

REVIEW OF ECONOMIC AND BUSINESS STUDIES

Copyright © 2016 by Doctoral School of Economics and Business Administration

Alexandru Ioan Cuza University

Published by Alexandru Ioan Cuza University Press

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior permission of Doctoral School of Economics of the Alexandru Ioan Cuza University.

Address:

14th Lăpuşneanu Street, 4th Floor, Room 412

Iaşi – Romania, Zip Code 700057

E-mail: rebs@feaa.uaic.ro

Web: www.rebs.ro

ISSN 1843-763X

Managing Editors

Co-Editor-in-chief: Professor **Ion POHOAȚĂ**

Co-Editor in chief: Dr. Hab. **Alin ANDRIEȘ**

Senior Editor: Dr. **Gabriel CUCUTEANU**

Editorial Board

Professor **Jean-Pierre BERDOT**, Université de Poitiers, France

Professor **Enrique BONSON**, Universidad de Huelva, Spain

Professor **Henri BOUQUIN**, Université de Paris-Dauphine, France

Professor **Régis BOURBONNAIS**, Université de Paris-Dauphine, France

Professor **Oana BRÂNZEI**, York University, Toronto, Canada

Professor **Mihai CALCIU**, Université de Lille, France

Professor **Laura CISMAȘ**, West University of Timișoara

Professor **Cristian CHELARIU**, York University, Canada

Lecturer **Roxana CHIRIAC**, University of Konstanz, Germany

Professor **Bernard COLASSE**, Université de Paris-Dauphine, France

Professor **Christian CORMIER**, Université de Poitiers, France

Professor **Daniel DĂIANU**, Member of the Romanian Academy, President of the
Romanian Society of Economics

Professor **Emilian DOBRESCU**, Member of the Romanian Academy

Professor **Aurel IANCU**, Member of the Romanian Academy

Professor **Constantin IONETE**, Member of the Romanian Academy

Professor **Mugur ISĂRESCU**, Member of the Romanian Academy, Governor of
the National Bank of Romania

Professor **Vasile IȘAN**, Rector of Alexandru Ioan Cuza University of Iași

Professor **Jaroslav KITA**, University of Economics Bratislava, Slovakia

Professor **Raymond LEBAN**, Conservatoire National des Arts et Métiers, France

Professor **Dumitru MIRON**, Academy of Economic Studies, Bucharest

Professor **Luiz MONTANHEIRO**, Sheffield Hallam University, United Kingdom

Professor **Mihai MUTAȘCU**, West University of Timișoara

Professor **Bogdan NEGREA**, Academy of Economic Studies, Bucharest

Professor **Louis G. POL**, University of Nebraska at Omaha, United States of America

Professor **Gabriela PRELIPCEANU**, Ștefan cel Mare University, Suceava

Professor **Danica PURG**, President of CEEMAN, Bled School of Management, Slovenia
Professor **Gerry RAMEY**, Eastern Oregon University, United States of America
Professor **Ravinder RENA**, Polytechnic of Namibia, Namibia
Professor **Jacques RICHARD**, Université de Paris-Dauphine, France
Professor **Antonio García SÁNCHEZ**, Universidad Politécnica de Cartagena, Spain
Professor **Alan SANGSTER**, Aberdeen Business School, The Robert Gordon University, Scotland, United Kingdom
Professor **Victoria SEITZ**, California State University, United States of America
Professor **Alexandru TODEA**, Babeş-Bolyai University, Cluj Napoca
Professor **Gabriel TURINICI**, Université de Paris-Dauphine, France
Professor **Peter WALTON**, ESSEC Business School Paris, France

Editors

Professor **Marin FOTACHE**
Professor **Iulia GEORGESCU**
Professor **Costel ISTRATE**
Professor **Gabriel MURSA**
Professor **Mihaela ONOFREI**
Professor **Carmen PINTILESCU**
Professor **Adriana PRODAN**
Professor **Adriana ZAIȚ**

Editorial Secretary

Ph.D. **Mircea ASANDULUI**
Ph.D. **Anca BERȚA**
Ph. D. Candidate **Cristina IONIȚĂ**
Ph. D. **Adriana-Emilia ROBU**
Ph. D. Candidate **Nicu SPRINCEAN**
Ph.D. **Ovidiu STOFOR**
Ph.D. **Silviu TIȚĂ**

Table of Contents

RESEARCH ARTICLE	7
RETURNING TO GENERAL AND VOCATIONAL HIGH-SCHOOLS IN INDONESIA.....	9
<i>Karina MAHIRDA, Heni WAHYUNI</i>	
ENTREPRENEURIAL INTENTIONS OF UNIVERSITY STUDENTS: A COMPARISON BETWEEN KOSOVO AND TURKEY USING SHAPERO’S MODEL.....	29
<i>Boratay UYSAL</i>	
WHAT ARE THE DIMENSIONS OF ONLINE SATISFACTION?.....	45
<i>Claudia BOBĂLCĂ, Oana ȚUGULEA</i>	
HEDONIC PRICE ANALYSIS OF NON-BARREN BROODMARES.....	61
<i>Bree L. DORITY, Dayna LARREAU, Frank TENKORANG</i>	
THE VALUE RELEVANCE OF FINANCIAL INFORMATION UNDER THE INFLUENCE OF COUNTRY RISKS. THE CASE OF THE INDIAN LISTED COMPANIES	77
<i>Ioan-Bogdan ROBU, Mihai CARP, Costel ISTRATE, Cristian POPESCU, Mihaela-Alina ROBU</i>	
INDIVIDUAL PENSION FUNDS AND CAPITAL MARKET DEVELOPMENT IN TURKEY	95
<i>Yilmaz BAYAR</i>	
MACROECONOMIC DETERMINANTS OF SHADOW BANKING – EVIDENCE FROM EU COUNTRIES.....	111
<i>Teodora Cristina BARBU, Iustina Alina BOITAN, Sorin Iulian CIOACA</i>	
FISCAL POLICY, FDI AND MACROECONOMIC STABILIZATION.....	131
<i>Claudiu Tiberiu ALBULESCU, Nicolae Bogdan IANC</i>	
THE IMPACT OF LEVERAGE ON FIRM GROWTH. EMPIRICAL EVIDENCE FROM ROMANIAN LISTED FIRMS.....	147
<i>Sorin Gabriel ANTON</i>	
EXAMINING THE INFLUENCE OF SOME MACROECONOMIC FACTORS ON FOREIGN DIRECT INVESTMENTS.....	159
<i>Alina ȚARAN, Marilena MIRONIUC, Maria-Carmen HUIAN</i>	
LABOUR FORCE EFFECTS TO CURRENT ACCOUNT MOVEMENT OF ASEAN + 6 COUNTRIES	183
<i>Ni Putu Wiwin SETYARI, Tri WIDODO, M. Edhie PURNAWAN</i>	
SOURCES OF ECONOMIC GROWTH IN THE SOUTHERN AFRICAN DEVELOPMENT COMMUNITY: ITS LIKELY IMPACT ON POVERY AND EMPLOYMENT.....	211
<i>Monaheng SELETENG, Sephooko MOTELLE</i>	
CASE STUDY	251
ISSUES OF ORGANIZATIONAL CULTURE IN ROMANIA – A CASE STUDY	253
<i>Dumitru ZAIȚ, Adriana ZAIȚ</i>	
PERCEIVED USEFULNESS OF OPEN SOURCE INFORMATION IN THE ARABIC LANGUAGE FOR AN ORGANIZATION: A CASE STUDY.....	281
<i>Cristian OBREJA, Gabriel CUCUTEANU</i>	
BOOK REVIEW	291
A REVIEW OF ‘BRAIN COMPUTATION AS HIERARCHICAL ABSTRACTION’	293
<i>Bodo HERZOG</i>	

RESEARCH ARTICLE



RETURNING TO GENERAL AND VOCATIONAL HIGH-SCHOOLS IN INDONESIA

KARINA MAHIRDA^{*}, HENI WAHYUNI^{**}

Abstract: *Promoting vocational secondary education can be an appealing option for developing countries in order to improve labour market outcomes. The main reason for the promotion of vocational education is the increase of the labour force. The debate regarding the benefit resulted from vocational education, as opposed to general education is far from conclusive. This paper analyses the return to schooling of vocational and general high-schools in Indonesia using Indonesian Family Life Survey (IFLS). The study finds no difference in the returns to schooling between vocational and general high-schools in Indonesia. The findings may imply that the government should focus on promoting general education, especially in the developing countries such as Indonesia, easing the access to higher education, as well as improving the curriculum in vocational education.*

Keywords: *earning, Indonesia, vocational school, general school*

JEL Classification: *I210, I260, I250, J240*

1. INTRODUCTION

Promoting vocational secondary education can be an appealing option for developing countries to improve labour market outcomes. The traditional view (Adams et al., 1992) states that vocational schooling holds the key to addressing youth unemployment, as well as improving labour market outcomes in terms of earnings by preparing students with technical and job specific skills.

On the other hand, the debate regarding the benefit derived from vocational education, as opposed to general education, is far from conclusive. Firstly, empirical evidence across the globe is mixed. In some countries, graduates of

^{*} Karina Mahirda, Faculty of Economics and Business, Universitas Gadjah Mada, Jl. Sosio Humaniora No. 1, Bulaksumur, Yogyakarta, Indonesia 55281, karina.mahirda@gmail.com

^{**} Heni Wahyuni, corresponding author, Faculty of Economics and Business, Universitas Gadjah Mada, Jl. Sosio Humaniora No. 1, Bulaksumur, Yogyakarta, Indonesia 55281, hwahyuni@ugm.ac.id

vocational high-schools earn higher earnings as opposed to those of general high-schools, while in (examples) the reverse is true. Previous studies found that there are no significant differences in earnings between the two graduate profiles.

Secondly, World Bank policy recommendations have supported the promotion of general over vocational secondary education (World Bank, 1995). It was argued that vocational and technical skills are better suited since the vocational education can result in workers too narrowly trained. This argument is consistent with an earlier study (Psacharopoulos, 1989) which showed that the social rates of return to investment in very specialized vocational education were lower than general secondary education, largely because of the much higher costs for the provision of vocational secondary education. In the case of Indonesia, Ghozali (2006) found that a public vocational school is 28 % more costly for the government than a public general high-school.

Thirdly, vocational education may divert students from lower socioeconomic background from higher education and professions (Shavit and Arum, 1995). That is, vocational education may hinder the future socioeconomic attainment by lowering the students' to tertiary education, and, as a result, their access to the professions and other higher prestige jobs. Shavit and Arum (1995) argued that the reason for this diversion lies in the nature of vocational education which are not designed or planned to prepare student for tertiary education. Therefore, vocational schools actively breed inequities, particularly as they commonly attract students from lower socioeconomic background.

Despite this debate, the Indonesian Ministry of Education and Culture began to formalize the expansion of vocational senior secondary education in 2006 (Ministry of Education and Culture, 2006). According to the Ministry's strategic plan, the main reason was to increase the size of "ready to work" labour force, mainly among those who do not attend higher education. Moreover, it was argued that the increase in the share of vocational secondary school graduates would result in a lower overall unemployment rate. Therefore, the Ministry targeted a 50:50 ratio of vocational to general high-school students by 2010 and a ratio of 70:30 by 2015. In order to achieve these targets, constructions of new general secondary schools were halted, while new vocational schools were built and some already established general high-schools were being converted into vocational high-schools.

Since this aspect has been more widely in developed countries, the present study provides a case study of the Indonesian situation, which could support future applications in the developing countries. The main objectives are as follows: firstly, finding out if there are any differences in earnings between graduates of vocational and general high-school. Vocational high-school graduates are expected to have technical or job-specific skills. Meanwhile, general high-school graduates do not usually face the same expectation, as their curriculum high-school is more academic. Therefore, the different expectation in terms of skills should be reflected by the wage differential high-school.

Secondly, the present study aims to find out whether attendance at vocational high-school results in earnings premium high-school. Attending a vocational high-school is supposed to give some earnings premiums (or higher earnings) over attendance at general high-school. The main objective of vocational education is, among others, to provide job specific training. Therefore, the labour market is expected to better reward vocational education.

Using Indonesian Family Life Survey (IFLS) data, a rich individual and household survey data, and after testing for the possibility of sample selection problem, the study finds that there is no significant difference in the return to schooling in terms of earnings between workers who attended general and vocational high-school as their the highest level of education high-school.

2. LITERATURE REVIEW

The most widely utilized approach to measure return to schooling in terms of earnings is the Human Capital Earning Function (Lemieux, 2003; Chiswick, 2003). The function is based on the work of Jacob Mincer (1974). Chiswick (2003) states that Mincer's human capital earning function has several distinct features which make it particularly attention-worthy. Firstly, the functional form is not an ad hoc. The function is an identity based on the optimizing behaviour of individuals and it represents labour market process outcomes. Second, it transforms the immeasurable into measurable. That is, it converts the monetary cost of the investment in human capital into years of schooling and years of labour market experience. Thirdly, the function can be adjusted to include other variables affecting the earnings. Fourthly, the coefficients of the regression equation have economic interpretations; they are pure numbers, devoid of units, and their

standard errors can be estimated. This allows comparisons across time and demographic groups. Fifthly, although earnings are positively skewed and the inequality of earnings rises with the level of schooling, by using the natural logarithm of earnings as the outcome variable, the residuals are closer to being normally distributed and reducing the outliers' effect. Lemieux (2003) reviews the literature on alternative specifications of the earnings function to determine whether the basic equation (Equation 1) is the most appropriate. He argued that after 30 years following the inception of the equation, the human capital earnings function fits the data remarkably well in most contexts, and it remains a parsimonious and relatively accurate way of modeling the relationship between earnings and schooling.

The human capital earnings function is a simple regression model with a linear schooling terms and a low-order polynomial in experience (Mincer, 1974; Card, 1998). This function assumes that:

- (1) the only costs of schooling are the foregone earnings, and that
- (2) each individual starts working immediately upon graduation.

In its basic specification, returns to education are estimated as follows:

$$\ln(\text{Wage}) = \beta_0 + \beta_1 \text{Schooling} + \beta_2 \text{Experience} + \beta_3 \text{Experience}^2 + u \quad (1)$$

where:

- *Schooling* is the number of years of schooling;
- *Experience* is the number of years of experience in the labour market;
- *Experience*² is the squared term of the experience variable; and
- *u* is a random disturbance terms representing the other not explicitly measured variables in the equation that may affect earnings.

The equation specifies that wage is dependent on years of schooling, years of labour market experience, and experience squared. Log wage is used instead of wage so that the regressors are interpreted in terms of their marginal effects (Mincer, 1974). Thus, the function provides a direct measure of the return to schooling through the coefficient of the years of schooling variable. Labour market experience is included in the model since the more experienced a worker is, the higher his/her earning. Since most data sets do not provide information on the actual years of labour market experience, this variable can be calculated by subtracting age from years of schooling minus the official age at which the

individual started primary schooling. The quadratic experience is included to capture the nonlinear relationship between experience and earnings (Mincer, 1974).

It is also important to expand the basic equation above to include control variables that may affect wage. The literature reviewed in this study controls for gender and urbanity or area of residence.

It has been argued that the coefficient estimates of the Ordinary Least Squares (OLS) regression of the human capital earnings function could suffer from endogeneity and self-selectivity biases (Griliches, 1977). The schooling variable that captures the years of schooling of the individuals in the sample is believed to be endogenous. This endogeneity, referred to as *ability bias*, takes place when individuals with greater ability are more likely to receive additional schooling and higher incomes, possibly leading to a correlation between schooling and wages without a causal link. If the ability bias is present, the OLS estimation method should be replaced with a test for endogeneity in order to test whether the schooling or education variable in the model is endogenous

Additionally, the estimates derived from the human capital earnings function may be biased due to sample selectivity. When estimating the human capital earnings function, only those who reported wages at the time of the survey are taken into consideration in the present analysis, leaving aside those unemployed, who had no wage to report. The problem is not that The problem would be of major concern if the missing wage data were not randomly missing, while the unemployed individuals constituted a self-selected sample and not a random sample. If such was the case, the OLS estimates would be biased due to this self-selection. Therefore, Heckman's (1979) two-step approach is performed to detect selectivity bias and to correct if such potential bias is present.

Empirical evidence considered in the literature are mixed. In Egypt, attending vocational high-school resulted in earnings premium of 29.3 % % for men, high-school (El-Hamidi, 2006) However, in the case of women, attending vocational high-school resulted in an earnings penalty of 2.1 % %high-school. Similarly, in Thailand, Moenjak and Worswick (2003) found that vocational high-school gives earnings premiums of 63.9 % % for its male graduates and 49.4 % for its female graduates high-school. Neuman and Ziederman (1991) found that, in Israel, vocational high-school gives earnings premium for its graduates by up to 10%, compared to general high-school. They argued that a central factor

accounting for the favorable vocational school outcomes is the availability or growth of employment opportunity as well as the match between vocational graduates' skills and the available jobs. On the other hand, in Tanzania (Kahyarara and Teal, 1999) found that general school graduates earn some wage premium over their counterparts who graduated from vocational school for high level of general school graduates.

Vocational and general secondary school graduates experience no significant differences in labour market outcome in several other countries. Malamud and Pop-Eleches (2008) found that in Romania there is no significant difference in the earnings between vocational and high-school graduates. Similarly, Lechner (2000) studied the effectiveness of government sponsored vocational training in East Germany and found that, at least in the short run, there are no positive earnings and employment effects of attendance at vocational programs.

3. DATA AND METHODOLOGY

3.1. Secondary Education in Indonesia

The secondary education in Indonesia consists of six years of schooling: three years in junior, followed by three in senior high-school. Upon graduating from junior high-schools, students can choose whether to continue their education and enroll in general high-school (*Sekolah Menengah Atas* or *SMA*) or in vocational high-school (*Sekolah Menengah Kejuruan* or *SMK*). Based on the status, high-schools can be divided into public school, private school, and religious school. The first two are under the administration of the Ministry of Education and Culture, while the third is managed by the Ministry of Religious Affair.

General and vocational high-school is distinct in many ways. The former focuses more on academic and theoretical materials and curriculum. The latter focuses on a more profession-based and practical curriculum. Unlike many Western countries, senior secondary education in Indonesia requires students to choose a focus of their studies. Upon passing the tenth grade, students in general high-school must choose to major in either social sciences, exact and natural sciences, or language. On the other hand, a vocational high-school usually specializes on one or a couple of majors. The available majors are business management, tourism, culinary, cosmetology, social work, arts and crafts,

performing arts, health, technical, marine, agriculture and forestry, textile, technology, shipbuilding, and aviation studies.

Based on the differing characteristics of the two school tracks, students attending a general high-school usually plan to continue their tertiary education, while those who attend a vocational high-school, upon graduation, usually enter the labour market

Recently, the Ministry of Education and Culture of Indonesia planned to further the expansion of vocational education in Indonesia. According to the most recent strategic plan (Ministry of Education and Culture, 2015), in order to increase the country's competitiveness within the ASEAN Economic Community 2015, plans were put in place in order to (1) build new vocational high-schools and reconstruct existing ones high-schools; (2) increase the availability of practice tools and laboratories, and (3) review the curriculum and improve the quality of vocational education.

The focus remains on building and developing vocational high-schools which match the regional economic potential where the schools are located. This means that more efforts and financial resources are going to the development of the vocational as opposed to general secondary education (Table 1). Moreover, the Minister of Education and Culture has stated explicitly that the Ministry is going to build two hundred new vocational secondary high-schools alone in 2015¹.

If we only consider the unemployment statistics, it is tempting to support the Government's plan to reinstate the vocational secondary education. During the 2004-2014 period, the rate of unemployed individuals with vocational high-school profile (Figure 1).

Table 1 Public funds (in billion rupiah) for senior secondary education in 2015 in Indonesia

Year	General high-school	Vocational High-school
2015	8,010,000	9,009,000
2016	9,432,897	11,542,632
2017	9,803,759	12,060,606
2018	10,118,011	12,390,842
2019	10,452,033	12,972,781
TOTAL:	47,816,700	57,975,855

Source: Monetary allocation plan of the Ministry of Education and Culture for Senior Secondary Education

¹ Hazliansyah. "Kemendikbud Berencana Bangun 200 SMK Tahun Ini", *Republika*, March 4, 2015. <http://www.republika.co.id/berita/pendidikan/education/15/03/04/nknp81-kemendikbud-berencana-bangun-200-smk-tahun-ini>.

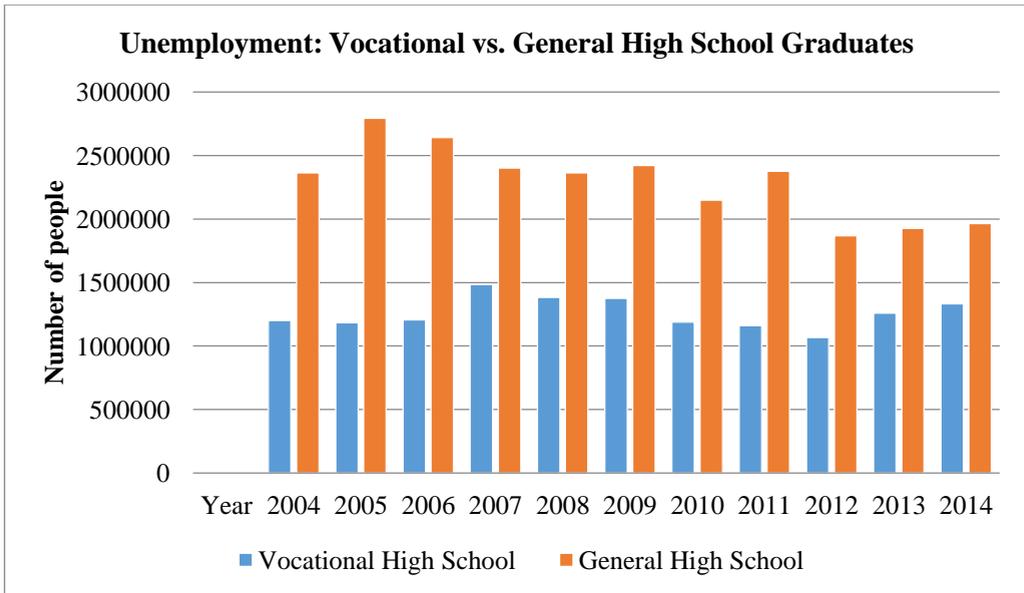


Figure 1 *Unemployment based on educational attainment*

Source: <http://www.bps.go.id/linkTabelStatis/view/id/972>

3.2. Data and Method

The data used was taken from the 2007-2008 wave of the Indonesian Family Life Survey (IFLSIFLS4). The surveys were conducted by the RAND Corporation, together with three Indonesian institutions, namely the University of Indonesia, Universitas Gadjah Mada, and Survey METRE.

The IFLS is a large-scale national panel/longitudinal survey that provides extensive data on three levels (individual, household, and community). It includes the main features of the communities (e.g., health and education facilities) where the individuals and households reside. The IFLS4 survey covers 13 of the 33 provinces in Indonesia, while the other IFLS survey waves include 13 of the 27 provinces,² representing 83 % of the population: four provinces on Sumatra (North Sumatra, West Sumatra, South Sumatra, and Lampung), all provinces in Java (DKI Jakarta, West Java, Central Java, DI Yogyakarta, and East Java), and four

² Initially, Indonesia had 27 provinces. This number was increased to 33 (in 2008) and to 35 (in 2012).

provinces within the remaining main island groups (Bali, West Nusa Tenggara, South Kalimantan, and South Sulawesi) (Strauss et al., 2004; Strauss et al., 2009).

This study investigates the return to schooling in terms of earnings for individuals whose last educational attainment is senior secondary high-school in Indonesia. Therefore, the analysis is limited to the individuals who graduated from either general or vocational school and who did not continue their education, entering the labour market.

The model is specified as follows:

$$\begin{aligned} \ln(W_i) = & \beta_0 + \beta_1 dVocational_i + \beta_2 Experience_i + \beta_3 Experience_i^2 \\ & + \beta_6 dFemale_i + \beta_7 dUrban_i + u_i \end{aligned} \quad (2)$$

where:

- $\ln(W_i)$ is the log of monthly wage in Indonesian rupiah for individual i . The survey question is: “approximately what was your salary/wage during the last month?”. The answers are in rupiah amount of the salary/wage during the last month.
- The key variable ($dVocational_i$) is a dummy variable for the type of school for individual i (1= vocational high-school and 0 = general) high-school. The survey question is: “what is the highest level of education attended?” Attending a vocational high-school is expected to give some earnings premiums. The main objective of vocational education is, among others, to provide job specific training. Thus, it is expected that the labour market would reward vocational education more than general education. Thus, it is expected that the $dVocational$ variable has a positive sign.
- $Experience_i$ is work experience in years for individual i . This variable is calculated by subtracting age from years of schooling and the age at which the respondents started primary schooling. The more experienced a worker is, the higher his/her salary is, since experience is associated with higher skills and productivity (Mincer, 1974). Therefore, it is expected to see a positive relationship between experience and earnings.
- $Experience_i^2$ is the squared term of work experience in years for individual i . This variable is independently generated by transforming $Experience_i$ into its squared term. This variable is expected to have a negative sign, since the marginal return from experience tends to decline over the lifetime (Mincer, 1974).

- $dFemale_i$ is a dummy variable for gender for individual i (1 = female; 0 = male). Pirmana (2006) found that female workers earn less than their male counterparts, thus this variable is expected to have a negative sign.
- The residence variable ($dUrban_i$) is a dummy variable for area of residence for individual i (1 = urban; 0 = rural). People living in the urban area may be subjected to different employment characteristics and minimum wage law, which, in turn, may differently affect their level of earnings (El-Hamidi (1998), Purnastuti et al. (2011)). Thus, the variable urban is expected to have a positive sign. u_i is the disturbance term.

Following the objectives of this study, two hypotheses are tested. The first hypothesis states that there is a wage differential between vocational and general high-school graduates. The second hypothesis states that vocational high-school graduates earn significantly higher wages than general high-school graduates.

4. RESULTS

4.1. Summary Statistics

Table 2 shows that 1978 individuals in the sample graduated from the vocational high-school and for 788 of them the wages were not observed. 48 % of vocational high-school graduates in the sample are female 79 % live in the urban areas. The average work experience is 13 years.

Within the same sample there are 2152 individuals who graduated from a general high-school, and for 903 of them the wages were not observed. 49 % of them are female and 77 % live in the urban area. The average work experience is also 13 years.

On average, graduates of a general high-school earn slightly more (i.e. the average wages are 1,053,119 rupiahs and 1,118,723 rupiahs for vocational and general high-school graduates respectively). The standard deviations of wages for both graduate profiles are large. Large standard deviation is typically found in wage data with enough observations. Transforming wages into the logarithmic form would shrink the standard deviations considerably. Therefore, the use of log wage instead of wage should minimize the outliers' effect on the analysis.

Table 2 Summary statistics of the sample

Variable	Vocational High-school			General High-school		
	Obs.	Mean	Standard Deviation	Obs.	Mean	Standard Deviation
Wage	1190	1,053,119	920111.6	1249	1,118,723	970324.3
ln(Wage)	1190	13.618	0.742	1249	13.642	0.799
dVocational (1=vocational 0=general)	1978	1	0	2152	0	0
Experience	1978	13.135	11.029	2152	13.623	10.379
Experience ²	1978	294.136	494.623	2152	293.243	457.772
dFemale (1=female 0=male)	1978	0.482	0.499	2152	0.486	0.499
dUrban (1=urban 0=rural)	1978	0.786	0.410	2152	0.765	0.424

Note: wage is expressed in rupiah; experience and experience² are expressed in years

Source: IFLS 4 (2007-2008)

4.2. Results

Labour market experience is the independent variable which has been shown to have a nonlinear relationship with wage (Mincer, 1979). The augmented partial residual plot of the experience variable is shown to detect nonlinearity. The augmented component plus residual of the labour market experience shows a slight departure from linearity. Therefore, to maintain the assumption of linearity in parameter, the squared term of the labour market experience variable is included in the model.

Ramsey RESET test is performed to check whether the model has omitted variables. The null hypothesis for the test states that the model has no omitted variable. The p-value of the F-statistic from the Ramsey RESET test is not significant. Therefore, the null hypothesis of no omitted variables cannot be rejected. The null hypothesis is not rejected and can be concluded that the model has no omitted variables. This implies that all important variables that may affect wage have been included in the model.

The assumption of zero population mean of the error is checked using kernel density estimate. The residual is found to resemble the normal distribution. Thus,

the assumption of normality of the residuals is not violated. Furthermore, the model fulfills all the classical assumption of linear regression.

This study aims to find out whether the return to general senior secondary education is different from the return to vocational senior secondary education in Indonesia. Therefore, instead of using years of schooling as an independent variable, a dummy variable of high-school type is used to capture the type of senior secondary education attended by individuals in the sample. To test whether the variable $dV_{\text{vocational}}$ in the model is endogenous, additional variables are adopted as the instrument for the variable $dV_{\text{vocational}}$ in the model. IQ scores and United States' Armed Forced Qualification Test scores have been used as the instruments for years of schooling (Heckman et al., 2006; Lemke and Rischall, 2003). However, data on IQ is not available in the IFLS. Alternatively, the individuals' parental education has been used to instrument the education or schooling variable (Willis and Rosen, 1979; Card, 1999).

To test for endogeneity, this study utilizes two instruments, namely the parents' education. Three dummy variables for each instrument are included. Each instrument is classified into three groups. The first (the reference group) is for the parent who did not receive any schooling. The second classification is for the parent with basic education (i.e. primary, junior secondary, and senior secondary education). The last classification is for the parent who graduated from higher education (i.e. college and university education).

Table 3 *Test of Over-identifying restrictions*

Ho: instruments are valid

Ha: instruments are not valid

Score $\chi^2(3) = 7.21224$ ($p = 0.0654$)

Table 3 presents the result from test of over-identifying restrictions. This test aims to test the validity of the parents' education as the instruments for $dV_{\text{vocational}}$. To test whether $dV_{\text{vocational}}$ can be treated as exogenous, the instruments have to be valid instruments to use to fit the model in the first place.

The p-value of the chi-square from the test of over-identifying restrictions is not significant at either 5 or 1 % confidence level. Therefore, the null hypothesis is not rejected and can be concluded that the parents' education is a valid instrument.

Table 4 *Test of endogeneity*

Ho: variables are exogenous	
Ha: variables are not exogenous	
Durbin(score) chi2(1)	= 0.424924 (p = 0.5145)
Wu-Hausman F(1,840)	= 0.398346 (p = 0.5280)

Table 4 shows the results from test of endogeneity. The p-value of both the Durbin score and the Wu-Hausman F-statistic are not significant at both 1 and 5 % confidence level. Therefore, the null hypothesis cannot be rejected and it can be concluded that dVocational is not endogenous. As endogeneity is not a problem, the OLS is appropriate for the analysis in this study.

Heckman two-step approach (Heckman, 1979) is adopted to detect selectivity bias and to correct if such potential bias is present. Initially, a probit model of labour force participation is estimated (selection equation). Afterwards, the derived inversed mills ratio ($\lambda = \rho$ multiplied by sigma; it measures the selection effect) is included in the human capital earnings function (wage equation) as an additional regressor.

Each step has a residual for each observation. To test for selectivity bias, the relationship between the residuals for the two steps is examined. If the unobservables in the selection equation (1st step) are correlated with the unobservables in the wage equation (2nd step) the estimation will result in biased estimates without correction in the OLS regression. Rho measures the correlation coefficient between the unobservables determining the employment selection and the unobservables determining the wage. A positive coefficient for rho indicates that the unobservables are positively correlated with each other, indicating the presence of selectivity bias.

Table 5 *Heckman selection model*

Variable	Coefficient	Standard Error
Wage Equation:		
dVocational	-.0010139	.0304044
Experience	.0266096 ***	.0074382
Expeirence ²	-.0002011	.0002214
dFemale	-.2170417*	.1295531

Variable	Coefficient	Standard Error
dUrban	.1535569 ***	.0435923
Constant	13.33968 ***	.1121312
Selection Equation:		
dVocational	.0855549 *	.0441135
Experience	.0823981 ***	.0071408
Experience ²	-.0022679 ***	.0001681
dFemale	-1.34062 ***	.0451088
dUrban	.2625585 ***	.0527227
dMarried	-.0311726 ***	.0068549
HHsize	-.3298942 ***	.0572443
Constant	.6719787 ***	.0818799
Mills Ratio		
Lambda	-.1274926	.1728548
Rho	-0.17379	
Sigma	.73360664	
Lambda	-.12749264	.1728548

*** Significant at alpha = 0.01;

** Significant at alpha = 0.05;

* Significant at alpha = 0.1

This method requires identifying the variables which may affect an individual's decision of whether to work or not. Besides using variables included in the basic human capital earnings function, additional variables must be identified. For this purpose, the individual's household size and marital status is included in the selection equation because they are presumed to directly influence the decision whether to participate in the labour force or not, without affecting the monthly wage.

The individuals in the sample can be classified into censored and uncensored observations. Out of 4130 individuals in the sample, 1691 are censored (i.e. do not have wage data).

Table 5 shows the result from Heckman two-step. Rho is negative, indicating that the unobservables in the selection equation are not correlated with the unobservables in the wage equation. The result indicates that selection into the sample for the second step (wage equation) is a random process.

Additionally, all the variables in the selection equation are statistically significant. However, when the inverse mills ratio is included in the wage equation, it turns out to be statistically insignificant (the p-value of inverse mills ratio's lambda is 0.416), indicating that sample selection is not a problem and that the OLS estimates for this data set would not suffer from selectivity bias.

4.3. Regression Results and Discussion

Table 6 presents the results of the human capital earnings function. The regression (Table 6) computed an R-squared value of 0.1076, indicating that the independent variables are able to explain 10.76 % of the variances in the dependent variable Low R-squared values are frequently encountered in cross-sectional data with a large number of observations due to the diversity in cross-sectional units (Gujarati and Porter, 2009). One way to increase the value of R-squared is by increasing the number of independent variables in the model and/or including some interaction terms of the independent variables already included in the model. An attractive option is to include a measure of education-to-job matching as an additional regressor. Neuman and Ziderman (1991) included an interaction term that captures vocational high-school graduates in Israel, employed in jobs or industries relevant to their specializations. However, data on secondary school specialization and the industries in which the individual is employed are not available in the IFLS.

Table 6 *Dependent variable: $\ln(W_i)$*

Variable	Coefficient	Robust Std. Error
dVocational	0.0034	.0296086
Experience	0.0306***	.006004
Experience ²	-0.0003*	.0001847
dFemale	0.3093***	.0355442
dUrban	0.1705***	.0410127
Constant	13.27***	.0587725
R ² = 0.1076;		
F-statistic = 51.95		

*** Significant at alpha = 0.01;

** Significant at alpha = 0.05;

* Significant at alpha = 0.1

The relatively low R-squared value should not be problematic since the F-test of joint significance rejects the null hypothesis that all independent variables in the model are not jointly significant in affecting the dependent variable. The model F-value is 51.95, which is larger than the p-value from the F-table (0.0000). Therefore, the alternative hypothesis that all independent variables in the model are

jointly significant in affecting the dependent variable can be accepted, notwithstanding the fact that the R-squared is only 0.1076.

Table 6 shows that all variables except the dummy variable of senior secondary school type are significant. The variable *dVocational* is not significant. Note that this variable is a dummy variable indicating the type of senior secondary school in which the individual graduated (1 = the individual graduated from vocational high-school; 0 = the individual graduated from general high-school). The insignificance of *dVocational* indicates that, on average, there is no significant difference in the earnings between individuals whose highest educational attainment is vocational and general high-schools.

The finding of this study is similar with the one in Romania (Malamud and Pop-Eleches, 2010), which analyzed the effect of an educational reform in 1973. The policy required that the students born after January 1, 1959, to complete an additional two years of general school, without being admitted in vocational schools, leading to a large proportion of students to shift from vocational to general school. However, the study mentioned found that there is no significant difference in earnings between vocational and general graduates. Similarly, in the case of Germany (Lechner, 2000), where it was shown that, at least in the short-run, there are no positive earnings and employment effects of attendance at vocational programs. Meanwhile, Kahyarara and Teal (2008) found that the rate of return from vocational education is not statistically significant for all levels of vocational education after controlling for experience, tenure, and endogeneity of education.

On the other hand, this result is contrary to the findings of El-Hamidi (2006) who found that the return on vocational secondary school graduates is higher than that of general secondary schools graduates. However, the findings applied only to men. The present study does not differ based on gender. On the other hand, the difference on rate of return on education between men and women probably existed for both types of high-schools and might have continued in the tertiary education segment.

The reason behind the similar labour market outcomes in terms of earnings behind the two graduate profiles may be explained by the job-market signaling. Having a vocational credential may not signal the individual's advantage with regard to job-specific skills to employers in Indonesia. Thus, employers may not perceive vocational credential to be positively correlated with having greater ability

or having skills that are relevant to perform the jobs, despite the main goal of vocational education is to instill technical or job-specific skills to their graduates.

For another factor, the study finds that the potential labour market experience variable is significant at 1 % confidence level. Meanwhile, its squared term is significant at 10 % confidence level. The coefficients on the potential labour market experience variable and its squared term have the expected signs: the potential labour market experience has a positive coefficient, with its squared term having a negative coefficient. This portrays the usual concavity of the experience-earnings profile. The increase in earnings associated with an extra year of potential labour market experience is given as:

$$\frac{\partial \ln(wage)}{\partial experience} = \widehat{\beta}_2 + 2\widehat{\beta}_3 experience \quad (3)$$

where:

- $\widehat{\beta}_2$ is the estimated coefficient on the labour experience variable, and
- β_3 is the estimated coefficient on the experience squared variable. This implies that the payoff varies with the potential work experience.

The negative coefficient of the squared term of labour experience and the resulting concavity of the relationship between potential labour experience and wage implies that an additional year of potential labour experience increases earnings until the payoff from an additional year of labour experience starts to decline. Therefore, it is important to estimate the level of potential labour experience at which the predicted experience-earnings profile peaks.

This is where $\widehat{\beta}_2 + 2\widehat{\beta}_3 experience = 0$; it occurs when the potential work experience is 51 years. The findings of the present study are supported by those regarding the returns of vocational education (Neuman and Ziderman, 1991; Moenjok and Worswick, 2003; El-Hamidi, 2006; Kahyarara and Teal, 2008). In addition, Mincer (1962) shows explicitly that earnings imply a decreasing in on-the-job training investments with age.

The dummy variable female is significant at 1 % confidence level. This variable indeed turned out to have a negative coefficient, indicating that, on average, females earns 26.6 % less than male workers. One explanation for this is the gender discrimination present in Indonesia, caused by employer discrimination and

occupational choice (i.e. construction and mechanical work). The latter may lead to an excess labour supply labour in “female oriented jobs”, further decreasing wages.

The dummy variable urban is significant at 1 % significance level. It has a positive coefficient as expected and it indicates that residents of urban areas receive significantly higher earnings than individuals living in the rural areas. Specifically, the estimates suggest that, on average, workers from urban areas earn 18.59 % more than workers from rural areas. The findings of the present paper are supported by previous empirical results (Moenjak and Worswick (2003), El-Hamidi (2006)).

5. CONCLUSION

From the results presented above, it can be concluded that:

- (1) in terms of earnings, there is no significant difference in the return to schooling between workers with vocational versus general high-school education;
- (2) conclusion regarding the second hypothesis, which states that vocational graduates earn higher wages than general graduates, cannot be made.

Based on these findings, it is hard to justify the government’s expansion plan of vocational secondary education in Indonesia. However, it is important not to rush to oppose the plan altogether. This study analyzes return to schooling only in terms of earnings, but there are many other aspects to consider (i.e. employment). Vocational education may serve the purpose of safety net for the lower income families, which are financially unable to send their children to tertiary education. This safety net may improve students’ chance to obtain gainful employment as skilled workers. Moreover, it is plausible that the similarity in earnings may be caused by some unobservable characteristics (i.e. compensating differentials). Thus, a worker may be paid less in monetary wage because he/she receives part of the compensation in other forms (i.e. pleasant working conditions, better amenities etc.). Additionally, it is possible that the current curriculum in the vocational high-school does not fully prepare students to work after graduation.

One of implication is that any plan to expand vocational education, as well as education as a whole, should have a balance between quantity and quality. It is not enough to build more schools. It has become a prerequisite to have quality schools so as to drive economic growth and development. Moreover, within the vocational high-schools, the portion of academic curriculum should be increased.

