affect the behaviour of the military or security services.

[70] Labour market policies are divided into the active and the passive. Active policies include job-matching and job-creation schemes. Passive policies include unemployment insurance and welfare payments.

6. THE CHIANG RAI CONTEXT

Thailand is emerging from a factory age that is characterized by an import-substitution, export-promotion paradigm based on OEM (original equipment manufacturing) factory-based production in areas such as textiles, clothes and electronic components. Increased labour costs have contributed to the declining competitiveness of this form of Thai industry and competition has intensified as neighbouring Vietnam and China can now supply large pools of disciplined, well-educated, low-cost labour and significant incentives to foreign firms wishing to invest there. Preparations have been made to some extent in connection with the adoption of a new economic paradigm based on high added value in manufacturing and services and the entry into the knowledge or information economy. In spatial terms, this has meant taking measures to ensure that industrial growth takes place throughout the country and is not concentrated almost wholly in Bangkok, as has been the case in the past. New centres for further industrial growth include the eastern seaboard region to the south of Bangkok and the northern province of Chiang Rai and its surrounding area. This northern area is part of the region that has been called the 'Golden Triangle' and it brings together northern Thailand with Burma, Laos and China. A long history of migration and porous borders has meant that cross-border economic activities have flourished in this area, although some have in the past been illegal. New transportation infrastructure projects represent a further incentive for investors to look at Chiang Rai favourably. Spreading the economic base of the country was also consistent with the 2001-6 Thai Rak Thai administration's policy of reducing income inequality by developing the provinces of the country and, at the same time, reducing the impulse for internal migration which has contributed to various social problems. Measures taken to promote Chiang Rai and its surrounding area are administered through a variety of government agencies, notably the Board of Investment (BOI). They include incentives for inward investment including subsidized inputs, tax holidays and the like, as well as infrastructure development and the signing of various international agreements to promote cross-border economic activities. Some efforts have been made to consider the labour market considerations of developments in Chiang Rai but, to date, these have been partial and lacking in co-ordination.

Table 61 *Chiang Rai Gross Provincial Product at Current Market Prices*

- ACTIVITY	MILLIONS OF BAHT	%AGE
Agriculture	**14,134**	**30.9**
Agriculture, Hunting and Forestry	13,745	30.1
Fishing	389	0.9
Non-Agriculture	**31,610**	**69.1**
Mining and quarrying	322	0.7
Manufacturing	1,799	3.9

- ACTIVITY	MILLIONS OF BAHT	%AGE
Electricity, Gas and Water Supply	746	1.6
Construction	1,811	4.0
Wholesale and Retail Trade; Repair of Motor Vehicles, Motorcycles and Personal and Household Goods	8,736	19.1
Hotels and Restaurants	1,159	2.5
Transport, Storage and Communications	2,829	6.2
Financial Intermediation	1,828	4.0
Real Estate, Renting and Business Activities	2,597	5.7
Public Administration and Defence; Compulsory Social Security	3,131	6.8
Education	4,390	9.6
Health and Social Work	1,807	4.0
Other Community, Social and Personal Services Activities	359	0.8
Private Households with Employed Persons	98	0.2
Gross Provincial Product (GPP)	**45,744**	**100**
GPP Per Capita (Baht)	**35,109**	
Population(1,000 persons)	**1,303**	

Source: Chiang Rai Provincial Statistical Office.

Table 62 *Labour Market Indicators for Chiang Rai Province*

WORK STATUS	MALE	FEMALE	TOTAL	PERCENTAGE
Employer	44,191	8,899	**53,090**	7.6
Government Employee	23,696	20,293	**43,989**	6.3
Private Employee	124,018	101,417	**225,435**	32.3
Own Account Worker	138,397	100,468	**238,865**	34.2
Unpaid Family Worker	47,900	83,704	**131,604**	18.9
Member of producers' cooperatives	906	4,055	**4,961**	0.7
Total	**379,108**	**318,836**	**697,944**	100

Chiang Rai province has a total area of some 11,678,369 square meters or 7,298,981 Rai and is in the far north of the country, bounded by Burma to the west, Laos to the east and Chiang Mai Province to the south. The total population of Chiang Rai is just under 1¼ million people. Table 61 shows basic economic details about the province and Table 62 provides labour market indicators.

The labour force in Chiang Rai is about 714,094 people, of which 225,435 workers are in the private sector. However, only 43,723 workers are registered for social security, since the economy of Chiang Rai is based on agriculture and is largely informal in nature. Casual labour patterns extend throughout the province with average daily wages of between 80-120 baht – significantly below the stipulated legal minimum wage.

Barter and labour exchange are common. A principal source of labour is the hill tribes' people who mostly live in mountain villages, together with Thai workers aged over 40. Most younger workers have migrated elsewhere for work.

Social Security Office records show that some 76.7% of employers in the province employ nine or fewer workers. Large companies are scarce. Unofficial retail shop workers in Chiang Rai are estimated at about 30% of the total of workers and Provincial Statistical Office figures for 2005 suggest that 18.9% of workers are unpaid family workers.

This study shows that, in general, people in Chiang Rai are quite well educated. Most people who pursue higher studies will go to work in other provinces such as Lampang, Bangkok, Samut Prakan and Rayong, since there is little work appropriate for new graduates in Chiang Rai. Many interviewees suggest that, though there are many technical colleges in Chiang Rai, there are very few factories requiring the skills possessed by the graduates produced by those colleges. Most of the factories that do exist are rice mills and the majority of all business operations in the province are directly related to agriculture, tourism or small and medium sized retail outlets. There are four universities in Chiang Rai: Rajabhat University, Mae Fah Luang University, Rajamangalah University of Technology and Mahachulalongorn - Rajvitthayalai University. In addition, there are seven institutions under the Vocational Education Department (one of which is the Chiang Rai Agriculture and Technology College), while a further five institutions fall under the office of the private education commission. This indicates that there is capacity for educating the future workforce, although the exact nature of the curriculum remains to be established as far as labour market planning is concerned.