Job-specific skills acquired transmitted through technical or vocational curriculum does pay off in the short run in terms of the immediate transition to work, so long as these skills are relevant in sectors with growing demands and as long as the right conditions for this are fulfilled (i.e. links to the job market, job expansion, matching between technical curriculum with short-term labour market demand). However, beyond immediate transition to work, the payoff of the technical skills achieved through a vocational education would likely cease in the long run. Increasing the proportion of academic curriculum will allow such students to benefit from cognitive skills, which have an increased importance in economy driven ever more by technology and knowledge with a considerably quick update technology and knowledge

The government initiative dedicated to matching the type of vocational high-schools with regional economic potential (where the schools are located) should be praised. However, in order to avoid preparing students for jobs that may no longer exist or which have little returns, it is equally important to match such labour force high-schools with market demand, especially with the long run.

Despite the possible contribution of the present study, there is a limitation regarding the measurement of education to job matching. Including a measure of education to job matching (i.e. specialization taken in high-schools and the subsequent jobs/industries/fields of occupations) may enrich the understanding of returns to schooling. Unfortunately, such data is presently not available in the IFLS, thus it is worthy to pursue additional datasets. Additionally, return to schooling in terms of employment and analyzing whether vocational education serves as a safety net or diversion should complement the understanding of returns to schooling.

REFERENCES

1. Avril V. Adams, John Middleton and Adrian Ziderman (1992). "The World Bank's Policy Paper on Vocational and Technical Education and Trainings", *UNESCO Prospects, Quarterly Review of Education*, Volume XXII, No. 2, pp.127-140.
2. Card, David (1999), "The Causal Effect of Education on Earnings", *Handbook of Labour Economics*, Volume 3, Part A, pp.1801-1863.
3. Chiswick, Barry R (2003), "Jacob Mincer, Experience, and the Distribution of Earnings", *Review of Economics of the Household*, No. 1, pp.343-361.
4. El-Hamidi, Fatma (2006), "General or Vocational? Evidence on School Choice, Returns, and 'Sheepskin' Effects From Egypt 1998", *The Journal of Policy Reform*, Volume 9, Issue 2, pp.157-176.

5. Griliches, Zvi (1977), "Estimating the Return to Schooling: Some Econometric Problem", *Econometrica*, Volume 45, Issue 1, pp.1-22.
6. Heckman, James J. (1979), "Sample Selection Bias as a Specification Error", *Econometrica*, Volume 47, No. 1, pp.153-161.
7. Heckman, James J., Jora Stixrud and Sergio Urzua (2006), "The Effects of Cognitive and Noncognitive Abilities on Labour Market Outcomes and Social Behaviour", *Journal of Labour Economics*, Volume 24, No. 3, pp.411-482.
8. Kahyarara, Godius and Francis Teal (2008), "The Returns to Vocational Training and Academic Education: Evidence from Tanzania", *World Development*, Volume 36, Issue 11, pp.2223-2242.
9. Lechner, Michael (2000), "An Evaluation of Public Sector Sponsored Continuous Vocational Training Program in East Germany", *Journal of Human Resources*, Volume 35, Issue 2, pp.347-375.
10. Lemieux, Thomas (2003), "The Mincer Equation Thirty Years after Schooling, Experience, and Earnings", *Center for Labour Economics Working Paper 62*, UC Berkley.
11. Lemke, Robert J. and Isaac C. Rischall (2003), "Skill, Parental Income, and IV Estimation of the Returns to Schooling", *Applied Economic Letters*, Volume 10, pp.281-286.
12. Malamud, Ofer and Cristian Pop-Eleches (2008), "General Education vs. Vocational Training: Evidence from an Economy in Transition", *NBER Working Paper 14155*, NBER.
13. Mincer, Jacob (1957), *A Study of Personal Income Distribution*. Unpublished Ph.D. dissertation, Columbia University.
14. Mincer, Jacob (1958), "Investment in Human Capital and Personal Income Distribution," *Journal of Political Economy*, Volume 66, Issue 4, pp. 281-302.
15. Mincer, Jacob (1962), "On-the-job Training: Costs, Returns and Some Implications," *Journal of Political Economy*, Volume 70, Issue 5, Part 2, pp. S50-S79.
16. Mincer, Jacob (1974), *Schooling, Experience, and Earnings*. National Bureau of Economic Research Books.
17. Ministry of National Education (2006), *Rencana Strategis Departemen Pendidikan Nasional Tahun 2005-2009*, Indonesian Ministry of National Education.
18. Ministry of Education and Culture (2015), *Rencana Strategis Kementerian Pendidikan dan Kebudayaan 2015-2019*, Indonesian Ministry of Education and Culture.
19. Moenjak, Thammarak and Christopher Worswick (2003), "Vocational Education in Thailand: a Study of Choice and Returns", *Economics of Education Review*, 22, pp.99-107.
20. Neuman, Shoshana and Adrian Ziderman (1991), "Vocational Schooling, Occupational Matching, and Labour Market Earnings in Israel", *The Journal of Human Resources*, Volume 26, Issue 2, pp.256-281.
21. Strauss, J., Beegle, K., Sikoki, B., Dwiyanto, A., Herawati, Y. & Witoelar, F. (2004), *The third wave of the Indonesia Family Life Survey (IFLS3): overview and field report WR144/1-NIA/NICHD*, RAND Labour and Population, Santa Monica.
22. Strauss, J., Witoelar, F., Sikoki, B. & Wattie, A.M. (2009), *The fourth wave of the Indonesia Family Life Survey (IFLS 4): overview and field report WR-675/1-NIA/NICHD*, RAND Labour and Population, Santa Monica.
23. Willis, Robert J. and Sherwin Rosen (1979), "Education and Schooling Decision", *Journal of Political Economy*, Volume 87, No. 5.



ENTREPRENEURIAL INTENTIONS OF UNIVERSITY STUDENTS: A COMPARISON BETWEEN KOSOVO AND TURKEY USING SHAPERO'S MODEL

BORATAY UYSAL*

Abstract: *Entrepreneurship has emerged as an essential instrument for social and economic development in both industrialized and developing countries. However, while the phenomenon spreads all over the world, the intention of young generations to become self-employed differs according to country context. In this regard, the paper investigates the differences in the levels of entrepreneurial intentions and their antecedents of university students from Turkey and Kosovo. With the purpose of measuring such differences, structured questionnaires based on Shapero's model were distributed within the main universities in Ankara and Prishtina. The findings indicate that there is a statistically significant difference between Turkey and Kosovo in determination of entrepreneurial intentions.*

Keywords: *entrepreneurship, entrepreneurial intention, Shapero's Model, Kosovo, Turkey*

JEL Classification: L26

1. INTRODUCTION

The role of entrepreneurship in economic and social development has been brought to attention by numerous researchers and the entrepreneurship phenomenon has become prominent in societies all over the world. Nowadays, entrepreneurial ventures spur economic growth, create jobs and, thus, engender conditions for a prosperous society. From this point of view, understanding how and why individuals become entrepreneurs in diverse country contexts has become significant in order to further such progress. Hence, the literature on the

* Boratay Uysal, Department of Business Administration, Middle East Technical University, 06800 Ankara, Turkey, boratay.uysal@metu.edu.tr

The author would like to thank project assistant Cansu Selcuk (Bilkent University) and senior students Alma Meha from University of Prishtina and Merve Macit from Hacettepe University for their contributions in collecting the data and developing this paper.

entrepreneurship phenomenon, particularly with regard to the entrepreneurial intentions and their formation in various settings, has flourished recently.

However, a detailed literature review has shown that more than a few developing country settings and models of entrepreneurial intentions still remain largely unexplored. Herein, this paper aims to provide a distinct perspective by comparing Kosovar and Turkish students' entrepreneurial intentions, using Shapero's model for the first time.

Expanding into country samples, since its declaration of independence, Kosovo has been transforming itself into a market economy and numerous aspects of this transition, along with a high rate of unemployment and emigration, induces the business environment to be less conducive for entrepreneurship (Estrin et al. 2006). Today, the involvement of Kosovar young generation in entrepreneurial activities is still low despite the yearly wave of 6500-business related graduates.

Meanwhile, Turkey, with its diversified economy, market openness and ability to adjust to fast changes, stands out as a promising platform for entrepreneurs. However, early-stage entrepreneurial undertakings is still insufficient in Turkey compared to those in developing countries (Karadeniz and Özdemir 2009), indicating that a huge potential of working population of 27.6 million is not yet fully made use of..

This empirical exercise and comparison of these two diverse, yet culturally and geographically close countries, highlight the important factors concerning entrepreneurs in industrialized and developing countries and reveals the possible areas of improvement with regard to the psychological aspects of entrepreneurship in Turkey, Kosovo and beyond. The subsequent sections address a review of existing literature, research methods, results, conclusions and discussion.

2. LITERATURE REVIEW

The earliest studies known explaining why certain individuals become entrepreneurs when others do not were conducted at the individual level (Ribeiro-Soriano and Urbano 2009). Earlier studies, which distinguished entrepreneurs from non-entrepreneurs, were based on personality characteristics and demographic variables (Gartner 1989). However, over the years, the literature has shown that predicting entrepreneurial behaviour through modelling personality characteristics and demographic variables holds a limited explanatory power (Izquierdo and Buelens, 2011).

Numerous social psychologists have shown that intention essentially holds a satisfactory explanatory power for planned behaviour. In this sense, the focus gradually moved from personality characteristics and demographics to intention. However, despite the wide-ranging literature, a widely-accepted definition of entrepreneurial intention has not been attained yet (Shook et al. 2003). Within the context of this paper, entrepreneurial intention stands for the self-acknowledged conviction of an individual that he/she intends to start a new business and consciously plans to do it within a determined period (Thompson 2009).

Ajzen's theory of planned behaviour (1991) and Shapero's model of entrepreneurial intention (1982) stand out as the most recognized intention-based models.

However, most of the previous researches on entrepreneurial intention used theory of planned behaviour (TPB) which suggests that intention is the result of three antecedents, namely attitude toward behaviour, subjective norm, and perceived behavioural control. Within the entrepreneurial context; TPB suggests that favourable evaluation of entrepreneurial career (attitude toward behaviour), positive perception of significant others' opinions on entrepreneurship (subjective norm), and perceived easiness of becoming an entrepreneur (perceived behavioural control) result in strong entrepreneurial intention (Kautonen et al. 2013).

On the other hand, Shapero's model of entrepreneurial intention postulates that entrepreneurial intention is predicted by three antecedents which are perceived desirability, perceived feasibility, and propensity to act. Accordingly, the more an individual perceives entrepreneurship attractive (perceived desirability), believe in his/her capability of starting a business (perceived feasibility), and have disposition to control his/her life by making decisions (propensity to act), the stronger entrepreneurial intention should be (Krueger et al. 2000).

Throughout the years, several meta-analyses on these two intention-based models were conducted. Krueger et al. (2000) undertook a study on 97 senior university business students and found that, even though both of the intention-based models have significant explanatory powers, Shapero's model of entrepreneurial intention predicts considerably better the students' intentions to become self-employed. The same study also found that subjective norm component of TPB was not statistically significant in explaining entrepreneurial intention.

On the other hand, Schlaegel and Koenig (2014), in their evaluation of 98 studies, observed that components of TPB explained the 28 % of variance in

entrepreneurial intention whereas components of Shapero's model of entrepreneurial intention explained 21 % of the variance. Furthermore, their evaluation indicated that there is a statistically significant correlation between attitude toward behaviour component of TPB and entrepreneurial intentions. However, a related point to consider is that Schlaegel and Koenig's study sample included only one study that incorporates all three components of Shapero's model of entrepreneurial intention.

To the best of our knowledge, within the Turkish context, the other researchers have made use solely TPB on entrepreneurial intentions. One recent study by Bozkurt (2014) analysed 202 students taking an entrepreneurship course at a state university in Turkey and determined that attitude toward behaviour and perceived behavioural control components of TPB have positive effects on entrepreneurial intentions of these students. However, correlated with Krueger's findings, there was not a statistically significant relationship between subjective norm and entrepreneurial intention in their study.

Another study on entrepreneurial intention included demographic and contextual factors along with TPB (Gurbuz and Aykol 2008). In this study, subjective norm stands out as having the strongest relationship with entrepreneurial intention, while all three components of TPB have positive contribution to entrepreneurial intention.

Contradictory to existing literature (Cartera et al. 2003), this study also claimed that self-realization has a negative impact on entrepreneurial intention since Turkish students prefer traditional employment to entrepreneurship. Despite the abundance of studies conducted in Turkish context, the detailed literature review yielded only one study which includes Kosovar students.

Karamanos and Vasileiou (2015), in their evaluation of 931 students from 8 Balkan countries, observed a rather low average of entrepreneurial intention across the region and associated this with high level of uncertainty avoidance and low levels of individualisms and indulgence.

In literature, numerous researchers have also studied the differences between countries with respect to the entrepreneurial intention and TPB. Engle et al (2010) undertook a comparison across 12 countries with respect to entrepreneurial intention and TPB, indicating that attitude, subjective norm, and perceived behavioural control form the entrepreneurial intention. However, the most effective component and the variance explained by TPB differs in each country. Similarly, a

study on differences among students in 5 developing and 9 developed countries with respect to entrepreneurial intentions also supported TPB and indicated that students from developing countries have stronger intentions to become self-employed (Iakovleva et al. 2011).

In addition, there have been several country comparative studies that include Turkey in their study samples. For example, Shneor et. al. (2013) researching business students in Norway and Turkey found that entrepreneurial intentions of Turkish students are higher than their Norwegian counterparts, yet there is not significant difference in levels of their social norms. Furthermore, a recent study by Ozaralli and Rivenburgh (2016) indicated that even though both U.S. and Turkish students' attitude toward becoming self-employed are high, they have low levels of intentions to start their own businesses. At this juncture, there have been no studies conducted on cross country comparisons of entrepreneurial intentions with respect to Shapero's model.

3. DATA AND METHODOLOGY

With respect to the literature review, this study was conducted to examine and compare Turkish and Kosovar university students' intentions to become self-employed with respect to Shapero's model of entrepreneurial intention. Thus, the first group of hypotheses pertains to applicability of Shapero's model to both countries and the second group compares countries with respect to the components of the model.

Hypothesis 1a: There is a positive impact of perceived desirability on entrepreneurial intention.

Hypothesis 1b: There is a positive impact of perceived feasibility on entrepreneurial intention.

Hypothesis 1c: There is a positive impact of propensity to act on entrepreneurial intention.

Hypothesis 2a: Turkish students have higher levels of perceived feasibility compared to Kosovar students.

Hypothesis 2b: Turkish students have higher levels of perceived desirability compared to Kosovar students.

Hypothesis 2c: Kosovar students have higher levels of propensity to act compared to Turkish students.

Hypothesis 2d: Turkish students have higher levels of entrepreneurial intentions compared to Kosovar students.

On testing the hypotheses of this study, entrepreneurial intention of students is the dependent variable, whereas the components of the model (i.e. perceived feasibility, perceived desirability, and propensity to act) stand for the independent variables.

3.1. Study Sample and Data Collection

The study sample consists of 202 university students, 101 from each country, from notable universities in Turkey and Kosovo. A comparison between the samples from Turkey and Kosovo has shown that gender, class, age and occupation distributions are significantly similar. Additionally, diverse backgrounds of students coming from several cities of Turkey and Kosovo to attend prestigious universities in major cities enable this paper to distinguish the factors that are most effective in forming entrepreneurial intentions. The demographic characteristics of the sample are summarized in Table 1 and the names of the universities are shown in Table 2.

Table 1 Demographic Distribution of Study Sample

Demographic distribution	Turkey		Kosovo	
	Frequency	Frequency	Percent	Percent
Gender				
Female	51	50,5	56	55,4
Male	50	49,5	45	44,6
Total	101		101	
Class				
First Year	3	3	5	4
Second Year	9	8,9	15	14,9
Third Year	21	20,8	19	18,8
Final Year	60	59,4	52	51,5
Graduate Degree	8	7,9	16	10,9
Total	101		101	
Age				
18 to 22	44	43,6	70	69,3
23 to 27	54	53,5	26	25,7
28 or older	3	3	5	5
Total	101		101	
Occupation				
Student	64	63,4	55	54,5
Student, working part-time	31	30,7	25	24,8
Student, working full-time	6	5,9	21	20,8
Total	101		101	

Table 2 *Names of the Universities*

Universities	
Ankara	Prishtina
Bilkent University	University of Prishtina
Hacettepe University	
Middle East Technical University	

The data used was compiled through self-administrated questionnaires formulated in English and then translated in Albanian and Turkish. The translated questionnaires were distributed and collected at several classes in respective universities.

The original questionnaire consisted of 5 sections and a total of 23 questions. The first section comprises four questions about the demographic data, followed by sections regarding entrepreneurial intention and its antecedents stated in Shapero's model of entrepreneurial intention. The parts related to the antecedents were designed to enable a measurement of perceived desirability, feasibility and propensity to act and each part consisted of 5 questions measured on a 7-point scale ranging from Total Disagreement to Total Agreement. To remove possible biases, in the last section, 4 questions, measured with the same scale, addressed the issue of entrepreneurial. The theoretical background of the questionnaire (see Appendix) was grounded on a previous study (name of the author, year) in the Turkish context in which Linan and Chen's questions on entrepreneurial intention (Liñán and Chen, 2009) were tailored with Burger's desirability of control measure (Burger, 1985).

3.2. Scale Validity and Reliability

Prior to hypothesis testing, alpha reliability analysis was performed to evaluate internal reliability of the questionnaire. As detailed in Table 3, reliability coefficient for the variables range from 0.76 to 0.95 for Turkish sample and 0,88 to 0,93 for Kosovar sample by so satisfies the minimum of 0.7 as recommended by Nunnally (Nunnally et al. 1967) and shows a high internal consistency.

Table 3 *Alpha Reliability Analysis*

Variables	# of Items	Cronbach α	
		Turkey	Kosovo
1.Entrepreneurial Intention	4	0,95	0,92
2.Perceived Desirability	5	0,884	0,885
3.Perceived Feasibility	5	0,853	0,93
4.Propensity to Act	4	0,755	0,884

Subsequent to reliability analysis, exploratory factor analysis was performed to realize validity among study factors. Within the analysis, the result of KMO and Bartlett's test shows that the data is suitable for principal component analysis. With respect to PCA shown in Table 4, it was inferred that all of the independent variables are located at their estimated components without cross-loading apart from propensity_item1 factor which was later removed from the study.

Table 4 *Principal Component Analysis for Independent Variables*

Principle Component Analysis Survey Items	Perceived Desirability		Perceived Feasibility		Propensity to Act	
	TR	KS	TR	KS	TR	KS
Desirability_Item1	0,87	0,807				
Desirability_Item2	0,698	0,797				
Desirability_Item3	0,777	0,701				
Desirability_Item4	0,822	0,742				
Desirability_Item5	0,825	0,815				
Feasibility_Item1			0,798	0,761		
Feasibility_Item2			0,809	0,701		
Feasibility_Item3			0,846	0,816		
Feasibility_Item4			0,664	0,762		
Feasibility_Item5			0,771	0,804		
Propensity_Item2					0,73	0,782
Propensity_Item3					0,732	0,841
Propensity_Item4					0,789	0,786
Propensity_Item5					0,744	0,813

- Rotation Method: Varimax with Kaiser Normalization.
- KMO(Turkey): 0.794; $p < .000$
- KMO(Kosovo): 0.889; $p < .000$

3.3. Test of the Research Questions

To examine the relationship among the study variables and test the first group of hypotheses, correlation and multiple regression analyses were conducted. Afterwards, the second group of hypotheses were tested through carrying out separate independent-tests and differences between Turkish and Kosovar students were investigated.

As detailed in Table 5, the results of the correlation analysis show that the strongest relationship ($r = 0.612$) is between entrepreneurial intention and perceived feasibility. However, additional tests indicate that, in the combined sample, even though perceived desirability displays the strongest relationships with entrepreneurial intention in Turkey, the relationship of perceived feasibility with

entrepreneurial intention in Kosovar sample dominates both the correlation analysis and multiple regression analysis.

Table 5 *Pearson Correlation Coefficients*

Variables	1	2	3	4
1.Entrepreneurial Intention	1			
2.Perceived Desirability	0.599**	1		
3.Perceived Feasibility	0.612**	0.49**	1	
4.Propensity to Act	0.410**	0.412**	0.363**	1

** : Correlation is significant at 0.01 level (2-tailed).

Subsequent to the first analysis, multiple regression analysis was conducted and it was found that all three of the independent variables have an individual impact on the formation of entrepreneurial intention ($p < 0.05$). However, the most significant variable (Table 6) is the perceived feasibility, which has a beta coefficient of 0.393. Herewith, when considering also the correlation analysis, the first group of hypotheses (*Hypothesis 1a, Hypothesis 1b, and Hypothesis 1c*) is supported (first group = subject + is supported = verb).

Table 6 *Multiple Regression Analysis*

Independent Variables	Dependent Variable	Beta Coefficient	Sig.
1.Perceived Desirability	Entrepreneurial Intention	0,357	0,00**
2.Perceived Feasibility		0,393	0,00**
3.Propensity to Act		0,12	0,033*

▪ Adjusted R. Square=0,496, F=66,98

▪ * $p < 0.05$ 00 ** $p < 0.01$

With regard to the second group of hypotheses, the first independent t-test yielded that among the university students who have taken the questionnaire, there is a statistically significant difference between Turkish ($M = 5,05$ $SD = 1,29$) and Kosovar ($M = 4,49$ $SD = 1,12$) students in terms of their perception towards the feasibility of starting their own business ($p < 0.05$). Therefore, hypothesis 2a is supported and, moreover, Cohen’s d value indicates a moderate practical significance (Table 7). This goes to show that fragile administrative system and low government and educational support in Kosovo has a considerable influence over perceived easiness of entrepreneurial ventures.

Table 7 Independent t-test for differences between Turkey and Kosovo on Perceived Feasibility

	Mean	StDev.	Levene's Test	t	df	Sig. (2-tailed)	d _{Cohen}
Turkey	5,053465	1,292715	Equal variances assumed	3,306831	200	0,001119	0,47
Kosovo	4,491089	1,118043					

For the second phase of independent t-tests, the results in Table 8 revealed that, in terms of their perception of entrepreneurship as a desirable path, there is no statistically significant difference between Turkish (M = 5,32 SD = 1,27) and Kosovar (M=5,12 SD=1,22) students. ($p > 0.05$). Therefore, hypothesis 2b is not supported, leading to the conclusion that the degree to which students find the prospect of becoming self-employed attractive does not differ across the two countries.

Table 8 Independent t-test for differences between Turkey and Kosovo on Perceived Desirability

	Mean	StDev.	Levene's Test	t	df	Sig. (2-tailed)
Turkey	5,324752	1,269599	Equal variances assumed	1,151582	200	0,250868
Kosovo	5,122772	1,222774				

Whereas perceived desirability is invariant between Turkey and Kosovo, the third phase of independent t-tests (Table 9) has shown that there is a statistically significant difference between Turkish (M = 5,28 SD = 1,43) and Kosovar (M = 5,66 SD = 0,93) students in terms of their level of readiness to act upon their choices and perceptions ($p < 0.05$). Therefore, hypothesis 2c is supported and, moreover, Cohen's d value indicates a moderate practical significance. In other words, when comparing the Turkish and Kosovar students' dispositions to follow through, the Kosovars' willingness to pursue any given opportunity with high tendencies of benefit was higher than their Turkish counterparts.

Table 9 Independent t-test for differences between Turkey and Kosovo on Propensity to Act

	Mean	StDev.	Levene's Test	t	df	Sig. (2-tailed)	d _{Cohen}
Turkey	5,284653	1,432668	Equal variances not assumed	-2,230425	171,243329	0,027018	0,20
Kosovo	5,663366	0,926981					

In terms of the final independent t-test, there is a statistically significant difference between Turkish (M = 5,35 SD = 1,49) and Kosovar (M = 4,87 SD =

1,55) students in terms of their intentions towards self-employment ($p < 0.05$). Therefore, hypothesis 2d is supported and, moreover, Cohen's d value indicates a moderate practical significance. This result (Table 10), coupled with the fact that Kosovo is a recently established country, indicates that Kosovar students' willingness to pursue entrepreneurship was influenced by the feasibility factors. Notwithstanding this aspect, the considerably high rate of intentions supports the notion that, in the event of removing actual and perceived barriers on entrepreneurship, Kosovar students have the potential to reach the intention levels of their Turkish counterparts.

Table 10 Independent t -test for differences between Turkey and Kosovo on Entrepreneurial Intention

	Mean	StDev.	Levene's Test	t	df	Sig. (2-tailed)	d_{Cohen}
Turkey	5,351485	1,488362	Equal variances assumed	2,247419	200	0,025705	0,32
Kosovo	4,871287	1,547827					

4. RESULTS AND DISCUSSION

The application of Shapero's model of entrepreneurial intention formed the core structure of this study and the findings from the correlation and multiple regression analyses showed that perceived desirability, perceived feasibility, and propensity to act influence both Kosovar and Turkish students' self-employment intentions, although the variables are not invariant between the countries. From this point forth, this study has similar findings with Ngugi et al. (2012) involving Kenyan university students and Klapper and Jarniou's (2006) study of three French higher education institutions, both making use of Shapero's model of entrepreneurial intentions in culturally diverse contexts.

In order to investigate the entrepreneurial intentions of Turkish and Kosovar students and how they differ from one another, several independent t -tests were conducted. The results revealed that both Turkish and Kosovar students have solid intentions to start their own businesses, while Kosovar students' level of intentions are considerably lower than their Turkish counterparts. With respect to the Turkish context, the results support previous findings provided by Uysal and Guney's (2016) study of 103 business students in the Turkish metropolitan areas and Naktiyok and Timuroglu's (2009) study of 234 students in Erzurum.

However, taking into consideration also the low level of actual entrepreneurial activities, as detailed by the GEM project (2010), the reasons why such high level of intentions do not morph into behaviours should continue to be examined. (Consider rephrasing, too ambiguous, cannot make any connection). However, persistent emigration, recent political and social unrest coupled with regulatory and economic vicissitudes decreased the market efficiency despite the high level of self-employment intentions. Moreover, recent economic instabilities that Turkey has been undergoing could have led to a decreased level of entrepreneurial activities.

Meanwhile, the lower but noteworthy level of entrepreneurial intentions of Kosovar students, despite their low feasibility perceptions, calls for macro level improvements in economic and political settings in Kosovo. Accordingly, correlated with the existing literature (Solymossy 2005) (Mustafa and Lleshi 2014), eliminating actual and perceived obstacles to entrepreneurship in Kosovo requires a dynamic private sector activity in diversified sectors, a strong corporation between education system and business community, and involvement of all parts of the community in policy development.

This study, as in all other empirical studies, has a number of limitations that should be addressed. First, the generalisation of the findings is restricted since the study sample is gathered from three Turkish universities and one Kosovar university located in the capital cities of the respective countries. Another limitation is the choice of 23 items questionnaire which can limit the predictive power of the study. Finally, since self-administrated questionnaires were used for data collection, common-method bias can be regarded as potential weakness. Thus, outcomes with greater predictive power might be possible in future studies with wider samples from different regions of both countries and additional variables.

Despite the aforementioned limitations, it is believed that the application of Shapero's model can pave the way for academic researchers, industry professionals, and government administrators to review current local conditions and systems in Kosovo and Turkey with respect to entrepreneurial intention and its antecedents. By this way, it is believed that both counties will have societies full of entrepreneurial individuals who can think outside the box.

REFERENCES

1. Ajzen, Icek (1991), 'The Theory Of Planned Behaviour', *Organizational Behaviour and Human Decisions Processes*, 50.2, 179–211.
2. Bosma, Niels and Levie, Jonathan (2010), ' Global Entrepreneurship Monitor 2009 Executive Report'.
3. Bozkurt, Özlem Çetinkaya (2014), 'Planlanmış Davranış Teorisi Çerçevesinde Öğrencilerin Girişimci Olma Niyetlerinin İncelenmesi', *Ekonomi ve Yönetim Araştırmaları Dergisi*, 1 (3), 27-47.
4. Burger, Jerry M. (1985), 'Desire For Control And Achievement-Related Behaviors', *Journal of Personality and Social Psychology*, 48.6, 1520-33.
5. Cartera, Nancy M., et al. (2003), 'The career reasons of nascent entrepreneurs', *Journal of Business Venturing*, 18.1, 13-39.
6. Engle, Robert L., et al. (2010), 'A twelve-country evaluation of Ajzen's model of planned behavior', *International Journal of Entrepreneurial Behavior & Research*, 16.1, 35-57.
7. Estrin, Saul, Meyer, Klaus E., and Bytchkova, Maria (2006), 'Entrepreneurship In Transition Economies', *The Oxford Handbook Of Entrepreneurship*, 693-725.
8. Gartner, William B. (1989), 'Who Is an Entrepreneur?' Is the Wrong Question', *Entrepreneurship: Theory & Practice*, 13, 47-68.
9. Gurbuz, Gulruh and Aykol, Sinem (2008), 'Entrepreneurial intentions of young educated public in Turkey', *Journal of Global Strategic Management*, 4.1, 47-56.
10. Iakovleva, Tatiana, Kolvereid, Lars, and Stephan, Ute (2011), 'Entrepreneurial intentions in developing and developed countries', *Education+ Training*, 53.5, 353-70.
11. Izquierdo, Edgar and Buelens, Marc (2011), 'Competing models of entrepreneurial intentions: the influence of entrepreneurial self-efficacy and attitudes', *International Journal of Entrepreneurship and Small Business*, 13.1, 75-91.
12. Karadeniz, Esra and Özdemir, Özlem (2009), 'Entrepreneurship in Turkey and Developing countries: a comparison of Activities, Characteristics, Motivation and Environment for Entrepreneurship', *Mibes Transactions*, 3(1), 30-45.
13. Karamanos, Anastasios and Vasileiou, E. (2015), 'Insights from understanding entrepreneurial intention amongst students across Balkan countries', *The 8th International Conference for Entrepreneurship, Innovation and Regional Development* (Sheffield), 146-61.
14. Kautonen, Teemu, Gelderen, Marco Van, and Tornikoski, Erno T. (2013), 'Predicting entrepreneurial behaviour: a test of the theory of planned behaviour', *Applied Economics* 45.6, 697-707.
15. Klapper, Rita and Leger-Jarniou, Catherine (2006), 'Entrepreneurship Intention among French Grande École and University Students: An Application of Shapero's Model', *Industry and Higher Education*, 20 (2), 97-100.
16. Krueger, Norris F., Reilly, Michael D., and Carsrud, Alan L. (2000), 'Competing models of entrepreneurial intentions', *15.5*, 411-32.
17. Liñán, Francisco and Chen, Yi- Wen (2009), 'Development And Cross- Cultural Application Of A Specific Instrument To Measure Entrepreneurial Intentions', *Entrepreneurship theory and practice*, 33.3, 593-617.
18. Mustafa, Besim and Lleshi, Samir (2014), 'Education in Entrepreneurship in Kosovo', *Academic Journal of Interdisciplinary Studies*, 3.2, 67-71.

19. Naktiyok, Atılhan and Timuroğlu, M. Kürşat (2009), 'Öğrencilerin motivasyonel değerlerinin girişimcilik niyetleri üzerine etkisi ve bir uygulama', *Atatürk Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 23.3.
20. Ngugi, John Karanja, et al. (2012), 'Application of Shapero's model in explaining entrepreneurial intentions among university students in Kenya', *International Journal of Business and Social Research*, 2.4, 125-48.
21. Nunnally, Jum C., Bernstein, Ira H, and Berge, Jos MF ten (1967), *Psychometric Theory* (226; New York: McGraw-Hill).
22. Ozaralli, Nurdan and Rivenburgh, Nancy K. (2016), 'Entrepreneurial intention: antecedents to entrepreneurial behavior in the USA and Turkey', *Journal of Global Entrepreneurship Research*, 6.1, 1-32.
23. Ribeiro-Soriano, Domingo and Urbano, David (2009), 'Overview of collaborative entrepreneurship: an integrated approach between business decisions and negotiations', *Group Decision and Negotiation*, 18.5, 419-30.
24. Schlaegel, Christopher and Koenig, Michael (2014), 'Determinants of entrepreneurial intent: a meta-analytic test and integration of competing models', *Entrepreneurship Theory and Practice*, 38.2, 291-332.
25. Shapero, Albert and Sokol, Lisa (1982), 'The social dimensions of entrepreneurship', *Encyclopedia of entrepreneurship*, 72-90.
26. Shneor, Rotem, Camgöz, Selin Metin, and Karapinar, Pinar Bayhan (2013), 'The interaction between culture and sex in the formation of entrepreneurial intentions', *Entrepreneurship & Regional Development*, 25.9-10, 781-803.
27. Shook, Christopher L., Priem, Richard L., and Mcgee, Jeffrey E. (2003), 'Venture creation and the enterprising individual: A review and synthesis', *Journal of Management*, 29(3), 379-99.
28. Solymossy, Emeric (2005), 'Entrepreneurship in extreme environments: building an expanded model', *The International Entrepreneurship and Management Journal*, 1.4, 501-18.
29. Thompson, Edmund R. (2009), 'Individual Entrepreneurial Intent: Construct Clarification And Development Of An Internationally Reliable Metric', *Entrepreneurship Theory and Practice*, 33(3), 669-94.
30. Uysal, Boratay and Guney, Semra (2016), 'Entrepreneurial Intentions of Turkish Business Students: An Exploration Using Shapero's Model', *Yönetim Bilimleri Dergisi*, 14(28), 27-47.

APPENDIX

1. What is your gender?

- Male
- Female
- Prefer not to disclose

2. What is your age?

- 18- 22
- 23- 27
- 28 or older

3. Which class are you in?

- First Year
- Second Year
- Third Year
- Final Year
- Graduate Programme (Master’s and PhD)

4. What is your occupation?

- Student
- Student, Working Part Time
- Student, Working Full Time

5. Indicate your level of agreement with the following sentences from 1 (total disagreement) to 7 (total agreement)

	Questions	1	2	3	4	5	6	7
1	The idea of starting my own business seems very fascinating.							
2	If I had the necessary resources and the opportunity, I would like to start my own firm.							
3	I consider entrepreneurship more prestigious than private or public employment.							
4	I associate entrepreneurship with advantages rather than disadvantages.							
5	The best way for me to follow my passion and feel fully fulfilled is through pursuing entrepreneurship.							

6. To extend, do you agree with statements regarding entrepreneurial feasibility? Indicate from 1 (total disagreement) to 7 (total agreement)

	Questions	1	2	3	4	5	6	7
1	I know how to develop an entrepreneurial project.							
2	If I were to start my own firm, I would probably succeed.							
3	I can control the process of creating a new firm.							
4	I am aware of the necessary practical details needed to start a firm.							
5	It would not be a difficult task for me to launch a new firm and keep it working.							

7. Indicate your level of agreement with the following sentences from 1 (total disagreement) to 7 (total agreement)

	Questions	1	2	3	4	5	6	7
1	I would rather make my own mistake than to take orders from someone else.							
2	I always try to demonstrate a leadership role when I am in group projects.							
3	I enjoy making my own decisions.							
4	I feel that I am generally more capable of handling situations compared to others.							
5	When I am faced with a problem, I prefer to do something about it rather than let it continue.							

8. Indicate your level of agreement with the following sentences from 1 (total disagreement) to 7 (total agreement)

	Questions	1	2	3	4	5	6	7
1	I have truly considered though of starting a new business.							
2	The possibility that I will start my own business is high.							
3	I will make any effort to launch my own business and run it.							
4	My professional aim is to become an entrepreneur.							



WHAT ARE THE DIMENSIONS OF ONLINE SATISFACTION?

CLAUDIA BOBÂLCĂ*, OANA ȚUGULEA**

Abstract: *The purpose of the research is to identify the factors affecting online satisfaction. As a research method, we applied a quantitative survey based on a questionnaire. The sample consists of 532, students at Faculty of Economics and Business Administration, aged between 19-26 years, who buy online various products from the Internet. In order to identify the dimensions of online satisfaction, we used exploratory factor analysis with SPSS 17.0, with Principal Components as extraction type and Varimax as rotation method. Nine dimensions of online satisfaction were identified, namely: products corresponding to the online description, good price, comfort, easily accessible information, personal data security, good design, support, personalization, and website awareness.*

Keywords: *online satisfaction, factor analysis, price, data security, website.*

1. INTRODUCTION

As e-commerce is growing both globally and in Romania and the number of retailers is increasing, competitive differentiation can no longer be based only on product quality, but also on the customer approach. In the global economy, in the context of a highly competitive international market, consumer orientation is no longer just a choice but it has become a requirement for the survival of the business. Companies have realized the importance of their presence on the Internet either through presentation, commerce websites or through social networks.

Understanding the reasons consumers choose to buy online the Internet, from a particular website, understanding the factors that influence the level of

* Claudia Bobâlcă, Alexandru Ioan Cuza University of Iași, Faculty of Economics and Business Administration, Iași, Romania, iuliana.bobalca@uaic.ro

** Oana Țugulea, Alexandru Ioan Cuza University of Iași, Faculty of Economics and Business Administration, Iași, Romania, ciobanu.oana@uaic.ro

customers' satisfaction have become extremely important conditions for the profitability of the companies.

Customer satisfaction is nowadays a sustainable competitive advantage and a requisite for customer loyalty (Petrusca and Danilet (2012), which, in the online environment, can easily shift from one trader to another (Chou et al. (2015)).

Research dedicated to online shopping shows that the satisfaction level is lower than the offline stores (Sheng and Liu, 2010), which turns the process of keeping customers happy into a real challenge. On the other hand, in the online environment the level of consumer satisfaction influences the perceived image of the retailers, this image being more volatile . These are sufficient reasons for companies to be concerned with understanding how consumers choose to buy and what are the factors that influence their satisfaction in the online acquisition process.

In this context, understanding the online satisfaction components becomes a necessity. The present study aims to identify such components for products purchased from online stores.

2. ONLINE SATISFACTION

Satisfaction is defined as “an affective answer to an experience” (Ting et al., (2013)) which includes customers' emotions, feelings and moods (Chen and Cheng (2012)). Emotions are generated by the consumer's thoughts already influenced by previous experiences (Jang and Namkung (2009)).

In the online environment, satisfaction is very important for customers who evaluated it on two levels: the transaction process and the relationship characteristics (Shankar et al. (2003)).

Marketing orientation is based on a one-to-one customer approach. The level of satisfaction is influenced by the quality of the relationship with the sellers. Treating every customer as if he/she is unique is a component of personalization, which refers to paying personal attention to each client, understanding the buyer's specific needs and offering him/her services which would increase the comfort level (Kim et al., 2006)). A specific factor influencing online satisfaction is personal data security (Yingjiao and Paulins (2005)). The comfort of buying online, , at any given hour contributes to the customer's satisfaction (Schaupp and Bélanger, (2005); Khalifa and Liu (2007)).

Among the elements that encourage the online purchasing, we encounter: ease of navigation and information search, guarantees of security, clarity of return policy and website design (Siddiqui et al. (2003)). The graphic style (i.e. selected images, colors, image size, picture quality, number of photos, animations) is an important component in assessing the site's quality (Kim et al. (2006)). Studies show a direct link between the graphical quality of the site and the perception about online buying (Raney et al. (2003) or between the graphical quality of the site and the level of consumer satisfaction (Eroglu et al. (2003); Kim et al. (2006)). According to Yen and Lu (2008) the determinants of satisfaction in online purchasing, are: perceived benefits, website efficiency, meeting the needs of buyers and personal data security. Zhang et al. (2010) mention three components that lead to satisfaction, namely: site characteristics, online services and price.

3. RESEARCH CONTEXT AND PURPOSE

The research purpose is to identify the factors affecting online satisfaction.

Literature review indicates various online satisfaction dimensions, based on the investigated field (i.e. products or services): apparel, IT products, books, banking or tourism.

Our research is not focused on a specific category, but rather it explores online product shopping.

The research hypothesis is as follows: Price, perceived quality of the product and security affect the customer's online satisfaction.

Price is an important determinant of customer satisfaction (Khalifa and Liu, 2007). The lack of tangibility increases the role of price, as a quality barometer. In the online environment, the customer does not know for sure what he is buying before receiving the postal. The unknown area is considerable larger than in offline sector. In this context, price perceptions are more important in post-selling satisfaction (Liu, Arnett, 2009).

Furthermore, there are many studies that link product quality and security to online satisfaction (Souitaris and Balabanis (2007); Dong (2012); Cebi (2013)).

4. RESEARCH METHODOLOGY

As a research method, we applied a quantitative survey based on a questionnaire. Following previous research, data was collected through a qualitative research (Bobalca (2015a) Bobalca (2015b)) for understanding the elements used by online shoppers in order to evaluate their satisfaction.