7. THE IMPACT OF CORRUPTION ON THE LABOUR MARKET

The impact of corruption on the labour market in the Chiang Rai region may be divided into the following areas: human trafficking; under-payment of wages and dangerous working conditions; environmental degradation and overall lower levels of contribution to economic development as a whole. Since corruption by definition occurs in secret and beyond public scrutiny, it is impossible to identify accurately exactly what the costs of the corruption actually are, although estimates are possible. Additionally, the costs are not always amenable to measurement by strictly financial means. For example, the trafficking of women, whether voluntary or involuntary, has a human cost on both the supply and the demand side which it is impossible to quantify. The additional costs of environmental degradation are also very difficult to calculate as they include the costs of future flooding and drought and forecasting the future, especially at a time of global climate change, is problematic. The World Bank assesses the costs of illegal logging as

reaching the level of billions of dollars but, since the transactions do not take place in open markets, then there can be no certitude as to the extent to whether appropriate prices are being set on either side (Reuters, 2006). To some extent, the suicides that follow floods on an annual basis in Thailand should be attributed to the illegal logging but no widely accepted scheme measures the value of human and family life.

In terms of the labour market more specifically, it is clear that many workers are obliged to work on a daily basis, with no job security, no guarantee of minimum wage payments and intense competition with other workers. This occurs, for example, in the tea-picking industry, which employs casual labour for many of its seasonal activities. The prevalence of low-cost and low value-added jobs resulting from the underpaying of salary means that marginally profitable activities remain profitable when corruption is employed – i.e. to avoid safety inspections or auditing. Consequently, graduates of tertiary level institutions in Chiang Rai are obliged to leave home to find work elsewhere, often in Bangkok, to be able to take advantage of their skills and competencies. Nearly all of those graduates with technical skills fall into this category. At the same time, the pool of unqualified and largely unskilled labour is being topped up by those farmers whose livelihoods have been negatively affected by the Free Trade Agreement with China, which has led to a steady stream of fruit and vegetables arriving from Yunnan province and distributed to the large retail chains now prevalent throughout Thailand. Entrepreneurial activity tends to be suppressed when low value-adding activity remains profitable because it is less risky. Indeed, the lack of the rule of law in the region that keeps it from reaching the higher level of economic and social development that would be possible.

People who are able to obtain higher quality employment with additional security are able to be part of developing local communities with more resources available for community services, public health and education facilities. This assists with political stability as well as better life opportunities for those involved, which is another desirable outcome.

8. CONCLUSIONS

It is clear that further research is required before more satisfactory estimates of the cost of corruption in any region of Thailand can be completed. The issue is particularly important in the current climate because of the need for the Kingdom to move away from the EAEM and towards a new vision for the economy which features steps taken towards the knowledge-based economy. This is necessary in order to provide evidence to create a labour market policy that recognises current and necessary future changes in the country and the ways in which the economy should be transformed.

In order to reduce the human and social costs attached to labour migration, it is necessary to redistribute resources from the centre to the regions of the country, thereby strengthening the regions. Strengthening the social fabric will reduce the reliance of individuals on precautionary saving (which is particularly problematic for communities relying on subsistence agriculture and its reliance upon the systemic infliction of personal debt) and enable individuals to obtain leverage from the assets that they are able to register. This method has proven to be successful in promoting regional and community development in a number of other countries.

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IS MOBILE LEARNING HEADING A WRONG WAY?

Mugurel PATRICHI*

Abstract *Mobile technologies are commonplace in our society, with more than 4.5 billion mobile cellulars registered worldwide in 2009. With so much available equipment, learning solutions providers have a long history of experiments concerning the delivery of information to a specific user, preferable in any location he might be. However recent surveys or position stances assumed by teachers, trainers or authors seem to indicate that behind mobile learning discussions lays a very immobile reality*.

Keywords*: mobile learning, M-Learning, E-Learning, M-Learning detractors*

JEL Codes: *D83, Q55*

INTRODUCTION

A Google search using "mobile learning" came up with 67,200,000 answers [1]. Definitions, white papers concerning "Incorporating Mobile Learning Into Mainstream Education" [2], so called "essential information" [3], mobile learning kits [4], reviews, portals, books, in the first ten pages of Google Results there is nothing to suggest anything else that *Mobile learning, or m-learning, is a growing phenomenon where people use grab and go devices that allow them to access information from almost anywhere* [5].

With one exception, on page three, a link to a report that states "*With the announcement of Apple Inc.'s iPad and the recent growth in the sales of wireless-enabled netbooks, the subset of distance learning known as "mobile learning" has become a hot topic of conversation — but hasn't moved past the discussion stage in New England. Despite a long history in New England of enterprise software development, a vast number of colleges (many of which were early adopters of Internet-based educational technologies) and a strong presence of wireless and mobile development here, this region has not taken to mobile learning in a significant way, say experts.*" [6]

* Mugurel PATRICHI, Alexandru Ioan Cuza" University of Iaşi, Faculty of Economics and Business Administration, Doctoral School of Economics
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Returning to the original Google search (which is, admittedly, hardly a scientific method of investigation), one could notice, however, the fact that in those ten pages of results we cannot find any real, large-case implementation. Guides, yes; companies promoting their mobile learning expertise, yes; even some examples. But nothing more beyond, as the above study puts it, *a hot topic of conversation*.

In fact, a more scientific search of the subject reveals some troubling facts: for instance, Gartner expects that over 85 percent of handsets shipped globally will include some form of browser by 2011 [7]. A literature review will show that the mainstream authors and researchers promote guidelines, methodologies and, lacking other word, belief in the M-Learning paradigm (for instance [17] or [18]). Research papers have been put forward, showcasing successful pilot programs (a lot of examples can be found in [14] and [40]). However, outside the peer-reviewed academic environment, detractors of the mobile learning paradigm voice their disagreements using online journals and blog posts. This paper investigates the opinions of these teachers, trainers and managers, in order to see if the current path of mobile learning leads to a dead end. And questions worth investigating have been raised by articles like [23], [29] and [33]. Furthermore, Gartner predictions fail to mention anything about E-Learning using mobile devices. Nothing in Gartner`s Top 10 Consumer Mobile Applications for 2012, nor in Top 10 Mobile Technologies to Watch in 2010 and 2011. There are mentions about different elements that might be included in a Mobile Learning initiative (for instance, local awareness, mobile browsing). But in 2009 top E-Learning solution provider Blackboard released Mobile Learning application for all major mobile platforms in less than a year [8], going as far as acquiring the company responsible for the category defining suite on iPhone [9]; if not for other moves on the e-learning/mobile learning market, that was expected to provoke at least a nod from the Gartner analysts.