The sample consists of 532 young people, students at Faculty of Economics and Business Administration, 19-26 years old, who purchase online various products. The subjects have at least 1 year experience as Internet buyers and they have bought products at least twice in the 6 months prior to the application of the questionnaire. 72.7% of the respondents are female and 27.3 % are male. The distribution of the sample based on monthly revenues is presented in Table 1, which also reveals that most of the Internet buyers (37.4%) have less than 700 Ron every month as personal revenue.

Table 1 *Sample distribution of the income*

		Frequency	Valid Percent	Cumulative Percent
Valid	Less than 700 Ron	199	37,4	37,4
	700-1000 Ron	152	28,6	66,0
	1001-2000 Ron	129	24,2	90,2
	2001-3000	27	5,1	95,3
	Over 3000	25	4,7	100,0
	Total	532	100,0	

As seen above, the respondents usually buy IT products (33,7%) and Consumer Electronics (20%) from the Internet. Also, they buy apparel products (18,9%) and footwear (14,1%).

Table 2 *Type of products brought from the Internet*

		Responses		Percent of Cases
		N	Percent	
Online product	Apparel	119	18,9%	26,5%
	Footwear	89	14,1%	19,8%
	Consumer Electronics	126	20,0%	28,1%
	IT products	212	33,7%	47,2%
	Books	78	12,4%	17,4%
	Toys	5	0,8%	1,1%
Total		629	100,0%	140,1%

The data was collected at the faculty, at the end of the courses. Each respondent was selected so as to meet the necessary conditions to be part of the sample and was informed about his/her implication in the research. Verbal consent was asked and the subjects were informed about the possibility to quit anytime the questionnaire.

5. RESEARCH INSTRUMENT

In order to measure online satisfaction, in the research questionnaire 53 items were used. The items were built based on a previous qualitative research (Bobalca (2015a); Bobalca (2015b)) and on the literature review results. All responses were measured on seven-point Likert scales ranging from 1 (strongly disagree) to 7 (strongly agree), a more detailed scale which reduces the probability to obtain extreme answers (Yuksel (2001)).

There are different recommendations regarding the minimum number of respondents for conducting factor analysis, however, the common rule supports the need to use a minimum number of 50 cases (Garson (2010)). According to Hatcher (1994), the number of the subjects must be five times larger than the number of variables, while Norušis (2005) suggests a minimum number of 300 subjects.

6. RESEARCH RESULTS

For identifying factors affecting online satisfaction, we used exploratory factor analysis with SPSS 17.0, with Principal Components as extraction type and Varimax as rotation method.

After we first run factor analysis, 11 factors explaining 62.94 % of the total variance were generated.

KMO test (Kaiser-Meyer-Olkin) has a value of 0.945, indicating that, in this case, the factor analysis is appropriate for the analysis of the correlation matrix. A KMO test value greater than 0.7 indicates a good value (Pintiliecu (2007)). Sig value is less than 0.05, then the null hypothesis (i.e. the population correlation matrix is an identity matrix) is rejected.

The next step was to remove from the Component Matrix the items with loading value smaller than 0.4. Regarding the items loading values in factor analysis, most researchers consider appropriate for exploratory purposes using a level of 0.4 for the main factor and 0.25 for the others (Raubenheimer (2004)). Hair

et al. (1998) consider that a value greater than 0.6 is a marker for high loadings, while a value lower than 0.4 is indicative of weak loadings.

Following this rule, we removed two items:

On this site there are many opinions of other clients

It is very important the brand of the products I have ordered

We ran a second factor analysis with 51 items, and 10 factors, explaining 62.47 % of the total variance, were identified. There were no items with factor loadings less than 0.4 in the Components Matrix, thus we removed from Rotated Component Matrix 8 items with almost similar loadings:

I like the way the pictures of the products are made

I am satisfied with after-sales services

The information on the website is constantly updated

The information on the website is easy to understand

The products are presented with sufficient details on the website

I am satisfied with the gifts / prizes offered by the website

I am satisfied with the manner in which my online order is confirmed

I feel safe purchasing from this website

Another factors analysis was run with the rest of 43 items and 9 factors explaining 63% of the total variance were generated. We followed the same procedure and we removed from the Rotated Component Matrix 3 more items:

I am satisfied with the price I have paid for the products' delivery

I like that I can study the offer as long as I need before ordering

It is very simple to search for a product on this website

We ran a final factor analysis with only 40 items and 9 factors, explaining 64.63 % of the total variance, were generated. KMO test indicated a value of 0.934, indicating that the factor analysis is appropriate in this case. This results are supported by the value of Sig smaller than 0.05 (Table 3).

Table 3 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		,934
Bartlett's Test of Sphericity	Approx. Chi-Square	10921,038
	df	780
	Sig.	,000

Table 4 presents the total explained variance for the final factor analysis. 9 factors with Eigenvalues higher than 1 were grouped, explaining 64.63 % of the total variance.

Table 4 *The total explained variance*

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	13,047	32,617	32,617	13,047	32,617	32,617
2	2,461	6,153	38,770	2,461	6,153	38,770
3	2,160	5,399	44,169	2,160	5,399	44,169
4	1,790	4,475	48,644	1,790	4,475	48,644
5	1,646	4,114	52,759	1,646	4,114	52,759
6	1,404	3,511	56,269	1,404	3,511	56,269
7	1,194	2,986	59,255	1,194	2,986	59,255
8	1,094	2,735	61,990	1,094	2,735	61,990
9	1,057	2,642	64,632	1,057	2,642	64,632
10	,876	2,190	66,822			
11	,822	2,056	68,878			
12	,780	1,950	70,828			
13	,719	1,797	72,625			
14	,701	1,753	74,378			
15	,685	1,712	76,090			
16	,659	1,648	77,738			
17	,626	1,565	79,303			
18	,560	1,399	80,702			
19	,544	1,361	82,063			
20	,512	1,279	83,342			
21	,477	1,193	84,535			
22	,463	1,158	85,693			
23	,447	1,118	86,811			
24	,442	1,104	87,915			
25	,432	1,079	88,994			
26	,389	,973	89,967			
27	,386	,965	90,932			
28	,364	,911	91,843			
29	,334	,836	92,679			
30	,328	,819	93,498			
31	,323	,808	94,306			
32	,317	,791	95,097			
33	,298	,746	95,843			
34	,285	,712	96,556			
35	,277	,691	97,247			
36	,255	,638	97,885			

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
37	,239	,597	98,482			
38	,229	,574	99,056			
39	,204	,511	99,566			
40	,173	,434	100,000			

We used *Rotated Factor Matrix* to identify the nine factors obtained from the analysis. For each factor we measured scale reliability using Cronbach-Alpha coefficient. We named every factor according to the items from its structure.

We named the first factor „Products correspond to the online description”. It explains 32.61 % of total variance and the Cronbach – Alpha coefficient is 0.82 valid for all the six items. After removing the items *I can choose from a larger diversity of the supply* and *I am very satisfied about the policy of returning the goods*, the reliability coefficient grew to 0.86 (Table 5). Regarding a good Cronbach–Alpha coefficient value, Schumacker and Lomax (2004) indicate the value of 0.7, while Malhotra (1996) consider 0.6 a good value.

Table 5 Reliability coefficient for the scale “Products correspond to the online description”

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,828	,835	6
,860	,862	4

The final scale for measuring “Products correspond to the online description” dimension is composed of 4 items and has an internal consistency of 0,86, being a reliable scale (Table 6).

Table 6 “Products correspond to the online description” Scale (Average, Explained variance and Cronbach – Alpha coefficient)

Items	Average	Explained variance	α
The products I get always correspond to my expectations	5,74	32,61%	0,86
The products I get always correspond to the description/image from the website	5,87		
I am satisfied with the quality of the products I order	6,05		
The information of the website describes reality	5,96		

All the items presented in Table 6 have a big significance in building the factor “Products correspond to the online description”, with items averages bigger than 5 (on a 7 point Likert scale). The general average of the scale is 5.84.

The second factor, “Good price”, explains 6.15% of total variance and the Cronbach – Alpha coefficient is 0.80 for all the six itmes of the scale, as Table 7 indicates.

Table 7 “Good price” Scale (Average, Explained variance and Cronbach – Alpha coefficient)

Items	Average	Explained variance	α
The products are affordable	5,63	6,15%	0,80
I receive the appropriate value for the price I have pay	5,88		
Prices are cheaper compared with those in offline stores	5,75		
It is easier for me to compare the offers than in offline stores	5,90		
The website presents attractive promotions	5,62		
It is cheaper to buy from this website	5,54		

All the items have a big significance in building the factor “Good price”, with items averages bigger than 5 (on a 7 point Likert scale). The general average of the scale is 5.72.

Table 8 presents the third factor, “Comfort”, which explains 5.39% of total variance. The scale measuring “Comfort” dimension is composed from 6 items and has a good reliability, with Cronbach – Alpha coefficient value of 0.83.

Table 8 “Comfort” Scale (Average, Explained variance and Cronbach – Alpha coefficient)

Items	Average	Explained variance	α
I save plenty of time buying from this website	6,01	5,39%	0,83
It is very comfortable to buy from this website	6,18		
It is very simple to order from this website	6,33		
This website is easy to use	6,40		
I am very satisfied with how quickly I receive the products	5,69		
The products are safely delivered	6,13		

All the items have a big significance in building the factor “Comfort”, with items averages bigger than 5 (on a 7 point Likert scale). The general average of the scale is 6.12.

Another factor, originally grouped in 4 items, was graphically named “Easily accessible information”. It explains 4,47% of total variance and the Cronbach – Alpha coefficient was 0.813 for all 4 itmes. After we have removed the item *I can easily select a certain product category*, the reliability coefficient grew to 0.83 (Table 9).

Table 9 *Reliability coefficient for the scale “Easily accessible information”*

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,813	,814	4
,834	,834	3

The final scale for measuring “Easily accessible information” dimension is composed from 3 items and has a good reliability level, with an internal consistency of 0.83 (Table 10).

Table 10 *“Easily accessible information” scale (average, explained variance and Cronbach – Alpha coefficient)*

Items	Average	Explained variance	α
I can easily find on this website information about delivery	6,19	4,47%	0,83
I can easily find on this website information about payment	6,28		
I can easily find on this website all the information I need for ordering products	6,26		

All the items have a great significance in building the factor “Easily accessible information”, with items averages bigger than 6 (on a 7 point Likert scale). The general average of the scale is 6.24.

According to Table 11, the scale for measuring “Good design” dimension is build out of 4 items and has an internal consistency of 0,81, indicating a good level of reliability. This factor explains 4,11% of the total variance.

Table 11 *“Good design” scale (average, explained variance and Cronbach – Alpha coefficient)*

Items	Average	Explained variance	α
The website attractively presents the products	5,81	4,11%	0,81
The website has a nice design	5,89		
I like the colors from this website	5,49		
I like the way sales promotions are flagged	5,74		

All the items have a big significance in building the factor “Good design”, with items averages bigger than 5 (on a 7 point Likert scale). The general average of the scale is 5,73.

Table 12 presents the scale for “Support” dimension, explaining 3,51% of the total variance. This is a reliable scale, according to the value of Cronbach–Alpha coefficient.

Table 12 “Support” scale (average, explained variance and Cronbach – Alpha coefficient)

Items	Average	Explained variance	α
I can easily communicate with website consultants	5,25	3,51%	0,88
Website consultants are always willing to help me	5,27		
If I have problems, I know the website consultants will quickly solve them	5,16		
This website is paying attention to my needs, as a customer	5,78		

All the items have a big significance in building the factor “Support”, with items averages bigger than 5 (on a 7 point Likert scale). The general average of the scale is 5,37.

Another factor, initially composed from 4 items, was graphically named “Personalization”. It explains 2,98% of total variance and the Cronbach – Alpha coefficient was 0,73 for the scale with all 4 itmes. After removing the item *It is very easy to search a product on this website*, the reliability coefficient grew to 0,754 (Table 13).

Table 13 Reliability coefficient for the scale “Personalization”

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,732	,734	4
,754	,756	3

Table 14 presents the structure of “Personalization” factor, items average, explained variance and Cronbach – Alpha coefficient.

Table 14 “Personalization” scale (average, explained variance and Cronbach – Alpha coefficient)

Items	Average	Explained variance	α
The messages (ads, promotions) I receive from this website fit me	4,81	2,98%	0,75
This website makes me feel like I am unique, as a customer	4,33		
I like buying from this website	5,60		

All the items have an average significance in building the factor “Personalization”, with items averages bigger than 4 (on a 7 point Likert scale). The general average of the scale is 4,92.

Table 15 “Personal data security” scale (average, explained variance and Cronbach – Alpha coefficient)

Items	Average	Explained variance	α
I feel safe to pay online the order on this website	4,82	2,73%	0,71
I consider my personal data to be protected on this website	5,44		
The terms regarding transaction security are easy to understand	5,57		

Three items compose the scale for measuring “Personal data security” factor, all of them having averages bigger than 4. The general average of the scale is 5,28. This factor explains 2,73 % of total variance (Table 15).

The last factor, “Website awareness” explains only 2,64 % of total variance. The Cronbach – Alpha coefficient for the scale is 0,75, indicating a good, reliable scale (Table 16).

Table 16 “Website awareness” Scale (average, explained variance and Cronbach – Alpha coefficient)

Items	Average	Explained variance	α
The website is very popular	6,08	2,64%	0,75
The website has a good reputation	6,03		

The two items have a big significance in building the factor “Website awareness”, with items averages bigger than 6 (on a 7 point Likert scale). The general average of the scale is 6,06.

7. CONCLUSIONS

The purpose of our research was to identify the dimensions of online satisfaction. The factor analysis generated 9 dimensions (Figure 1): products correspond to the online description, good price, comfort, easily accessible information, good design, support, personalization, personal data security, website awareness.

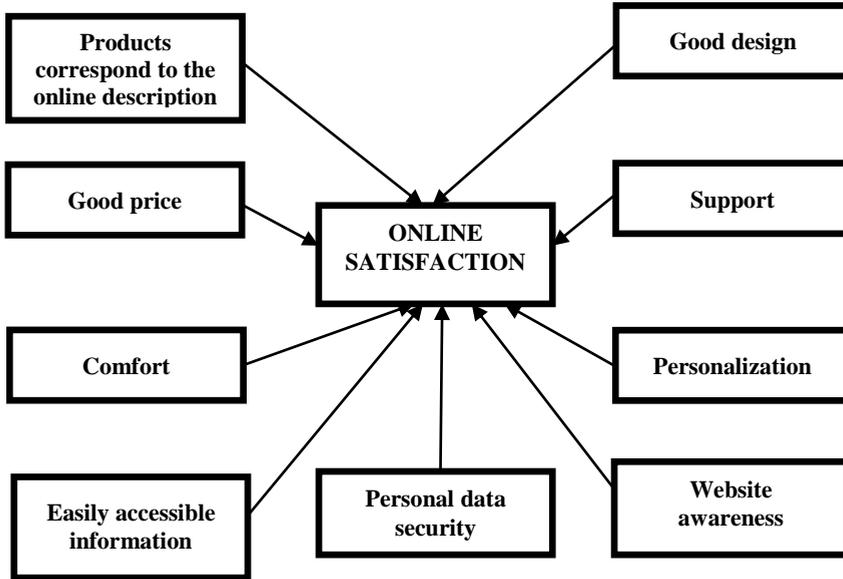


Figure 1 Online satisfaction dimensions

The research hypothesis (i.e. Price, perceived quality of the product and security affect customer's online satisfaction) was partially confirmed. A good price and personal data security are important factors leading to the customer's satisfaction. Besides the expected factors, another 7 dimensions were identified. Among these factors, perceived quality of the products was not specifically mentioned, yet it was reflected by the dimension *Products correspond to the online description*.

We developed a reliable scale for measuring each dimension of online satisfaction. This model can be used in future studies with the purpose to measure the level of satisfaction for a specific website.

Managerial implications. The research results can be used to understand the factors that contribute to the customer's satisfaction in order to develop effective relationship strategies for attracting and maintaining customers for a specific website.

Limitations of the research. The consistency of the sample is a limitation of this research. Only young students at Faculty of Economics and Business Administration, 19-26 years old, were included in the study, meaning that the results are not relevant for other groups. Furthermore, in order to measure *Website Awareness*, a scale with only 2 items was developed, requiring further research. Another future research direction would be extension of the sample by diversifying using age, education, and income. The dimensions of online satisfaction can be investigated for loyal customers and non-loyal customers, ultimately comparing the results.

REFERENCES

1. Bobalcă, C., 2015a. *Loialitatea clienților – premisă a expansiunii firmei în mediul online*. Bucuresti: Editura ASE.
2. Bobâlcă, C., 2015b. The Loyal Customers' Perception Regarding the Online Buying Process. *CES Working Papers*, VII (2), pp. 241-255.
3. Cebi, S., 2013. Determining importance degrees of website design parameters based on interactions and types of websites. *Decision Support Systems*, 54 (2), pp. 1030-1043.
4. Chen, C.W. and Cheng, C.Y., 2012. How online and offline behavior processes affect each other: customer behavior in a cyber-enhanced bookstore. *Quality & Quantity*, 47(5), pp. 1-17.
5. Chou, S., Chen, C. and Lin, J., 2015. Female online shoppers. *Internet Research*, 25 (4), pp. 542 - 561
6. Danileț, M. and Petrușcă, C., 2014. Metaphors That Can Turn Accounting Into A Career. An Analysis Of Presentation Discourses In Romanian Faculties Of Economics, International Conference "Communication, Context, interdisciplinarity", (CCI 3) 3th Edition 2014
7. Dong, X. , 2012. Index system and evaluation model of e-commerce customer satisfaction. International Symposium on Robotics and Applications (ISRA), 3-5 June, Kuala Lumpur, pp. 439-442.
8. Garson, D., 2010. Factor Analysis, *College of Humanities and Social Sciences*, [online] Available at:< <http://faculty.chass.ncsu.edu/garson/PA765/factor.htm#factoring>> [Accessed 20 June 2015].
9. Hair, J.F., Anderson, R. E., Tatham, R. L. and Black, W. C., 1998. *Multivariate Data Analysis With Readings*, 5th ed., Englewood Cliffs. NJ: Prentice-Hall.
10. Hatcher, L., 1994. *A Step-By-Step Approach to Using the SAS System for Factor Analysis and Structural Equation Modeling*. Cary, NC: SAS Institute. Focus on the CALIS procedure
11. Khalifa, M. and Liu, V., 2007. Online consumer retention: contingent effects of online shopping habit and online shopping experience. *European Journal of Information Systems*, Vol. 6, pp. 780–792.

12. Jang, S.C. and Namkung, Y., 2009. Perceived quality, emotions, and behavioral intentions: application of an extended Mehrabian-Russell model to restaurants. *Journal of Business Research*, 62 (4), pp. 451-460.
13. Kim, M., Kim, J. and Lennon, S., 2006. Online service attributes available on apparel retail web sites: an E-S-QUAL approach. *Managing Service Quality: An International Journal*, 16 (1), pp. 51 – 77.
14. Liu, C. and Arnett, K.P., 2009. Factors influencing satisfaction and loyalty in online shopping: an integrated model. *Online Information Review*, 33(3), pp. 458 – 475.
15. Malhotra, N. K., 1996. *Marketing Research, An Applied Orientation*. New Jersey: Prentice Hall.
16. Norušis, M. J., 2005. *SPSS 13.0 Statistical Procedures Companion*, Chicago: SPSS, Inc.
17. Petrușcă, C.I and Danileț, M., 2012. Developing the Research Instrument for Measuring Loyalty within the Financial-Accounting Services, *Proceedings of International Conference Marketing – from information to decision 5th Edition 2012*, Editura SC Roprint, pp. 371-379.
18. Pintilescu, C., 2007. *Analiza statistică multivariată*, Iași: Ed. Universității Al.I. Cuza.
19. Raubenheimer, J. E., 2004. An Item Selection Procedure to Maximize Scale Reliability and Validity. *South African Journal of Industrial Psychology*, 30 (4), pp. 59-64.
20. Schaupp, L.C. and Bélanger, F., 2005. A conjoint analysis of online consumer satisfaction. *Journal of Electronic Commerce Research*, 6 (2), pp. 95-111.
21. Schumacker, R. E. and Lomax R. G., 2004. *A Beginners Guide to Structural Equation Modeling*, Mahwah, NJ: Lawrence Erlbaum Associates
22. Sheng, T. and Liu, C., 2010. An empirical study on the effect of e-service quality on online customer satisfaction and loyalty. *Nankai Business Review International*, 1 (3), pp. 273–283.
23. Shankar, V., Smith, A.K and Rangaswamy, A., 2003. Customer Satisfaction and Loyalty in Online and Offline Environments. *International Journal of Research in Marketing*, 20(2), pp. 153 – 175.
24. Souitaris, V. and Balabanis, G., 2007. Tailoring online retail strategies to increase customer satisfaction and loyalty. *Long Range Planning*, 40 (2), pp. 244-261.
25. Ting, C.-W., Chen, M.-S. and Lee, C.-L., 2013. E-satisfaction and post-purchase behaviour of online travel product shopping. *Journal of Statistics and Management Systems*, 16 (2), pp. 223-240.
26. Yingjiao Xu V. and Paulins, A., 2005. College students' attitudes toward shopping online for apparel products. *Journal of Fashion Marketing and Management: An International Journal*, 9 (4), pp. 420 -433.
27. Yuksel, A., 2001. Managing Customer Satisfaction and Retention: A Case of Tourist Destinations, Turkey. *Journal of Vacation Marketing*, 7 (2), pp. 153-168.



HEDONIC PRICE ANALYSIS OF NON-BARREN BROODMARES

BREE L. DORITY*, DAYNA LARREAU**, FRANK TENKORANG***

Abstract: *The current real average selling price of a thoroughbred broodmare is nearly half its peak value in 2000. While annual price changes are influenced by economic performance, different prices at an auction are influenced by physical and genetic characteristics of broodmares. We use auction data from the 2013 November Keeneland Breeding Stock Sales to estimate a hedonic pricing model. We find prices are positively influenced by earnings of the covering sire, earnings of the broodmare, pedigree, and the racing performance of broodmare progeny. Conversely, the age of a broodmare and the day on which the horse sold have dampening effects on broodmare prices.*

Keywords: *broodmare, hedonic pricing, thoroughbred*

JEL Classification: *D46, L11, Q13*

1. INTRODUCTION

The real average thoroughbred broodmare selling price doubled during the period 1990-2000, however, since peaking in 2000, the real selling price has nearly returned to its 1990 value (Keeneland Association; Neibergs 2001). Yearly fluctuations indicate that price cycles were recorded within the economy (i.e. during the 1990-1991 and 2001 recessions, real average broodmare selling prices fell about 7 % and 28 %, respectively; whereas during the Great Recession of 2007-2009, prices dropped 54 %. Price variability *within* a given year also shows that prices vary substantially from one broodmare to another. For example, during 2001-2014 November Keeneland Breeding Stock Sales, the minimum price

* Bree L. Dority, Department of Economics, University of Nebraska-Kearney, 1917 W 24th St, Kearney, NE 68849, USA, doritybl@unk.edu

** Dayna Larreau, Department of Economics, University of Nebraska-Kearney, 1917 W 24th St, Kearney, NE 68849, USA, s-dlarreal@unl.edu

*** Frank Tenkorang, Department of Economics, University of Nebraska-Kearney, 1917 W 24th St, Kearney, NE 68849, USA, tenkorangf1@unk.edu

registered yearly was \$ 1,000, whereas the highest price generally reached around \$ 4 million. The purpose of this research is to quantify the non-barren broodmare sale price relationship due to a wide range of measurable characteristics of the 2013 Keeneland Breeding Stock Sales.

Few studies exist on the price determinants of broodmares (Neibergs 2001; Maynard and Stoeppel 2007), and the data encompassed relates to prices from years prior to the Great Recession, when an unprecedented growth was recorded, almost reaching peak values, while the yearly price variability was disregarded entirely. Although breeders may hold their higher quality stock until better market conditions, the broodmare market environment has changed since the Great Recession (i.e. prices have plummeted to the 1990s value and reveal a higher yearly volatility).

The present article contributes to the existing literature by examining broodmares in foal and broodmare prospects. In the sample used, broodmares in foal are defined as those currently pregnant, whereas broodmare prospects relate to those who have not been exposed to a stallion. Additionally, barren broodmares are those who have been exposed but did not get pregnant and, thus, have not been included.

Neibergs (2001) includes all broodmares sold in 1996 (e.g., in foal, barren, and prospects), whereas Maynard and Stoeppel (2007) focus on only broodmares in foal sold in 2005. The latter argue that Neibergs' (2001) assumption that the marginal impacts of the price determinants are the same for barren and in foal broodmares is invalid, particularly for the stud fee variable, where a \$ 0 stud fee was assigned to barren broodmares. Consistent with Maynard and Stoeppel (2007), we assume the price of a broodmare is a function of attributes signaling the future racing performance of her foals. Therefore, barren broodmares were not considered given they are not presently producing foals, but they retain the future potential. The average prices of broodmares that are barren, in foal, and prospects are \$ 33,833, \$93,117, and \$ 192,280, respectively, indicating that, unlike broodmare prospects, barren broodmare prices are sharply discounted. This is most likely because of the increased production costs of maintaining an open mare and/or due to the risk of reproductive deficiency.

Finally, in order to control for the quality of the sire bred to the broodmare the covering sire's career earnings were included. Because broodmare prospects have not been exposed to a stallion, the present contribution is the usage of four

approaches to predict the covering sire's earnings for the stallion the broodmare prospect is likely to be exposed to. This approach is different from that of Neiberger (2001), who assigned a zero value to the sire's earnings for broodmare prospects. Overall, the results suggest that pedigree and the success of a broodmare's progeny are more important than the racing performance in determining the price.

2. LITERATURE REVIEW

The American Horse Council Foundation estimated that \$ 26.1 billion was contributed to the national GDP by the horse racing industry, and, within the state of Kentucky, the horse industry produced goods and services valued at \$ 2.3 billion. Given such a considerable contribution, breeders, buyers, sellers, and others are interested in understanding the thoroughbred market. Previous studies have considered mostly yearlings and sires, since these account for a larger share of racing horses (Robbins and Kennedy (2001), Parsons and Smith (2008), Plant and Stowe (2013), Ng et al. (2013), Stowe (2013), Stowe and Ajello (2010)).

Thoroughbred yearling³ studies have been conducted using data from several countries. Robbins and Kennedy (2001) investigated the determinants of auction prices in a local market in British Columbia. Using a log linear hedonic price model and a sample of 1,581 yearlings from the Canadian Thoroughbred Horse Society for the period 1985-1997, they find that age, gender, birth month, stake race, sire characteristics (i.e. stud fee), and dam's characteristics (i.e. black type and progeny earnings) have a positive impact on yearling price.

Similarly, using British thoroughbred yearling auction data from 2004, Parsons and Smith (2008) examine price determinants of yearlings, while at the same time they focus on the British Horseracing Board's Owners' Premium initiative, designed to support the national breeding industry. Such a maneuver was expected to provide a premium for British sired and reared yearlings, however, the authors did not find sufficient evidence. Consistent with Robbins and Kennedy (2001), their other findings indicate that gender, month of birth, and stud fee impact yearling prices.

³ Yearlings are defined as horses between 1 and 2 years old, who have never been raced before the auction (Ng et al. (2013)).

Ng et al. (2013) and Plant and Stowe (2013) examine the pricing of yearlings using 2005 Australian Thoroughbred auction data and 2008 Keenel and auction data, respectively. The first find that age, gender, color, parents' and siblings' characteristics, and type of buyer (i.e. foreigner) are significant factors affecting prices and the results are robust to different specifications of parent and sibling characteristics. Plant and Stowe (2013) account for the impact of disclosures (i.e. eye, scope, and vet) on market prices, and find that such information decreases prices of low quality yearlings, but has no effect on prices of high quality yearlings.

Stowe and Ajello (2010) find that earnings, career wins, grade of races won, dam races, and stud fee of sire's sire positively affect freshman sire stud fees. For leading thoroughbred sires, their stud fees are influenced by yearling price and progeny performance (Stowe, (2013). Hansen and Saghalian (2015) studied the shift in stud fee from the time a sire enters the breeding shed to when it becomes established. Their results show that early in a sire's breeding career, it is its own racetrack record that determines its stud fee, but in later years, the leading factor is the progeny performance.

3. EMPIRICAL METHODS

Building on the work of Neibergs (2001), Maynard and Stoeppel (2007), and (mention all the main sources!), we construct an empirical hedonic pricing model where a non-barren broodmare price is a function of her breeding characteristics, racing characteristics, genetics, and market factors. Specifically, we estimate equations of the following form:

$$\ln(\text{price}) = \alpha + \sum_b^5 \beta_b x_b + \sum_r^4 \beta_r x_r + \beta_g x_g + \sum_m^{10} \beta_m x_m + \varepsilon \quad (1)$$

The dependent variable is the natural logarithm of the price the broodmare sold at auction. The breeding characteristics (x_b) capture the broodmare's expected ability to produce successful progeny, and include whether the broodmare is a prospect, the broodmare's age, the covering sire's total career earnings, and

whether the broodmare has produced any black type⁴ offspring and any graded stakes offspring. It should be noted that Neiberger (2001) and Maynard and Stoeppel (2007) included the sire's stud fee to control for the quality of the sire bred to the broodmare. Although the stud fee captures the market's valuation of the stallion's genetics, the sire's career earnings captures actual performance and may be a better signal of the future racing performance of the foals.

The racing characteristics (x_r) represent the broodmare's own ability as a racehorse, and include its previous earnings, as well as the number of races won, placed, and showed. Genetics (x_g) or the ability of the broodmare's parents to produce successful racehorses, is captured using a binary variable (= 1 if the broodmare's sire or dam is a black type producer). Market factors (x_m) include whether the broodmare was born in the U.S., whether the price was the reserve not attained value, and binary variables indicating the day on which the broodmare was auctioned during the 10-day sale.

Table 1 provides variable definitions and the expected signs, and Table 2 presents means and standard deviations for all broodmares in the sample. Overall, the average price of broodmares in the sample is \$ 96,529, but prices range from \$ 1,000 to \$ 4 million. On average, the broodmares are slightly older than 9 years and have \$ 87,600 in career earnings. More than 6 % and 12 % of the broodmares are graded stakes and black type producers, respectively, and 97.3 % of the broodmares had a sire or dam which was a black type producer. The average earnings of the covering sire is nearly \$ 1.6 million.

Table 1 Variable definitions and expected signs

Variable	Description	Expected Sign
Dependent Variable		
Price	Broodmare selling price	N/A
Breeding Characteristics		
PROSPEC		
T	=1 if a broodmare prospect	-
AGE	Age of broodmare in years	-
S_EARN	Actual or estimated covering sire earnings (in \$10,000)	+
BT_PROD	Broodmare is a black type producer	+

⁴ Black type refers to boldface type used in sales catalogs to distinguish horses that have won or placed in a stakes race.

Variable	Description	Expected Sign
GS_PROD	Broodmare is a graded stakes producer	+
Racing Characteristics		
M_EARN	Broodmare's career race earnings (in \$10,000)	+
WON	Number of races broodmare won	+
PLACED	Number of races broodmare placed	+
SHOWED	Number of races broodmare showed	+
Genetic Characteristics		
	=1 if either of the broodmare's parents was a black type producer	
PT_BT		+
Marketing Characteristics		
BIRTH	=1 if broodmare was born in the U.S.	+
RNA	=1 if reserve not attained	-
DAYi	Dummy variable for day of sale, $i = 3, 4, \dots, 10$	-

Table 2 Means and Standard Deviations

Variable	Non-Barren Broodmares		Pregnant Broodmares		Broodmare Prospects	
	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.
Dependent Variable						
Price	96,529	227,280	93,117	212,570	192,280	477,830
Breeding Characteristics						
PROSPECT	0.034	0.182	0.000	0.000	1.000	0.000
AGE	9.130	3.556	9.220	3.583	6.592	0.814
S_EARN	159.410	141.060	165.090	140.250	0.000	0.000
BT_PROD	0.122	0.328	0.127	0.333	0.000	0.000
GS_PROD	0.058	0.234	0.060	0.238	0.000	0.000
Racing Characteristics						
M_EARN	8.760	14.729	8.236	13.827	23.457	27.025
WON	1.938	2.296	1.842	2.229	4.612	2.532
PLACED	1.659	2.160	1.574	2.062	4.061	3.243
SHOWED	1.490	1.979	1.407	1.876	3.816	3.100
Genetic Characteristics						
PT_BT	0.973	0.163	0.974	0.160	0.939	0.242
Marketing Characteristics						
BIRTH	0.955	0.207	0.957	0.203	0.898	0.306
RNA	0.133	0.340	0.134	0.341	0.122	0.331

Approximately 3.4% of the sample are broodmare prospects, and the mean price of prospects is \$192,280, which is nearly \$100,000 more than the mean price of pregnant broodmares. Moreover, on average, prospects are younger than pregnant broodmares (6.6 years compared to 9.2 years), have higher career earnings (\$234,570 compared to 82,360), and have won, placed, and showed in more races than pregnant

broodmares. This is important because although broodmare prospects are not in foal, their average characteristics also differ from barren broodmares sold in 2013. For example, the average barren broodmare was 10.3 years old and sold for \$ 33,833. Unlike Maynard and Stoeppel (2007) who only examined broodmares in foal, broodmare prospects were retained in the sample because their price is not discounted due to factors associated with being barren (e.g., loss in earnings for not being in foal, risk due to lack of reproductive soundness, etc. (Neibergs (1997))). Thus, based on the selling price, it appears there is an expectation among buyers that broodmare prospects will produce successful foal in the future and/or continue to race successfully.

Also, we use four approaches to predict the expected covering sire's earnings for broodmare prospects in our sample. This is different from Neibergs (2001) who assigned a zero stud fee value to barren broodmares, and likely broodmare prospects, arguing that it reflects the expected value of the foal for a barren mare. Approach 1 ly uses the average covering sire's earnings for all pregnant broodmares (\$ 1.65 million) as the covering sire's earnings for the prospects. For Approach 2, we construct pregnant broodmare price quartiles, and use the average covering sire's earnings in the relevant price quartile for the broodmare prospects' covering sire earnings.

For Approaches 3 and 4, we use the observed positive relationship between covering sire's earnings and pregnant broodmare prices and construct a sire earnings-to-broodmare price ratio, which shows how much larger the covering sire's earnings are compared to the selling price of the pregnant broodmare. We estimate how this ratio is related to information on the broodmares, and then use the results to predict the ratio for broodmare prospects. Finally, given the predicted ratio, we can predict the covering sire's earnings for the stallion the broodmare prospect is likely to be exposed to.⁵ Using OLS and Tobit, Approaches 3 and 4 involve estimating equations of the following form:

$$ratio_i = f(age_i, x_{r,i}, x_{g,i}, x_{m,i}) \quad (2)$$

where:

- *ratio* is the sire earnings-to-broodmare price ratio,

⁵ It should be noted that we may have introduced endogeneity into the model with Approaches 3 and 4. However, as shown in the results section, our findings are robust across all specifications suggesting that any bias is minimal.

- *age* is the broodmare's age, and
- x_r , x_g , and x_m are the racing characteristics, genetics, and market factors .

The subscript denotes pregnant broodmare *i*. Although 97.7 % of the sire earnings-to-broodmare price ratios for the pregnant broodmares are greater than one, using the OLS estimates, we obtain negative predicted ratios for 11 of the broodmare prospects in the sample. Tobit estimation used restricts the predicted ratios for the broodmare prospects to be positive. Overall, the average covering sire earnings for all non-barren broodmares ranges from \$ 1.65 million to \$ 1.95 million, compared to \$ 1.59 million for pregnant broodmares.

3.1. Data

Data on the broodmare was collected from the Keeneland website. The Keeneland Thoroughbred auctions are held in Lexington, Kentucky, where the Keeneland Association is located. Keeneland began in 1936 and has become the source of America's best thoroughbreds through its auctions and important races, including the first leg of the Triple Crown, the Kentucky Derby. Keeneland has sold more champions and stakes winners than any other selling company. The auctions attract buyers from nearly all U.S. state and 50 countries to Keeneland's four annual sales (Keeneland Association). The November Breeding Stock sale is where broodmares are bought and sold, and in November 2013, 1,474 broodmares were sold.

The data used includes the broodmare's sale price, age, career race earnings, number of races won, placed, and showed, place of birth, whether pregnant or a prospect, whether a black type and graded stakes producer, if either parents were black type producers, the day of sale and who the covering sire is. Data covering sire earnings was derived from the Blood-Horse Stallion Register, which covers information on more than 2,700 Thoroughbred stallions.

4. RESULTS

Table 3 presents the parameter estimates for several specifications and the estimated price flexibilities and marginal values for Approach 3 estimation.⁶

⁶ Given the limited printing space, results for Approach 3 were provided, although results for Approaches 1-4 are very similar (details can be provided upon request)

Specifically, column A shows the parameter estimates when the sample is restricted to only pregnant broodmares. This is analogous to Maynard and Stoeppel's (2007) approach. Column B presents the parameter estimates when we restrict the covering sire's earnings to be zero for broodmare prospects, which is an analogous approach to Neibergs (2001). Column C presents the parameter estimates using our Approach 3 outlined above, and the estimates in columns D, E, and F are based on the parameter estimates in Column C.⁷

Overall, the magnitudes and statistical significance of the parameter estimates are similar across the specifications, and the direction of the signs on all the estimated coefficients are as expected. The similar results despite differences in estimation of the covering sire variables may be because stud fee and sire earnings are highly intertwined (Stowe and Ajello (2010), Hansen and Saghaian (2015)).

4.1. Breeding Characteristics

Of the breeding characteristics, the earnings of the covering sire and whether the broodmare is a black type and graded stakes producer are positively related to her sale price. That is, if the covering sire's earnings increase by \$ 10,000, her sale price increases by 0.05 %. More importantly, compared to a non-black type and non-graded stakes producing broodmare, a black type and a graded stakes broodmare producer has a sale price that is 22 % and 47 % higher, respectively. Based on the estimated marginal values, this is an increase of approximately \$8,400 and \$18,600, respectively. Conversely, with each additional year the broodmare's selling price decreases by 7.7 %. It is important to consider the horse's age and its progeny performance together as Hansen and Saghaian (2015) found progeny performance became more important as the sire aged. Breeders and buyers will expect older broodmares to have successful progeny to insure their investment is worthwhile.

Given the additional features, the price of a broodmare prospect is discounted by 27 % or about \$10,500 from that of a broodmare in-foal. Overall, the results are consistent with Neibergs (2001) and Maynard and Stoeppel (2007) despite the differences in estimation and time periods examined. Comparing price

⁷ Since the null hypothesis that the estimated coefficients are the same in two separate regressions (i.e. using only broodmares in foal or only broodmare) was not rejected, data has been pooled, one

flexibilities, a 1 % increase in age decreases the broodmare's selling price by 0.86 % according to Neibergs (2001), by 1.14 % according to Maynard and Stoeppel (2007), and by 0.70 % according to our estimation.

4.2. Racing Characteristics

The only racing characteristic that is statistically significant is the mare's career earnings, which suggests that if they increase by \$ 10,000 its selling price increases by 1.5%. This is consistent with Neibergs (2001) and Maynard and Stoeppel (2007) who estimated price flexibilities of 0.10 and 0.14, respectively, compared to our price flexibility of 0.13.

Comparing the 1.5 % per \$ 10,000 increase in price due to the broodmare's career earnings to the 7.7 % reduction due to age indicates that, for sellers, it would be worth it to breed and/or sell the broodmare early on if it is less talented, instead of holding onto it and hoping it will perform well in the following races. A yearly win of close to \$ 50,000 is needed to offset the age reduction. Overall, results suggest that untalented broodmares should be bred often from a young age in an attempt to produce a black type and/or graded stakes foal, which is estimated to increase its value by 22 and 47 %, respectively.

4.3. Genetic Characteristics

Although we find that the success of a broodmare's progeny is an important factor influencing her price, her pedigree is even more important. That is, compared to a broodmare with no black type producing parents, a broodmare with at least one black type producing parent has a sale price that is 108 % higher, or about \$ 21,000. Altogether, results are consistent with Neibergs (2001) and Maynard and Stoeppel (2007), suggesting that pedigree and the success of a broodmare's progeny are more important than the performance in determining its price.

When attending an auction, buyers and sellers alike focus on pedigree and progeny. It is very important to trace black type and/or graded stakes progeny through the pedigree in order to attempt to predict success in future foals, rather than sire earnings or stud fees. Broodmares with a line of repeatedly producing black type and/or graded stakes foals, whether or not they are winners themselves, will be more genetically likely to produce proven racers. Therefore, the broodmares that produce the most black type and/or graded stakes foals are more genetically disposed to proven progeny and, thus, are valuable.