THE DEFINITIONS

The MOBIlearn Guidelines are defining Mobile Learning as *Any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies* [10]. Another widely used definition (for examples [11], [12]) states that M-Learning, although related to E-Learning and distance education, it is distinct in its focus on learning across contexts and learning with mobile devices. Despite hardly being a scientifical resource, we will mention Wikipedia's definition of mobile devices, *a pocket-sized computing device, typically having a display screen with touch input or a miniature keyboard* [39]. Other viable definitions of Mobile Learning start with *The advent of mobile technologies* [which] *has created opportunities for delivery of learning via devices such as PDAs, mobile phones, laptops, and PC tablets (which are laptops*

designed for a handwriting rather than a keyboard interface). Collectively, this type of delivery is called m-Learning [13]. Or, another definition, starting with the goals of the process: *The task confronting the field of Mobile Learning is to harness this vast availability of wireless technology to education and training. Its role is to orchestrate the move from the wired learning environment of today to the wireless virtual learning environment of tomorrow* [14].

There are three elements that one can see common to these definitions: the process of learning itself, which is adapted to use the new technologies for delivering information and/or accessing knowledge. We will consider that the latter two elements are actually IT related: the technology is the hardware: the laptops, mobiles, PDA's and such; the adaptation, concerns the software, the applications meant to deliver education/training to the handheld equipments. A researcher in educational science would probably disagree with this technical approach to the learning process. Defining "learning" is not one of this paper's objectives, although some concerns will be addressed in the chapter dedicated to the teaching process.

One should note that there are actually two discussions here: one concerning the classroom adoption of the mobile learning, and the other concerning the use of mobile technologies in trainings and other forms of employee education. However, from the point of view of the three items above (learning, adaptation and technology), there is only one discussion, with different implementations.

THE TECHNOLOGY

We chose to start this paper with the final part of the triangle, the technology, because, if (at least apparently), the term "learning" is self explanatory, the scientific advances are what drive forward the "push" for mobile learning. Some authors go as far as claiming *it is so important for researchers and practitioners to be familiar with mobile technology applicable to m-Learning. It simply is not possible for someone to log onto a learning management system wirelessly from a personal digital assistant if wireless networks don't exist or if PDA's do not support wireless connectivity* [15].

One of the most comprehensive definitions of mobile learning related hardware comes from Bryan Alexander: *Mobile telephony. Laptops, increasingly wireless. Personal digital assistants, including PalmPilots and Pocket PCs. The Danger Hiptop. Tablet PCs. Handheld gaming tools, such as the N-Gage. MP3 players. Wireless connectivity detectors. Bluetooth-enabled devices. Wireless access points, which can irradiate a room or area or be knitted into a cloud covering a block, a campus, or an urban sector. Digital cameras, still and motion, which are increasingly found in cell phones. USB drives. Fusion devices, such as combination phone/PDA/MP3-players.*

RFID tags in the millions. All of these are supported by ambitious, shifting, emergent infrastructure networks of connectivity, access, and payment [16]

Early attempts to use technology in a classroom made use of magnetic devices and tapes. Some experiments included using phone lines to assist students. As the computers got more portable, attempts have been made to use this advantage. Since the early '90s pocket-like implementations have been achieved, using either state funded projects or private funded one [13]. United Kingdom and Australia had national programs for funding the acquisitions and implementation of mobile learning equipments. Private companies like HP and IPaq funded experimental implementations of mobile learning using their equipment. The European Union funded the MOBIlearn project, which gathered researchers from all over the world to define a mobile learning framework.

However, studies have show that universities have problems in assuring the financial sustainability of the M-Learning project beyond the pilot phase ([17] has some examples). Some proposed using students` own mobile units (since most, if not all, had reasonably recent cellphones) [18], but still, there is the problem of carrier costs: in the United States, for instance, choosing a mobile equipment means taking into consideration the carrier that supports it. While in Europe the same device can be used in multiple networks, in the USA there is a fierce competivity between mobile carriers, including exclusivity on some devices. So it is hard to think about a universal solution, for instance on a campus level, without taking into consideration the fact that the universities have to provide the equipment themselves, since nowhere in the study contracts does it say anything about students having to accept a certain carrier. Recent takes on the subject propose to make use of the fact that most of the students own a cellphone/smartphone and just use them [19]. However, even disregarding the ownership of the terminal, there is still the problem of developing a software platform conveniently accessible though the use of different terminals.

Studies have also shown that as the complexity of the teaching process increases, students are more dissatisfied with it [20]. Best results have been obtained when using laptops/notebooks/netbooks/tabletPC`s, which can provide enough computing power, adequate input mechanisms and large display area, compared to cellphones/smartphones/PocketPC's (for example [14], [19], [20]). Other scientists expressively dismiss the usage of laptops, as they are *portable, not mobile* [21]. The MOBIlearn guidelines rejected any definition of mobile learning that refers to specific tools, but use laptops as comparing elements later on their documents. The discussion is a little circular, and important if one whishes to relate to past implementations: most of the successful experiments with Mobile Learning (some of them presented in [13]) included sending participants in low-if-any network coverage, with Tablet PC`s, although the only basic difference from a normal laptop is the lack of a keyboard. While this poses certain

problems, it also offers some interesting possibilities in terms of hand recognition and communication in abnormal environments. For instance, in one of the most successful experiments, the University of Melbourne, having won a contract from HP, gave tablet PC`s to medical students and sent them to remote locations in medical practice [22]. In order to overcome the lack of network access, a full medical database was loaded on the tablet PCs. So the students were mobile (meaning they were out of the school class, doing what many consider "best way of teaching"), but in terms of technology usage, they were just carrying slender desktop computers.

The problem is that by dismissing the usage of TabletPC's, one dismisses much of the pilot programs successes. It can be argued that TabletPCs were used because of the limitations of other technologies, in terms of processing power and storage, issues that are steadily overcomed as the smartphone technology and network coverage pick up speed. Still, one of the biggest issues with smartphones is their screen size: as author and pedagogist Roger C. Schank puts it: *E-Learning will not happen, at least not seriously, on mobile phones.[...]I don't know about you, but staring at mobile phone for an hour makes my eyes hurt. Try doing it all day for a year. It makes no sense* [23]. And if we talk about recent development, like Apple's IPad or modern Tablet PC's, they use the internet to connect to the same applications that any desktop computer would be able to connect. This makes mobile learning hardly different from e-learning.

Author and E-Learning researcher Mark Oehlert`s commented: *I will [...] continue to argue that Mobile Learning (as opposed to "imMobile Learning?") will not cross into the mainstream as long as we continue to fail to adapt our design to the fact that most mobile devices are first audio devices and, distantly second, visual devices* [24]. In eastern Asia there is a steady market of language-learning audio book [25]. Students are listening on their MP3-compatible equipments while commuting, but it's worth mentioning that audiobooks that tried to teach anything else then English and Chinese did not prove so successful. Across the Pacific, however, with the launching of the iPod, students and teachers could record audiofiles (called podcasts) and distribute them with ease. Experiments with this type of mobile learning showed that the students are interested in hearing the lectures, but in some cases one could notice that the podcasts where listened on the desktop computer, not on the mobile device [26]. Videocasts are increasing popular on internet platforms such as YouTube, but more researches are needed in order to identify whether these podcasts are viable on a mobile device, or they are being used on desktop computers, as part of the e-learning process.

Summarizing the discussion about technology, we should state that the technological leaps are there: in five years we moved from cellphones with two-lines displays to smartphones with real-life colored touchscreens. The network coverage moved from cables to satellites, and the scientists are working to improve the battery life.

All of these can be improved (especially the battery life), but in our view there are enough scientifical achievements to discuss using mobile equipments for learning.

For the rest of this paper we will consider laptops and alike portable, not mobile, so we will not refer to them when discussing the other issues.

THE ADAPTATION

E-learning specialist Mark Oehlert commented on the connection between Mobile learning and technology: *We are content to continue barreling along down the Mobile Learning road, when 95% of those m-efforts begin with a focus on the technology. STOP!! More so than with PC-based efforts, mobile efforts MUST begin with the user experience - THAT is* [the] *place we must reverse engineer from, NOT from the hardware to the user* [24]. He also suggests some stages that need to be covered in any discussion about M-Learning:

- Stating the requirement for mobile content (as opposed to any discussion about terms like Mobile Learning/instruction/performance/support)
- Describing the optimal user's mobile technology-mediated experience in meeting that requirement (as opposed to anything concerning optimal organization mobile technology)
- Discussing the capabilities necessary to meet the requirements without a reference to any particular platform
- Constructing a technology baseline of the organization (both end-user and infrastructure)
- Only then, *while considering the implications of our user experience work, our capabilities that we need and our existing and near-term technology environment, we may BEGIN to ever so gently talk about specific technology.* It should be noted, however, that this is hardly the path a software provider will choose, since he is not trying to convince the client to use m/e-learning, he is trying to sell his product

On a different note, author and consultant Clark Quinn, gave the following answer concerning M-Learning: *Mobile Learning is not about courses on a phone. […] while there are learning implications for mobile devices, it's really about performance support. Yes, one of the applications of mobile devices is learning augmentation, extending the learning experience over time through distributed presentations, examples, and practice, but the real opportunities are providing context-sensitive support for the mobile workforce* [27].

A 2008 study from Ambient Insight claimed that mobile market revenues reached 538 million$ in 2007 in US alone [28]. With the launch of different new platform

(Apple's IPhone and IPad, Google's Android), this value was expected to grow. According to the Ambient Insight's taxonomy, there are three types of mobile learning:

- Handheld Decision Support (mobile field forces, healthcare responders),
- Location-Based learning services (GPS-related information for tourists, for instance)
- Device-embedded learning (language translators, for instance).

This view focuses more on the commercial application of the mobile devices. Handheld decision support were expected to generate the biggest revenues, and are featured most in the official channels for software distribution (and the offer is extremely varied, ranging from dictionaries and medical compendiums to audio-books). Also, the study shows that the higher education and consumer segments are the stronger buyers in the current market, yet healthcare will dominate by 2013. It is unclear how much these prediction have been affected by the 2009 US healthcare policy.

However, a late 2009 survey comes to shred the view that mobile learning deeply penetrated the training market [29]. According to its authors, *most responses (605)* [out or 968] *came from corporations, with 13 percent working in higher education and 8 percent in the government and military sectors. Nearly 60 percent of those who responded had been in the field for 10 or more years. The most frequently occurring E-Learning practice is the testing of skills and knowledge. […]Instructional design practices that represent pedagogy options made a strong showing. Tutorials, scenario-based learning, and problem-solving strategies were persistent.[…] E-coaching and the use of mobile devices were rare.* Furthermore, the least occurring E-Learning practice was *our programs are delivered on mobile devices*, scoring an average of 1.11 out of 3 (where 1 means "Rarely or never").

A long-favored strategy, online discussions to support knowledge transfer from the classroom to the workplace amazed us by being not at all typical of the practices reported by respondents.

Even though the survey fails in terms of representation, it does point out some interesting conclusions: first of all, there is a predominance of "old ways of teaching". Although enlisted as something to be wanted, personalization of content appeared only scarcely. Further more, the main usage of E-Learning is testing, instead of teaching. And, again, the usage of mobile devices was *rare*. It can be argued that the mixing of money issues and the client preference for the classroom makes it hard to implement it in commercial activities. After all, the greatest success was achieved with pilot programs and test runs in an academic environment (usually state-funded). However, with all the hype concerning mobile learning, this still acts as a cold shower.