4.4. Marketing Characteristics

The above results hold controlling for the birth place of the broodmare, the day on which it was sold, and whether the price was the reserve not attained value rather than the sale price. So far no evidence that the mare U.S.-born influences its price. However, consistent with previous studies, we find that each additional selling day had a statistically significant price discount with the largest discount occurring on day 10 (more than \$ 51,000)⁸. This indicates that if buyers are willing to wait, they may receive considerable discounts. On the other hand, the reserve not attained value (e.g., the last competitive auction price bid) was statistically significant, as opposed to Neibergs' (2001) perspective, suggesting that the last competitive auction price bid does not accurately reflect the broodmare value (e.g., the seller chose an unrealistic reserve price).

Overall, despite the change in the broodmare market environment since the Great Recession, we find that most valuable broodmares are those resulting from a black type producing parent, who already produced black type winners and graded stakes winners themselves. These results are consistent with Neibergs (2001) and Maynard and Stoepfel (2007) who examined price determinants of broodmares in the pre-Great Recession time period. If the broodmares with a valuable pedigree and successful progeny are bred with a high quality stallion, then, according to Robbins and Kennedy (2001) and Parsons and Smith (2008), the offspring will sell for a higher price as a yearling, and the winning genetics passed on will influence the yearlings' resale value and stud fee.

⁸ Since there was no significant price discount on Day 2 relative to Day 1, 8 rather than 9 binary variables representing the day on which the broodmare sold were included because.

Table 3 Regression results

Variable	Approach 3 Estimation					
	Pregnant Broodmares [A]	Neibergs (2001) Approach [B]	Parameter Estimates [C]	Transformed Para. Est. ^a [D]	Price Flexibility [E]	Marginal Value [F]
PROSPECT		-0.237 ** (0.106)	-0.308 *** (0.098)	-0.268		-10,584
AGE	-0.077 *** (0.007)	-0.077 *** (0.007)	-0.077 *** (0.007)		-0.702	-3,042
S_EARN	0.0004 *** (0.0001)	0.0004 *** (0.0001)	0.0005 *** (0.0001)		0.083	20
BT_PROD	0.196 ** (0.076)	0.197 ** (0.077)	0.198 ** (0.076)	0.215		8,436
GS_PROD	0.399 *** (0.099)	0.393 *** (0.099)	0.393 *** (0.099)	0.474		18,602
M_EARN	0.014 *** (0.004)	0.015 *** (0.004)	0.015 *** (0.004)		0.131	592
WON	0.008 (0.02)	0.009 (0.018)	0.010 (0.018)		0.020	398
PLACED	0.013 (0.013)	0.008 (0.012)	0.008 (0.012)		0.013	307
SHOWED	-0.016 (0.013)	-0.016 (0.012)	-0.017 (0.012)		-0.025	-661
PT_BT	0.693 *** (0.116)	0.741 *** (0.111)	0.738 *** (0.111)	1.078		21,055
BIRTH	-0.030 (0.094)	-0.013 (0.088)	-0.007 (0.088)	-0.011		-288
RNA	-0.141 ** (0.058)	-0.140 ** (0.057)	-0.139 ** (0.057)	-0.131		-5,232
DAY3	-0.872 *** (0.09)	-0.878 *** (0.087)	-0.878 *** (0.087)	-0.586		-25,524

Variable	Approach 3 Estimation					
	Pregnant Broodmares [A]	Neibergs (2001) Approach [B]	Parameter Estimates [C]	Transformed Para. Est. ^a [D]	Price Flexibility [E]	Marginal Value [F]
DAY4	-0.938 *** (0.086)	-0.939 *** (0.083)	-0.938 *** (0.083)	-0.610		-26,730
DAY5	-1.544 *** (0.081)	-1.548 *** (0.078)	-1.546 *** (0.078)	-0.788		-39,046
DAY6	-1.571 *** (0.084)	-1.568 *** (0.082)	-1.567 *** (0.082)	-0.792		-37,192
DAY7	-1.961 *** (0.083)	-1.965 *** (0.08)	-1.961 *** (0.08)	-0.860		-42,592
DAY8	-1.977 *** (0.101)	-1.989 *** (0.099)	-1.983 *** (0.099)	-0.863		-38,923
DAY9	-2.817 *** (0.101)	-2.820 *** (0.099)	-2.815 *** (0.099)	-0.940		-50,604
DAY10	-2.963 *** (0.108)	-2.983 *** (0.105)	-2.973 *** (0.105)	-0.949		-51,428
CONSTANT	12.002 *** (0.158)	11.944 *** (0.152)	11.923 *** (0.151)			
R-squared	0.67	0.68	0.68			
n	1375	1424	1424			

Heteroskedasticity-consistent standard errors are in parentheses.

*p ≤ .10. **p ≤ .05. ***p ≤ .01.

^a Binary variable coefficients transformed according to Kennedy (1981).

5. CONCLUSIONS

The present study uses a hedonic pricing model and Keeneland data from 2013 to examine specific factors related to thoroughbred broodmare prices. In order to control for the quality of the sire bred to the broodmare, the covering sire's career earnings were included, compared to Neiberghs (2001) and Maynard and Stoeppel (2007) who used the sire's stud fee. Although the latter captures the market's valuation of the stallion's genetics, the sire's career earnings captures actual performance, potentially better signaling the foals' future racing performance of the foals. Overall, the impact of the sire's career earnings on broodmare prices is smaller than the impact of the stud fee on broodmare prices. However, both impact broodmare prices by a far smaller amount than the pedigree and progeny performance variables (e.g., a 1 % increase in either the stud fee or the sire's career earnings increases broodmare prices by less than 1 %).

Although market conditions were different in 2013 compared to the period 1996-2005, on which the previous research focused, the present results are consistent with earlier ones. Thus, it is suggested that pedigree and the success of a broodmare's progeny are more important for determining its price than the racing performance. Specifically, the genetics variable had the greatest impact on price, followed by whether the broodmare herself was a graded stakes producer.

REFERENCES

1. American Horse Council (n.d.), *National economic impact of the U.S. horse industry*,
2. <http://www.horsecouncil.org/national-economic-impact-us-horse-industry>, [Accessed 10.26.2014]
3. Hansen, C., & Saghaian, S. (2015), "Progeny? Performance? What really matters in a stud fee?" *Southern Agricultural Economics Association Annual Meeting*. Atlanta, GA.
4. Keeneland Association (n.d.), *About Keeneland sales*, <http://www.keeneland.com/sales/about-keeneland-sales>, [Accessed 3.12.15]
5. Keeneland Association (n.d.), *Annual sales figures*, <http://www.keeneland.com/sales/annual-sales-figures>, [Accessed 10.26.14]
6. Keeneland Association (n.d.), *Conditions of sale*, <http://www.keeneland.com/sales/conditions-sale>, [Accessed 3.10.15]
7. Keeneland Association (n.d.), *Racing sales*, <http://flex.keeneland.com/summaries/summaries.html>, [Accessed 11.16.14]
8. Kennedy, P. (1981), "Estimation with correctly interpreted dummy variables in semilogarithmic equations", *American Economic Review*, Vol. 71, No. 4, pp. 801.

9. Maynard, L., & Stoeppel K. M. (2007), "Hedonic price analysis of thoroughbred broodmares in foal", *Journal of Agribusiness*, Vol. 25, No. 2, pp. 181-195.
10. Neibergs, J. (2001), "A hedonic price analysis of thoroughbred broodmare characteristics", *Agribusiness*, Vol. 17 No. 2, pp. 299-314.
11. Ng, T., Chong, T., Siu, M., & Everad, B. (2013), "What determines the price of a racing horse?" *Applied Economics*, Vol. 45 No. 3, pp. 369-382.
12. Parsons, C., & Smith, I. (2008), "The price of thoroughbred yearlings in Britain", *Journal of Sports Economics*, Vol. 9 No. 1, pp. 43-66.
13. Plant, E., & Stowe, C. (2013), "The price of disclosure in the thoroughbred yearling market", *Journal of Agricultural and Applied Economics*, Vol. 45 No. 2, pp. 243-257.
14. Robbins, M., & Kennedy, P. (2001), "Buyer behaviour in a regional thoroughbred yearling market", *Applied Economics*, Vol. 33 No. 8, pp. 969- 977.
15. Stallion Register (n.d.), *Stallion register online*, <http://www.bloodhorse.com/stallion-register/>, [Accessed 11.16.14]
16. Stowe, C. (2013), "Breeding to sell: a hedonic price analysis of leading thoroughbred sire stud fees", *Applied Economics*, Vol. 45 No. 7, pp. 877-885.
17. Stowe, C., & Ajello, B. (2010), "A Hedonic price analysis of differentiated products of unknown quality: Freshman sire stud fees in the thoroughbred breeding industry", *Journal of Agribusiness* Vol. 28 No. 1, pp. 19-30.



THE VALUE RELEVANCE OF FINANCIAL INFORMATION UNDER THE INFLUENCE OF COUNTRY RISKS. THE CASE OF THE INDIAN LISTED COMPANIES

IOAN-BOGDAN ROBU*, MIHAI CARP**, COSTEL ISTRATE***,
CRISTIAN POPESCU****, MIHAELA-ALINA ROBU*****

Abstract: *In the decision-making process investors need quality financial information based on reported accounting numbers. Such numbers are present in financial statements and must meet a series of fundamental characteristics, such as relevance and faithful representation. The present paper aims to analyse and assess the value relevance of financial information on the financial market in India under the influence of the main country risk components (i.e. economic risk and freedom to set up businesses, corruption control, financial, fiscal, monetary and investment freedom). The research was carried out on a sample of companies listed on the regulated market in India between 2006 and 2014. The results of applying general linear models have shown that, over time, the country risk can have a significant influence on the value relevance of the financial statements reported at the financial market level.*

Keywords: *Indian capital markets, financial information, value relevance, risk country*

JEL Classification: *M41, O16, O53*

1. INTRODUCTION

One of the major communication tools between the companies listed on a regulated market and the stakeholders is given by the financial statements. Their general aim as defined according to the internationally recognized framework, is to

* Ioan-Bogdan Robu, Alexandru Ioan Cuza University of Iasi, bogdan.robud@feaa.uaic.ro

** Mihai Carp, Alexandru Ioan Cuza University of Iasi, mihai.carp@feaa.uaic.ro

*** Costel Istrate, Alexandru Ioan Cuza University of Iasi, istrat@uaic.ro

**** Cristian Popescu, Alexandru Ioan Cuza University of Iasi, popescu@uaic.ro

***** Mihaela-Alina Robu, Alexandru Ioan Cuza University of Iasi, mihaela.robud@feaa.uaic.ro

provide useful information in order to support the decisions of the main users (IASB, 2014).

According to the international conceptual frameworks (IFRS and US GAAP), financial reporting is based on the fulfilment of some essential criteria provided by such frameworks, i.e. relevance and faithful representation, respectively (IASB, 2014). The examination of these two fundamental characteristics provided to users leads to the validation of the financial statements *value relevance* (Barth *et al.*, 2001).

Seen as an attribute of financial information, the value relevance can be reflected by the share's price or return (El-Sayed Ebaid, 2012). Based on price variation, it can be assessed the very short term market response to the information related to the companies' financial position and performance (Easton, 1999). Beginning with the statistical analysis of the relation between a company's reported accounts and its market value (Beisland, 2009), the value relevance of financial statements can be estimated by correlating the two types of values (Ohlson, 1995; Barth *et al.*, 2001; Kaaya, 2015). A significant correlation indicates the existence of a value relevance of financial statements, as well as a high degree of utility for the financial information reported by companies (Barth *et al.*, 2008).

The financial information utility and the investors' reaction to the accounting figures can also be influenced by the financial market on which the company shares are traded and for which the mentioned reports are performed (Alali & Foote, 2012). Simultaneously, in the case of emergent countries, a series of macroeconomic factors, as well as some country risk components, can influence the economic growth on the financial market, as a consequence of economic liberalization or of an increase in competitiveness and efficiency of the listed companies (Kotwal *et al.*, 2011).

In India's case, the fiscal, monetary and financial reforms together with the international trade liberalization (Saha, 2012) can contribute to the financial market development and investment growth. However, such an economic growth on the financial market may be influenced also by other country risk components (Vij & Kapoor, 2007).

The present study is aimed at analysing and assessing the value relevance of the financial statements on India's financial market in India, following the influence of the main country risk components (i.e. economic risk and freedom to

set up a business, corruption control, financial, fiscal, monetary and investment freedom). The results are based on a study carried out on the companies listed on the regulated market between 2006 and 2014. The general linear models have shown that, over time, the country risk can have a significant influence on the value relevance of the financial statements reported at the financial market level.

The study is organised as follows: Section I comprises the literature review and the hypothesis; Section II describes the methodology; Section III presents the results and discussions, and Section IV concludes.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Financial statements are widely used as a way to predict the future cash flows obtained by shareholders and, therefore, to estimate the return on shares and inherent risks (Negakis, 2005). The informative content of financial statements is useful for investors in the decision-making process and provides an accurate description of the financial position and financial performance of the listed companies.

2.1. The value relevance of financial information

The concept of *value relevance* relates to the way in which the information provided in the financial statements may influence share price (Francis & Schipper, 1999). The change in the share price determined by financial statements is based on reporting exclusively relevant financial information (Beaver, 2002). The value relevance of financial statements is focused on modelling the relation between a company's market values and traditional accounting information (Clarkson *et al.*, 2011).

The analysis of the financial information on a share's price or return was particularly focused on the information in the profit and loss account (mainly given by profit or profit variation), as well as that in the balance sheet (regarding the company's financial position). The balance sheet information represents a significant part of the reported financial statements regarding the existing assets and resources and is useful for investors in the company's assessment process and in estimating value modifications (Huang and Zhang, 2012).

The value relevance of financial statements can be evaluated by using econometric models. Among the best known, the Ohlson (1995) model is focused on the influence of a company's equities and net income during a certain period on the share price. Although in relation to value relevance (Ohlson, 1995), this model

uses to the same extent net income and equities, some argue that the result-related information can have a different relevance when compared to the balance sheet information (Francis and Schipper, 1999; Landsman & Maydew, 2002; Core *et al.*, 2003; Collins *et al.*, 2009).

Such differences related to value relevance can occur as a consequence of the different roles played by the financial statements components in the decision making process of the main users (Barth *et al.*, 1998; Barth *et al.*, 2001). In this sense, Dimitropoulos and Asteriou (2009) and Barton *et al.* (2010) state that the information related to the operating result influences share return to a greater extent as compared to that related to group global turnover. Other researchers consider that analytical results have a more significant influence as compared to the aggregate ones (El-Sayed Ebaid, 2012) and that the information related to having a profit is more relevant to investors than the loss-related one (Collins *et al.*, 2009). With regard to equity, their analysis by components does not improve the relevance of reported information and it does not lead to an increase in the explanatory power of the stock return (Ohlson & Penman, 1992).

2.2. The quality of financial information on the emergent Asian markets

The assessment of the value relevance of the financial information reported by companies is particularly important in the case of emergent economies. In such economies, the financial markets development requires efficient tools to diagnose the factors with a significant influence on the mentioned process. The Asian case, whose economic dimension is continuously expanding, represents a prolific area of debate with regard to the financial information quality and relevance. It is known that the use of the International Financial Reporting Standards (IFRS) contribute to the reduction of information asymmetries (Boț a Avram *et al.*, 2015) and their implementation in this geographic area is implicitly aimed at improving the quality of reported financial information.

Although the IFRS enforcement consequences on the relevance of accounts have been thoroughly studied (Barth *et al.* 2008), the case of the emergent countries remains relatively unknown (Chebaane and Othman, 2014). In the Asian and African communities, the enforcement of IFRS has had a positive effect on the financial information relevance (Chebaane and Othman, 2014). The results of such

analyses were focused on using the price model (Ohlson, 1995) and a series of qualitative variables (i.e. degree of economic openness, governance system, or investor's protection).

Some researchers argue that emergent markets only provide investors with limited information possibilities, thus requiring the introduction of complementary regulations, beyond those related to accounts or corporate governance (Alali and Foote, 2012). In such cases (e.g., the United Arab Emirates), the financial information relevance can significantly vary despite the IFRS enforcement. In the case of financial markets development, IFRS enforcement contributes to an increase in financial information relevance while, following the decline in the stock market activity, investors reduce the usage of accounts as information source of information (Alali and Foote, 2012).

The *value relevance* of financial information can also be influenced by the context of institutional transition towards market economy (Qu and Zhang, 2015). Unlike mature, Western economies, China faces the existence of some significant differences regarding the quality of financial reporting determined by the permanent economic shifts. When using the *fair value* concept, the IFRS enforcement is followed by an increase in the value relevance of the reported financial information based on the price model (Qu and Zhang, 2015). As for the informative content of financial statements, an increase in the value relevance of book value-related information as compared to the net income can be observed (Qu and Zhang, 2015).

In other emergent markets, such as is the case of the Kuwait Stock Exchange (KSE), the value relevance of the listed companies' reported information experienced a significant decline in time (Al-Hares *et al.*, 2012). This can be explained by the fact that, at the local stock exchange level, the available information regarding the value of dividends or incomes does not sufficiently meet investors' informative needs (Al-Hares *et al.*, 2012). In the case of the Tehran Stock Exchange, an increase in the value relevance of reported financial information can be observed in time (Shahzad *et al.*, 2013)

The country risk. Business and investment imply taking risks which must remain within reasonable limits. There are endogenous risks, which entrepreneurs can control, and exogenous risks (including country risk), which they must consciously accept,. For the last three decades, following the expansion of

globalization, the country risk has become a constant concern for international organizations and some international firms. According to Dudian (1999), the country risk measures the degree of exposure to losses which may occur during contracts with foreign partners, generated by certain events which can be partially or totally controlled by the governments of the parties involved. Meldrum (2000) adds the influences generated by the economic, legal, socio-political structures or by the geostrategic position.

There are numerous studies evaluating the impact of the country risk on great emergent countries such as, India, China, Brazil, etc. Due to the markets accelerated growth and geographical scale, such countries attract massive foreign investment (Keshava, 2008). In an empirical study carried out by Zheng (2009), it is shown that the country risk, particularly the political one, plays an important role in attracting investment. His opinion is shared by other empirical studies, such as Harms's (2002) or Krifa-Schneider's (2010). Kapoor and Vij (2007) conclude that the Indian socio-cultural, economic and political risks negatively influence investment and its efficiency, while an improvement in these areas would significantly contribute to achieving positive results in terms of foreign investment. On the other hand, Singh and Jun (2007) find that the high rates of economic growth, exchange rate and political stability have all led to an improvement in country risk and to an increase in the foreign investment in India.

2.3. Hypotheses development – value relevance of financial information for the Indian context

There is a continuously developing framework applied to Indian companies' reporting system which is aimed to improve the quality of financial information, but which still generates difficulties in interpreting the companies' annual reports (Srinivasan and Narasimhan, 2012). The Indian companies publishing both consolidated financial statements and individual statements are confronted with significant differences regarding the value relevance of financial information. Thus, as a consequence of the optional character of these reports, we note that, in the case of annual financial statements, individual financial statements are value relevant to investors, while in the case of consolidated financial statements, only interim quarterly reports are significantly value relevant (Srinivasan and Narasimhan, 2012).

The value relevance of the information reported by Indian companies can be influenced by the sector in which they activate, i.e. public or private (Sharma, 2014). The financial informations reported by public sector companies have a superior *value relevance* compared to the information reported by private sector companies (Sharma, 2014). In the case of private sector companies, such a difference can be explained by the value relevance of dividends and book value, whose decline can significantly influence investors' decisions. Unlike private sector companies, public sector companies only witness a rising trend in terms of value relevance in relation to dividends, the income and book value being characterized by a reduction of value relevance (Sharma, 2014).

In the case of the companies listed on the Bombay Stock Exchange (BSE), we have identified the existence of a good value relevance of the financial statements (Khanna, 2014). Nevertheless, the results do not reveal the value relevance of the various components of the financial statements.

Thus, in our study, we propose the following hypothesis:

H1: In the case of the Indian companies listed on the stock exchange, the reported informations related to the financial position and performance significantly and differently influence investors' decisions, with a direct impact on the stock market capitalization

Country risk implications on investors' reaction and value relevance.

In addition to financial information, investors use information related to the macroeconomic context, which clearly leaves a mark on the reference financial market.

Both micro- and macroeconomic information can lead to a better understanding of the conditions, thus possibly providing additional contributions to the investment capitalization. Depending on the market reforms initiated in India, supported also by the transition from a centralized to a market economy, Chari and Banalieva (2015) identify an increase in the companies' profitability. However, this increase was preceded by a fall in performance, as a consequence of the period of adjustment to the newly created market conditions (Chari and Banalieva, 2015).

In India's case, a high level of economic risk coupled with a low level of political risk can significantly influence the companies' solvency at the national level (Vij and Kapoor, 2007). Moreover, financial integration could be viewed as a decisive factor of economic growth (Bipasha, 2016), while economic liberalization can trigger economic growth by providing access to capital and new technologies

(i.e. elements increasing the companies' competitiveness and efficiency, Kotwal *et al.*, 2011).

Although the literature provides evidence regarding the country risk influence (and its components) on Indian economy, based on these results we cannot straightforwardly assess the impact of the country risk on the value relevance of the information reported by the Indian companies listed on the stock exchange.

Thus, we propose the following hypothesis:

H₂: *In the case of Indian companies listed on the stock exchange, the country risk (evaluated on the basis of its components) significantly influences value relevance, with a direct impact on stock market capitalization.*

Starting from the two hypotheses proposed for testing and validation, our study is aimed at estimating and evaluating the value relevance of financial statements (with the support of some financial indicators) as well as the influence of country risk (based on some of its components which have a direct effect on the companies' performance) on the value relevance of the information reported by companies listed on the stock exchange.

3. METHODOLOGY

In order to validate the two above hypotheses, we propose a statistical analysis focused on the : the identification of the target population and the selection of the sample to be analysed, selection of models of analysis for value relevance under country risk, data gathering and their analysis under SPSS 20.0 (Jaba, 2002).

3.1. Target population and sample

The study was carried out on the Indian companies listed on the financial market in the 2006-2014 period. The main capital markets in India are the National Stock Exchange of India Limited (NSE) and the Bombay Stock Exchange Limited (BSE), the first ever established on the Asian continent (National Stock Exchange, 2002). Based on the information provided by the Orbis database, we have identified 6929 Indian companies listed at the end of 2015. Only those which provided data related to stock market capitalization were selected for analysis. The total sample comprises 29,252 Indian observations, analysed during the 2006-2014 period - in 2006 – 2171 companies, in 2007 – 2644 companies, 2008 - 2956

companies, in 2009 – 3645 companies, in 2010 – 3187 companies, in 2011 – 4010 companies, in 2012 – 4134 companies, 2013 – 4273 companies, in 2014 – 2232 companies.

3.2. Models and data source

In order to analyse the financial information relevant to investors, the study departed from the price model proposed by Ohlson (1995), although it has been used in studies on Indian companies and it has enabled the analysis of the financial information relevance reported on the capital markets in India (Srinivasan and Narasimhan, 2012; Khanna, 2014).

In order to improve the quality of estimated results and eliminate the influence of scale effects (Robu *et al.*, 2016), in *equation (1)*, we use financial ratios as shown below:

$$MV/TA_t = \beta_0 + \beta_1 \cdot ROA_t + \beta_2 \cdot ROE_t + \beta_3 \cdot FL_t + \varepsilon \quad (1)$$

where:

- MV/TA : market capitalisation to total assets at the end of year t ;
- ROA_t : return on assets (net income/total assets) at the end of year t ;
- ROE_t : return on equities (net income/total equities) at the end of year t ;
- FL_t : financial leverage (total debts/total equities) at the end of year t ;
- $\beta_{i=0, \dots, 3}$: parameters of the proposed model;
- ε : error component of the proposed model.

In order to test the influence of the country risk components on the value relevance of financial information and, implicitly, on investors, we follow Erb *et al.* (1996) and make use of: business freedom ($BusF$), control of corruption ($CtrlC$), financial freedom ($FinF$), fiscal freedom ($FiscF$), investment freedom ($InvF$), monetary freedom ($MonF$), and percentage of the annual GDP growth ($GDPg$).

The evolution of the country risk components used is illustrated in Table 1. The components' low values indicate the presence of risk whereas the high values indicate the diminishing risk.

Table 1 Evolution of the country risk components in India (2006-2014)

Indicator	2006	2007	2008	2009	2010	2011	2012	2013	2014
BusF	49.60	50.80	50.90	54.40	36.30	36.90	35.50	37.70	37.70
	<i>Period 1 – Increase of BusF</i>				<i>Period 2 – Decrease of BusF</i>				
CtrlC	45.85	40.78	43.69	38.76	36.19	33.93	34.93	35.41	38.94

Indicator	2006	2007	2008	2009	2010	2011	2012	2013	2014
	<i>Period 1 – Decrease of CtrlC</i>		<i>– of Period 2 – Decrease of CtrlC</i>			<i>Period 3 – Increase of CtrlC</i>			
FinF	30.00	30.00	30.00	40.00	40.00	40.00	40.00	40.00	40.00
	<i>Period 1 – Stagnation of FinF</i>			<i>Period 2 – Increase and stagnation of FinF</i>					
FiscF	76.10	76.10	75.70	73.80	73.40	75.40	76.10	78.30	79.40
	<i>Period 1 – Decrease of FiscF</i>					<i>Period 2 – Increase of FiscF</i>			
InvF	50.00	40.00	40.00	30.00	35.00	35.00	35.00	35.00	35.00
	<i>Period 1 – Decrease of InvF</i>				<i>Period 2 – Increase and stagnation of InvF</i>				
MonF	77.60	77.20	70.30	69.30	67.50	65.10	62.90	65.30	65.50
	<i>Period 1 – Decrease of MonF</i>							<i>Period 2 – Increase of MonF</i>	
GDPg	9.26	9.80	3.89	8.48	10.26	6.64	5.08	6.90	7.42
	<i>Period 1 – Increase 1 of GDPg</i>					<i>Period 2 – Increase 2 of GDPg</i>			

Source: <http://www.heritage.org/index/country/india>

In order to test the country risk influence on the relevance of financial information, we propose the following model, based on the components enumerated above:

$$MV/TA_t = \beta_0 + \beta_1 \cdot ROA_t + \beta_2 \cdot ROE_t + \beta_3 \cdot FL_t + \beta_4 \cdot CRC_{iP} + \beta_5 \cdot CRC_{iP} \cdot ROA_t + \beta_6 \cdot CRC_{iP} \cdot ROE_t + \beta_7 \cdot CRC_{iP} \cdot FL_t + \varepsilon \quad (2)$$

where:

- CRC_{iP} - existence of a specific country risk component (with $i \in \{BusF; CtrlC; FinF; FiscF; GDPg; InvF; MonF\}$) in the analysed period (P1, P2 or P3 from Table 1).

4. RESULTS AND DISCUSSIONS

The main results are focused on the presentation of the mean values of the financial variables included in the proposed models (Table 2), of the estimated correlation coefficients as well as of the estimations of the proposed regression models parameters.

Table 2 Yearly and total means and of the analysed variables

Variable	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
MV/TA _(%)	68.49	70.96	42.42	64.44	59.19	53.54	50.28	52.83	65.14	57.39
ROA _(%)	4.06	3.99	2.25	2.86	2.83	1.83	1.50	1.25	2.09	2.36
ROE _(%)	10.10	9.74	5.98	7.07	7.26	5.02	4.50	3.96	5.23	6.21
FL	1.43	1.43	1.41	1.32	1.39	1.30	1.30	1.30	1.27	1.35

Source: Authors' processing in SPSS 20.0

The data illustrated in Table 2 shows the evolution of the indicators in the proposed models, in the period under analysis. If during the period 2006-2007, the stock exchange capitalization values were high in comparison to the total assets level (68-71 %), the 2008-2013 period is marked by a decline in stock exchange capitalization levels (with the noticeable exception in 2009), making a significant return by 2014. This can be explained by the economic context at the global level, marked by the recent crisis. With regard to the return ratios (*ROA* and *ROE*), the analysed period shows a constant decline. Based on these results, we may consider that in, the case of listed Indian companies, there is a decline in the results of the operating activities and the benefits obtained by investors.

The existence of significant relations between the analysed variables was tested by using the Pearson correlation matrix. Table 3 shows the estimated values for the variables proposed in the models under analysis.

Table 3 Pearson correlation matrix for the analysed variables

Variables	<i>MV/TA</i>	<i>ROA</i>	<i>ROE</i>	<i>FL</i>
<i>MV/TA</i>	1.00	0.30	0.23	-0.30
<i>ROA</i>	0.30	1.00	0.86	-0.12
<i>ROE</i>	0.23	0.86	1.00	0.03
<i>FL</i>	-0.30	-0.12	0.03	1.00

* all the estimates are significant for a 0.05 level

Source: Authors' processing in SPSS 20.0

The data in Table 3 shows that return ratios (*ROA* and *ROE*) have a significant and positive influence on the stock market capitalization (in relation to the value of total assets), while the financial leverage (*FL*) has a significant though negative influence. Thus, an increase in the return of listed companies leads to an increase in their market value, while an increase in the financial leverage level determines a fall in their market value.

In order to assess the relevance of financial information to investors and the influence of the country risk components on relevance, Table 4 illustrates the estimations of the regression models.

Table 4 Parameters estimates for the proposed models based on equation 2**

Variable	Basic model	Models with Country Risk Components (CRC)						
		<i>BusF</i>	<i>CtrlC</i>	<i>FinF</i>	<i>FiscF</i>	<i>InvF</i>	<i>MonF</i>	<i>GDPg</i>
Intercept	65.89*	65.29*	64.41*	66.10*	64.34*	65.29*	65.65*	64.34*
ROA	2.86*	3.03*	3.39*	2.99*	3.09*	3.03*	3.81*	3.09*
ROE	0.02	-0.16*	-0.15	-0.08	-0.11	-0.16*	-0.12	-0.11
FL	-11.41*	-11.38*	-11.17*	-11.38*	-11.27*	-11.38*	-10.81*	-11.27*
CRC _{P1}	-	1.99*	9.10*	-0.79	3.75*	1.99*	0.39	3.75*
CRC _{P2}	-	-	0.91	-	-	-	-	-
CRC _{P1} ·ROA	-	-0.49*	-0.57	-0.51*	-0.52*	-0.49*	-1.27*	-0.52*
CRC _{P1} ·ROE	-	3.97*	0.52*	0.37*	0.22*	3.97*	0.21	0.22*
CRC _{P1} ·FL	-	-0.33	-1.85*	-0.27	-0.48	-0.33*	-0.78	-0.48
CRC _{P2} ·ROA	-	-	-1.02*	-	-	-	-	-
CRC _{P2} ·ROE	-	-	0.11	-	-	-	-	-
CRC _{P2} ·FL	-	-	-0.23	-	-	-	-	-
R ²	0.163	0.164	0.170	0.163	0.164	0.164	0.165	0.164
N	29248	29248	29248	29248	29248	29248	29248	29248

* significant estimate for a risk level of 0.05

** dependent variable is *MV/TA*

*** for *CtrlC* the reference period is P3, and for all the others risk components, P2 is the reference category

Source: Authors' processing in SPSS 20.0

Table 4 illustrates the parameters estimates for the basic model, without taking into account the country risk. For the models including the influence of risk we have used P2 as reference period. For the *CtrlC* variable, the reference period is P3. The significant values within (0 and 0.05) are marked with asterisk.

Basic model: In the case of the listed Indian companies, based on the estimated values we can conclude that only the financial information on return on assets and financial leverage can significantly influence stock market capitalization. A 1 % increase in the return on assets leads to a 2.86 % increase in stock market capitalization (as compared to turnover), while an increase in financial leverage by one unit (double) leads to a fall by 11.41% in stock market capitalization. In addition, information regarding return on equities does not significantly influence stock market capitalization.

Model with *BusF*: If the *Business freedom* (P2) risk component increases, then all the information regarding the financial position and performance is value relevant to investors and has a significant influence on stock market capitalization. However, if this risk (P1) is diminished, the information regarding the financial leverage is no longer value-relevant to investors, possibly suggesting that the general business context is more important than the company's financial indicators. In other words, a potential investor will analyse an Indian company's performance only if he/she finds that, at the macroeconomic level, the business environment is secure.

Model with *CtrlC*: We notice that should the corruption index falls (P3 in Table 1), the information regarding *ROA* and *FL* is value-relevant to investors, while an increase in the same index in India determines an increase in the value relevance of information regarding *ROE* and *FL* in P1 and *ROA* in P2. Consequently, investors are interested in the way corruption-related costs can influence return. They may be tempted to believe that better corruption control has a positive influence on the business context and on the companies' financial results.

Model with *FinF*: Table 1 shows that with a higher level of *financial freedom* in the P2 period, compared to the P1 period (i.e. a lower level of risk), the P2 *ROA* and *FL* information becomes value-relevant (see Table 3), whereas with the higher financial risk in P1, the information related to *ROE* and *ROA* were value relevant, though with major variations regarding the importance of relevance. In higher financial risk situations, investors are more interested in immediate rather than long-term earnings. This aspect is indicated by the fact that, in the context of a higher risk, the *FL* value relevance diminishes. When dealing with a long-term placement, an investor is more interested in financial leverage rather than equity returns. In the case of a short-term placement, the investor will only be interested in equity and/or asset returns.

Model with *FiscF*: a decrease in the risk regarding *fiscal freedom* in P2 corresponds to a positive influence from *ROA* and a negative influence from *FL* on the stock market capitalization. Concurrently, the increase in the risk regarding fiscal freedom in the P1 period corresponds to a decline in *ROA* influence and an increase in *ROE* influence on stock market capitalization. *FL* is not value relevant in either phase since it is possible that the enterprise funding is not influenced by fiscal factors.

Model with *InvF*: this model shows that, irrespective of the country risk evolution affecting the freedom of investment, the financial information regarding position and performance continues to be value-relevant to investors, whereas an increase in this risk (*P1*) amplifies their influence on stock market capitalization.

Model with *MonF*: we observe that if the risk related to *monetary freedom* declines, *ROA* and *ROE* become value relevant on the capital market; however, it can be observed that, in period *P1*, an increase in this risk led to an insignificant decline in *FL* and *ROA* influence on stock market capitalization.

Model with *GDPg*: a relatively low *GDP* increase leads to an increase in stock market capitalization under the *ROA* influence and to a decline in capitalization under the *FL* influence. However, a very significant increase in *GDP* (in *P1*) determines a decline in stock market capitalization under *ROA* influence and an increase under *ROE* influence. The *FL* influence is insignificant in both periods, a fact which shows that the macroeconomic dynamic does not greatly influence the funding instruments.

5. CONCLUSIONS

The results support the hypotheses, therefore, the value relevance of the financial information reported by the Indian companies listed on the stock market to the capital market has been evaluated and the influence of the main country risk components on the stock market capitalization and, implicitly, on the investors' decisions, has been estimated.

In the case of Indian listed companies, the results show that, the information related to return on assets *ROA* and financial leverage *FL* is value relevant to investors. However, under the influence of various country risks components, the value relevance of this information may increase or decrease.

The main shortcoming of this study consists in the limits of our analysis, it being focused only on Indian companies, without any comparison with other emerging or Asian markets. Another limitation is given by the fact that the analysis includes a relatively small number of financial indicators which can influence stock market capitalization.

The future research is expected to carry out analyses on the main stock markets in Asian countries in order to test the influence of the country risk on the relevance of financial information at the capital market level. Another research area

is provided by the panel data analysis of the country risk influence on the relevance of the financial information reported by the companies listed on the Asian stock market in order to identify a series of differences in time as well as information value relevance.

ACKNOWLEDGEMENTS

For Ioan-Bogdan ROBU, this paper was financed by the “Alexandru Ioan Cuza” University of Iasi, within the **Annual research grants** project, no. 23/03.12.2015, Code GI 20/2015 *Grants for the young researchers of the UAIC* competition.

REFERENCES

1. Alali, F. A., Foote, P. S. (2012). The value relevance of international financial reporting standards: Empirical evidence in an emerging market. *The international journal of accounting*, 47(1), 85-108.
2. Al-Hares, O. M., AbuGhazaleh, N. M., Haddad, A. E. (2012). Value relevance of earnings, book value and dividends in an emerging capital market: Kuwait evidence. *Global Finance Journal*, 23(3), 221-234.
3. Barth, M. E., Beaver, W. H., Landsman W. R. (2001), *The relevance of the value relevance literature for financial accounting standard setting: another view*, Journal of Accounting and Economics, Vol. 31, Issue 1-3, 77-104.
4. Barth, M. E., Beaver, W. H., Landsman, W. R. (1998), *Relative valuation roles of equity book value and net income as a function of financial health*, Journal of Accounting and Economics, Vol. 25, Issue 1, 1-34.
5. Barth, M.E., Landsman, W.R., Lang, M.H. (2008), *International Accounting Standards and Accounting Quality*, Journal of Accounting Research, Vol. 46, No. 3, 467-498.
6. Barton, J., Hansen, B., Pownall, G. (2010), “Which Performance Measures Do Investors Value the Most-and Why?”, *The Accounting Review*, 85, (3), 753-789
7. Beaver, W. H. (2002), *Perspectives on Recent Capital Market Research*, The Accounting Review, Vol. 77, No. 2, 453-474.
8. Beisland, L.A. (2009), A Review of the Value Relevance Literature, The Open Brown, S., Lo, K., Lys, T. (1999), Use of R² in accounting research: measuring changes in value relevance over the last four decades, *Journal of Accounting and Economics*, Vol. 28, Issue 2, 83-115.
9. Bipasha S, (2016), "Nexus between financial inclusion and economic growth: evidence from the emerging Indian economy", *Journal of Financial Economic Policy*, Vol. 8 Iss 1 pp.
10. Boța Avram, C., Groșanu, A., Rachișan, P.R. (2015), “Does country-level governance influence auditing and financial reporting standards? Evidence from a cross-country analysis”, *Current Science*, 18(7), pp. 1222-1227
11. Chari, M. D., Banaliev, E. R. (2015). How do pro-market reforms impact firm profitability? The case of India under reform. *Journal of World Business*, 50(2), 357-367.

12. Chebaane, S., Othman, H. B. (2014). The impact of IFRS adoption on value relevance of earnings and book value of equity: the case of emerging markets in African and Asian regions. *Procedia-Social and Behavioral Sciences*, 145, 70-80.
13. Clarkson, P., Hanna, J. D., Richardson, G. D., Thompson, R. (2011), *The impact of IFRS adoption on the value relevance of book value and earnings*, Journal of Contemporary Adoption & Economics, Vol. 7, Issue 1, 1-17.
14. Collins, D. W., Li, O. Z., Xie, H. (2009), *What drives the increased informativeness of earnings announcements over time?*, Review of Accounting Studies, Vol. 14, Issue 1, 1-30.
15. Core, J. E., Guay, W. R., Van Buskirk, A. (2003), *Market valuations in the New Economy: an investigation of what has changed*, Journal of Accounting and Economics, Vol. 34, Issues 1-3, 43-67.
16. Dimitropoulos, P. E., Asteriou, D. (2009), *The value relevance of financial statements and their impact on stock prices. Evidence from Greece*, Managerial Auditing Journal, Vol. 24, No. 3, 284-265.
17. Dudian, M. (1999), *Evaluarea Riscului de Țară*, Editura All Beck
18. Easton, P. D. (1999), *Security Returns and the Value Relevance of Accounting Data*, Accounting Horizons, Vol. 13, No. 4, 399-412.
19. El-Sayed Ebaid, I. (2012), *The value relevance of accounting-based performance measures in emerging economies. The case of Egypt*, Management Research Review, Vol. 35, No. 1, 69-88.
20. Erb, C., Harvey, C., Viskanta, T. (1996), "Political risk, economic risk and financial risk", *Financial Analysis Journal*, 52:28-46
21. Francis, J., Schipper, K. (1999), *Have Financial Statements Lost Their Relevance?*, Journal of Accounting Research, Vol. 37, No. 2, 319-352.
22. Harms, P. (2002). Political risk and equity investment in developing countries. *Applied Economics Letters*, 9(6), 377-380.
23. Huang, Y., Zhang, G. (2012), *An Examination of the Incremental Usefulness of Balance-Sheet Information Beyond Earnings in Explaining Stock Returns*, Journal of Accounting, Auditing and Finance, Vol. 27, No. 2, 267-296.
24. International Accounting Standards Board - IASB (2014), *International Financial Reporting Standards*. CECCAR, Seventh Edition Revised
25. Jaba, E. (2002), *Statistica*, ed. a 3-a, Ed. Economică, București
26. Kaaya, I. D. (2015), *The International Financial Reporting Standards (IFRS) and Value Relevance: A Review of Empirical Evidence*, Journal of Finance and Accounting, Vol. 3, No. 3, 37-46.
27. Keshava, D. (2015), *The effect of FDI on India and Chinese Economy; A comparative analysis*, disponibil la http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1089964 , accesat la 12.11.2015.
28. Khanna, M. (2014). Value Relevance of Accounting Information: An Empirical Study of Selected Indian Firms. *International Journal of Scientific and Research Publications*, Vol. 4, No 10, pp. 1-6
29. Kotwal, A., Ramaswami, B., Wadhwa, W. (2011). Economic liberalization and Indian economic growth: What's the evidence?. *Journal of Economic Literature*, Vol. 49, No. 4, pp. 1152-1199.

30. Krifa-Schneider, H., Matei, I. (2010). Business climate, political risk and FDI in developing countries: Evidence from panel data. *International Journal of Economics and Finance*, 2(5)
31. Landsman, W. R., Maydew, E. L. (2002), *Has the Information Content of Quarterly Earnings Announcements Declined in the Past Three Decades?*, *Journal of Accounting Research*, Vol. 40, Issue 3, 797-808.
32. Meldrum, D. (2000). Country risk and foreign direct investment. *Business economics*, 35(1), 33-40.
33. National Stock Exchange (2002), *Indian Securities Market: A Review*, Vol. IV, National Stock Exchange of India Ltd.
34. Negakis, C. J. (2005), *Accounting and Capital Markets Research: A Review*, *Managerial Finance*, Vol. 31, No. 2, 1-23.
35. Ohlson J. A. (1995), *Earnings, Book Values, and Dividends in Equity Valuation*, *Contemporary Accounting Research*, Vol. 11, No. 2, 661-687.
36. Ohlson, J. A., Penman, S. H. (1992), *Disaggregated accounting data as explanatory variables for returns*, *Journal of Accounting, Auditing and Finance*, Vol. 7, Issue 4, 553-573.
37. Qu, X., Zhang, G. (2015). Value-relevance of Earnings and Book Value Over the Institutional Transition in China: The Suitability of Fair Value Accounting in This Emerging Market. *The International Journal of Accounting*, 50(2), 195-223.
38. Robu, I.B., Grosu, M., Istrate, C. (2016), "The Effect of the Auditors' Rotation on the Accounting Quality in the Case of Romanian Listed Companies under the Transition to IFRS", *Audit financiar*, 14(1), pp. 3-14, 65-77
39. Saha, S. (2012), "Productivity and Openness in Indian Economy", *Journal of Applied Economics and Business Research*, 2(2), 91-102.
40. Shahzad, F., Zaheer, B., & Anees, M. (2013). Value relevance of accounting information: A case of Karachi stock exchange listed companies in Pakistan. *African Journal of Business Management*, 7(17), 1594-1598.
41. Sharma, M. (2014). Value relevance of accounting information: A comparative study of public and private sector companies in India. *Asia Pacific Journal of Research*, Vol II Is. XII., 114-121
42. Singh, H., Jun, K. W. (1995). Some new evidence on determinants of foreign direct investment in developing countries. *World Bank policy research working paper*, (1531).
43. Srinivasan, P., Narasimhan, M. S. (2012). The value relevance of consolidated financial statements in an emerging market: The case of India. *Asian Review of Accounting*, 20(1), 58-73.
44. Vij, M., Kapoor, M. C. (2007). Country risk analysis: A case study of India. *Journal of Management Research*, 7(2), 87.
45. Zheng, P. (2009). A comparison of FDI determinants in China and India. *Thunderbird International Business Review*, 51(3), 263-279.



INDIVIDUAL PENSION FUNDS AND CAPITAL MARKET DEVELOPMENT IN TURKEY

YILMAZ BAYAR*

Abstract: *Beginning with the 1980s, when the sustainability of the public pension systems became endangered, many countries have developed their individual pension plans and/or occupational pension plans in order to supersede or support their public pension systems. This study examines the impact of individual pension funds on the development of both debt securities market and stock market in Turkey during the period October 2006-May 2015, using Hatemi (2008) cointegration test and Toda and Yamamoto (1995) causality test with monthly data. We found that, in the long run, the private pension funds had positive impact on both development of debt securities market and stock market. Furthermore, causality appears to exist between the market for private pension funds, the debt securities market and the stock market.*

Keywords: *individual pension funds, stock market, debt securities market, time series analysis*

JEL Classification: *C22, G10, G23*

1. INTRODUCTION

The population aging, the fall in fertility rates and government revenues, due to the frequent and severe global financial crises, affected the financial sustainability of the pension systems, predominantly based on the defined benefit schemes, and forced the countries to reform their pension systems. In this context, many countries have increased the retirement age, made changes in the number of years used in benefit calculation, the valorization of past earnings and indexation of pensions in payment, linked pensions to higher life expectancy and changed the structure by transitioning from defined benefit pension plans to the defined contribution pension plans, supported by private pension plans present during the

* Yilmaz Bayar, Faculty of Economics and Administrative Sciences, Department of Economics, Uşak University, yilmaz.bayar@usak.edu.tr

1980s period (i.e. individual pension plans and occupational pension plans ; Whiteford and Whitehouse, (2006)).

Turkey belatedly began to make reforms in the pension system contrary to the pension reforms in the world. The sytem was dominated by the public pension system based on a pay-as-you-go schemes and, until the 2000s, the share of occupational pensions was very small. At the beginning of the century, the retirement age was gradually increased and a private pension system was established.

In this context, the legal framework of individual pension system, which is the third pillar of the Turkish Pension System, was established in October 2001 and it became operational as of October 2003. The main objectives is to reduce the share of public pension system, increase the welfare of the retired and contribute to both the economic development and capital market development (Pension Monitoring Center, (2015a)). As a consequence, according to the Pension Sustainability Index (PSI), during 2011-2014, Turkey shifted upwards by than five places (Allianz, 2014).

Since its implementation, the Turkish Individual Pension System has made significant progress and more than 5 million persons participated, with 19 companies operating in the pension business sector, the value of individual pension funds, as of 31st December 2014, surpassing 34 billion Turkish lira; TL (Pension Monitoring Center (2015b)). During the 2009-2014 period, the Turkish pension funds have generally been invested in the debt securities, and only 10-14 % of the funds being invested in the stocks (Table 1).

Table 1 Consolidated asset allocation of the pension mutual funds in Turkey (2009-2014)

Year	Government bonds (in TL) ratio (%)	Reverse repo ratio (%)	Stock ratio (%)
2009	69-75	12-17	7-11
2010	58-72	9-18	8-14
2011	57-72	6-18	8-17
2012	58-62	7-13	11-16
2013	57-60	5-9	14-18
2014	50-57	6-10	13-16

Note: The ratios show the yearly asset level

Source: Pension Monitoring Center, 2015c

Worldwide, the share of pension funds in the pension system has increased and, in 2013, the value reached USD 24.7 trillion, which represented 26.67 % of the USD 92.6 trillion provided by institutional investors (OECD, 2014). Thus, pension funds became an important institutional investor in the world.

The expansions in private pensions have led researchers to investigate the impact of private pensions on capital market development as of 2000s, but the studies have generally focused on the interaction between private pensions and stock market development. Therefore, the present study contributes by considering both stock market and debt securities market, it being among the first to investigate the relationship between private pensions and capital market in the case of Turkey.

Therefore, the impact of the growing pension funds on stock market and debt securities market in Turkey during the period October 2006-May 2015 is investigated using cointegration and causality analyses. The remainder of the study is organized as follows: Section 2 provides the literature review ; Section 3 presents the data and econometric methodology; Section 4 presents the findings of econometric application and Section 5 concludes.

2. LITERATURE REVIEW

As of 1980s, when the sustainability of the public pension systems was considerably endangered, many countries began supporting or superseding the public pension systems by funded pension schemes (i.e. private pension plans and occupational pension plans) . Increases in private pensions have encouraged the researchers to determine the economic impacts of growing private pensions. In this regard, studies have generally focused on the impact of the growing private pension funds on the economic growth and the development of capital markets (Zandberg and Spierdijk (2013), Bijlsma et al. (2014), Enache et al. (2015)).

Pension funds as institutional investors are long-term sophisticated investors, with better knowledge, compared to the individual investors. In this regard, it is expected that the pension funds contribute to the development of capital markets by capital accumulation, fund raising, increasing liquidity, reducing the volatility and increasing financial innovation in the capital markets (Enache et al., 2015).

On the other hand, extensive studies have been conducted to reveal the impact of private pension on capital markets. The empirical findings have generally benefited from panel regression and causality analysis to investigate the

relationship between expanding private pensions and capital market development, employing total financial assets of pension funds for pension funds and stock market capitalization for stock market development and total value of debt securities outstanding for debt market development. Results showed that private pension funds, as institutional investor, had positive impact on the development of capital markets or Granger cause of the development of capital market (Davis (1998), Catalán et al. (2000), Walker and Lefort (2002), Aras and Müslümov (2005), Niggemann and Rocholl (2010), Hu (2012), Thomas et al. (2014), Enache et al. (2015)), while relatively few studies have found that private pension funds had no significant impact on the capital markets (Raddatz and Schmuckler (2008)).

In one of the early works, Davis (1998) investigated the impact of pension funds on financial markets development in G7 countries (i.e. Canada, France, Germany, Italy, Japan, UK and U.S.) using panel regression and found that increases in the share of institutional investors, including pension funds proxied by the share of institutional investors in total financial assets, had positive impact on the size of financial sector proxied by total financial assets/GDP and the share of equity in total financial assets.

On the other hand, Catalan et al. (2000) examined the causality between contractual savings and stock market development proxied by stock market capitalization in 14 OECD countries and 5 developing countries (Chile, Malaysia, Singapore, South Africa, and Thailand), employing Granger causality test, and a unidirectional causality from contractual savings to the stock market capitalization was revealed in the UK, Belgium, Spain, Netherlands, Canada, Finland and Germany.

Impavido and Musalem (2000) also investigated the relationship between contractual savings and stock market development in 21 OECD countries and 5 developing countries during the 1982-1996 period, using panel regression, and it was found that contractual savings, including pension funds, had positive impact on stock market development.

Walker and Lefort (2002) examined the interaction between pension funds and development of capital markets in Argentina, Chile and Peru using time series analysis and found that pension funds had positive impact on stock market development only in Peru. Furthermore, they investigated the same relationship in 33 emerging market economies using panel regression and found that pension funds decreased the market volatility.

On the other hand, Impavido et al. (2003) conducted an empirical analysis on the impact of pension funds on capital market development proxied by stock market capitalization and total value of bonds outstanding in selected 33 countries including OECD and emerging economies such as Argentina, Chile, Hungary, Malaysia, Poland, South Africa and Turkey by using dynamic panel regression and found that pension funds had positive impact on the development of both stock market and debt market. Aras and Müslümov (2005) also conducted the Sims (1982) causality analysis between institutional investors including pension funds proxied by total financial assets of pension funds as % of GDP and stock market development proxied by stock market capitalization in 23 OECD countries during 1982-2000 period and found that pension funds had positive impact on stock market development.

Raddatz and Schmuckler (2008), using descriptive statistics, regression and Lakonishok et al. (1992) herding statistic, examined the relationship between pension funds and capital market development in Chile during the 1995-2005 period and revealed that there was no significant relationship between pension funds and the development of capital markets.

On the other hand, using dynamic panel regression, Hryckiewicz (2009) analyzed the relationship among pension funds proxied by financial assets of the funds and stock market development proxied by stock market capitalization and debt market development proxied by total value of bonds outstanding in 8 Central and Eastern European countries during the 1995-2006 period and found that pension funds had positive impact on the development of stock market and debt market.

Meng and Pfau (2010) investigated the impact of pension funds proxied by financial assets of the funds on both stock market development proxied by stock market capitalization and debt market development proxied by private bond market capitalization in 32 developed and emerging market countries during the 2003-2007 period using dynamic panel regression and found that pension funds had positive impact on the development of stock market and debt securities market.

Niggemann and Rocholl (2010), employing panel regression, investigated the impact of pension reforms on development of capital markets in 57 countries during the 1976-2007 period and have reached similar results with Meng and Pfau (2010).

Using Johansen cointegration and Granger causality tests, Liang and Bing (2010) investigated the interaction between pension funds and financial

development in the UK during the 1970-2008 period and revealed that pension funds had positive impact on the development of financial markets.

Kim (2010) examined the impact of pension funds proxied by value of financial assets on capital market development proxied by stock market capitalization and domestic credit in 21 OECD countries during the 1991-2003 period using dynamic panel regression and found that pension funds had positive impact on stock market development.

Hu (2012) examined the impact of pension funds proxied by financial assets of the funds on development of stock market proxied by stock market capitalization and bond market proxied by bond market capitalization in 10 Asian and Pacific economies during the 2001-2010 period using panel regression and found that pension funds had positive impact on development of both stock market and bond market.

Raisa (2012) conducted an empirical study on the relationship between pension funds and stock market development proxied by stock market capitalization in EU-15 countries during 1994-2011 period using panel regression and revealed a positive relationship between pension funds and stock market development.

Sun and Hu (2014) investigated the relationship between pension funds and capital market development in 55 countries during 2001-2008 period using panel regression and reached similar findings with Hu (2012) and Raisa (2012).

Thomas et al. (2014), employing panel regression, examined the relationship between investments of pension funds in terms of stocks and stock market volatility in 34 OECD countries during the 2000-2010 period and revealed a negative relationship between financial assets of the funds in terms of stock and stock market volatility.

Furthermore, Enache et al. (2015) investigated the impact of pension funds proxied by financial assets of the funds on stock market development proxied by stock market capitalization in 10 Central and Eastern European countries during 2001-2010 period using panel regression and found that pension funds had positive impact on stock market development.

3. DATA AND METHODOLOGY

Using Hatemi (2008) cointegration test and Toda and Yamamoto (1995) causality test, the impact of individual pension funds on the development of stock

market and debt securities market in Turkey during the period October 2006-May 2015 was investigated.

3.1. Data

The monthly data (for the period October 2006-May 2015) of the total amount of individual pension funds was retrieved from the Pension Monitoring Center (2015b), while the monthly data of stock market capitalization and traded value of debt securities market was collected using the Istanbul Stock Exchange (i.e. Borsa Istanbul; (2015 a and b)). The data availability determined the period considered. The variables used as well as their symbols are presented in Table 2. The logarithmic forms of all the variables were used, together with the RATS 8.0, Gauss 10.0 and Eviews 9.0 software packages.

Table 2 Description of the used variables

BIST	Value of Borsa Istanbul National Stock Market Capitalization
DSM	Debt Securities Market Traded Value (outright purchases and sales market)
IPF	Private Pension Funds of All the Participants

Note: All values later on used are expressed in Turkish lira

3.2. Methodology

The first step was to test the stationarity of the time series using Lumsdaine and Pappell (1997) unit root test, followed by the analysis of the long-run relationship between the variables using Hatemi's (2008) cointegration test, estimating the cointegrating coefficients by Fully Modified Ordinary Least Squares (FMOLS). Finally, the causality between the variables was examined using Toda and Yamamoto's (1995) causality test.

3.2.1. Lumsdaine and Pappell's (1997) Unit Root Test

The traditional unit root tests (i.e. Augmented Dickey-Fuller (ADF) (1981) and Phillips-Perron (1988) unit root tests) disregard the structural breaks while testing the stationarity of the time series, thus yielding faulty results. Therefore, improving the Zivot and Andrews' (1992) unit root test, Lumsdaine and Papell (1997) developed a unit root test which enables two structural breaks in the series .

In the context of the Lumsdaine and Papell (1997) unit root test, there are two models, namely Model AA and Model CC, The first allows two structural

breaks only in the intercept, while the latter allows two structural breaks in both intercept and trend. expressed as follows:

$$\Delta y_t = \mu + \beta t + \theta DU1_t + \gamma DT1_t + \omega DU2_t + \psi DT2_t + \alpha y_{t-1} + \sum_{i=1}^k c_i \Delta y_{t-i} + \varepsilon_t \quad (1)$$

where:

- if $t > TB1$, $DU1_t = 1$, otherwise 0, and if $t > TB2$, $DU2_t = 1$, otherwise 0.
- If $t > TB1$, $DT1_t = t - TB1$ and otherwise 0, while if $t > TB2$, $DT2_t = t - TB2$ and otherwise 0.
- The dummy variables ($DU1_t$ and $DU2_t$) represent the structural breaks in the intercept at $TB1$ and $TB2$, while the remaining dummy variables ($DT1_t$ and $DT2_t$) represent the structural breaks in the trend at $TB1$ and $TB2$.

3.2.2. Hatemi (2008) Cointegration Test

In order to allow two structural breaks both in constant and trend, Hatemi (2008) developed Gregory and Hansen's (1996) cointegration test and the model can be expressed as follows:

$$y_t = \alpha_0 + \sum_{i=1}^2 (\alpha_i D_{it} + \beta'_i D_{it} x_t) + \beta'_0 x_t + u_t \quad (2)$$

where:

- α_0 - the constant term before the structural breaks;
- α_1 and α_2 - the change in the constant term due to the first and second structural breaks.
- β_0 - the trend term before the structural breaks;
- β_1 and β_2 - the change in the trend term due to the first and second structural breaks.
- The dummy variables (D_{1t} and D_{2t}) reflect the effects of structural breaks. $D_{1t} = 1$ if $t > n\tau_1$, otherwise 0. $D_{2t} = 1$ if $t > n\tau_2$, otherwise 0.
- τ_1 and τ_2 - unknown parameters showing the timing of regime change point (Yılancı and Öztürk (2011))

The test of null hypothesis (i.e. there is no cointegration among the variables) is conducted using ADF^* , Z_α and Z_t test statistics. ADF^* is calculated by applying ADF unit root test statistics to the residuals obtained from the (2) numbered equation. Z_α is calculated by using $Z_\alpha = m(\hat{\rho}^* - 1)$, where $\hat{\rho}^*$ is the

estimator of first-order autocorrelation coefficient which its bias is adjusted. Z_t is calculated by using $Z_t = \frac{(\hat{\rho}^* - 1)}{[\hat{\gamma}(0) + 2 \sum_{j=1}^B w(j/B) \hat{\gamma}(j)] / \sum_1^{n-1} \hat{u}_t^2}$ (Hatemi (2008)).

3.2.3. FMOLS

The FMOLS test was developed by Phillips and Hansen (1990) and it can explained by the following linear regression:

$$LDSM = \alpha + \beta_1 LIPF_t + \varepsilon_t \quad (3)$$

where:

- $LDSM$ - the dependent variable;
- $LIPF_t$ - the independent variable. Both variables are I(2).

$$\Delta LIPF_t = \mu + w_t,$$

where:

- μ - the $(k \times 1)$ average parameter vector of the independent variable;
- w_t - the $(k \times 1)$ vector of the stationary vectors. It is assumed that $\xi_t = (\varepsilon_t, w_t)$ is strongly stationary and has a covariance matrix with limited positiveness (Chi and Baek, (2011)).

3.2.4. Toda and Yamamoto (1995) Causality Test

Toda and Yamamoto (1995) improved the Granger (1969) causality test and this developed test can analyze the causality among the variables without pretesting cointegration. The optimal lag length p is determined by establishing the VAR model, followed by the addition of the highest integration degree (d_{max}) among the variables to the p . The Ordinary Least Squares model is estimated with the variables at the level for the $p + d_{max}$ lag. Finally, the constraints are imposed on the variables respectively and the significance of these constraints are tested using standard Wald test for p lag (Büyükkakın et al., (2009)).

4. EMPIRICAL ANALYSIS

4.1. Lumsdaine and Papell's (1997) Unit Root Test

Using the Lumsdaine and Papell's (1997) unit root test by the stationarity of the variables was tested by selecting the model CC, which enables the structural break both in constant and trend (. The results (Table 3) indicate that all the variables became stationary after first differencing.

Table 3 Results of the Lumsdaine and Papell's (1997) Unit Root Test

Variables	TB1	TB2	Test Statistic
LDSM	January 2010	August 2013	-6.5766*
D(LDSM)	January 2010	April 2011	-6.8179**
LIPF	February 2010	October 2012	-5.4247
D(LIPF)	February 2010	February 2014	-10.2647***
LBIST	December 2007	March 2009	-5.2229
D(LBIST)	February 2009	December 2011	-11.6301***

Note: Critical values at 1 %, 5 % and 10 %, respectively, are -7.19, -6.75 and -6.48 (Ben-David et al., (2003))

TB1 and TB2 represent the first and second structural breaks in the series

*, **, *** show the statistical significance at the 10 %, 5 % and 1 % level

4.2. Hatemi's (2008) Cointegration Test

This approach was used in order to determine whether there was long run relationship among the variables. In this regard, we established two models. LDSM (debt securities market) is the dependent variable in Model 1, while LBIST (stock market) is the dependent variable in Model 2. The model which allows breaks both in the constant and the trend was selected. The results (Table 4) indicate that there was long run relationship both between LDSM and LIPF and between LBIST and LIPF.

Table 4 Results of Hatemi's (2008) Cointegration Test

Dependent Variable		TB1	TB2	Test Statistic
LDSM	ADF*	December 2009	March 2012	-10.695030***
	Z_t	December 2009	April 2011	-11.233***
	Z_a	December 2009	April 2011	-114.482***
LBIST	ADF*	October 2008	April 2009	-5.9044977*
	Z_t	January 2008	April 2011	-5.449
	Z_a	January 2008	April 2011	-46.524

Note: *, **, *** denote that the statistical significance at the 10 %, 5 % and 1 % level.

TB1 and TB2 represents the first and second structural breaks.

4.3. Fully Modified Least Squares (FMOLS)

We estimated the long run cointegrating coefficients by FMOLS method developed by Phillips and Hansen (1990) because we found that there was cointegration relationship in the two models of Hatemis (2008) cointegration test. The results (Table 5-6) indicate that private pension funds had a positive impact on

the development of stock market and the debt securities market. In addition, when compared to the stock market, the impact of private pension funds on the debt securities market was relatively higher.

Table 5 FMOLS Results for Model 1

Dependent variable		LDSM		
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LIPF	0.487803	0.151873	3.211918	0.0018
C	28.77898	3.521471	8.172432	0.0000

Table 6 FMOLS Results for Model 2

Dependent variable: LBIST				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LIPF	0.383609	0.048175	7.962885	0.0000
C	17.76160	1.117025	15.90081	0.0000

The findings are consistent with the theoretical expectations and findings of previous studies investigating the same relationship for different country groups (Impavido and Musalem (2000), Impavido et al. (2003), Hryckiewicz (2009), Meng and Pfau (2010), Niggemann and Rocholl (2010), Kim (2010), Hu (2012), Sun and Hu (2014), Enache et al. (2015)). However, the impact of private pension funds on the development of debt securities market was relatively higher when compared to the stock market, because the share of debt securities in pension funds has been much more than the share of stocks in pension funds.

4.4. Toda and Yamamoto's (1995) Causality Test

We analyzed the causality among the individual pension funds, stock markets and debt securities market using Toda and Yamamoto's (1995) causality test. The results (Table 7) indicate that both IPF and BIST are Granger cause of DSM, while IPF is Granger cause of BIST.

Table 7 Results of Toda and Yamamoto's (1995) causality test

Null hypothesis	Chi-sq	Prob.
IPF does not Granger cause of DSM	4.724272	0.0297
BIST does not Granger cause of DSM	3.264052	0.0708
DSM does not Granger cause of IPF	0.709511	0.3996
BIST does not Granger cause of IPF	0.855907	0.3549
DSM does not Granger cause of BIST	0.010108	0.9199
IPF does not Granger cause of BIST	3.309739	0.0689

5. CONCLUSION

Recently, in Turkey, the market of individual pension funds has grown stably with the contribution of the government promotions. The present study examined the impact of individual pension funds on the development of both debt securities market and stock market in Turkey during the period October 2006-May 2015 using Hatemi's (2008) cointegration test and Toda and Yamamoto's (1995) causality test.

It was found that there was a long-run relationship between the variables and the individual pension funds had positive impact on the development of both stock market and debt securities market in the long run, but the impact of individual pension funds on the debt securities market was found to be relatively higher, because the individual pension funds mainly invest their funds in debt securities.

The above findings are consistent with the theoretical considerations and the general trend (Impavido and Musalem (2000), Impavido et al. (2003), Aras and Müslümov (2005), Hu (2012) and Enache et al. (2015)). On the other hand, the causality test indicated there was unidirectional causality from both stock market development and individual pension funds to the debt securities market, while there was unidirectional causality from individual pension funds to the stock market development. Thus, individual pension funds have contributed to the development of Turkish capital markets.

Following the 2001 Turkish economic crisis, many structural reforms especially in the banking sector and capital markets were implemented. The Turkish economy has experienced considerable rates of economic growth and foreign capital inflows after the structural changes in regulatory, legal and institutional framework. These economic and institutional improvements also restored the lost confidence of the Turkish public in capital markets. The governmental subsidies for the individual pension system, together with the increasing income and confidence in financial markets became useful for the development of individual pension system. The development of individual pension system contributed to the sustainability of the public pension system and capital market development in the light of our findings. On the other hand, the empirical studies showed that capital market development had positive impact on the economic growth (Barna and Mura (2010)). In this regard, it will also contribute to

the economic growth by providing long run capital through capital market development.

Consequently, private pensions may contribute to the sustainability of pension system, the development of capital markets and, in turn, the economic growth. Therefore, considering the population ageing phenomenon, the decline in government revenue and the spillover economic effects of private pension funds, countries should implement policies which would increase the share of private pensions.

REFERENCES

1. Allianz (2014), *2014 Pension Sustainability Index*, https://www.allianz.com/v_1396002521000/media/press/document/2014_PSI_ES_final.pdf [Accessed 03.05.2015]
2. Aras, G., Müslümov, A. (2005), "Institutional Investors and Stock Market Development: A Causality Study", *ISE Review*, Vol.29, pp.1-14.
3. Barna, F., Mura, P.O. (2010), "Capital Market Development and Economic Growth: The Case Of Romania", *Annals of the University of Petrosani-Economics*, Vol.10, No.2, pp.31-42.
4. Ben-David, D., Lumsdaine, R.L., Papell, D.H. (2003), "Unit Roots, Postwar Slowdowns and Long-Run Growth: Evidence from Two Structural Breaks", *Empirical Economics*, Vol.28, No.2, pp.303-319.
5. Bijlsma, M., van Ewijk, C., Haaijen, F. (2014), *Economic Growth and Funded Pension*
6. *Systems*, CPB Discussion Paper 279, <http://www.cpb.nl/sites/default/files/publicaties/download/cpb-presentation-funded-pensions-and-economic-growth-frankfurt-17-june-2013.pdf> [Accessed 08.05.2015]
7. Borsa Istanbul (2015a), *Stock Market Data-Market Capitalization*, <http://www.borsaistanbul.com/en/data/data/consolidated-data> [Accessed 05.05.2015]
8. Borsa Istanbul (2015b), *Debt Securities Market Data- Traded Value and Number of Contracts*, <http://www.borsaistanbul.com/en/data/data/consolidated-data> [Accessed 05.05.2015]
9. Büyükakın, F., Bozkurt, H., Cengiz, V. (2009), "Türkiye'de Parasal Aktarımın Faiz Kanalıyla Granger Nedensellik ve Toda-Yamamoto Yöntemleri ile Analizi" *Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, Vol.33, pp.101-118.
10. Catalán, M., Impavido, G., Musalem, A. (2000), "Contractual Savings or Stock Market Development: Which Leads?" *Journal of Applied Social Science Studies*, Vol.120, pp.445-487.
11. Chi, J., Baek, J. (2011), "Demand Analysis for Coal on the United States Inland Waterway System: Fully- Modified Cointegration (FMOLS) Approach" *Journal of the Transportation Research Forum*, Vol.50, No.1, pp.89-99.
12. Davis, E.P. (1998), *Linkages between Pension Reform and Financial Sector Development*, <http://www.ephilipdavis.com/67-FINDEV2.pdf> Accessed 07.05.2015]
13. Dickey, D.A., Fuller, W.A. (1981) "Distribution of the Estimators for Autoregressive Time Series with a Unit Root", *Econometrica*, Vol.49, pp.1057-72.

14. Enache, C., Miloş, L.R., Miloş, M.C. (2015), "Pension Reform and Capital Market Development in Central and Eastern European Countries", *Economic Research-Ekonomska Istraživanja*, Vol.28, No.1, pp.75-84, DOI: 10.1080/1331677X.2015.1022388
15. Granger, C.W.J. (1969), "Investigating Causal Relations by Econometric Models and Cross Spectral Models", *Econometrica*, Vol.37, pp.424-438.
16. Gregory, A. W., Hansen, B. E. (1996), "Residual-Based Tests for Cointegration in Models with Regime Shifts", *Journal of Econometrics*, Vol.70, No.1, pp.99-126.
17. Hatemi-J, A. (2008), "Tests for Cointegration with Two Unknown Regime Shifts with an Application to Financial Market Integration", *Empirical Economics*, Vol.35, No.3, pp.497-505.
18. Hu, Y. (2012) "Growth of Asian Pension Assets: Implications for Financial and Capital Markets" Asian Development Bank Institute Working Paper Series, No. 360, Tokyo: Asian Development Bank Institute.
19. Hryckiewicz, A. (2009), *Pension Reform, Institutional Investors' Growth and Stock Market Development in the Developing Countries: Does it Function?* Warsaw: National Bank of Poland, <http://ideas.repec.org/p/nbp/nbpemis/67.html> [Accessed 07.05.2015]
20. Impavido, G., Musalem, A. R. (2000), *Contractual Savings, Stock and Asset Markets*,
21. <http://info.worldbank.org/etools/docs/library/157954/contractual/pdf/wps2490.pdf> [Accessed 04.05.2015]
22. Impavido, G., Musalem, A. R., Tressel, T. (2003), "The Impact of Contractual Savings Institutions on Securities Markets" <http://elibrary.worldbank.org/content/workingpaper/10.1596/1813-9450-2948> [Accessed 04.05.2015]
23. Kim, H. S. (2010), *Spillover Effects of Pension Funds on Capital Markets – The Mechanisms and Preconditions*, http://growth-institutions.ec.unipi.it/pages/Pension_system/spillover.pdf [Accessed 08.05.2015]
24. Lakonishok, J., Shleifer, A., Vishny, R. W. (1992), "The Impact of Institutional Trading on Stock Prices", *Journal of Financial Economics*, Vol.32, pp.23-43.
25. Liang, R., Bing, L. (2010), "Management of UK Pension Funds and Financial Market Development: 1970-2008" 3rd International Conference on Information Management, Innovation Management and Industrial Engineering, pp.594-598.
26. Lumsdaine, R.L., Papell, D.H. (1997), "Multiple Trend Breaks and the Unit-Root Hypothesis", *The Review of Economics and Statistics*, Vol.79, No.2, pp.212-218.
27. Meng, C., Pfau, W. D. (2010), *The Role of Pension Funds in Capital Market Development*, <http://r-center.grips.ac.jp/gallery/docs/10-17.pdf> [Accessed 08.05.2015] (08.05.2015)
28. Niggemann, T., Rocholl, J. (2010), *Pension Funding and Capital Market Development*, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1571126 [Accessed 07.05.2015]
29. OECD (2014), *Pension Markets in Focus-2014*, <http://www.oecd.org/daf/fin/private-pensions/Pension-Markets-in-Focus-2014.pdf> [Accessed 03.05.2015]
30. Pension Monitoring Center (2015a), *Bireysel Emeklilik Sisteminin Tarihiçesi*, <http://www.egm.org.tr/?sid=70> [Accessed 04.05.2015]
31. Pension Monitoring Center (2015b), *BES Temel Göstergeleri*, <http://www.egm.org.tr/weblink/BESgostergeler.htm> [Accessed 05.05.2015]

32. Pension Monitoring Center (2015c), Bireysel Emeklilik Sistemi Gelişim Raporları 2004-2015, <http://www.egm.org.tr/?pid=360> [Accessed 06.05.2015]
33. Phillips, P.C.B., Hansen, B.E. (1990), "Statistical Inference in Instrumental Variables Regression with I(1) Processes", *Review of Economic Studies*, Vol.57, pp.99-125.
34. Phillips, P. C. B., Peron, P. (1988), "Testing for a Unit Root in Time Series Regression", *Biomètrika*, Vol.75(2), pp.336-346.
35. Raddatz, C., Schmuckler, S. L. (2008), Pension Funds and Capital Market Development. How much Bang for the buck?, <https://openknowledge.worldbank.org/handle/10986/6308> [Accessed 06.05.2015]
36. Raisa, M.L. (2012). "Spillover Effects of Pension Funds on Capital Markets: The EU-15 Countries Case", *Annals of the "Constantin Brâncuși" University of Târgu Jiu, Economy Series*, 4/2012, pp.164-170.
37. Sun, S., Hu, J. (2014), *The Impact of Pension Systems on Financial Development: An Empirical Study*, <http://ssrn.com/abstract=2481749> [Accessed 08.05.2015]
38. Thomas, A., Spataro, L., Mathew, N. (2014), "Pension Funds and Stock Market Volatility: An Empirical Analysis of OECD Countries", *Journal of Financial Stability*, Vol.11, pp. 92-103, <http://dx.doi.org/10.1016/j.jfs.2014.01.001>
39. Toda, H.Y., Yamamoto, T. (1995), "Statistical Inference in Vector Autoregressions with Possibly Integrated Processes" *Journal of Econometrics*, Vol.66, pp.225-250.
40. Walker, E., Lefort, F. (2002) Pension Reform and Capital Markets: Are There any (hard) Links?, <http://siteresources.worldbank.org/SOCIALPROTECTION/Resources/SP-Discussion-papers/Pensions-DP/0201.pdf> [Accessed 06.05.2015]
41. Whiteford, P., Whitehouse, E. (2006), "Pension Challenges and Pension Reforms in Oecd Countries" *Oxford Review of Economic Policy*, Vol.22, No.1, pp.78-94.
42. Yılandı, V., Öztürk, Z.A. (2011) "Türkiye ile En Büyük Beş Ticaret Ortağının Hisse Senedi Piyasaları Arasındaki Entegrasyon İlişkisinin Analizi: Yapısal Kırılmalı Birim Kök ve Eşbütünleşme Analizi", *Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, Vol.36, pp.261-279.
43. Zandberg, E., Spierdijk, L. (2013), "Funding of Pensions and Economic Growth: Are They Really Related?", *Journal of Pension Economics and Finance*, Vol.12, No.2, pp.151-167, <http://dx.doi.org/10.1017/S1474747212000224>
44. Zivot, E., Andrews, D. (1992), "Further Evidence on the Great Crash, The Oil Price Shock, and The Unit Root Hypothesis", *Journal of Business & Economic Statistics*, Vol.10, No., pp.251-270.



MACROECONOMIC DETERMINANTS OF SHADOW BANKING – EVIDENCE FROM EU COUNTRIES

TEODORA CRISTINA BARBU*, IUSTINA ALINA BOITAN**, SORIN IULIAN CIOACA***

Abstract: *Shadow banking is a topical, debated issue on the agenda of national and European macro-prudential regulatory and supervisory authorities. It is generally accepted that shadow banks and the traditional banking system have some core functions in common, such as credit and maturity transformation, and the exposure to similar risks. However, the tight banking regulations and the decreasing trend recorded by interest rates in the post-crisis period create prospects for shadow banking sector growth. Against this background, the present paper aims at investigating the particular impact that shadow banking activity exerts on macroeconomic fundamentals. The analysis covers 15 European Union countries, including Romania, during the period 2008 – 2015, using quarterly data. Shadow banking system is used as a proxy by monetary funds, due to breaks in the series or unbalanced number of observations across selected countries. By employing panel regression, it was found that the shadow banking total assets' variation is negatively influenced by the GDP growth, short term interest rates, M2/GDP ratio and the ratio of investment funds' assets in GDP, and positively determined by stock index dynamics and long term interest rates. The findings sustain the literature's point of view.*

Keywords: *shadow banking, monetary funds, macroeconomic determinants, panel data*

JEL Classification: *G21*

1. INTRODUCTION

Shadow banking is a topic of interest on monetary policymakers and practitioners' agenda. European Central Bank (2013) recognizes the importance

* Teodora Cristina Barbu, Bucharest University of Economic Studies, Faculty of Finance and Banking, Bucharest, ROMANIA. E-mail: teodorabarbu65@yahoo.com

** Iustina Alina Boitan, Bucharest University of Economic Studies, Faculty of Finance and Banking, Bucharest, ROMANIA. E-mail: iustinaboitan@yahoo.com

*** Sorin Iulian Cioaca, Bucharest University of Economic Studies, Faculty of Finance and Banking, Bucharest, ROMANIA. E-mail: cioaca_sorin@yahoo.com

achieved in recent years by shadow banking within international policy debates as well as from a central banking perspective.

Jeffers and Plihon (2011) argue that, in Europe, shadow banking system presents different features than that in the U.S., making it difficult to just take over the analyses and findings obtained for US and applying them to the European situation. Although for Europe there is no extended record of data on shadow banking activities, the authors suggest the refocus of studies and empirical research to European shadow banking.

Empirically speaking, quantitative research devoted to shadow banking, in particular in euro area, is still in an incipient stage, either from a financial stability, monetary policy or macroeconomic standpoint. Shortcomings in empirically modelling of the influence exerted by shadow banking activity are due, in part, to the imbalanced statistical coverage and relative short time series of the components of shadow banking system, but also to the heterogeneous nature of entities, activities and instruments that compose shadow banking. Most studies address only the conceptual perspective of the various facets of shadow banking activity and its prospects.

Our paper completes the existing strand of literature regarding shadow banking determinants by identifying a statistical relationship between the parallel banking sector, proxy by the money market funds for reasons related to data availability, and the evolution of main macroeconomic indicators. The novelty resides in employing data related to the post-financial crisis period for several EU countries. The paper is structured as follows: Section 1 reviews shadow banking definition and specificities, Section 2 investigates shadow banking ability in the monetary creation, Section 3 summarizes the most recent and significant empirical studies devoted to estimating the relationship between shadow banking and macroeconomic environment, Section 4 describes the methodology employed, the selection of variables and the results obtained, while the last section concludes.

2. CONCEPTUAL REVIEW OF SHADOW BANKING

DEFINITION AND FEATURES

The concept of *shadow banking* was coined in 2007 by economist and money manager Paul McCulley in order to “describe a large segment of financial intermediation that is routed outside the balance sheets of regulated commercial

banks and other depository institutions” (Noeth and Sengupta (2011)), being a characteristic of the US financial system.

A brief definition of shadow banking states that it replicates the core functions of the traditional banking system (i.e. credit, liquidity and maturity transformation), it is exposed to a large extent to the same risks but with far less capital (Meeks, Nelson and Alessandri (2013)).

In this respect, International Monetary Fund (2014) performed a graphical granular analysis by taking into account each segment of the euro area shadow banking and the specific risks involved at two moments of time (first quarter of 2009 and 2014). The exposure of shadow banking entities to various sources of risk is illustrated in Figure 1.

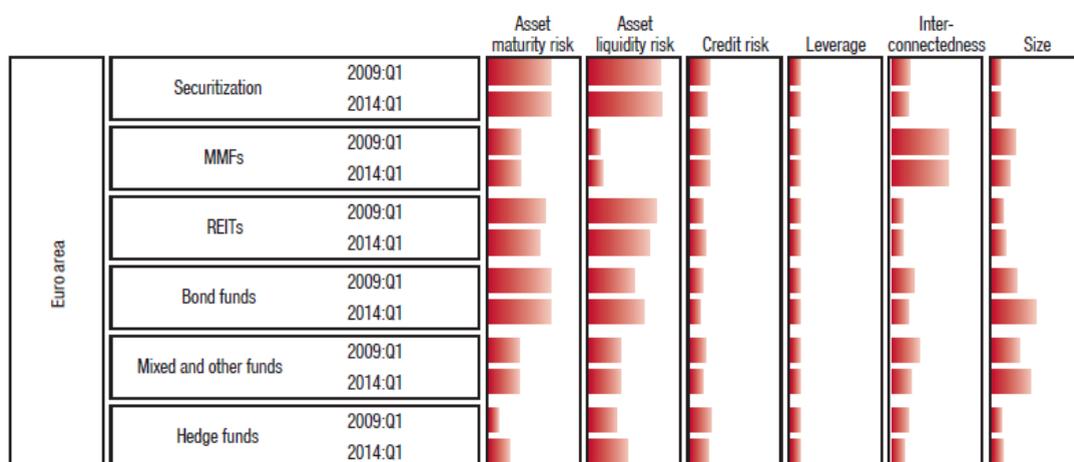


Figure 1 Shadow banking exposure to risks

Source: IMF (2014)

The highest exposures to maturity and liquidity risks belong to securitization, real estate investment trusts (REITs) and bond funds, while money market funds (MMFs) are most exposed to interconnectedness with regular banking and to a moderate extent to maturity risk.