One area that proved successful is assisting medical personnel through the usage of step-by-step podcasts, access to medical databases, videocasts for home study [30]. Although mentioned in papers and events on the subject of mobile learning, it can be

argued that a stronger component is the decision support system; this view is consistent with Ambient Insight's take on the subject, and with some change of perspectives on the learning process, that will be addressed later on.

THE TEACHING

Elearning analyst Miranda Welch comments upon Gartner`s definition of M-Learning: „*Mobile e-learning solutions enable training and development teams to create, publish, notify, deliver and track learning content and manage learning interactions for mobile users, regardless of their mobile devices". To me this definition does not cover the communication capability afforded by the technology. The definition seems to focus on the "management" of learning again, rather than the learning itself* [31]. This view is shared by training specialist Clark Quinn who stated that in 2008 *there will continue to be „E-Learning Solutions Providers" with no one on the executive/management team who really understands learning* [32].

While the mainstream view is that the mobile devices can complement the already existent e-learning techniques (we've already mentioned e-learning solution provider Blackboard's struggle to develop applications for all mobile platforms), there are voices who claim that the whole process made a wrong turn: *If PDA's were seen as the answer of how to address the personalization agenda, then how have we ended up replicating the same traditional, Victorian teaching methods?* asks teacher and learning consultant, Chris Nash in an article named „*The End of the M-Learning Revolution"*: *Watching a lesson where 30 kids are doing identical tasks on their PDA's does not deliver choice even if they have options for choice of input method (text, image, sound). Learning styles is not merely about which tool you use to capture you thoughts but also about the environment in which people find it conducive to learn and the ways in which we are more successful in processing stimuli or information* [33].

The already mentioned author Roger C. Schank blames the teachers for the current status. *Having been a professor myself for 30 some odd years, I've developed a healthy disrespect for professors as a group. They tend to lobby for keeping their lives easy, and that means, among other things, making sure they don't have to teach too much or teach in a way that makes them have to work too hard* [34].

In his turn, Chris Nash, while answering comments to his article, exonerates teachers as a group, but blames those in charge with the whole system*: There are many exciting and engaging technologies out there that stimulate students learning and offer different ways to interact with the world, and actually there are many teachers out there brave enough to have a go at offering a more student-centric curriculum based on a more personal access to learning, it's just that there are equally as many people, be it politicians, commercial organizations, or senior education advisers who make it so*

damned difficult to thrive and make it so easy to slip into Victorian teaching practices because ultimately the results are more 'measurable'[33]. It should be stated that at the time the article was written, in Chris Nash's country, United Kingdom, a national framework for educational upgrade was in place, which, among other things, had a program for implementing home-access to technology for youngsters. As of June the first, 2010, the organization that was overseeing it was abolished.

However, there is one other thing that should be taken into account: the difference between teaching/learning, and accessing information. It is clear, at least from Ambient Insight's mentioned report, that when it concerns non-didactical uses of the applications, anything that provides information through the use of mobile technologies it's perceived as being mobile learning. This is the case with accessing healthcare-related support information, for instance, or the tourist information. However, we have already mentioned the University of Melbourne's experiments [22], with putting students in low-if-any network coverage areas, in order to practice their medicine using a database stored on their tablet PC's. There is a fine line between studying about cures, and just using a search engine to look for to-do lists based on current symptoms. In other words, the students involved with the experiment were developing medical skills, or they where just using computer skills? Recent works in this area of learning chose to ignore the learning, in favor of the helping hand this equipment lend to the operating doctors [30].

Beside this practical approach, it has been noted that research on mobile learning is currently making a shift from practice-orientated research to theory building, taking into account experiences related to the learners' life worlds, agencies and cultural practices, in out-of-school, informal contexts [35]. In this view, old sociologist quotes found their way into mobile learning papers: *Learning for learning's sake isn't enough. . . . We may learn things that constrict our vision and warp our judgment. What we must reach for is a conception of perpetual self-discovery, perpetual reshaping to realize one's goals, to realize one's best self, to be the person one could be* [36]. This led to a shift from the technical definition of mobile towards the paradigm of "learners on the move": *We learn across space as we take ideas and learning resources gained in one location and apply or develop them in another. We learn across time, by revisiting knowledge that was gained earlier in a different context […] We move from topic to topic, managing a range of personal learning projects, rather than following a single curriculum. We also move in and out of engagement with technology, for example as we enter and leave cellphone coverage* [37]. This went side-by-side with a concept EU was very fond of, life-long learning; a 2005 study [38] on adults found that 51% of the learning episodes took place at home or in the learner's own office at the workplace. The rest occurred in the workplace outside the office (21%), outdoors (5%), in a friend's house (2%), at places of leisure (6%) or in other locations (14%) like places of worship, the doctor's

surgery, cafes, hobby stores, and cars. Only 1% of the self-reported learning occurred on transport. Ironically, this study supported two opposing view: one that claim education cannot be done while commuting [34], the other claiming that there are opportunities to design new technology that supports learning during the growing amounts of time that people spend traveling [36].

WRONG WAYS

Tooting the mobile learning as being ready to take over from e-learning was a wrong turn, in multiple ways. Technologically it created expectations regarding the actual capabilities of the system and lead to frustration regarding the actual implementation. Surveys showed that proposing mobile technologies as means of training failed, since clients were fond of old ways of teaching (classroom-style trainings). In the academic environment, the logistics proved to be too expensive, and even state funded pilot programs did not manage to achieve sustainability. It is not to say that attempting to use mobile technologies to access educational content was a mistake. But it's the label of "next best thing" that did the harm. In our view, mobile learning should have been regarded as more of a feature of e-learning, not an equal. Even surpassing the battery life issues, there is still the problem of accessing the information via a 3 inch screen.

Pedagogically, going mobile exposed deep flaws in the way teachers regard the whole IT-sustained learning process. The small number of teachers activating in the cyberspace (compared to the total number) empowers detractors to think that most of the teachers do not know how, or do not want to bother to make use of all the possibilities they have. And if copy-pasting the text book and uploading it might pass as (lousy) e-learning, mobile learning required everything to be scaled down (in terms of phrasing, pictures, content length) and reevaluated. In our view, this reevaluation is actually a good thing. The not-so-good thing is the complacency that if a page has been resized to fit a smartphone screen, then the adaptation is done and it is student's job to find ways to use it.