Arquié and Artus (2012) provide a synthesis of features of the institutions included in the shadow banking area: i) credit intermediation; ii) non-regulated or very loosely regulated and supervised; iii) lack of support from the Central Bank or public guarantees; iv) lack of deposits made on behalf of the public; v) a balance sheet heavily dependent on financial market conditions.

At the roots of shadow banking lie several economic mechanisms that motivate its activities, namely: i) specialization of loan origination, transformation and distribution; ii) no explicit public guarantee for liabilities; iii) regulatory and tax arbitrage; iv) taking advantage of mispriced tail risk (neglected risk); v) presence of asymmetric information; vi) direct involvement in money creation, by complementing mainstream banking; vii) short-term funding (Adrian (2014)).

McCulley (2009) explains that since shadow entities escaped from the Central Bank's regulatory and supervisory constraints, they do not face the same impediments as commercial banks do in terms of the amount of leverage, liquidity buffers or lending typology and investment products provided.

Noeth and Sengupta (2011) make a parallel between the sources of fragility of traditional versus shadow banking. The vulnerability of banks resides in a run by banks' depositors, while in shadow banking the run is generated by the providers of wholesale funding (i.e. money market intermediaries, repo market).

A debated issue relates to the coverage of shadow banking in terms of component entities. According to the European Central Bank (2015), the broad measure of euro area shadow banking includes money market funds, non-money market funds, financial vehicle corporations and other financial institutions. There is also a narrow measure composed only by investment funds, money market funds and financial vehicle corporations. A statistic computed by ECB (ECB (2015)) shows that € 23 trillion out of the approximately € 60 trillion of total financial system assets in the euro area are held by shadow banking entities.

On the other hand, European Securities and Markets Authority (ESMA (2012)) considers that shadow banking definition should be focused more on activities rather than on entities and proposes the launch of an operational definition, since the shadow banking system is often partially defined by the opposition to the traditional banking system.

Figure 2 provides a summary of most recent definitions launched by financial institutions and researchers, which account for specific peculiarities of shadow banking components.

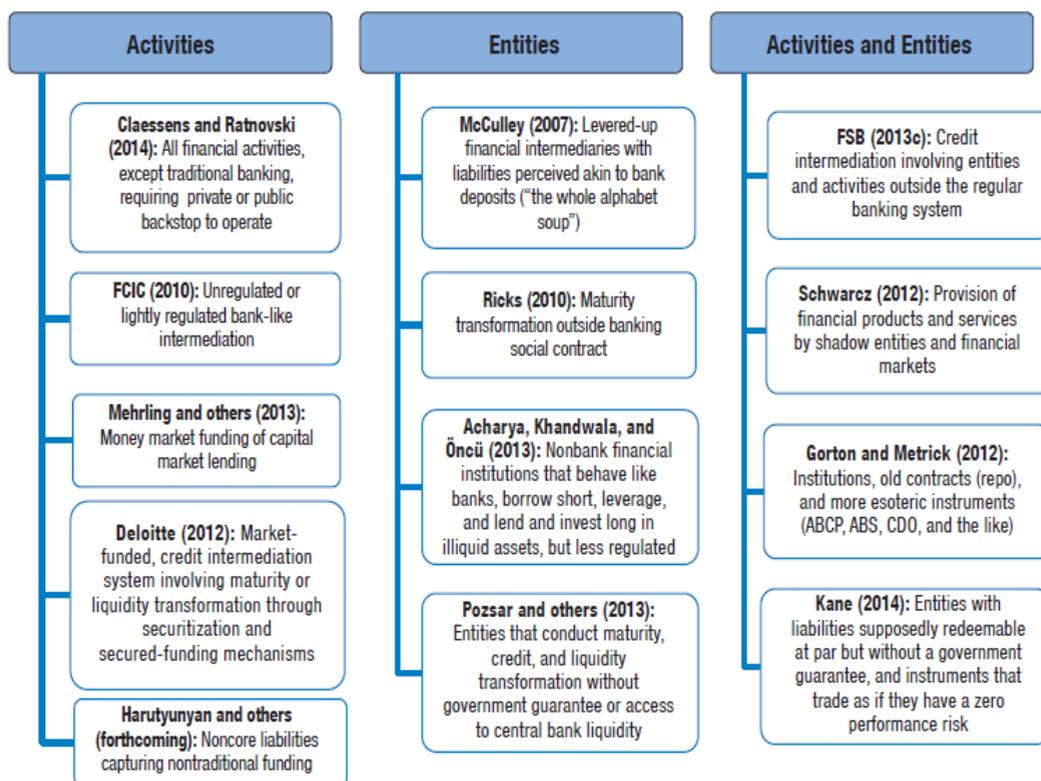


Figure 2 Synthesis of shadow banking definitions

Source: IMF (2014)

Another subject of debate is whether shadow banking exerts a strengthening or weakening effect on the monetary policy transmission mechanism. A report issued by Deutsche Bundesbank (2014) asserts that the increase in shadow banking activity changes the relative importance of individual transmission channels, by weakening the transmission of monetary measures through commercial banks and, at the same time, amplifying the transmission effect played by asset prices and other market-based variables.

According to the National Bank of Romania (BNR (2015)), shadow banking usually develops in times of tight banking regulations or when there is increased demand for assets, as is the case of pension funds and insurance companies. IMF (IMF (2014)) also identifies several common drivers behind shadow banking growth, namely "a tightening of banking regulation and ample liquidity conditions,

as well as demand from institutional investors, tend to foster nonbanking activities". ESMA (ESMA (2012)) completes the picture of the driving factors behind shadow banking development with regulatory arbitrage and risk appetite as well as investors' preference for safe assets.

Consequently, the current macroeconomic environment might be favourable to the further development of shadow banking, although regulators perceive this expansion as a major source of systemic risk.

This view is supported by CFA (CFA (2015)), which recognizes shadow banking potential for enhancing real economic activity and improving financial markets functioning, but outlines some of its threats to financial stability, such as procyclicality, interconnectedness, counterparty risk, systemic risk, low transparency and difficulty of monitoring.

IMF (IMF (2014)) tried to quantitatively estimate the historical contribution of several main subsectors of the financial system to systemic risk, by computing an indicator of marginal contribution to systemic risk. The indicator, depicting the percentage of systemic risk attributed to a given subsector has been computed distinctly for US, UK and Euro area (Figure 3).

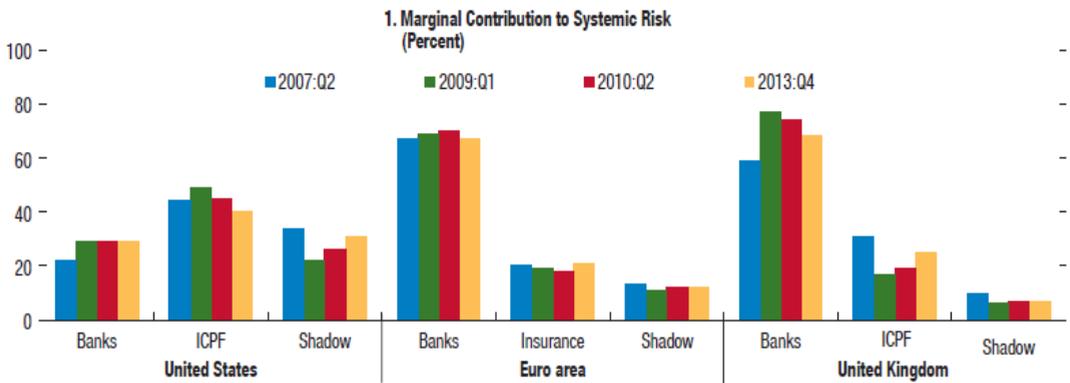


Figure 3 Exposure to systemic risk by subsectors of financial system and regions
Source: IMF (2014)

The findings illustrated that, in U.S., the contribution of each subsector to systemic risk is relatively more balanced than in Europe. However, by adding the contribution exerted by US nonbank financial intermediaries, represented by

shadow entities, pension funds and insurance companies, it results that the largest contribution to systemic risk belongs to them, and not to banking system. On the contrary, in the UK and Euro area, the banking system contribution dominates, exceeding 60 % of the total contribution. The IMF's explanation resides in the intrinsic features of the financial systems, which are more bank-based, as well as in the size and interconnections established between banks.

3. IS SHADOW BANKING INVOLVED IN MONETARY CREATION?

In this regard, the literature is widely fragmented. Ricks (2012) argues that shadow banking should not be perceived only as a financial one, but also as a monetary phenomenon, due to the presence of some interactions with the monetary system's institutional infrastructure. In his opinion, shadow banking issuance of financial instruments resembles money creation. More specifically, shadow banking is creating private money.

Sunderam (2012) empirically analysed the extent to which shadow banking liabilities might constitute substitutes for high-powered money in the banking system. His findings confirmed this hypothesis indicating that shadow banking liabilities positively respond to money demand, at least for the asset-backed commercial paper market during the period 2005-2006.

Adrian and Ashcraft (2012) believe that shadow banking involvement in credit intermediation should be seen as a financial innovation, with effects on the composition of monetary aggregates monitored and computed by central banks.

Werner (2014) explains the unique feature of money creation by banks through their ability of combining lending and deposit-taking operations, which cannot be achieved by other non-bank financial intermediaries. However, he still addresses several fundamental research questions, such as "Who can issue money?" and "Could shadow banking engage in money creation?"

From the standpoint of monetary issues, Michell (2016) claims that shadow banking is an extension of the traditional banking system and also a money issuer. The author explains that loans granted by the parallel banking system depict many resembling features with the classic financial intermediation and the non-bank financial intermediaries providing these loans are connected to banks' activity. On the other hand, the shadow banking liabilities act as near money, respectively they are liquid short-term stores of wealth. This view is supported by Pozsar (2014) and

Gordon and Metrick (2012), the latter arguing that the short-term financial resources used by shadow banking to finance their activities are a new form of money.

Jeffers and Plihon (2014) state that shadow banking monetary creation is based on avoiding capital requirements strictly imposed on to traditional banking. Their reasoning relies on the behaviour of investment banks as main actors in the parallel banking sector, who, out of thin air, created from trillions of dollars, which were later on invested in structured financial products, with no capital adequacy constraint. Thus, shadow banking has no limit in the process of monetary creation, as long as the level of capital is not regulated and the leverage is high.

In one of its analyses, Deloitte (2015) performs a more nuanced investigation on shadow banking component entities, with particular focus on money market funds (MMFs). Due to their specific mechanism of collecting financial resources and using them for financing real economy, MMFs are the meeting point, the mediator between short-term money demand and supply. They depict higher interconnections with the banking system, companies and the state, thus presently making them the subject of regulatory debates.

In this respect, the European Commission (2013) is actively concerned about designing the most appropriate regulatory framework and implementing stress tests for assessing changes in MMFs' main indicators (i.e. liquidity, interest rates, credit risk). The risk of contagion is increased by the presence of cross-country interconnections. In Europe, MMFs are highly concentrated in 3 countries (i.e. France, Ireland and Luxembourg), which holding more than 95 % of EU total assets (Table 1).

Table 1 *MMFs total assets by country*

Country	Total assets (EUR mil.)	EU share	Number of MMFs
France	381,676	40%	455
Ireland	284,551	29.8%	108
Luxembourg	240,294	25.19%	262
Sweden	11,869	1.24%	28
Spain	11,073	1.16%	111
UK	9,363	0.98%	34
Germany	4,722	0.49%	14
Finland	4,255	0.45%	12
Portugal	1,947	0.20%	12

Country	Total assets (EUR mil.)	EU share	Number of MMFs
Italy	1,398	0.15%	6
Poland	1,098	0.12%	14
Belgium	869	0.09%	11
Austria	724	0.08%	10
Netherlands	152	0.02%	1
Greece	37	0.004%	2
Latvia	21	0.002%	1
Lithuania	12	0.001%	1
Denmark	2	0.000%	1
Slovenia	0,86	0.000%	1

Source: EC (2013)

4. EMPIRICAL EVIDENCE OF THE RELATIONSHIP BETWEEN SHADOW BANKING AND MACROECONOMIC ENVIRONMENT

A study of den Haan and Sterk (2010) covering the post-1984 period in U.S., found that traditional bank credit is positively correlated with GDP, while shadow banking credit growth is negatively correlated with GDP.

Jeffers and Plihon (2011) examined 30 European countries over a time span of 12 years, in order to assess which factors contribute to the development of shadow banking entities in different European countries. They used two sets of variables: variables describing shadow bank activities and behaviour (i.e. other financial institutions total assets/GDP, liability/assets, derivatives/total assets) and variables related to the institutional environment (i.e. money and quasi money/GDP, bank credit to private sector/GDP, market capitalization/GDP, regulation) in which these non-bank financial intermediaries operate. They applied principal components analysis to sum up most of the information contained in the initial set of explanatory variables and group countries according to similarities in terms of the two principal components identified.

Meeks, Nelson and Alessandri (2013) have developed and tested a dynamic model which simulates the interaction between banking system and shadow banking through the securitized assets channel. The results indicated that banks' securitization of loans might create a beneficial, stabilizing effect on macroeconomy, while the matching between securitization and shadow banking high leverage exposes a country's economy to increased aggregate disturbances.

Deutsche Bundesbank (2014) applied a wavelet analysis, based on a flexible mathematical function, to model the statistical relationship between the money holdings of the non-bank financial intermediaries and some macroeconomic variables, namely the gross domestic product, the harmonized index of consumer prices and a share price index (DJ Euro Stoxx). The findings revealed no statistical significance between the growth rate of the real or nominal deposits of non-bank financial intermediaries and the growth rate of real GDP or the inflation rate. The presence of positive statistical significance has been found only for the share price index, with a lag of one year.

Duca (2014), on the other hand, applied co-integration models in order to investigate both the short-run and long-run determinants of the shadow or security market-funded credit in US. In the long-run, the findings suggested that regulations which disadvantaged banks had a beneficial effect by increasing the shadow banking system's share of business credit. The real price of information technology has a negative sign, while the reserve requirement tax exhibits a positive and statistically significant impact on the security market-funded share of short-term business credit. In the short run, retail deposit ceilings exert a highly significant and positive effect on shadow bank short-term business credit, the Treasury bond yield curve is highly significant and positive, and the Treasury bond spread is significant, but with a negative sign. In addition, the introduction of money market mutual funds raised the shadow bank business credit, while the introduction of deregulatory measures (such as money market deposit accounts and the passage of Dodd-Frank Act) had negative impacts.

A comprehensive empirical study performed by IMF (2014) on the shadow banking in advanced countries aimed at identifying main drivers of its growth patterns. The results suggested that a tightening of bank capital requirements creates incentives for banks to shift activities to the nonbank sector, hence positively influencing the growth of shadow banking. Banking sector size also positively determines the growth of shadow banking, an increase in the former being followed by the growth of the latter. There is a negative relationship between real short-term interest rates and respectively term spreads, and shadow banking growth. To account for those subsectors which are complementary to the banking system, the size of institutional investors has been considered as explanatory

variable. The empirical relationship between institutional investors' growth and shadow banking development is positive and statistically significant.

5. METHODOLOGICAL APPROACH AND RESULTS

By relying on quarterly data covering the period 2008–2015, we have studied the relationship between shadow banking systems in Romania and 14 other EU countries, using several macroeconomic indicators described in the literature.

The definition proposed by the Financial Stability Board, also accepted by other EU Central Banks, was used. In Romania's case, the definition outlines that shadow banking system is composed by nonbank financial institutions, investment funds and monetary funds. According to the extended view expressed by the Financial Stability Board and by the European Central Bank, the parallel banking system includes, besides monetary funds, the financial vehicle corporations and other financial intermediaries.

Box 1. Shadow banking components in Romania

From the standpoint of shadow banking structure, composed only by nonbank financial institutions (IFN), investment funds (FI) and monetary funds (Fmon), the diverging dynamics between nonbank financial institutions' total assets and those of investment funds can be noticed, the latter having recorded a gradual decrease in the post-financial crisis period (Figure 4). This trend is determined by the compression of nonbank financial institutions' lending, due to banks and nonbanks low appetite for providing new loans.

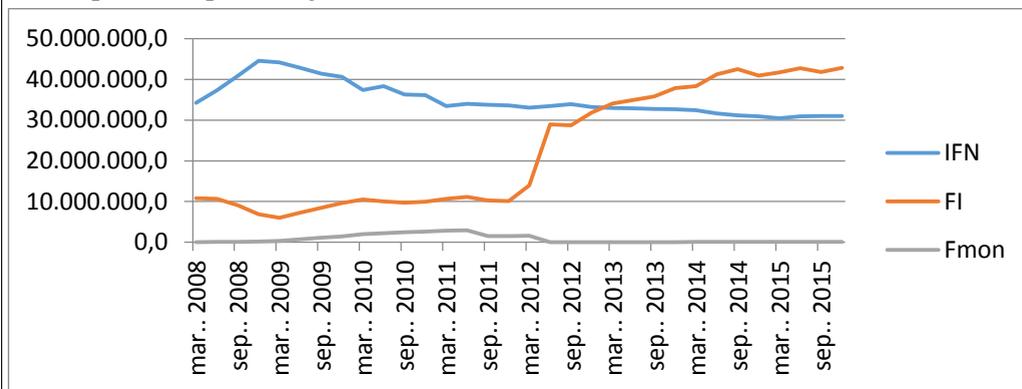


Figure 4 Total assets of each **Romanian** shadow banking component (q1 2008 - q4 2015)

Source: own computation

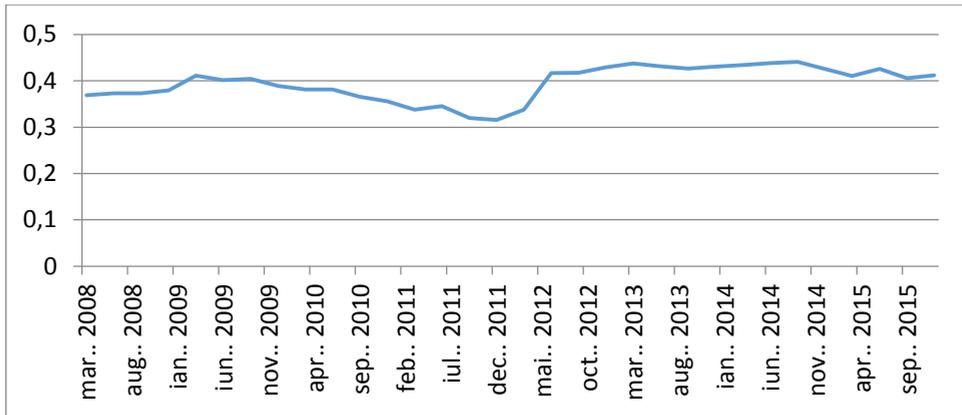


Figure 5 *The share of shadow banking total assets in GDP (q1 2008 – q4 2015)*

Source: Authors' computation

The value of the investment funds' total assets significantly increased (more than 4 times), following the new listings such as Fondul Proprietatea, the largest closed investment fund in Romania (with initial assets of more than 4 billion lei), and of the partial recovery of value losses recorded in the crisis period suffered by 5 Romanian financial investment societies. The lowest component, represented by monetary funds, depicted a positive evolution in the period of maximum turmoil.

However, the share of shadow banking system's total assets in nominal GDP is extremely low (i.e. less than 0,5 %), indicating that the role of this financial market component is marginal in financing real economy.

In the following, a Least Squares regression was run in order to test whether there is a significant relationship between the Romanian shadow banking total assets' variation and the two explanatory variables, namely the variation of nominal GDP and the interest rates spread, computed as the difference between interest rates for loans and those for deposits. The empirical results indicated a positive link between the variation of total assets and the variation of nominal GDP, seasonally adjusted. The coefficient of the interest rates spread is negatively correlated with shadow banking total assets' variation, suggesting the presence of a migration between the two components (mainstream and shadow banking), in search for better yields. Notwithstanding, the low value recorded by R-squared indicates that only 12.4675 % of the the variance related to the dependent variable

is explained by the two explanatory variables. These results are due mainly to the low number of available observations for the Romanian financial system.

The data series belonging to the 15 European countries (Austria, Belgium, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Luxembourg, Norway, Romania, Slovenia, Spain, Sweden) have been collected from OECD, European Central Bank, International Monetary Fund, National Bank of Romania and the Romanian National Institute of Statistics and cover the period during the first quarter of 2008 and the third quarter of 2015. Keeping in mind the unbalanced samples regarding the different components of shadow banking system (financial vehicles and other financial intermediaries such as hedge funds, real estate funds etc.), we considered that monetary funds are a good proxy for the shadow banking system in considered countries. As such, data on the net value of monetary funds' assets (the dependent variable in this study) was collected for each country.

Furthermore, the quarterly data series for several explanatory variables found in the literature was extracted in order to exert an influence on shadow banking dynamics. It has been considered the real GDP, the short-term and long-term level of interest rates, the share of monetary aggregate M2 in GDP and the share of investment funds' assets in GDP, as a measure for the financial system development. In order to analyse the relationship with the capital market, it has been considered the evolution of main indices for each national market, using 2010 as the year of reference.

From the standpoint of the raw data, it can be noticed the presence of extreme values in the sample. For instance, Luxembourg is the most important centre related to the the issuance of monetary funds, while Romania is located at the opposite pole, depicting extremely low values since it holds only one monetary fund.

By relying on such data, by means of panel data regression, the statistical link between the variation of monetary funds' net assets, as a proxy for the shadow banking system, and the variation of real GDP, the short-term and long-term level of interest rates, the share of investment funds' assets in GDP, the M2/GDP ratio, and the level of stock market indices was estimated (Table 2).

Table 2 *Relationship between shadow banking and the 6 macroeconomic variables*

Dependent Variable: SHADOW

Method: Panel Generalized Method of Moments

Transformation: First Differences

Sample (adjusted): 2008Q4 2015Q3
 Periods included: 28
 Cross-sections included: 15
 Total panel (balanced) observations: 420
 White period instrument weighting matrix
 White period standard errors & covariance (d.f. corrected)
 Instrument specification: @DYN(SHADOW,-2)
 Constant added to instrument list

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SHADOW(-1)	-0.224324	0.163633	-1.370899	0.1712
INDEX	0.192591	0.257216	0.748749	0.4544
INVEST_GDP	-0.115074	0.134852	-0.853335	0.3940
Long Term_IR	1.095044	4.026964	0.271928	0.7858
M2_GDP	-0.160851	0.232605	-0.691519	0.4896
REAL_GDP	-2.726153	1.078975	-2.526614	0.0119
Short Term_IR	-0.324021	1.624886	-0.199411	0.8420

Effects Specification

Cross-section fixed (first differences)

Mean dependent var	0.002334	S.D. dependent var	0.599385
S.E. of regression	0.534591	Sum squared resid	118.0301
J-statistic	9.781161	Instrument rank	15

As Table 2 illustrates, out of the 7 variables considered (from which one represents the first order lag of the dependent variable) only that corresponding to the real GDP is statistically significant, but with a negative sign. This result, in apparent contradiction with previous findings (which showed a positive relationship between the dynamics of real GDP and shadow banking size), might be explained through the reliance on a narrow definition for approximating shadow

banking and on the peculiarities of the time horizon considered (during and post-financial crisis).

The remaining six variables are not statistically significant, due to the presence of some redundancies between them. Nevertheless, it should be emphasized the positive sign of the coefficients for the variables describing the evolution of capital market and the long-term interest rates (explained by the orientation of investors towards higher yields and a long-term investment horizon) and the negative sign of the coefficients for short-term interest rates, the share of investment funds' assets in GDP and M2/GDP ratio.

To improve the statistical relevance of the relationship between our variables, we performed again the panel regression, with fewer variables. For instance, by considering as explanatory variables only the real GDP variation, the M2/GDP ratio and the stock market index, it has been obtained statistically significant coefficients. The signs associated with these coefficients are identical with those in the previous regression, but in this case the variables are highly statistically significant (Table 3).

Table 3 *Relationship between shadow banking, GDP and stock market index*

Dependent Variable: SHADOW
 Method: Panel Generalized Method of Moments
 Transformation: First Differences
 Sample (adjusted): 2008Q4 2015Q3
 Periods included: 28
 Cross-sections included: 15
 Total panel (balanced) observations: 420
 White period instrument weighting matrix
 White period standard errors & covariance (d.f. corrected)
 Instrument specification: @DYN(SHADOW,-2)
 Constant added to instrument list

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SHADOW(-1)	-0.140107	0.019233	-7.284717	0.0000
REAL_GDP	-4.301151	0.360921	-11.91716	0.0000
M2_GDP	-0.172953	0.048971	-3.531725	0.0005

INDEX	0.386628	0.088697	4.358977	0.0000
-------	----------	----------	----------	--------

Effects Specification

Cross-section fixed (first differences)

Mean dependent var	0.002334	S.D. dependent var	0.599385
S.E. of regression	0.551150	Sum squared resid	126.3667
J-statistic	12.35471	Instrument rank	15

Similarly, by considering as explanatory variables the stock market index, the M2/GDP ratio and long-term interest rates, the empirical results indicated that shadow banking evolution is positively correlated with the capital market and the level of interest rates (see table 4).

Table 4 Relationship between shadow banking, stock market index and long-term interest rates

Dependent Variable: SHADOW
 Method: Panel Generalized Method of Moments
 Transformation: First Differences
 Sample (adjusted): 2008Q4 2015Q3
 Periods included: 28
 Cross-sections included: 15
 Total panel (balanced) observations: 420
 White period instrument weighting matrix
 White period standard errors & covariance (d.f. corrected)
 Instrument specification: @DYN(SHADOW,-2)
 Constant added to instrument list

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SHADOW(-1)	-0.158794	0.022766	-6.974986	0.0000
INDEX	0.304995	0.066145	4.611016	0.0000

M2_GDP	-0.110177	0.035707	-3.085592	0.0022
--------	-----------	----------	-----------	--------

Effects Specification

Cross-section fixed (first differences)

Mean dependent var	0.002334	S.D. dependent var	0.599385
S.E. of regression	0.547953	Sum squared resid	125.2054
J-statistic	14.52421	Instrument rank	15

Source: own computation

It is of interest the negative relationship between the monetary aggregate M2 as a share of GDP and shadow banking size. The explanation comes from the mere composition of M2, which includes currency in circulation and deposits of all maturities. When deposits' interest rates follow a decreasing trend, people looking to save or invest at higher yields tend to shift to other types of financial investments, which the mainstream banking might not provide. Thus, the financial resources collected by banks by means of deposits record a decrease, which further impacts their ability to grant loans. Consequently, the financing of real economy through bank loans compresses, the money supply through the traditional banking channel decreases, being supplemented by an increase in shadow banking volume of activity.

Another argument for the statistical relationship identified resides in the variable we used as proxy for shadow banking, namely money market funds (MMFs). As European Commission (2013) states, MMFs depict some features equivalent to bank deposits, as follows: collects cash from investors for short time periods, offers instantaneous access to liquidity and stability of value. It should also be mentioned that, in this respect, the literature lacks a robust empirical testing or a generally accepted view.

6. CONCLUSIONS

It is becoming more readily agreed that shadow or parallel banking system acts as a complement to and not a substitute for traditional banking. The findings of our study are in line with this remark. By relying on data for 15 European countries, we have identified a linear relationship between the evolution of shadow banking and several macroeconomic indicators. The findings confirmed a positive relationship between shadow banking size and stock market indices and long-term interest rates. In other words, there is a pattern of investor behaviour, in times of stock market or interest rates increases, to focus on identifying investment alternatives that generate higher yields.

Moreover, it has been identified a negative link with the development of investment funds which might be explained by the migration of investors from investment funds to less restrictive investment vehicles in respect of investment policies. The negative relationship holds also for M2/GDP, suggesting that, in times of shadow banking expansion, the financing through the traditional banking channel decreases, as banks cannot create money.

It has to be mentioned that these results have been obtained for a number of 15 European countries, a geographic area where shadow banking is less developed than that in US. In addition, the results are highly dependent on the shadow banking definition and quantification, as well as on the breaks in the series or unbalanced number of observations across selected countries.

REFERENCES

1. Adrian T., Ashcraft A.B. (2012), Shadow Banking: A Review of the Literature, Federal Reserve Bank of New York Staff Reports Staff Report No. 580 October 2012
2. Adrian T. (2014), Financial Stability Policies for Shadow Banking, Federal Reserve Bank of New York Staff Reports, No. 664 February 2014
3. Arquie A., Artus P. (2012) Measuring the shadow banking in the Euro area: what does the ECB know? available at <http://www.parisschoolofeconomics.eu/IMG/pdf/jobmarket-2paper-arquie-pse.pdf>
4. CFA (2015) Shadow Banking: Policy Frameworks and Investor Perspectives on Markets-Based Finance, ISBN: 978-1-942713-02-9
5. Deloitte (2015) Money Market Funds European regulation – compromise on the horizon?
6. Deutsche Bundesbank (2014), The shadow banking system in the euro area: overview and monetary policy implications, Monthly Report, March 2014

7. Duca J.V. (2014) What Drives the Shadow Banking System in the Short and Long Run? Federal Reserve Bank of Dallas, Research Department Working Paper 1401.
8. European Central Bank (2015), Report on financial structures, October 2015.
9. European Commission (2013), IMPACT ASSESSMENT accompanying the document Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on Money Market Funds, Brussels, 4.9.2013
10. European Securities and Markets Authority (2012), Reply of ESMA to the European Commission's Green paper on Shadow banking, ESMA/2012/476
11. Gorton, G., Metrick, A. (2012). Securitized banking and the run on repo. *Journal of Financial Economics*, 104 (3), 425-451.
12. den Haan, Wouter J. and Vincent Sterk (2010), The myth of financial innovation and the great moderation, *Economic Journal*, Vol. 121, pp. 707–739.
13. International Monetary Fund (2014), Global Financial Stability Report 2014. Risk Taking, Liquidity, and Shadow Banking Curbing Excess while Promoting Growth, World Economic and Financial Surveys.
14. Jeffers E., Plihon D. (2011) What is so special about European Shadow banking?, First International Conference of Cost Action IS0902 Program « Systemic Risks, Financial Crises, and Credit », Université Paris 8
15. Jeffers E., Plihon D. (2014), Universal Banking and Shadow Banking in Europe, *Congres AFEP 2014 Economie politique et democratie*, 2-4 July, Paris.
16. McCulley P. (2009) The Shadow Banking System and Hyman Minsky's Economic Journey, chapter in the Research Foundation book *Insights into the Global Financial Crisis*, December 2009, The Research Foundation of CFA Institute.
17. Meeks R., Nelson B. and P. Alessandri (2013), Shadow banks and macroeconomic instability, Banca d'Italia Working Paper series, no. 939, November 2013.
18. Michell J. (2016) Do shadow banks create money? Financialisation and the monetary circuit, Post Keynesian Economics Study group, working paper 1605, March 2016.
19. National Bank of Romania (2015), Financial Stability Report.
20. Noeth B.J. and R. Sengupta (2011), Is shadow banking really banking? *The Regional Economist, A Quarterly Review of Business and Economic Conditions*, vol. 19, no.4, October 2011.
21. Pozsar, Z. (2014). Shadow banking: The money view. Working Paper 14-04, Office of Financial Research.
22. Ricks M. (2012), Money and (Shadow) Banking: A Thought Experiment," *31 Review of Banking and Financial Law*, 731 (2012)
23. Sunderam A. (2012). Money Creation and the Shadow Banking System. Harvard Business School Working Paper.
24. Werner, R.A. (2014), How do banks create money, and why can other firms not do the same? An explanation for the coexistence of lending and deposit-taking, *International Review of Financial Analysis*, vol. 36, December 2014, Pages 71–77



FISCAL POLICY, FDI AND MACROECONOMIC STABILIZATION

CLAUDIU TIBERIU ALBULESCU*, NICOLAE BOGDAN IANC**

Abstract: *The purpose of this paper is to investigate the impact of counter-cyclical fiscal policies and FDI inflows on macroeconomic stabilization in the selected Euro area countries. Performing a panel data analysis for 9 economies over the timespan 1980-2014 and, using a Pooled Mean Group estimator, it was shown that a counter-cyclical fiscal policy, associated with a lower tax burden during turbulent economic times, contributes to the reduction of output volatility. At the same time, increased FDI inflows positively influence the macroeconomic stabilization. In addition, a reduced volatility of investment inflows has a positive impact on the economic growth stabilization, but this result is sensitive to the way the tax burden is calculated. In a nutshell, the findings show that, in the long-run, authorities should resort to counter-cyclical fiscal policies and encourage FDI inflows to stabilize the economy and, thus, reduce the amplitude of business cycles.*

Keywords: *macroeconomic stabilization, fiscal burden, FDI inflows, Pooled Mean Group, Euro area*

1. INTRODUCTION

Since the middle of the 1980s, noteworthy studies underlined a reduction of the economic activity volatility, especially in developed countries (Kim and Nelson, (1999); McConnell and Perez-Quiros (2000)).

This evidence lead to a more in-depth analysis of the determinant factors sustaining the macroeconomic stabilization. Following this line, Stiroh (2009) emphasizes the impact of output structure modification, where the services sector, which is less volatile, became dominant, as well as the role of the technological

* Claudiu Tiberiu Albuлесcu, Management Department, Politehnica University of Timisoara, Timisoara, Romania, claudiu.albuлесcu@upt.ro

** Nicolae Bogdan Ianc, Management Department, Politehnica University of Timisoara, Timisoara, Romania, Finance Department, West University of Timisoara, Timisoara, Romania, LEO, University of Orléans, Orléans, France, nicolae.ianc89@e-uvt.ro

progress. Several empirical studies advance the positive role of economic integration on macroeconomic stabilization (De Souza (2004); Bekaert et al. (2006)). Other works underline the impact of financial innovation on the evolution of the financial structure of firms through the cycle (Jermann and Quadrini, 2006).

Albuлесcu and Goyeau (2008) defend the idea that the development of the derivatives markets also contributed to the reduction of the economic activity volatility. Meanwhile, Dynam et al. (2006) analyze the impact of financial innovation on the credit market for consumers and businesses.

A different strand of literature (Stock and Watson (2003)) underlines the role of “good luck” in output stabilization, a stabilization recorded due to a reduction in the structural shocks that affect the economy.

Nevertheless, the economic policies are considered as the essential ingredients in macroeconomic stabilization. Firstly, improved monetary policies lead to output stabilization (Taylor (1999); Cogley and Sargent (2001)). Secondly, the public expenditure policy and the financial reform stabilize the output (Blanchard and Simon (2001); Arias et al. (2007)).

The present paper complements the existing studies in two ways. On the one hand, it investigates how the counter-cyclical fiscal policies influence the macroeconomic stabilization in the selected Euro area countries. While previous studies focus on automatic stabilizers (Debrun and Kapoor (2010)), a different approach was adopted, and thus the role of the fiscal burden through the cycle was considered. An increase in the fiscal burden during contraction periods negatively affects the output stabilization.

Conversely, the fiscal burden should increase in economic boom periods in order to stabilize the output growth. This effect was captured considering the tax revenue to GDP ratio as a proxy for the fiscal burden. We posit that, if fiscal revenues increase over the real GDP (that is, the tax revenue to GDP ratio increases), this process has a negative impact on the output volatility. For example, in economic boom periods, associated with lower volatility, an increase in the fiscal burden stabilizes the output growth. On the contrary, if an increase in the tax revenue to GDP ratio has a positive influence on output volatility, this means that a pro-cyclical fiscal policy is applied.

The role of the fiscal burden in the macroeconomic stabilization is important from two perspectives. First, Issing (2005) shows that the stabilizing function of

fiscal policy is especially important for countries that are part of a monetary union, as nominal interest rates and exchange rates do not adapt to the situation of an individual country. Second, the stylized facts show that, as a response to crisis and to an increase in output volatility, 12 out of 17 Euro area countries that are also members of Organisation for Economic Co-operation and Development (OECD) recorded a drop in corporate income tax rates and taxing wages during the timespan 2007-2009. In the same line, Posch (2011) shows that the break in output volatility in the US can be associated with the period of tax reforms. On the other hand, we investigate the role of FDI inflows in the macroeconomic stabilization. As far as we know, this phenomenon was mostly neglected in the literature, with few exceptions (Ćorić and Pugh (2013); Hegerty (2014)). However, international investments can be easily associated with the economic integration process. In addition, FDI complement national investments and contribute thus to output stabilization. Further, a decrease in FDI inflows, determined by international investors' negative perception on the economic state, will lead to economic downturns and higher output volatility. Finally, by increasing the international diversification of the net worth, FDI tend to reduce the volatility of output growth (Portes (2007)). Thus, the impact of FDI inflows on output volatility was investigated, a negative impact in the long-run being expected. Furthermore, we posit that the reduced volatility of FDI flows has a positive effect on macroeconomic stabilization, which represents a supplementary investigation of this paper.

Our study is based on a panel data analysing 9 Euro area countries that are also OECD members, considering the time horizon 1980-2014. The output stabilization is computed using a 5-years rolling window standard deviation of real GDP. We consider the tax revenue to GDP ratio and the FDI inflows as explanatory variables. We also take into account the FDI volatility in an alternative specification of our model.

For robustness purpose, we use 3 different estimations of the tax burden, namely total tax revenue to GDP ratio (main analysis), as well as taxes on income, profits and capital gains to GDP ratio (direct taxation effect) and taxes on goods and services to GDP ratio (indirect taxation effect). Given the results of the panel unit root tests which show that most variables are $I(1)$, we use a Pool Mean Group (PMG) estimation (Pesaran et al. (1999)). However, because it is hard to consider

the panel is homogenous, for comparison purpose we also apply the mean-group (MG) approach (Pesaran and Smith (1995)). Such approaches are particularly appealing for macro-panels, as they do not require all variables to be stationary (i.e. they are based on the Maximum Likelihood methodology). In addition, in the PMG and MG estimations, the parameters are heterogeneous across groups. This is very useful because we see different fiscal systems in place in the Euro area countries.

Our findings show that a counter-cyclical fiscal policy, associated with lower tax burden during turbulent economic times, contributes to a drop in output volatility. At the same time, increased FDI inflows negatively influence output volatility (or positively influence the macroeconomic stabilization). In addition, the investment volatility positively affects the output volatility. The results are however sensitive to the way the fiscal burden is computed.

The rest of the paper is structured as follows: Section 2 presents the literature; Section 3 describes the data, general statistics and methodology. Section 4 shows the main results, while Section 5 is dedicated to robustness findings. The last section concludes.

2. LITERATURE REVIEW

The decades preceding the recent financial crisis (known also as the “Great Moderation”) are characterized by a global low level of the output volatility. In this context, a plethora of studies investigated the factors that conducted to the economic growth stabilization, factors that can be grouped in two categories, namely those related to modifications in the structure of the economy, and those related to better-adapted economic policies (Albuлесcu and Goyeau (2008)).

With regard to the first category of elements, we notice the sectoral changes in terms of output contribution. While Stiroh (2009) underlines the role of increased weight of services for the output stabilization, Davis and Kahn (2008) show that the consumption of durable goods and not the services contribute to a reduced economic volatility. Secondly, a better management of inventories is associated with a reduced volatility of production because firms can better respond to unanticipated modifications in their sales (McConnell and Perez–Quinos (2000)). Thirdly, Arias et al. (2007) highlight the role of diminished productivity shocks. Fourthly, international financial integration is found to be responsible for the output stabilization (Bekaert et al. (2006)), although Buch (2005) does not confirm

this result. Kose et al. (2003), who show that volatility smoothing is more common for developed countries, provide a reconciliation. Fifthly, the financial innovation plays a role in the macroeconomic stabilization. Jermann and Quadrini (2006) show that firms become more flexible in the choice of their financial structure when they use new financial products. In a similar fashion, Guay (1999) underlines the fact that firms which use derivatives record a reduction of their stock index returns volatility, while Albuлесcu and Goyeau (2008) perform a macro-level investigation, showing that the development of derivatives markets contribute to the economic activity stabilization.

The second category of determinant factors is associated with better-adapted economic policy decisions. On the one hand, Mishkin (2008) shows that inflation and output stabilization reinforce each other, both in the short and long runs. On the other hand, Boivin and Giannoni (2006) posit that it is not the price stabilization, but the change in the monetary policy transmission mechanisms which explain the macroeconomic stabilization. However, most of the existing works focus on the role of fiscal policy and the present paper follows the same path.