A third wrong turn concerns the changes in the definitions of both "mobile" and "learning". Without entering taxonomies, we side with those who consider a standardized evaluation as a vital part of the learning process. If knowledge is just being accessed, used, and then discarded, to be searched again next time via electronical equipment, then this is hardly education. The difference between accessing Wikipedia on the smartphone and letting Wikipedia know where someone is via GPS does not entitle the latter situation to be called mobile learning. We are explicitly referring to guided tours, delivering of context aware information, or calling mobile learning each time a student accesses on his

mobile internet the same unmodified content that could have been accessed from his desktop computer.

Furthermore, "diluting" the concept of *mobile* learning to include, for instance, learning when commuting, or social networking, or "dissecting" it by coordinates such as collaborative and cooperative learning will serve no purpose other then adding more theoretical layouts to what should have been, in our view, a practical approach.

Where could these wrong turns lead? Since academic implementation is a function of costs, failure to meet expectations in term of sustainability at the end of many state-funded pilot programs could lead to a decrease-to-a-halt in funding. Some of the pilot programs, like those in EU or Australian ended, and others, like the United Kingdom's were canceled due to budget constraints. On the other hand, it could be argued that there have been enough pilot programs to prove the viability of the mobile learning paradigm, and it's time to wait for the technology to follow up on the expectations, and for the content providers (in most cases, the teachers) to add learning content to the already existent infrastructure (YouTube, Google Books)

But for most of the mobile learning definitions, the technology did catch up already: there is access to multimedia content, internet browsing, context aware information on a mobile. What is missing is a straight, permanent connection with the learning. If the quantity of available learning content grows slower then the bubble of expectations deflates, the student will fill his educational needs by turning on the web-browser on his mobile equipment and surfing for information. He is becoming his own content provider, but there is no need for a label called "mobile learning" since there is already a label for what the student is doing:

"Browsing".

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BOOK REVIEW

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JESÚS HUERTA DE SOTO: ARTISAN OF NEW HORIZONS ON THE ORIGIN OF ECONOMIC CYCLES AND CRISES

Jesús Huerta de Soto, *Bani, credit bancar şi cicluri economice,* published in Romanian by the "Al. I Cuza" University Press in collaboration with Ludwig von Mises Institute, Bucharest, 2010, 853 p.

Reviewed by Ion POHOAȚĂ*

1. WHO IS THE AUTHOR?

An anniversary such as the one by which "Al. I. Cuza" University celebrated 150 years since its foundation can be emphasized and remembered in many ways. In our opinion, it would be proper to draw attention to the existence of some seminal works in world knowledge. The University of Iasi celebrated its anniversary by translating and publishing the book *Bani, credit bancar şi cicluri economice* by Jesús Huerta de Soto, reputed professor of Political Economy at the University Rey Juan Carlos of Madrid, Spain; "A professor of a rare talent, a scholar of an extremely wide intellectual horizon and with a deeply analytic capacity, and a writer who can make Economics to show as the best literary work, Senõr Jesús Huerta de Soto ought to be named one of the last "Humboldtian" academics in the university field of economic science" – in the concluding words to the touching Laudatio by which the Spanish professor was rightfully awarded the title of Doctor Honoris Causa of "Al. I. Cuza" University of Iasi. We would like to underline that he is a professor with a fascinating scientific and academic carrier, with many valuable books, with a great intellectual tenure consumed in seminal issues and for the purpose of answering fundamental issues in economics.

Of all his scientific products, we stopped at one, a true "magnum opus", synthesis of the first main direction of research, monetary theory, banking and cycle theory, developed by professor de Soto in *Bani, credit bancar şi cicluri economice*. First published in Spanish, in 1998, as *Dinero, Credito Bancario y Ciclos Economicos,*

* Professor Ion Pohoață, "Al. I Cuza" University of Iaşi, Scientific consultant of the Romanian edition of the book

according to the most experienced voices in the field, the work is one of the most complete, consistent and covering treaties on money, credit and economic cycle published in the literature of the field.

2. REASON FOR CHOOSING THIS BOOK

It is well known that many papers have been written on this topic, most of which are renowned ones. "Al. I. Cuza" Publishing House chose to offer the Romanian translation of this book based on solid arguments.

First, it is worth mentioning that the topic itself is in the pipeline and the book we are referring to has already become an *authority* in the field both in terms of *ideas* and *facts*. As far as the *former* is concerned, i.e. its acknowledgement by great minds that contributed to this field, we simply mention a few sequences. Up to the present, the book benefited from two English versions and translations in eleven languages. The core or thesis of the book was also the subject of a conference organized by Mont Pelerin Society in 1993 at Rio de Janeiro, an opportunity for the Nobel Prize winner, James Buchanan, to praise the theoretical debate on the central bank – free bank relation and the fractional reserve system clarified by professor de Soto. Many comments were made on the work and sides were taken by some of the most reputed publications in the field. To summarize, as far as money, credit and economic cycles are concerned, professor de Soto is already an authority in the field and his book is a seminal one with universalist valences. With respect to the *latter*, i.e. facts, since 1997 to present the evolution of real economy and mainly the Asian financial crisis, but also the present world crisis confirms to the author, and not only to himself, the veracity of statements and forecasts outlined in the book.