Moreover, Blanchard and Simon (2001) underline the role of public expenditure in the output stabilization. In this line, Debrun and Kapoor (2010) perform a panel data analysis for a set of advanced and emerging market economies, over the period 1970 to 2006. They report that automatic stabilizers strongly contribute to output stability, regardless of the type of economy. Other studies mention the impact of the fiscal policy (Fatás and Mihov (2003); Arias et al. (2007); Kumhof and Laxto (2009)). Fatás and Mihov (2003) study the effects of discretionary fiscal policies on output volatility and economic growth for 91 countries and discover that discretionary, aggressive fiscal policies induce significant macroeconomic instability. On the other hand, Kumhof and Laxto (2009) propose a tax revenue gap rule that delivers sizeable macroeconomic stabilization gains relative to a balanced budget rule. More recently, Posch (2011) uses a panel data analysis for 20 OECD countries spanning the years 1970 to 2004 and shows that taxes on labour and corporate income are negatively related to the macroeconomic volatility. A different approach is adopted by Furceri (2009), who argues that fiscal divergence is responsible for business cycle volatility. Moreover, according to the author, this effect is wider for the EMU countries than for the ten

other OECD countries. However, none of these works makes , the distinction between the direct and indirect taxation effect.

In addition, for a considerable time, the role of foreign investments in the output stabilization was neglected in the literature. While the FDI impact on economic growth is well prospected, little is done to investigate its impact on macroeconomic stabilization. A pioneer on this topic is Alper (2002) who examines the cross-correlations between output volatility and net capital inflows for Mexico and Turkey, and finds a significant relationship only for Mexico. The first theoretical study underlining the FDI-output volatility interaction is that of Portes (2007) who develops a general equilibrium model according to which international diversification through FDI implies less volatile external finance premium and, hence, less volatile output. Following Portes (2007), Ćorić and Pugh (2013) analyse data from 85 countries over the period 1961-2005, using a fixed-effects panel estimation and instrumental variable estimators, and report that FDI has a stabilizing effect on output. Using quarterly data from the mid-1990s to 2010 for the selected transition economies, Hegerty (2014) shows that non-FDI flows contribute more to macroeconomic volatility than do FDI flows. His analysis is based on VAR and impulse response functions. Ahmed and Suardi (2009) report similar findings. All the empirical approaches previously used require that variables are $I(0)$, expecting a positive relationship between FDI and output stabilization.

However, the interaction between FDI and output stabilization has a complex nature (for a review on this subject, see Kose et al. (2006). In theory, FDI can smooth consumption in face of economic shocks and, at the same time, exposes economies to instability during turbulent times. Therefore, we posit that the relationship between FDI and macroeconomic volatility is influenced by the business cycle. Consequently, we expect FDI inflows to have a negative impact on output volatility. At the same time, we posit that the FDI volatility can positively affect the output volatility. Different from other studies, we show that our variables are usually $I(1)$, thus questioning the linear methodologies previously used. To overcome this limitation, we use the PMG and the MG estimators, which do not require stationary variables. Overall, we test the effects of both fiscal policies and FDI inflows on the output stabilization, providing an up-to-date analysis.

3. DATA, GENERAL STATISTICS AND METHODOLOGY

3.1. Data

We use annual data (1980-2014) for 9 Euro area countries, which are also OECD members, namely Austria, Denmark, Finland, France, Ireland, Italy, Netherlands, Spain and Sweden. The fiscal burden variables are extracted from the OECD database. The FDI inflows to GDP ratio were extracted from the United Nations Conference on Trade and Development (UNCTAD) database and data are available starting with 1970. However, for Belgium, Germany, Luxembourg are partially missing and, consequently, they had been removed from the sample. We have obtained a strongly balanced panel dataset for the remaining 9 countries.

The macroeconomic stabilization is assessed based on the output volatility (computed using a 5-years rolling window standard deviation; Albulescu and Goyeau (2008)). The data are extracted from the World Bank database (World Development Indicators).

For the fiscal burden we have used as proxy the total tax revenue to GDP ratio. For robustness purpose, the taxes on income, profits and capital gains to GDP ratio and the taxes on goods and services to GDP ratio are used. In addition, for an alternative specification regarding the FDI impact, we have used the inflow volatility computed in a similar manner, using a 5-years rolling window standard deviation.

3.2. General statistics and panel unit root tests

We start the empirical analysis with the presentation of summary statistics of our sample (Table 1). We notice that the standard deviation is between 1.750 for the output volatility (*gdpsd*) and 5.823 for the taxes on income, profits and capital gains to GDP ratio (*tax 2*). The minimum level of the total tax revenue to GDP ratio (*tax1*) is 21.99 (recorded in 1980 in Spain), while the maximum level is 50.88 (recorded in 2014 in Denmark). The FDI inflow (*fdiflow*) recorded its minimum value of -15.06 (% of GDP) in 2005 in Ireland, while the maximum value was again registered by Ireland, in 2000.

Table 1 Summary statistics

	<i>gdpsd</i>	<i>tax1</i>	<i>tax2</i>	<i>tax3</i>	<i>fdiflow</i>	<i>fdisd</i>
Mean	1.750	39.45	14.06	11.81	2.343	1.681
SD	1.027	5.740	5.823	2.123	4.098	2.607

	<i>gdpsd</i>	<i>tax1</i>	<i>tax2</i>	<i>tax3</i>	<i>fdiflow</i>	<i>fdisd</i>
Min	0.290	21.99	5.490	4.552	-15.06	0.031
Max	5.602	50.88	33.19	16.59	25.95	15.40

Notes:

gdpsd – output stabilization (5-years standard deviation rolling window of real GDP growth rate);

tax1 – total tax revenue as % of GDP;

tax2 – taxes on income, profits and capital gains (tax revenue as % of GDP);

tax3 – taxes on goods and services (tax revenue as % of GDP);

fdiflow – FDI inflows;

fdisd – investment stabilization (5-years standard deviation rolling window of FDI inflow).

In order to sustain our choice regarding the empirical approach used in this paper, we continue our analysis with panel unit root tests. Before resorting to that, we perform a series of cross-sectional dependence tests in order to see if the null hypothesis of cross-sectional independence, assumed in panel unit root tests from the first generation, can be accepted or not (Table 2).

Table 2 Cross-sectional dependence and panel unit root tests

Cross-sectional dependence tests								
Main estimation		Pearson CD Normal			Friedman Chi-square		Frees Normal	
ns	<i>fdiflow</i> (Model 1)	23.63***			174.3***		2.491***	
(<i>tax1</i>)	<i>fdisd</i> (Model 2)	23.83***			177.7***		2.546***	
Pesaran pCADF panel unit root test								
	t-bar	Without trend			With trend			
		10%	5%	1%	t-bar	10%	5%	1%
<i>gdpsd</i>	-2.709	-2.210	-2.330	-2.550	-2.712	-2.730	-2.840	-3.060
<i>tax1</i>	-1.670	-2.210	-2.330	-2.550	-2.681	-2.730	-2.840	-3.060
<i>tax2</i>	-1.339	-2.210	-2.330	-2.550	-2.241	-2.730	-2.840	-3.060
<i>tax3</i>	-1.693	-2.210	-2.330	-2.550	-2.504	-2.730	-2.840	-3.060
<i>fdiflow</i>	-2.453	-2.210	-2.330	-2.550	-2.704	-2.730	-2.840	-3.060
<i>fdisd</i>	-2.403	-2.210	-2.330	-2.550	-2.422	-2.730	-2.840	-3.060

Notes: (i) ***, **, * means rejection of the null hypothesis of cross-sectional independence at 99 %, 95 % and 90 % confidence level (equivalent with the existence of cross-sectional dependence); (ii) pCADF test with two lags.

The results of cross-sectional dependence tests (Friedman (1937); Frees (1995); Pesaran (2004) show that the null is rejected in all the cases, and thus the existence of cross-sectional dependence. Consequently, we proceed to panel unit

root tests from the second generation and we use the Pesaran cross-sectional Augmented Dickey–Fuller (pCADF) test (Pesaran, 2007).

The findings of the panel unit root test show that the output volatility is stationary, while the fiscal burden is I(1). While the Pesaran pCADF panel unit root test without trend shows that the FDI-related variables are I(0), the trend consideration shows that the variables are I(1). We see that is not very clear if our variables are I(1) or I(0). The Autoregressive Distributive Lag (ARDL) dynamic panel specification associated with the PMG and MG estimation represents thus a solution for our estimations.

3.3. Methodology

Let us assume an ARDL (p, q_1, \dots, q_k) dynamic panel specification:

$$gdpsd_{i,t} = \sum_{j=1}^p \lambda_{i,j} gdpsd_{i,t-j} + \sum_{j=0}^q \delta'_{i,j} X_{i,t-j} + \mu_i + \varepsilon_{i,t} \quad (1)$$

where:

- \bar{i} is the number of groups (countries) and \bar{t} is the number of periods (years),
- $X_{i,t}$ is the $k \times 1$ vector of the explanatory variables (tax and FDI) and $\delta'_{i,j}$ are the coefficients,
- $\lambda_{i,j}$ are scalars and μ_i are group effects,
- $\varepsilon_{i,t}$ is the error term.

If the variables are I(1), Eq. (1) can be reparametrized into an error correction equation (Blackburne III and Frank (2007):

$$\begin{aligned} \Delta gdpsd_{i,t} &= \phi_i (gdpsd_{i,t-j} - \theta'_i X_{i,t}) + \\ &+ \sum_{j=1}^{p-1} \lambda^*_{i,j} \Delta gdpsd_{i,t-j} + \sum_{j=0}^{q-1} \delta^*_{i,j} \Delta X_{i,t-j} + \mu_i + \varepsilon_{i,t} \end{aligned} \quad (2)$$

where:

- ϕ_i is the error-correction speed of the adjustment term (which should be negative and significantly different from zero in order to have a long-run relationship),
- θ_i is the vector that explains the long-run relationships between variables.

In the case of dynamic heterogeneous panels, the fixed-effect estimation is usually applied and implies that time-series data for each group are pooled, while

the intercepts are allowed to differ across countries. Pesaran and Smith (1995) show that the slope coefficients are not necessarily identical and propose the MG estimator where the intercepts, slope coefficients and error variances are allowed to differ across groups. These approaches are considered extreme situations, and Pesaran et al. (1999) develop a maximum likelihood method (the PMG) which represents a reconciliation among other methods. As Blackburne III and Frank (2007) show, the PMG allows the intercept, short-run coefficients, and error variances to differ across groups (as in the MG estimator), but constrains the long-run coefficients to be equal across groups (as in the FE estimator). Further, reposing on a maximum likelihood approach, the PMG utilization does not imply the stationarity of the variables.

4. RESULTS

For each category of estimations (main and robustness), two categories of models are considered. In the first category (Model 1), the FDI inflow is used as explanatory variable. In the second category (Model 2), the inflow stabilization is considered. Table 3 presents the main results.

In Model 1a (PMG estimation), in the long-run, both the fiscal burden and FDI inflow negatively impact the output volatility. An increase in the fiscal burden during economic boom periods leads, as expected, to a decrease in output volatility. Moreover, a decrease in the fiscal burden amplifies the output volatility in the long-run. Therefore, counter-cyclical fiscal policies conduct to macroeconomic stabilization. In addition, FDI inflows negatively impact output volatility. That is, FDI inflows have a positive impact on economic stabilization. Conversely, a drop in FDI inflows amplifies output volatility. No significant influence is recorded in the short-run. However, this result is not validated by the MG estimator, which shows no influence either in the short or long runs.

Model 2a (both PMG and MG estimators) shows that only the counter-cyclical fiscal policy influences the output stabilization, while the volatility of FDI inflows has no significant impact although, as expected, the sign is positive. The error-correcting speed of adjustment term is different from 0, negative and significant, which shows the existence of a long-run relationship.

Table 3 PMG and MG main results

Variables	PMG		MG	
	Long-run coefficients	Short-run coefficients	Long-run coefficients	Short-run coefficients
Model 1a – FDI inflow				
<i>Adjustment coefficient</i>		-0.270*** (0.047)		-0.339*** (0.051)
<i>tax1</i>	-0.130*** (0.045)	-0.065 (0.040)	-0.140 (0.115)	-0.060 (0.040)
<i>fdiflow</i>	-0.067** (0.033)	-0.003 (0.022)	-0.128 (0.192)	0.017 (0.034)
Model 2a – FDI inflow stabilization				
<i>Adjustment coefficient</i>		-0.262*** (0.033)		-0.335*** (0.028)
<i>tax1</i>	-0.105** (0.051)	-0.072* (0.037)	-0.161** (0.076)	-0.050 (0.037)
<i>fdisd</i>	0.039 (0.057)	-0.122 (0.102)	0.052 (0.325)	-0.310** (0.156)

Notes:

(i) the value in parenthesis denotes the standard error;

(ii) ***, **, * indicates significance at 1 %, 5 % and 10 %.

However, there is no strong agreement between the PMG and MG estimations. In addition, based on direct or indirect taxes, we want to see which counter-cyclical fiscal policy is more effective in the output stabilization. Therefore, we proceed to a robustness check, where the taxes on income, profits and capital gains to GDP ratio (*tax2*) and the taxes on goods and services to GDP ratio (*tax3*), rather than the total tax revenue to GDP ratio is considered .

5. ROBUSTNESS ANALYSIS

Table 4 PMG and MG robustness check results

Variables	PMG		MG	
	Long-run coefficients	Short-run coefficients	Long-run coefficients	Short-run coefficients
Model 1b – FDI inflow				
<i>Adjustment coefficient</i>		-0.268*** (0.031)		-0.308*** (0.035)

Variables	PMG		MG	
	Long-run coefficients	Short-run coefficients	Long-run coefficients	Short-run coefficients
<i>tax2</i>	-0.062 (0.070)	-0.134*** (0.044)	-0.025 (0.113)	-0.130*** (0.043)
<i>fdiflow</i>	-0.034 (0.038)	-0.008 (0.024)	-0.114 (0.158)	0.004 (0.030)
Model 1c – FDI inflow				
<i>Adjustment coefficient</i>		-0.269*** (0.037)		-0.314*** (0.038)
<i>tax3</i>	-0.321** (0.127)	-0.115 (0.142)	-0.154 (0.341)	-0.134 (0.143)
<i>fdiflow</i>	-0.046 (0.037)	-0.004 (0.021)	-0.274** (0.109)	-0.032 (0.031)
Model 2b – FDI inflow stabilization				
<i>Adjustment coefficient</i>		-0.266*** (0.031)		-0.349*** (0.029)
<i>tax2</i>	-0.030 (0.068)	-0.138*** (0.036)	-0.230*** (0.088)	-0.088** (0.037)
<i>fdisd</i>	0.115* (0.065)	-0.134* (0.078)	0.631* (0.342)	-0.294* (0.169)
Model 2c – FDI inflow stabilization				
<i>Adjustment coefficient</i>		-0.249*** (0.039)		-0.357*** (0.045)
<i>tax3</i>	-0.335** (0.146)	-0.100 (0.147)	-0.209 (0.345)	-0.064 (0.115)
<i>fdisd</i>	0.168** (0.073)	-0.134 (0.090)	0.256 (0.346)	-0.253 (0.174)

*Notes: (i) the value in parenthesis denotes the standard error; (ii) ***, **, * indicates significance at 1%, 5% and 10%.*

We observe that the negative effect of the fiscal burden and FDI inflow on the output volatility is rarely significant. Under the PMG estimation, there is no long-run effect for Model 1b, while the negative impact manifests itself in the long-run for Model 1c, meaning that the counter-cyclical effect of the indirect taxation contributes to the output stabilization in the long-run, while the direct taxation can be used for the output stabilization in the short-run. The result can be explained from the consumers' perspective, who rapidly perceived a fiscal direct shock

associated with a reduction of their real revenues. The indirect fiscal shock is accommodated in the long-run perspective.

We also notice that the FDI inflow has no significant effect on the output stabilization, different from the main results reported (Table 3). At the same time, while there is a large agreement between the PMG and MG estimators for Model 1b, the consensus is less strong for Model 1c.

When the investment volatility is considered as explanatory variable (Models 2), we see that generally (3 out of the 4 cases under the PMG and MG estimations), a reduction in the FDI inflow volatility contributes to the macroeconomic stabilization, as expected. Although the sign of the fiscal burden is negative in all the cases, only for two estimations the effect is negative (Model 2b – MG and Model 2c – PMG).

Overall, we can conclude that the counter-cyclical fiscal policies and FDI inflow contribute to the output stabilization in the selected Euro area countries. Nevertheless, these results should be considered with caution, given the fact that there is no strong agreement between the PMG and the MG estimations. In addition, the findings are sensitive to the way the tax burden is measured. While the counter-cyclical effect of the indirect taxation manifests especially in the long-run, we notice that the direct taxation contributes to the output stabilization in particular in the short-run.

6. CONCLUSIONS

A panel data analysis was performed for 9 countries over the timespan 1980-2014, in order to investigate the effect of counter-cyclical fiscal policies and of FDI inflows on output stabilization. The PMG results show that a counter-cyclical fiscal policy and increased FDI inflows positively influence the output stabilization. However, these findings are not confirmed by the MG estimator.

Furthermore, it was discovered that FDI inflow stabilization contributes to the output stabilization. Nonetheless, these results are sensitive to the way the tax burden is measured. Even if the findings are not very robust, they confirmed the economic intuition. Therefore, in order to achieve the macroeconomic stabilization, policymakers should focus not only on structural reforms designed for the long run, but also on macroeconomic policies which allow both a short- and a long-run

stabilization. Applying counter-cyclical fiscal policies and encouraging FDI inflows help to achieve output stabilization.

Our study can be developed in order to include several control variables, reported as determinant factors of output stabilization in previous works. Future developments should also address the endogeneity issues which can be noticed in the macroeconomic stabilization-FDI inflows relationship. As several recent studies underline (e.g. Chenaf-Nicet and Rougier, 2016), a reduced output volatility represents a pre-condition for FDI entrance.

ACKNOWLEDGEMENTS

This work was supported by a grant of the Romanian National Authority for Scientific Research and Innovation, CNCS – UEFISCDI, project number PN-II-RU-TE-2014-4-1760.

REFERENCES

1. Ahmed A.D. and S. Suardi [2009], “Macroeconomic volatility, trade and financial liberalization in Africa”, *World Development*, 37, 1623-1636.
2. Albuлесcu C.T. and D. Goyeau [2008], “Produits dérivés et volatilité de l’activité économique”, *Economies et Sociétés*, Hors-série – ‘Globalisation, gouvernance et innovation’, HS n°42, XLII-8, 1489-1511.
3. Alper C.E. [2002], “Business cycles, excess volatility and capital flows: Evidence from Mexico and Turkey”, *Russian and East European Finance and Trade*, 38, 22-54.
4. Arias A., Hansen, G.D. and L.E. Ohanian [2007], “Why Have Business Cycle fluctuations become less volatile?”, *Economic Theory*, 32, 43-58.
5. Bekaert G., Harvey, C.R. and C. Lundblad [2006], “Growth Volatility and Financial Liberalization”, *Journal of International Money and Finance*, 25, 370-403.
6. Blackburne III E.F. and M.W. Frank [2007], Estimation of nonstationary heterogeneous panels, *The Stata Journal*, 7, 197-208.
7. Blanchard O. and J. Simon [2001], “The long and large decline in U.S. output volatility”, *Brookings Papers on Economic Activity*, 1, 135-174.
8. Boivin J. and M. Giannoni [2006], “Has Monetary Policy Become More Effective?”, *Review of Economics and Statistics*, 88, 445-462.
9. Buch C.M., Doepke J. and C. Pierdzioch [2005], “Financial Openness and Business Cycle Volatility”, *Journal of International Money and Finance*, 24, 744-765.
10. Chenaf-Nicet D. and E. Rougier [2016], “The effect of macroeconomic instability on FDI flows: A gravity estimation of the impact of regional integration in the case of Euro-Mediterranean agreements”, *International Economics*, 145, 66-91.
11. Cogley T. and T.J. Sargent [2001], “Evolving post-World War II U.S. inflation dynamics”. In *NBER Macroeconomics Annual 2001*. Cambridge, MA: The MIT Press, pp. 331-372.

12. Ćorić B. and G. Pugh [2013], Foreign direct investment and output growth volatility: A worldwide analysis, *International Review of Economics and Finance*, 25, 260-271.
13. Davis S.J. and J.A. Kahn [2008], "Interpreting the Great Moderation: Changes in the Volatility of Economic Activity at the Macro and Micro Levels", *Journal of Economic Perspectives*, 22, 155-180.
14. Debrun X. and R. Kapoor [2010], "Fiscal Policy and Macroeconomic Stability: Automatic Stabilizers Work, Always and Everywhere", *IMF Working Papers*, no. 10/111.
15. De Souza L.V. [2004], "Financial Liberalization and Business Cycles: The experience of Countries in the Baltics and Central Eastern Europe", *Deutsche Bundesbank Discussion Paper*, no. 23.
16. Dynan K.E., Elmendorf D.W. and D.E. Sichel [2006], "Can Financial Innovation Help to Explain the Reduced Volatility of Economic Activity?", *Journal of Monetary Economics*, 53, 123-150.
17. Fatás A. and I. Mihov [2003], "The Case for Restricting Fiscal Policy Discretion", *Quarterly Journal of Economics*, 118, 1419-1447.
18. Frees E.W. [1995], "Assessing cross-sectional correlation in panel data", *Journal of Econometrics*, 69, 393-414.
19. Friedman, M. [1937], "The use of ranks to avoid the assumption of normality implicit in the analysis of variance", *Journal of the American Statistical Association*, 32, 675-701.
20. Furceri D. [2009], "Fiscal Convergence, Business Cycle Volatility, and Growth", *Review of International Economics*, 17, 615-630.
21. Guay W. [1999], "The Impact of Derivatives on Firm Risk: An empirical Examination of New Derivatives Users", *Journal of Accounting and Economics*, 26, 319-351.
22. Hegerty S.W. [2014], Do International Capital Flows Worsen Macroeconomic Volatility in Transition Economies? *Bulletin of Applied Economics*, 1, 1-13.
23. Issing O. [2005], "The role of fiscal and monetary policies in the stabilisation of the economic cycle", Speech by Otmar Issing, *International Conference "Stability and Economic Growth: The Role of the Central Bank"*, Mexico City, 14 November 2005. Available at: <https://www.ecb.europa.eu/press/key/date/2005/html/sp051114.en.html>
24. Jermann U. and V. Quadrini [2006], "Financial Innovations and Macroeconomic Volatility", *NBER Working Papers*, no. 12308
25. Kim C.J. and C.R. Nelson [1999], "Has the US Economy Become More Stable, A Bayesian Approach Based on a Switching Model of Business Cycle", *Review of Economics and Statistics*, 81, 608-616.
26. Kose M.A., Prasad E.S., Rogoff K. and S.-J. Wei [2006], "Financial globalization: A reappraisal", *IMF Working Papers*, no. 06/189.
27. Kose M.A., Prasad E.S. and M.E. Terrones [2003], "Financial integration and macroeconomic volatility", *IMF Staff Papers*, Special Issue, 50, 119-142.
28. Kumhof M. and D. Laxto [2009], "Simple, Implementable Fiscal Policy Rules", *IMF Working Papers*, no. 09/76
29. McConnell M.M. and G. Perez-Quiros [2000], "Output Fluctuations in the United-States: What has changed since the early 1980's", *American Economic Review*, 90, 1464-1476.
30. Mishkin F.S. [2008], "How should we respond to asset price bubbles?", *Banque de France Financial Stability Review - 'Valuation and Financial Stability'*, 12, 65-74.

31. Pesaran M.H. [2004], "General Diagnostic Tests for Cross Section Dependence in Panels", *Cambridge Working Papers in Economics*, no. 0435.
32. Pesaran M.H. [2007], "A Simple Panel Unit Root Test in the Presence of Cross-Section Dependence", *Journal of Applied Econometrics*, 22, 265-312.
33. Pesaran M.H., Shin Y. and R.P. Smith [1997], "Pooled mean group estimation of dynamic heterogeneous panels", *Journal of the American Statistical Association*, 94, 621-634.
34. Pesaran M.H., and R.P. Smith [1995], "Estimating long-run relationships from dynamic heterogeneous panels", *Journal of Econometrics*, 68, 79-113.
35. Portes L.S.V. [2007], "Aggregate gains of international diversification through foreign direct investment: An inquiry into the moderation of U.S. business cycles", *Global Economy Journal*, 7, 1-36.
36. Posch O. [2011], "Explaining output volatility: The case of taxation", *Journal of Public Economics*, 95, 1589-1606.
37. Stiroh K.J. [2009], "Volatility Accounting: A Production Perspective on Increased Economic Stability", *Journal of the European Economic Association*, 7, 671-696.
38. Stock J.H. and M.W. Watson [2003], "Has the Business Cycle Changed? Evidence and Explanations". In *NBER Macroeconomics Annual 2002*, Vol. 17 (Eds. Gertler, M. and K. Rogoff), Cambridge, MA: MIT Press, pp. 159-218.
39. Taylor J.B. [1999], "Introduction to "Monetary Policy Rules"". In *Monetary Policy Rules* (Ed. Taylor J.B.), Chicago: University of Chicago Press, pp. 1-14.



THE IMPACT OF LEVERAGE ON FIRM GROWTH. EMPIRICAL EVIDENCE FROM ROMANIAN LISTED FIRMS

SORIN GABRIEL ANTON*

Abstract: *The aim of the paper is to assess the impact of leverage on firm growth in periods of economic growth and economic uncertainty. We employ a sample of Romanian listed firms over the period 2001-2011 and several alternative measures for firm growth (i.e. sales growth, assets growth, and employment growth). The results of fixed effects regression model show that the leverage has a positive effect on firm growth. Furthermore, profitability was found to positively influence the firm growth, while older firms saw a faster increase in assets and sales. Within this particular sample, firm size appears to constrain growth.*

Keywords: *Firm growth, financial structure, leverage, Romania, listed firms.*

JEL Classification: *G32, L25.*

1. INTRODUCTION

In Romania, leverage has risen sharply after 2000. According to data provide by the National Bank of Romania (Neagu et al., 2016), Romanian firms are financing their activity mainly using debt. The proportion of debt in total assets has increased from 20 % in 1994 to 63 % in 2014. Romanian firms have one of the highest leverage compared to other firms from Central and Eastern Europe (CEE) or from the Euro zone. For our panel data-set of listed Romanian firms we found an increase of leverage ratio from 11 % in 2001 to around 45 % in 2011. Despite this evolution, little is known about the effect of leverage on the dynamics of Romanian firms.

* Sorin Gabriel Anton, Alexandru Ioan Cuza University of Iași, Faculty of Economics and Business Administration, Iași, Romania, sorin.anton@uaic.ro

Previous studies focused mostly on the effect of leverage on investment decisions (Botoc and Enache, 2013) and on the performance (Botoc, 2013; Mihai and Mihai, 2012; Vintila et al., 2014) of the Romanian listed firms. Another strand of the literature focused on the factors determining the Romanian firms' target capital structure and adjustment speed to the target capital structure (Nivorozhkin, 2005; Brendea, 2014). While there is no empirical evidence on the relationship between leverage and firm growth in Romania, this paper aims to fill this gap in literature by providing insights on this topic.

The aim of the paper is to investigate the impact of leverage on firm growth during periods of economic growth and also of economic uncertainty. Using a sample of Romanian listed firms over the period 2001-2011, we found that leverage has a positive effect on firm growth. We contribute to the extant literature in three ways. Firstly, we provide insights on the relationship between the firm financing and firm growth in a transition economy from CEE using a sample of listed firms. Secondly, contrary to most of the previous studies, we employ three alternative growth measures to test the robustness of our findings. Thirdly, by employing a longer period of analysis, we assess the impact of leverage on firm growth in different phases of the economic cycle.

The remainder of this paper is structured as follows. Section 2 briefly reviews the existing literature on the relationship between firm growth and financial structure in CEE countries. Section 3 presents the variables and methodology employed in the paper. Section 4 discusses the empirical results, while the last section concludes.

2. LITERATURE REVIEW

A plethora of theoretical and empirical papers found that firm value is strongly affected by its capital structure. Most of the previous studies focused either on firms from developed countries (Molinari *et al.*, 2016; Donati, 2016; Dimelis *et al.*, 2016) or small and medium sized enterprises (SMEs) (Chittenden *et al.*, 1996; Carpenter and Petersen, 2002; Honjo and Harada, 2006; Tsuruta, 2015).

A large group of studies (Heshmati, 2001; Honjo and Harada, 2006; Hermelo and Vassolo, 2007; Huynh and Petrunia, 2010)) has found a positive effect of leverage on firm growth (measured in absolute or relative terms, using

different variables and time spans). Other studies (Lang et al., 1996) reported statistically significant negative effect of leverage on firm growth.

However, there are only few papers on this topic in the context of transition economies from CEE. Using a sample of firms operating in the Baltic countries (Estonia, Latvia, and Lithuania) over the period 2001-2008, Avama (2011) found a positive relationship between leverage and sales growth for local companies, while the impact of leverage on growth of multinational companies is insignificant. Mateev and Anastasov (2010) employed an extensive sample of 560 SMEs from 6 CEE countries (Bulgaria, Croatia, the Czech Republic, Poland, Romania, and Serbia) over the period 2001-2005 and found that leverage has a positive impact on sales growth.

To the best of our knowledge, there is no study on the relationship between leverage and firm growth on a sample of Romanian listed firms. Previous papers tested the effects of leverage on different financial decisions or on the profitability of Romanian listed firms. Using a sample of 67 firms listed on the Bucharest Stock Exchange, Botoc and Enache (2013) analysed the relationship between investment decisions, financial leverage, and growth opportunities. The authors found that higher debt has a negative effect on investment decisions. Botoc (2013) tested the effect of financial structure on the profitability of the Romanian listed firms over the period 2001-2011. The results showed that leverage negatively affects the profitability of the Romanian firms, which is consistent with the pecking order theory. Vintilă et al. (2014) confirmed the above mentioned findings by studying a sample of 40 Romanian listed firms over the period 2010-2012.

In order to test the relationship between leverage and firm growth, we use a sample of listed Romanian firms over the period 2001-2011 for several reasons. Firstly, previous studies have mostly focused on large firms or SMEs from developed economies. Secondly, following Botoc (2013), we have chosen to study listed firms given the reliability of their financial statements. Thirdly, Romanian firms have been subject to important financial constraints in the light of the latest global financial crisis, meaning that their growth may be affected by the lack of external financing. Fourthly, the Romanian listed firms are worthy of study because they operate in a banking-oriented financial system common in the European Union. The results may be of interest for other listed firms located in countries with similar financial systems, academics and policy makers. Knowing

the effects of debt on sales and job growth, shareholders and managers can adopt better financing and investment decisions. Public authorities, at local and central level, can elaborate better public policies aimed to support firm growth and, thus, job creation and economic growth.

3. DATA AND METHODOLOGY

Our analysis uses a sample of 63 Romanian firms listed on the Bucharest Stock Exchange. Financial data was manually collected from the firms' annual reports over the period 2001-2011. During this time span all the firms in the sample used the same accounting standard (i.e. Romanian Accounting Standard). The sample was restricted to the period 2001-2011 due to the fact that after 2011, listed firms in Romania were expected to use the International Financial Reporting Standards (IFRS). We excluded from our sample financial firms (banks and investment funds) as their financial structure is determined by other factors (e.g., high level of regulation), as well as firms with incomplete data. As a result of these restrictions, our final sample includes 571 firm year observations over the period 2001-2011.

The model is set up with the following specification:

$$\begin{aligned}
 \mathbf{FIRM\ GROWTH}_{i,t} &= \beta_0 + \beta_1 * \mathbf{LEVE}_{i,t-1} + \beta_2 * \mathbf{FIRM\ SIZE}_{i,t-1} + \beta_3 \\
 &* \mathbf{AGE}_{i,t-1} + \beta_4 * \mathbf{CURR_RATIO}_{i,t-1} + \beta_5 * \mathbf{ROA}_{i,t-1} + \beta_6 \\
 &* \mathbf{FIN_CONS}_{i,t-1} + \beta_7 * \mathbf{INV_OPP}_{i,t-1} + u_i + \varepsilon_{i,t} \quad (1)
 \end{aligned}$$

where:

- $\mathbf{FIRM\ GROWTH}_{i,t}$ denotes growth rate for firm i in year t ($i= 1, \dots, N$; $t = 1, \dots, T$) computed using three different firm-specific variables;
- \mathbf{LEVE} , our independent variables of interest, measure the degree of indebtedness;
- $\mathbf{FIRM\ SIZE}$, \mathbf{AGE} , $\mathbf{CURR_RATIO}$, \mathbf{ROA} , $\mathbf{FIN_CONS}$, and $\mathbf{INV_OPP}$ represent control variables for firm i at time t ;
- $\beta_0, \beta_1, \dots, \beta_7$ are parameters to be estimated;
- u_i are firm-specific fixed effects;
- $\varepsilon_{i,t}$ is an idiosyncratic disturbance term.

Following Honjo and Harada (2006), in order to limit the potential endogeneity issues (i.e. reverse causality among variables) the firm-specific variables are lagged 1 year.

Variable selection was influenced by the existing empirical studies in the area (Honjo and Harada, 2006; Avarmaa, 2001; Kiani et al., 2012).

In order to test the robustness of our findings, we employ several alternative measures of firm growth: employment growth, sales growth, and total assets growth. Growth is measured as the logarithmic difference in the number of employees/sales/assets in two consecutive years. Most of the previous studies used only sales growth and/or employment growth as proxy for firm growth. Table 1 presents an overview of the dependent and independent variables employed in the models.

Table 1 Variables description

Variable	Abbreviation	Description
Dependent variables		
Employment growth	GR_EMP	Log (no of employees _{i,t}) – log (no of employees _{i,t-1})
Total assets growth	GR_AS	Log (total assets _{i,t}) – log (total assets _{i,t-1})
Sales growth	GR_SA	Log (sales _{i,t}) – log (sales _{i,t-1})
Independent variables		
Leverage	LEVE	Total liabilities/Total assets
Firm size		
1. Number of employees	EMP	1. Log of number of employees
2. Total assets	TA	2. Log of total assets
3. Sales	SA	3. Log of sales
Firm age	AGE	Log of firm age
Current ratio	CURR_RATIO	Current assets/Current liabilities
Return on assets	ROA	Earnings before taxes (EBT)/Total assets
Financial constraints (dummy variable)	FIN_CONS	1 if the firm paid a dividend in the current year and 0 otherwise.
Investment opportunities	INV_OPP	Capital expenditures over total sales

Following Rajan and Zingales (1995), we compute leverage as the ratio of total liabilities to total assets. This broad definition has two main advantages: (1) it recognizes trade credit as a short term financing source and (2) it is available for all firms.

As firm-specific explanatory variables which could impact firm growth we employ firm size, age, current ratio, profitability, financial constraints, and investment opportunities. Firm size is measured alternatively by the number of employees, sales, or total assets.

Several theoretical papers (Demircuc-Kunt and Maksimovic (1998); Gulati and Zantout (1997)) argue that (previous year(s)) firm profitability is an important determinant of the firm growth. Numerous papers have used ROA and/or ROE as explanatory variables in firm growth models.

As already highlighted by Dinh et al. (2010), access to finance is the most binding constraint for firm growth in developing countries. To capture the effects of financial constraints on firm growth, we employ a dividend dummy that will take value 1, if the firm paid dividends in the current year, and 0 otherwise.

From the previous empirical evidence, we posit the following research hypotheses:

H1: Leverage is positively associated with firm growth.

H2: Firm size and firm growth are negatively related.

Due to the fact that our sample includes observations of 63 non-financial firms over 11 years, panel data analysis techniques can be used. The panel regression analysis has the advantage of controlling for unobservable firm characteristics and also for missing values which may influence firm growth (Brooks, 2008).

4. EMPIRICAL RESULTS

Table 2 shows the descriptive statistics for the full unbalanced panel dataset with 63 firms and 571 observations. Outliers have been eliminated by winsorizing observations in the top and bottom 1 percentile. The dependent variables display a wide variation across firms and over time. In Table 2, the means of GR_AS and GR_SA are approximately 13.1 % and 8.4 %. On average, firm growth increases when we use assets growth and sales growth as proxies. These results correspond to the expansion phase recorded by the Romanian economy during the period 2001-2008. The average growth in

negative (-0.077) when we use the number of employees to measure growth. The mean value for leverage (0.407) is in line with other previously reported values for Romanian listed firms (Botoc, 2013; Brenda, 2014).

Table 2 Descriptive statistics

Variable	Mean	S. D.	Minimum	Maximum	Obs.
GR_EMP	-0.077	0.263	-2.913	1.407	571
GR_AS	0.131	0.306	-1.827	2.322	571
GR_SA	0.084	0.404	-2.449	3.109	571
LEVE	0.407	0.268	0.000	1.774	571
EMP	6.489	1.235	2.639	11.057	571
TA	11.737	1.533	8.290	17.337	571
SALES	11.417	1.548	6.573	16.634	571
AGE	3.351	0.679	0.693	4.727	571
CURR_RATIO	2.168	2.623	0.160	28.962	571
ROA	3.255	10.423	-65.454	82.257	571
FIN_CONS	0.284	0.451	0.000	1.000	571
INVOPP	0.030	0.052	-0.044	0.480	571

Before running the models, we conducted several tests. First, we tested for correlation across variables. Table A1 (see Appendix) presents the correlation matrix of dependent and independent variables. We notice a low level of correlation among the dependent variables – various measures of firm growth that will be used later on alternatively in the models. As the correlation among independent variable is moderate, we consider that multicollinearity is unlikely to be a problem in our models.

To choose between fixed-effects model and random-effects model we used the Hausman test. We tested the following hypotheses: H_0 = random effects and H_1 = fixed effects. According to the results (Table 3), H_0 is rejected ($p < 0.0001$), meaning that the fixed effects specification is to be preferred. The advantage of fixed effects panel data model is that it controls for time-invariant, firm-specific characteristics that affect firm growth, but are not captured by firm-level control variables.

Table 3 Results for the Hausman test

Correlated Random Effects - Hausman Test			
Equation: EQ01 (GR_EM dependent variable)			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	18.080144	7	0.0000

Equation: EQ02 (GR_AS dependent variable)			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	68.165037	7	0.0000
Equation: EQ03 (GR_SA dependent variable)			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	115.083557	7	0.0000

As already mentioned, in order to investigate the effect of leverage on different measures of firm growth, we employ three models. Table 4 reports the results of the fixed effects models. The first model (column two) uses employment growth as dependent variable. The second model (column three) employs total assets growth, while the third model (column four) uses sales growth as proxy for firm growth.

Table 4 *Impact of leverage on firm growth (2001-2011)*

Variables (1)	Model 1-GR_EMP (2)	Model 2 – GR_AS (3)	Model 3 –GR_SA (4)
C	1.462761 (0.387130)	1.646042 (0.336371)	3.889618 (0.475439)
LEVE (-1)	0.168640** (0.080576)	0.207149** (0.091033)	0.291686** (0.124412)
EMP (-1)	-0.108878*** (0.032835)	-	-
TA (-1)	-	-0.215446*** (0.026114)	-
SALES (-1)	-	-	-0.385029*** (0.038140)
AGE (-1)	-0.269079*** (0.087136)	0.273316** (0.115807)	0.133025* (0.146493)
CURR_RATIO (-1)	-0.004133 (0.006937)	-0.003293 (0.007800)	-0.001270 (0.010466)
ROA (-1)	0.002712** (0.001357)	0.004611*** (0.001528)	0.005544*** (0.002098)
FIN_CONS (-1)	0.084532** (0.033784)	-0.003038 (0.037976)	0.017878 (0.050855)
INVOPP (-1)	-0.937815*** (0.309742)	-0.412381 (0.344234)	-0.482547 (0.460862)
R-squared	0.263360	0.289292	0.289894
Adjusted R-squared	0.154287	0.184954	0.185644
Total panel (unbalanced) observations	536	540	540

Standard error in parentheses

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

In all models, our results show a positive effect of leverage on firm growth. Hypothesis 1 is accepted at a significance level of 5 %. Our results confirm the findings of the previous studies focused on firms operating in developed countries (Honjo and Harada, 2006; Huynh and Petrunia, 2010). As the local capital market is still underdeveloped, Romanian firms from our sample can develop their business only if they are able to obtain debt financing. This issue is common for other firms operating in CEE countries (Avarmaa, 2011).

We also found a negative relationship between firm size and firm growth. Hypothesis 2 is accepted on our sample at a significance level of 1 %. Our results suggest that Gibrat's law (or Law of Proportional Effect) does not hold in this sample of firms.