Second, in our opinion, the authority of the book is strongly founded on *the theoretical basis of report*. The author makes no secret from claiming the origin of his ideas when he directly sends to the *Austrian School* – one of the most reputed and solid schools of economic thought in the world. Moreover, the author draws on the old sources of this school; he invites us to acknowledge the exceptional novelty of the scientific product of the *Salamanca School*; he invites us to reflect along with the learned Jesuit and Dominican monks on topics such as the role of entrepreneur in economy, the subjective dimension of value, the way to set he "right" price on the free market, the place and role of a healthy currency in financial stability or, last, on the profitable effects of free trade. The true Wien school that the author glorifies and fructifies, animated by masters of economic spirit such as Carl Menger, Eugen Böhm-Bawerck, Friederick von Wieser, with their vision on subjective value, free competitiveness, currency calculus, capital and interest theory, etc. already represents the second theoretical register to which de Soto acknowledges his belonging. From Ludwig von Mises and Ludwig von Hayek who are also very present in the book, de Soto takes all and especially the openness,

polyvalence, multidisciplinarity and methodology. In this way, professor de Soto joins other reputed European economists such as Pascal Salin and Guido Hülsmann to give a professional and updated reply to the American version of the Austrian School that inspired him; from Murray Rothbard that put the ethic criteria at the foundation of politics and of the banking and monetary policy; from Israel Kirzner in making entrepreneurial approach a realistic source of analysis of economic issues. As brilliant follower of great professors, Jesus Huerta de Soto did not have another alternative than to write a *great book*. One can only think and write properly based on such foundations when one draws on Menger, Böhm-Bawerck, Mises or Hayek, and when one is in direct competition with the brilliant North Americans Rothbard or Kirzner. Due to its drawing on such philosophers, the book is revealed to us as one of the most accomplished *synthesis* on the topic discussed; a synthesis responding to the integrative vocation which is specific to the Austrian School where the multidisciplinary approach is at ease; where the micro analysis is subordinated to the macro one and vice versa; where nominal economy is caught in-between the texture of the real one; where, finally, economic, legal, historical, institutional, ethic, etc. dimensions coexist in the theoretical-doctrinary approach of some apparently "dull" issues such as money, capital, interest, economic cycle, accounting or banking practice.

The strong theoretical and methodological foundation of the Austrian School on which the professor's book lies on is a mark of seriousness, consistency and profoundness of analyses that become complete in this perimeter. But he is not the only one. A book written by an "Austrian" is also interesting because it offers a different perspective, by definition; it is, from the beginning, an alternative to "mainstream economics". From de Soto's writing, we found out the "opposition" to orthodox economic and political theory with respect to money, credit and economic cycle. However, no further explanations are needed to prove that it is convenient and useful to stop at a landmark book.

3. WHAT DOES THE BOOK TELL US?

Professor de Soto's book is a thick one having the attributes of a *treaty*, not only by dimensions, but also by its analytical load. Moreover, it targets a wide readership. Students, researchers, professors, specialists in monetary and banking issues can cut their right "slice" from the book. In other words, the book is also appropriate for a partial reading, although it remains splendid on the whole.

It is not easy to present such a great work as the one herein in a few pages. By trying to find its essence, we believe that the author had at least three *aims*:

- Clarifying the traditional theory on money deposit agreements, and adjacent, the theory on money, bank accounts and economic cycles;

- Making a critical presentation of the financial-monetary system centred on and starting from the Central Bank as coordinating pivot; revealing the synonymy of such a system and prove, with arguments, that it does not stand a chance in efficiently using economic calculus and that, finally, it will collapse as any other social system, fruit of a social image;
- Building and presenting a new model of financial system applicable to a free society.

An *obsessive* question defines all these aims: "Why does Say's Law not apply in certain circumstances, recurrently and as a result of credit expansion?" Or, in other words, why is economic life cyclical and crises seem to be unwanted, yet permanent company? This is the fascinating story of a growth aiming at permanence, sustainability but which is painfully stopped for "human" reasons and needs to be restarted.

Jesus Huerta de Soto tries to give "another answer" to this question; one that keeps in line with the Austrian School of thought, but yet opposed to the official paradigm. In order to meet his objectives, he posits his analysis on three foundations spreading on nine chapters.

All the pages of the book are important for the logic of demonstration and most of them are quotable. We believe that the following deserve special attention:

- For the *1st part* (chapters 1-3):
  - the exceptional presentation of the theory on money deposit agreements and its dissimilarity with the (mutuum) loan contract;
  - the percussive historical study in which, based on a rich empirical basis, the banker's perverting process is revealed to us as he turns from a serious figure summoned by modern economy and history to the money lender and takes on his extortionate practices. Thus he becomes a criminal who breaks the traditional principles on several officially acknowledged occasions only to allow himself to lend the sight money that were entrusted to him. Based on this foul process, we are initiated to the passage from deposit agreements with a reserve coefficient of 10% to the fractional reserve system. In this process, the concern for liquidity is transferred from the private bank to an entity with central-coordinating functions, also called Central Bank. Moreover, we find out, in context, about the theoretical poverty of the doctrinary attempts at justifying such practices (of fractional reserves) that, in the author's opinion, will keep their status of breaking the law.
- *The second foundation* (chapters 4-7) sends to the *core of the analysis.* In a critical manner, the author presents the main doctrines, i.e. *monetary* and *Keynesian*, that support the financial system with fractional reserve. Mainly considered to be two alternative theories, we find out from de Soto's book that monetarism and Keynesianism strongly interfere having the following *mutual gaps*:

- The lack of a solid theory of capital able to explain the intimate relation between production structures and nominal ones. They are both criticized for operating with the mythical concept of homogenous and reproducing capital, a ground that produces revenue, a concept with no sustainability in real economy;
- The compromise made by both doctrines to A. Marshall for misunderstanding two main issues:
  a) Currency is not neutral; credit and currency expansion influences the production structures, not in a balanced and simultaneous manner as an "ebb", but in an unequal and disproportionate way as an "earthquake", leading to a bad allocation of resources in macroeconomic terms;
  b) Prices influence costs and not vice versa; (in this sense, the references to the well-known demonstration of P. Sraffa in *Production of Goods by Goods* is eloquent);
- They are both exclusively and intendendly macro-economic. Hence, from an epistemological perspective, they are both facing the same obstacle: they see only macro ideas, instead of concrete intrinsically micro ones;
- They both take cause for effect suggesting the increase in the amount of money as remedy instead of readjusting real economy.

We *especially and particularly* mention a critical aspect for each of the two doctrines:

In the case of *monetarism*:

- The pure mechanicist vision of the quantitative theory of money rendered by the equation MV = PT; a vision sustained by the belief in the existence of general levels of prices and relative structures with powerful influences causing distortions in the production structures.

In the case of *Keynesianism*:

- The Utopia of declared neutrality for the currency;
- The conviction to an accounting approach induced by the famous equation I (investments) = S (economies). The author insists on the sources of economies to draw our attention to the fact that S comes from money created out of nothing by a bank without any support in voluntary, normal economies and a correspondent in real life; therefore we have to expect distortions from the evolution of economy;
- The falsity of the correlation between the capital's marginal efficacy and the interest rate that we arrive at in the lack of a solid capital theory.

The author replies by imposing the vision of the Austrian School whose partisan he proclaims to be without any reservations; a School that feeds on the glory of the consistent capital theory as basis for understanding the cyclical evolution of economy; a theory based on which:

- Production is sequentially regarded by taking into consideration the time factor and the turning of goods from simple to high quality goods;
- Capital is inhomogeneous;
- Money have an active role and their circulation affects price structures;
- The micro-macro distinction is void and the two plans are two components intimately related in a network.
- Crises have endogenous causes; they mainly owe to credit expansion;
- Costs are subjective and determined by prices.

Chapter 8, with its special architecture and a unique significance from a normative-doctrinary viewpoint, is interposed between the second and the third part. The beginning *core* is fructified herein, the one that was the subject of an article the author published in France, in 1994 under the title "Banque centrale ou banque libre: le débat théorique sur les réserves fractionnaires". In this chapter, professor de Soto tells us *the story of Central Bank* as lender of last resort. He describes the historical process revealing to us that despite the intended aim, the Central Bank is not the result of a spontaneous process of social cooperation and hence of the functioning of free market mechanisms. On the contrary, it is *a created organization* as a result of the serious consequences that derived from the violence of the fundamentals in private law, following the suggestion of private banks that, once they lost their customers' trust, asked for support from the government. The latter gives its help in time by founding the Central Bank. In the meantime, the process mentioned above occurs, i.e. the concern for liquidity is transferred to the Central Bank so that private banks "fructify" capital as source from sight deposits. This is all based on "a degenerative system of law" according to which even the existence of the Central Bank seems to be a *dilemma* as:

- *Theoretically*, it was created to maintain monetary stability and impose a system of rules meant to throw credit extortionate practices into oblivion;
- *Practically*, the Central Bank makes most of its appearance and shows off in moments of crises. And in these moments it forgets its historical mission and in relationship with the state (government), also interested in "fructifying" the moment and in "self-financing", it fills the circulation channels with currency out of nothing, by issuing massive liquidities - a pretended salvaging remedy for dealing with the crisis. By taking such measures and putting itself in the position of lender of last resort, the Central Bank practically annuls its theoretically defined mission.

The last part which is the most exciting one is the *model* offered by professor de Soto as alternative to "mainstream economics" for economic cycles and crises. In his noble modesty, the author does not insist on the total originality of his *proposal.* He only pretends to have made a *synthesis* of what others said before him: Mises in *The Theory of*

Money and Credit, Monetary Stabilization and Critical Policy; Hayek in *The Monetary Policy of the United States after the Recovery from the 1920 Crisis, Monetary Nationalism and International Stability* or *The Denationalization of Money*; Rothbard in *The Case of the 100 Percent Gold Dollar;* M. Allais in *Les conditions monétaires d'une économie de marche: des enseignements du passé aux reformes de demain,* etc. in H. Simons, M. Friedman and other theorists of the Chicago School, partisans (naïve partisans, in de Soto's opinion) of the system with a reserve coefficient of 100%.

Jesus Huerta de Soto's proposition may be summarized to three main sentences:

a. The total freedom of choosing the currency. The privatization of the currency and the elimination of intervention from the part of the state and the Central Bank in the issuing process and monetary control are had in view. In other words, "a denationalization of money" is proposed as envisaged by Hayek. Technically speaking, the privatization of money by substituting it with its equivalent in gold or other monetary money standards.
b. "Elimination of the Central Bank and of the other governmental organisms devoted to control and intervention on the financial and banking market".
c. The respect of the reserve coefficient of 100% for sight deposits.

In short, professor de Soto, as well as his predecessors on the idea, envisage a financial-monetary system functional in a completely free economy; an economy built by imposing and respecting a set of rules and a system of laws. Neither the author, nor the ones that inspired him were so naïve to see that there were too many powerful counter-weight forces interested in an economy that would not be perfectly free. Hence the critique against the government-state, incapable of restraining itself and intervene in the economic play. Hence the goal of the "toreador" professor de Soto to defeat the "bull" embodied by the opportunist figure of the Central Bank, appendix of the profiting and interventionist state.

4. MESSAGE OF THE BOOK

- The general message of the book is a liberal one. The application of the theorem of the impossibility of socialism is an attempt specific to the Austrian School to prove that any social engineering, exclusively operational in the financial-banking system fails and finally turns against the population. In a liberal style, the demonstration is made with the tools and craftsmanship of a learned theorist keeping in line with the aristocratic scientific tradition opened once and for all by Mises, Hayek and Rothbard.
- Professor de Soto's logical and captivating demonstration is received with difficulty. It is "against nature" and against the stream. Although it puts the nail on the head and points to the origin of the syncopes in economic growth, his pleading is scientifically accepted, yet opposed to mainstream ideology. Such a book ruins the mechanisms of official policy and science not interested in causes, but in temporary remedies. In this

unfortunate state of affairs, the example of professor de Soto should be an exemplary one that is worth following in the necessary attempt to revive the tradition of the Austrian School; this is as necessary as the law of science corresponds to the twin interests of banking agents and the state.

- Jesus Huerta de Soto is professor of Political Economy. In other words, a "professional theorist", nourished by the sources of the best schools in the world and serious readings in economics and beyond. Such formation comprising knowledge of economy, law, history, philosophy, ethics or national accountancy allowed for his openness and span to develop; allowed him the perspective of a double analysis: from the inside with the tools of the specialist in economics; from the outside, with the mind of the scholar not belonging to any ideological dogma and free from the narrow traps of any "profession" on the large field of economic theory and practice. He tried and succeeded in telling us why we were always wrong in our attempts of permanent growth and we were forced to start again because he afforded an "outer" vision. A convinced Keynesist, a monetarist or a practitioner in a bank do not have the chance to succeed in this way. Such a chance is only given to an established theorist such as professor de Soto.