The relationship between firm age and growth is significant statistically in all three models, but the signs are mixed. On the one hand, age has a negative effect on the employment growth, suggesting that young firms are likely to hire more people. On the other hand, age is positively related to sales and total assets growth. These results indicate that older firms are likely to increase faster their assets and sales.

Our results show a positive relationship between ROA and firm growth, suggesting that firm growth in Romania is financed by increasing firm profitability. All other firm-level variables (financial constraints, investment opportunities, and current ratio) are not statistically significant in all three models.

In order to test the robustness of our findings, we winsorize all the observations with leverage above 1. We ran again the models and the results (available upon request) remained broadly consistent with the previous findings.

5. CONCLUSIONS

The aim of the paper is to assess the effect of leverage on firm growth on a sample of Romanian non-financial firms listed on the Bucharest Stock Exchange. As firm specific variables that can influence firm growth, we employ firm size, age, current ratio, return on assets, financial constraints, and investment opportunities.

Using a fixed effects regression model on firm level data over the period 2001-2011, we found that leverage exerts a positive effect on firm growth. According to our models, highly leveraged firms grow faster as lower leveraged firms during the period examined. Our results stand for various measures of firm growth (i.e. sales growth, assets growth, and employment growth).

Estimation results suggest a statistically significant relationship between firm size and firm growth. Larger firms grow slower, while smaller firms grow faster. Moreover, we found that profitability positively influences firm growth and older firms increase faster their assets and sales.

This study presents some limitations. Firstly, as most of the previous studies, we consider total growth (i.e., the sum of organic and acquired growth,) without taking into account mergers and acquisitions given the lack of information on this topic. Secondly, as only listed firms are included in our analysis, the findings cannot be generalized to all Romanian firms.

REFERENCES

1. Avarmaa, M., "Does Leverage Affect Company Growth in the Baltic Countries?", 2011 International Conference on Information and Finance (IPEDR), vol.21, 2011, IACSIT Press, Singapore, pp. 90-95.
2. Botoc, C, Enache, C., Underinvestment Problem: Romanian Evidence, *Annales Universitatis Apulensis Series Oeconomica*, 15(2), 2013, 552-560.
3. Boțoc C., 2013. Profitability - Capital Structure trade off: case of publicly Romanian companies, *The Annals of The University of Oradea, Economic Sciences*, Tom XXII, 1, 409-415.
4. Brendea, G., Financing Behavior of Romanian Listed Firms in Adjusting to the Target Capital Structure, *Finance a úvěr-Czech Journal of Economics and Finance*, 64, 2014, no. 4, pp. 312-329.
5. Brooks, C. (2008), *Introductory Econometrics for Finance*, Second Edition, Cambridge University Press, Cambridge.
6. Carpenter, R.E. and Petersen, B.C., Is the growth of small firms constrained by internal finance? *Review of Economics and Statistics*, 2002, 84, 298–309.
7. Chittenden, F., Hall, G. and Hutchinson, P., Small firm growth, access to capital markets and financial structure: Review of issues and an empirical observation. *Small Business Economics*, 1996, 8(1), 59–67.
8. Demirguc-Kunt, A. and Maksimovic, V., Law, finance, and firm growth. *Journal of Finance*, 1998, 53, 2107–2137.
9. Dimelis, S., Giotopoulos, I. & Louri, H., 2016, "Can Firms Grow Without Credit? A Quantile Panel Analysis in the Euro Area", *Journal of Industry, Competition and Trade*, doi:10.1007/s10842-016-0216-1.

10. Dinh, H., Mavridis, D., Nguyen, H., “The Binding Constraint on Firms’ Growth in Developing Countries”, *The World Bank. Policy Research Working Paper*. 2010, 5485.
11. Donati, C. (2016), Firm growth and liquidity constraints: evidence from the manufacturing and service sectors in Italy, *Applied Economics*, 48:20, 1881-1892, DOI: 10.1080/00036846.2015.1109044.
12. Gulati, D. and Zantout, Z., Inflation, capital structure, and immunization of the firm’s growth potential. *Journal of Financial and Strategic Decisions*, 1997, 10(1), 77–90.
13. Honjo, Y. & Harada, N., “SME Policy, Financial Structure and Firm Growth: Evidence from Japan”, *Small Business Economics* (2006) 27: 289–300, DOI 10.1007/s11187-005-6703-0.
14. Hermelo, F., Vassolo, R., The Determinants of Firm’s Growth: an Empirical Examination. *Revista Abante*. 2007, 10(1): 3-20.
15. Heshmati, H., On the Growth of Micro and Small Firms: Evidence from Sweden. *Small Business Economics*. 2001, 17 (3): 213-228.
16. Huynh, K., Petrunia, R., Age effects, leverage and firm growth. *Journal of Economic Dynamics & Control*. 2010, 34(5): 1003-1013.
17. Kiani, K.M., Chen, E. H. & Madjd-Sadjadi, Z. (2012), “Financial factors and firm growth: evidence from financial data on Taiwanese firms”, *Quantitative Finance*, 12:8, 1299-1314, DOI: 10.1080/14697688.2011.556143
18. Lang, L., E. Ofek and R. M. Stulz, 1996, Leverage, Investment, and Firm Growth, *Journal of Financial Economics* 40, 3–29.
19. Mateev, M. Anastasov, Y., “Determinants of small and medium sized fast growing enterprises in Central and Eastern Europe: A panel data analysis, *Financial Theory and Practice*, 2010, 34 (3), pp. 269-295.
20. Molinari, M., Giannangeli, S. and Fagiolo, G. (2016), Financial Structure and Corporate Growth: Evidence from Italian Panel Data. *Economic Notes*, 45: 303–325. doi:10.1111/ecno.12059.
21. Mihai I.O., C. Mihai (2012), “Ultimate Owner and Firm Performance - Evidence from Romanian Mining and Quarrying Listed Firms”, *Annals of “Dunarea de Jos” University of Galati, Economics and Applied Informatics*, no. 2.
22. Neagu, F., Dragu, F., Costeiu, A., 2016, “După 20 de ani: schimbări structurale în economia României în primele decenii postdecembriste”, *Banca Națională a României, Caiete de studii* Nr. 42.
23. Nivorozhkin E (2005): Financing choices of firms in EU accession countries. *Emerging Markets Review*, 6:138–169.
24. Rajan, R. G. and Zingales, L. (1995), What Do We Know about Capital Structure? Some Evidence from International Data. *The Journal of Finance*, 50: 1421–1460. doi:10.1111/j.1540-6261.1995.tb05184.x.
25. Tsuruta, D., Leverage and firm performance of small businesses: evidence from Japan, *Small Business Economics* (2015) 44:385–410, DOI 10.1007/s11187-014-9601-5.
26. Vintilă, G., Nenu, E. A., Gherghina, S.C., Empirical Research towards the Factors Influencing Corporate Financial Performance on the Bucharest Stock Exchange, *Scientific Annals of the “Alexandru Ioan Cuza” University of Iași Economic Sciences* 61 (2), 2014, pp. 219-233. DOI 10.2478/aicue-2014-0009.

APPENDIX 1.**Tables A1** *Correlation matrix of variables*

	GR_EMP	GR_AS	GR_SA	LEVE	EMP	TA	SALES	AGE	CURR_RATIO	ROA	FIN_CONS	INVOPP
GR_EMP	1											
GR_AS	0.263	1										
GR_SA	0.432	0.256	1									
LEVE	0.044	-0.092	0.065	1								
EMP	0.214	0.027	0.086	0.099	1							
TA	0.034	0.040	-0.001	0.092	0.638	1						
SALES	0.128	0.002	0.175	0.240	0.699	0.880	1					
AGE	-0.101	-0.093	-0.049	-0.024	-0.113	-0.135	-0.111	1				
CURR_RATIO	-0.087	-0.006	-0.063	-0.445	-0.212	-0.085	-0.204	-0.007	1			
ROA	0.193	0.159	0.180	-0.410	0.011	-0.092	-0.007	-0.050	0.137	1		
FIN_CONS	0.104	0.017	0.063	-0.230	0.151	0.117	0.171	-0.055	0.059	0.325	1	
INVOPP	-0.152	-0.182	-0.152	-0.122	-0.010	0.260	0.066	-0.107	0.165	-0.060	0.063	1



EXAMINING THE INFLUENCE OF SOME MACROECONOMIC FACTORS ON FOREIGN DIRECT INVESTMENTS

ALINA ȚARAN*, MARILENA MIRONIUC**, MARIA-CARMEN HUIAN***

Abstract: *The aim of this paper is to study the determinants of inward foreign direct investments (FDI) at a multi-regional and European level, while focusing on a series of macroeconomic factors, in the FDI receiving countries. Multiple regression analysis and ANOVA analysis of variance are applied. Findings show that the degree of economic freedom is a significant factor of multi-regional inward FDI during the period 2012-2015, but this effect is caused only fiscal freedom, government spending, monetary, trade, and financial freedom. For the more economically and politically stable European countries, the level of economic freedom does not influence their inward FDI. At the same time, market size and level of economic development of the host countries have a positive influence on FDI inflows, while financial markets development, workforce availability and adoption of the International Financial Reporting Standards (IFRS) are not significant determinants.*

Keywords: *foreign direct investments, economic freedom, economic growth, IFRS adoption*

JEL Classification: *F23, M48, M21*

1. INTRODUCTION

Foreign direct investments (FDI) are a formally accepted macroeconomic measure of the productive activity of multinational corporations in foreign countries (Roach (2005); Alfaro (2016)). Being a considerable source of external

* Alina Țaran Alexandru Ioan Cuza University of Iași, Faculty of Economics and Business Administration, Carol I Boulevard, No 22, Iasi, Romania, taran.alina.ro@gmail.com

** Marilena Mironiuc, Alexandru Ioan Cuza University of Iași, Faculty of Economics and Business Administration, Carol I Boulevard, No 22, Iasi, Romania, marilena@uaic.ro

*** Maria-Carmen Huian, Alexandru Ioan Cuza University of Iași, Faculty of Economics and Business Administration, Carol I Boulevard, No 22, Iasi, Romania, maria.huian@uaic.ro

finance with numerous positive externalities (Sghaier and Abida (2013), they are regarded as strategic investments (Alguacil et al. (2011), with influence on productivity and competitiveness of the receiving countries (Javorcik and Spatareanu (2009); Merlevede et al. (2014). According to the international organizations which provide data (i.e. UNCTAD, OECD, IMF, World Bank), FDI is defined as investments involving a long-term relationship based on the ownership of at least 10 percent of the ordinary shares or voting rights of a company by a foreign investing entity. Consisting of equity investments, reinvested earnings or intra-company loans, FDI is seen as having a direct or indirect contribution to economic growth of the receiving countries (Quazi (2007); Wang et al. (2013); Sghaier and Abida (2013); Nobakht and Madani (2014); Alfaro (2016); Narula and Pineli (2016)), governments competing in incentives to attract them (Ramasamy and Yeung (2010); Boateng et al. (2015).

Many studies focused on the determinant factors of FDI and, especially on their effects on host economies, resulting in contradictory results. (Merlevede et al. (2014); Boateng et al. (2015); Narula and Pineli (2016)). Thus, there is a recognized need of research on this subject in order to reveal the sensitive and changing aspects of FDI patterns which may help finding new valuable strategies for policy-makers seeking to attract FDI and to maximize their spillovers (Narula and Pineli (2016)).

This paper aims to provide an actual assessment of the determinants of FDI. We analyse the recent tendencies of FDI on 75 countries during the period 2012–2015, taking into account the influence of institutional and macroeconomic factors mainly expressed by the degree of economic freedom of the receiving countries or by other indicators, and the significance of the applicable accounting principles of the host countries, International Financial Reporting Standards (IFRS) or non-IFRS.

This study distinguishes itself through the new dataset used in the empirical analysis, the specific selection of variables and the comparative approach: economic freedom index and individual components of the economic freedom index; multi-regional level of analysis and European level, offering an actual perspective of the main country-specific factors that influence the internationalisation decision of multinational corporations.

The paper is structured as follows: Section 3 investigates the main approaches regarding FDI determinants and their benefits for the global economy; .

Section 4 discusses the results, and, Section 5 concludes providing recommendations for future research.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

It is considered that FDIs play an important role in the global economy because they have effects on both source and host entities, and also on their home and-receiving countries.

Regarding investing entities, it is generally expected that they benefit from access to raw materials and natural resources, lower costs, market demand or higher productive efficiency (Lyroudi et al. (2004); Roach (2007); Kang and Jiang (2012); Nakano and Purevdorj (2014), enhancing their development and performance. However, in their internationalisation process, multinational corporations also face difficulties due to various economic conditions and regulations, cultural perspective or geographic distance from their country of origin (Rugman et al. (2011); Nakano and Purevdorj (2014). Thus, in the long run, gained competitive advantages should overcome additional costs caused by the liability of foreignness in order for multinational corporations to efficiently value their overseas activity.

From the perspective of FDI-receiving firms, foreign influence brings about financial support, technological progress, managerial know how, employee training, new distribution channels or other knowledge-related links (Quazi (2007); Lee and Rugman (2012); Sghaier and Abida (2013); Narula and Pineli (2016)). Furthermore, these advantages are expanded on the local economic environment, strengthening market competition, innovation and labour productivity, increasing global market access, creating job opportunities, generating fiscal earnings, reducing income and technology gaps between the host and receiving economy, and in fact, directly or indirectly, enhancing economic growth (Quazi(2007); Wang et al. (2013); Nobakht and Madani (2014); Narula and Pineli (2016). Thus, FDIs become an attractive and efficient development strategy, especially for developing countries (Narula and Pineli (2016).

Multinational corporations and, in fact, foreign investments are not regarded only in a positive light. Some argue they have negative influence on host economies and on the natural environment, affecting local cultural identity, labour conditions

and employment level, local politics or domestic markets and domestic firms (Chanda (2003); Chandler and Mazlish (2005); Roach (2007); Wang et al. (2013)).

Nevertheless, the FDIs' benefits depend on the capacity of host countries to take advantage of the attracted foreign capital (Crespo and Fontoura (2007); Azman-Saini et al. (2010); Alfaro (2016)). According to Onwuka and Chaiechi (2013), the positive effects may become effective if the receiving countries have adequate capacity to absorb (i.e. developed financial markets or qualified human capital). A well-functioning financial system is playing a significant intermediary role in enhancing positive influence on economic growth (Sghaier and Abida (2013); Nobakht and Madani (2014)). Trade liberalization has the same effect on upper and middle-income countries (Nobakht and Madani (2014)). Furthermore, the relocation decisions are also determined by the quality of local institutional factors (Wang et al., (2013); Alfaro (2016)), foreign investors being interested in the safety and security of the investments, seeking stable economic conditions, legislative transparency and trustworthy political environments. Such country-specific characteristics may explain the ambiguity existing in literature (Azman-Saini et al. (2010)).

The way in which home countries are affected by FDIs depends on investments characteristics and country-specific factors as well, principal effects being reflected on exports, total production, domestic investments or employment (Kokko, (2006); Herzer (2008)). Referring to the multiple circumstances that affect international investments, Cohen (2007) affirms that FDI flow can have positive, negative, neutral or uncertain effects on the investing and receiving economies.

Although the receiving economies are interested in attracting FDI, it is not only the quantity, but also the quality, that influences their effects on the host countries. According to Narula and Pineli (2016), multinational enterprises have multiple motivations and organisational strategies based on which they undertake investments abroad, thus defining the quality and continuity of FDI flows. Following Dunning's (year of publication ?!) theory, the purposes of internationalisation strategies of multinational firms are market advantages and market dominance, natural resources and raw materials availability, performance increase or strategic assets access (Kang and Jiang (2012)).

Investment decisions of multinational corporations take into consideration the interests of parent companies and the characteristics of host regions, in terms of cost, localization, production facilities, human capital etc. The determinants of FDI

found so far by the literature, are: market size, economic development, gross capital formation, corporate taxation, market openness, financial liberalization, trade liberalization, investment agreements, inflation, research and development capability, culture and geography, natural resources, labour costs and quality, physical infrastructure, economic stability, domestic financial system, return on investment, favourable growth perspectives, favourable investment prospects etc. (Quazi, (2007); Caetano and Caleiro (2009); Crotti et al. (2010); Ramasamy and Yeung (2010); Doytch and Eren (2012); Kang and Jiang (2012); Chen et al. (2014); Boateng et al. (2015); Economou et al. (2016)).

As economic conditions are changing over time, Boateng et al. (2015) explained that the importance of FDI determinant factors and the investments patterns are changing as well. They recognised a shift in FDI literature from a microeconomic and industry-specific perspective to a renewed interest in localisation and market aspects, investments being oriented to a favourable economic environment.

Kang and Jiang (2012) studied determinant factors of Chinese outward FDIs and found that institutional factors such as regulative, normative and cognitive systems have significant influence on internationalization decision of multinational corporations. In addition to these, but not as important and dynamic as institutional factors, economic factors (i.e. natural resources, development level of host countries) remain significant for Chinese investors. Efobi et al. (2014) consider that institutional policies related to confidence in economic stability and development of the host countries are the main determinant of FDI inflows.

Using/Based on the institutional factors, Wang et al. (2013) define the “rules of the game” in shaping foreign activities of multinational corporations. Some institutional aspects are proxied by economic freedom or other indices reported by various organizations and institutions. Generally, the concept of economic freedom defines an economic system based on private property and free markets (Lawson (2008)).

To the best of our knowledge, two sources of measuring economic freedom were found: The Heritage Foundation, which publishes annually the Economic Freedom Index, in collaboration with The Wall Street Journal, and The Fraser Institute, which determines the Economic Freedom of the World. These indices are based on a mixed assessment of quality of overall labour and property rights recognised by countries, with subcomponents referring to regulatory aspects,

governmental power, trade, market, labour or monetary policies, and property rights (The Heritage Foundation (2016)).

Quazi (2007) used the Economic Freedom Index as a proxy for domestic investment climate and proved it is a significant and robust determinant of FDI in East Asian countries, along with foreign investors' incremental knowledge about investment opportunities in host countries, return of investment, domestic demand and political instability factors. Using various components of Economic Freedom Index, Kang and Jiang (2012) proxied institutional factors from 8 Asian countries, emphasizing their relevance for the Chinese investors who sought to finance foreign productive activities. Previous studies found Economic Freedom of the World also a significant determinant of economic growth, facilitating FDI effects (Azman-Saini et al., (2010); Alguacil et al. (2011)).

Thus, notwithstanding the specificities of such indices, country-specific institutional characteristics seem to have a significant influence on the inward FDI level, reflecting the absorbing capacity. This influence is expected to be positive, a higher degree of economic freedom expressing economic and political stability, openness and a favourable business environment for foreign investments.

Another important factor of the FDI's inflows is the level of financial market development both in investing and receiving countries (Donaubauer et al., (2016)). Being an intermediary determinant of the FDI's influence on economic growth (Onwuka and Chaiechi (2013); Sghaier and Abida (2013); Nobakht and Madani (2014); Alfaro (2016) or having a direct effect on attracting foreign capital (Soumare and Tchana (2015), developed financial markets help countries benefit from FDI spillovers and enhance economic growth (Javorcik and Spatareanu (2008); Alfaro (2016)), while helping foreign companies finance investments abroad (Alfaro (2016)). Moreover, Soumare and Tchana (2015) demonstrate that there is a bilateral relationship between foreign investments and the degree of development of financial markets. As such, the financial markets development is assumed to explain the tendencies of inward FDI's, while attractin foreign investors who search for a regulated and transparent framework for their long-term investments.

According to Boateng et al. (2015) the macroeconomic determinants of the FDI are insufficiently studied. Villaverde and Maza (2012) noticed that in, the European region, inward FDI's are usually determined by the economic potential, labour market advantages, degree of technological development and market

competitiveness of the receiving countries. Alguacil et al. (2011) explain that the amount and influence of attracted foreign capital varies across countries due to the income level, thus, a better economic position would be more promising to foreign investors. Asongu and Kodila-Tedika (2015) found that the growth in domestic product and real domestic output have a positive influence on attracted FDIs from emerging economies, while Boateng et al. (2015) prove that the productive capacity of host countries is positively correlated with FDIs inflows in Norway, high values of domestic product promising market competitiveness and development. Following these findings, a higher level of economic development is expected to be more convincing for foreign companies willing operate in a flourishing business environment.

Market-seeking multinational corporations take into consideration especially the market characteristics of the regions where they decide to extend their activity (Boateng et al. (2015); Narula and Pineli (2016)), market size being the most important factor of foreign investments made by industrial companies (Ramasamy and Yeung, (2010)). Increasing the attractiveness for the FDIs, market size reflects the potential demand for the products and services provided by foreign enterprises (Cuyvers et al. (2011) ; Gauselmann and Marek (2012)). On the other hand, Villaverde and Maza (2012) found that market size does not enhance FDI inflows in Spain, suggesting that it can be justified by the strategic interests of the investments regarding exploitation of resources or other advantages, rather than market opportunities. However, generally, the market size is expected to be a representative factor of the location decision of multinational entities expanding their mostly consumer good's production and distribution activity abroad, mainly of those producing consumer goods.

It is broadly-accepted that multinational corporations are seeking for cheap labour force, but what happens with the the labour availability? In countries with high labour demand, people tend to easily accept job offers with lower benefits than in countries with more job opportunities (Boateng et al (2015)), but this assumption is not empirically validated (Gauselmann and Marek (2012); Boateng et al. (2015)). Moreover, it was affirmed that foreign companies can even determine an increase in unemployment in the host countries due to business reorganisations or technological improvements of their production lines (Wang et al. (2013)). It is possible that the number of cases in which foreign companies

reduce unemployment exceed, making human capital a strategic factor that influences foreign investments.

The extension of IFRS adoption on global level generated a great controversy regarding their influence on investment decisions of multinational corporations, especially in developing economies (Gordon et al. (2012)). Lower information processing costs, lower information asymmetry and high-quality reporting generated by the usage of the same reporting standards both in home and host countries of foreign investments were seen as favourable for FDI inflows (Márquez-Ramos (2011); Gordon et al. (2012); Aissat et al. (2013); Chen et al. (2014)).

Efobi et al. (2014) proved that IFRS adoption does not increase inward FDIs' levels. Furthermore, there are still countries which do not agree with IFRS principles (Aissat et al. (2013)). The conclusion is that, in the long term, the applicability of the same accounting principles confer a better comparability and understanding of the worldwide business activities, a fact which would be beneficial for stakeholders.

Based on such evidence, we expect that all the aforementioned factors have a positive influence on FDI inflows of the recent period. Thus, the hypothesis to be tested is the following:

H: *The degree of economic freedom, level of financial market development and of economic development, market size, workforce availability and IFRS applicability of the host countries are significant determinants of inward FDI.*

3. METHODOLOGY AND DATA

3.1. Worldwide FDI Overview

It is considered that studies regarding FDIs' determinants and their economic effects are highly important nowadays due to the increasing level of worldwide FDI flows and due to strategic policies of the host countries interested in attracting foreign capital (Azman-Saini et al. (2010)). For a better understanding of the recent evolution of FDI flows, we analysed inward FDI in comparison with real GDP evolution at the global level for the period 2005-2015 (Figure 1).

The worldwide FDI net inflow significantly increased in the years 2005-2007. Being affected by the recent economic crisis, its trend was descending during the period 2007-2009 and it ascending again, but in a smaller degree than before

the crisis, in 2009-2011. From then, FDI inflow had a variable evolution during the period 2012-2015, with a visible drop in 2013-2014. In comparison to the FDI evolution, real GDP maintained its increase during the period 2005-2015, with a descent during the years 2008-2009, but not as sharp as that of the FDI. Since 2009, worldwide real GDP recovered its increasing trend until 2014-2015, when it registered another decrease.

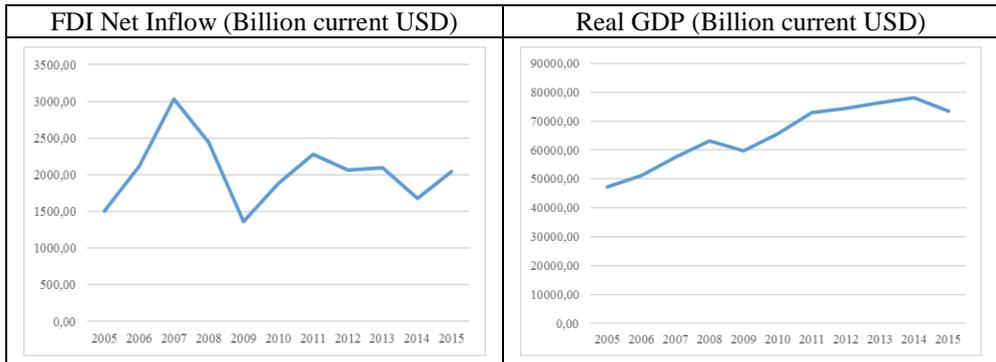


Figure 1 The evolution of FDI and real GDP during the period 2005-2015

Source: World Development Indicators database – World Bank

These results show that, recently, inward FDI were oscillating although domestic production was generally increasing. This fact raises the following question: what determined this variation of FDI inflows? Based on the aforementioned theoretical insights, we empirically test the significance of the identified factors on the inward FDI during the period 2012-2015, and, thus, we try to find empirical evidences for answering to this question.

3.2. Variables and data sources

A synthesis of the selected variables, their signification and their data sources are presented in Table 1.

Table 1 Selected variables

Variables	Explanations	Data source
Inward Foreign Direct Investment (FDI)	Internationalisation decision of multinational corporations	The Heritage Foundation
Economic Freedom Index (EFI)	Institutional and economic conditions reflected by economic freedom	The Heritage Foundation

Variables	Explanations	Data source
S&P Global Equity Indices (SP)	Financial market development	The World Bank
GDP per capita (GDPcp)	Economic development level	The Heritage Foundation
Population (POP)	Market size	The Heritage Foundation
Unemployment rate (UEM)	Workforce availability	The Heritage Foundation
IFRS adoption status (IFRS)	IFRS applicability Dummy variable: 0-not adopted IFRS; 1-adopted IFRS, integrally or partially	The IFRS Foundation and the IASB website
Components of the Economic Freedom Index		
Private property freedom (PRP)	Protection of property rights	The Heritage Foundation
Freedom from corruption (COR)	Secure economic relationships and corruption limitedness	The Heritage Foundation
Fiscal freedom (FIS)	Tax burden	The Heritage Foundation
Government spending freedom (GOV)	Government expenditures	The Heritage Foundation
Business freedom (BUS)	Conditions of setting up a business	The Heritage Foundation
Labour freedom (LAB)	Labour market regulations	The Heritage Foundation
Monetary freedom (MON)	Price stability and control	The Heritage Foundation
Trade freedom (TRD)	Custom restrictions	The Heritage Foundation
Investment freedom (INV)	Investment constrains	The Heritage Foundation
Financial freedom (FIN)	Banking efficiency and financial sector independence	The Heritage Foundation

As noted above, the institutional and macroeconomic characteristics of FDI receiving countries play a key role in internationalization decision of foreign companies. According to Azman-Saini et al. (2010), a higher degree of economic freedom attracts a higher level of foreign investments.

The Economic Freedom Index is based on 10 components referring to property rights protection, secure economic relationships and corruption limitedness, tax burden, government expenditures, conditions of setting up a business, labour market regulations, price stability and control, custom restrictions, investment constrains, and banking efficiency and financial sector independence (Table 1).

In our empirical study, we alternatively consider both the index and its components as independent variables which describe the institutional and economic environment, and thus, the degree of economic freedom of the FDI receiving countries.

Following Donaubauer et al. (2016), the level of financial markets development is a tested determinant factor of actual tendencies in foreign investments, proxied by the S & P Global Equity Indices, reported by Standard & Poor's and included in the World Development Indicators database of the World Bank. This indicator reflects the annual percentage change in stock market prices at country level, being referred to as a measurement of performance of financial markets (Gimet and Lagoarde-Segot (2012); The World Bank (2016)).

The level of economic development of the countries is measured by their per capita GDP (Villaverde and Maza (2012); Boateng et al. (2015)) while the market size is proxied by the population of the FDI receiving countries (Aziz and Makkawi (2012)). Workforce availability in host countries is reflected in the unemployment rate (Gauselmann and Marek (2012); Boateng et al. (2015)).

For estimating the effect of IFRS adoption on FDI flows, we construct a dummy variable which expresses the applicability of IFRS in the analysed countries. This information was collected from the The IFRS Foundation and the IASB websites. The dependent variable is the FDI inflow included in The Heritage Foundation dataset.

In order to verify the influence of the selected factors on FDI evolution we perform a multiple linear regression analysis, based on the Ordinary Least Square method, testing if the models are appropriate and significant for our data (ANOVA F-Statistics test) and if the implicit assumptions of this method are generally held. In order to study the discriminatory power of categorical factors on inward FDI observations we apply analysis of variance One-Way ANOVA (Jaba and Grama (2004)).

3.3. Descriptive statistics of the selected variables

In order to test the hypotheses, we studied FDI determinants on a sample of 75 out of the 186 countries existing in The Heritage Foundation database, during the period 2012-2015, with the reported Economic Freedom Index for the period 2013-2016. Our dataset is designed based on data availability constraints of all variables during the entire studied period. S & P Global Equity Indices is reported

only for a limited number of countries, those which have a financial market for which the index can be determined.

Our observations contain selected countries from the all six regions of the world defined in The Heritage Foundation database (Table 2).

Table 2 *Selected countries, grouped by regions*

Region	Selected countries
Europe (31 countries)	Austria, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom
North America (3 countries)	Canada, Mexico, United States
Asia-Pacific (16 countries)	Australia, Bangladesh, China, Hong Kong SAR, India, Indonesia, Japan, South Korea, Malaysia, New Zealand, Pakistan, Philippines, Singapore, Sri Lanka, Thailand, Vietnam
Middle East & North Africa (9 countries)	Bahrain, Egypt, Israel, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates
South and Central America & Caribbean (9 countries)	Argentina, Brazil, Chile, Colombia, Ecuador, Jamaica, Panama, Peru, Trinidad and Tobago
Sub-Saharan Africa (7 countries)	Botswana, Ghana, Kenya, Mauritius, Nigeria, South Africa, Zambia

Table 3 presents the descriptive statistics of our observations, overall or grouped by regions. Generally, a high level of heterogeneity of observations can be observed within regions and within overall dataset.

As it was expected, the mean levels of FDI inflows during the period 2012-2015 are higher in North America, Asia-Pacific, South and Central America, and Europe than in the other regions. The standard deviation values of FDI for these regions are high, especially in North America and Asia-Pacific, showing significant differences in FDI inward flows among the countries from these regions. The economic freedom index has, on average, high mean levels in North America, Europe, Middle East, and Asia-Pacific and lower levels in Sub-Saharan Africa and South and Central America, with an increased heterogeneity in Asia-Pacific and South and Central American countries. However, all regions are moderately free,

with average values of the economic freedom index between 60 % and 70 %, North American countries being mostly free, with index mean values higher than 70 %.

Table 3 *Descriptive statistics of the selected variables*

Region	Statistics	FDI	EFI	POP	GDPcp	SP	UEM
Europe	Mean	12,997	67.66	25.49	31,131	1.22	10.41
	St Dev	17,088	7.52	33.10	15,200	22.31	5.41
North America	Mean	80,856	73.75	155.68	36,746	3.07	6.53
	St Dev	72,549	5.70	123.01	15,984	16.08	1.23
Asia-Pacific	Mean	27,247	66.63	236.12	20,926	4.75	4.45
	St Dev	35,747	12.84	417.43	20,127	17.53	1.97
Middle East & North Africa	Mean	5,074	67.14	15.76	37,192	2.99	7.30
	St Dev	4,629	5.89	24.44	28,813	16.06	4.27
South and Central America & Caribbean	Mean	14,214	62.29	39.82	14,729	-2.56	7.13
	St Dev	19,532	10.29	59.13	5,306	27.93	2.96
Sub-Saharan Africa	Mean	2,689	63.42	44.23	8,138	2.73	15.73
	St Dev	2,709	7.33	55.44	6,310	27.54	9.85
Multi-regional (total)	Mean	17,254	66.56	79.13	25,576	1.93	8.71
	St Dev	29,719	9.34	215.98	19,157	21.84	5.94

Unit measurements: FDI (Millions current USD), EFI (%), POP - Millions, GDPcp (PPP), SP (annual % change), UEM (%)

The hierarchical order of the mean values of population, per capita GDP, S & P Global Equity indices and unemployment rate are not similar, but may be partially correlated with the hierarchical order of regions with high mean levels of FDI inflows. However, uncertain evidences are noticed for S & P Global Equity indices. It has high mean values in North America and Asia-Pacific, but a considerable small level in Europe, this reflecting no significant variations of the activity of the European financial markets. Unemployment rate has also a particular distribution over regions, with high mean levels and high standard deviation values in Sub-Saharan African and European countries, unemployment being still a sensible problem of these regions. On the opposite side, Asian-Pacific countries register the smallest average rate of unemployment.

Regarding the accounting principles applicable in the observed countries, all European, South and Central American and Sub-Saharan African countries were applying IFRS in their financial reporting, completely or partially. Only few countries from the remaining regions do not apply IFRS.

For a better understanding of the concept of economic freedom and the aspects it relates to we analyse also its components. As it can be seen from Table 4, on average, the weakest level of freedom is register by the freedom from corruption, this being still a big problem for the studied countries. Besides it, freedom of governmental expenditures and protection of private property rights are also constraining issues for the overall evaluation of country-level economic freedom. The highest level of liberalisation is achieved in terms of trade activities, followed by monetary and fiscal freedom. Standard deviation values of these indices indicate a high discrepancy among the granted economic liberties of the countries.

Looking at the differences between regions, there are considerable discrepancies between European, North American countries and the rest on almost all aspects covered by the components of Economic Freedom Index. This fact proves that these two regions are leading the world in terms of favourable conditions to foreign investments. However, regarding fiscal and governmental expenditures liberties, these two regions impose the highest constraints, while the Middle East and African countries are the least restrictive in terms of taxation and Asia-Pacific economies are the most flexible with their allocation from the state budget (Table 4).

Table 4 *Descriptive statistics of EFI components*

Regions	PRP	COR	FIS	GOV	BUS	LAB	MON	TRD	INV	FIN
Europe										
Mean	66.2	60.3	68.5	37.4	77.7	59.3	79.5	86.7	75.7	65.3
Std Dev	22.5	19.8	14.9	18.4	1.0	13.5	4.6	2.8	17.3	14.4
North America										
Mean	73.7	62.9	75.1	58.8	83.8	77.7	76.7	85.8	72.9	70.0
Std Dev	17.9	23.4	6.45	14.5	7.4	15.9	1.0	2.9	4.5	8.5
Asia-Pacific										
Mean	52.9	50.2	78.3	77.6	74.1	67.4	75.9	76.9	55.2	57.6
Std Dev	28.3	24.4	7.8	15.5	18.7	16.4	7.2	8.9	21.7	21.2
Middle East & North Africa										
Mean	53.1	51.2	92.0	63.2	68.8	71.0	75.9	79.3	58.4	58.4
Std Dev	14.9	11.3	13.0	13.1	5.4	9.9	6.4	4.6	15.5	11.8

Regions	PRP	COR	FIS	GOV	BUS	LAB	MON	TRD	INV	FIN
South, Central America & Carib.										
Mean	42.2	39.0	77.2	67.6	67.4	61.2	73.8	76.0	62.5	55.8
Std Dev	21.0	12.4	6.1	15.1	11.6	13.8	9.0	6.2	20.7	13.6
Sub-Saharan Africa										
Mean	46.3	40.6	80.1	75.9	64.4	62.9	72.9	74.8	59.3	57.0
Std Dev	16.4	13.8	7.4	7.4	10.1	8.4	3.4	9.0	14.8	10.7
Multi- regional (total)										
Mean	57.3	52.7	75.6	57.3	73.7	63.7	76.9	81.3	66.1	61.1
Std Dev	24.2	20.6	13.7	23.5	13.2	14.4	6.4	7.7	20.0	15.8

4. RESULTS AND DISCUSSIONS

4.1. Multi-regional inward FDI analysis

Table 5 Statistical estimations of the inward FDI determinants

Estimation 1:					
$\ln FDI = \alpha + \beta_1 \ln POP + \beta_2 \ln GDP_{cp} + \beta_3 IFRS + \beta_4 EFI + \beta_5 SP + \beta_6 UEM + \varepsilon$					
N = 286; R Square = 0.614; Adjusted R Square = 0.606; F Statistic = 74.085 (Sig 0.000)					
Estimation 2:					
$\ln FDI = \alpha + \beta_1 \ln POP + \beta_2 \ln GDP_{cp} + \beta_3 IFRS + \beta_4 X_i + \beta_5 SP + \beta_6 UEM + \varepsilon$					
$X_i - EFI \text{ components, } i=1-10$					
N = 286; R Square = 0,655; Adjusted R Square = 0,635; F Statistic = 34,106 (Sig 0,000)					
Model 1	Coef.	Sig.	Model 2	Coef.	Sig.
(Constant)	-4.503	0.000	(Constant)	-3.446	0.017
lnPOP	0.771	0.000*	lnPOP	0.696	0.000*

lnGDPcp	0.865	0.000*	lnGDPcp	0.949	0.000*
IFRS	-0.490	0.061	IFRS	-0.249	0.363
EFI	0.043	0.000*	PRP	0.006	0.450
SP	-0.002	0.400	COR	-0.005	0.614
UEM	-0.005	0.614	FIS	-0.028	0.000*
			GOV	0.019	0.000*
			BUS	-0.008	0.271
			LAB	0.010	0.064
			MON	-0.031	0.032*
			TRD	0.042	0.002*
			INV	-0.008	0.217
			FIN	0.022	0.005*
			SP	-0.003	0.281
			UEM	-0.001	0.922

* $p \leq 0.05$

For the first estimation, all variables were considered, the degree of economic freedom being measured by its index. As expected, based on the previous findings (Quazi (2007), Kang and Jiang (2012) and Fofana (2014)), the population size, per capita GDP and economic freedom index have a positive and significant influence on inward FDI. This indicates that in their decision to invest abroad, investors are seeking large and economically developed markets able to absorb their offer of provided goods and services. Furthermore, the investments are oriented towards countries with secure and stable conditions for doing business.

However, unexpected results were found regarding the financial market development proxy, workforce availability and IFRS adoption status, which are not statistically significant predictors of inward FDI. The lack of representativeness of financial markets factor can be imposed to investments in small domestic companies, unlisted on the financial market, or to a preference on bank financing.

The hierarchy of the factors, established based on the standardized estimated coefficients of the independent variables, shows that from the identified significant predictors of inward FDI, market size and the economic development effects have the highest explanatory power of FDI inflows. The contribution of economic freedom effects is significant, but has a more reduced contribution to the variation of foreign investments.

Repeating our estimation by replacing the economic freedom index with its ten components, we found that only fiscal freedom, government spending, monetary, trade and financial freedom are significant factors of FDI flows. This suggests that multinational corporations are mainly concerned about these economic and institutional aspects when they decide to extern their activity abroad. Relating fiscal freedom to the interest of companies to avoid high tax burdens, or governmental spending to the opportunities to benefit from special incentives, we may suppose that all these liberties are key issues that affect multinational corporations. Monetary, financial and trade conditions have the same effect as well. Regarding the other factors, similar to the first estimation, only market size and degree of economic development are statistically significant.

The proceeded estimations provide the same results regarding the influence of the tested factors on the FDI inflows. The goodness-of-fit tests show that the data is appropriate. As indicated by adjusted R Square statistic, the explanatory power of the second model is higher, , indicating that detailed components of economic freedom are more representative than the index. The standard assumptions regarding residuals and independent variables of the regression analysis were verified without suspicious evidences which can affect our results.

Results (Table 5) show that IFRS adoption status is not a significant determinant of FDI during the analysed period. The univariate analysis of variance of foreign investment flows shows that there are statistically significant differences in the mean levels of inward FDI between countries which apply IFRS and those which do not use these standards for their financial reporting (F Statistic = 28.985; Sig. 0.000). Contrary to the findings of Gordon and Loeb (2012) and Chen et al. (2014), these results support those of Efobi et al. (2014). Furthermore, the insignificant role of IFRS applicability for FDI evolution may be explained by the period of the study (i.e. 2012-2015), IFRS being already adopted by most of the analysed countries.

These results partially confirm the research hypothesis. Only the effects of market size factor, level of economic development and economic freedom of the FDI receiving countries are significant enough to explain the inward FDI variations during the recent period.

4.2. European countries inward FDI analysis

Taking into account the mean value differences of FDI levels among regions, we checked if inward FDI tendencies in European countries differ significantly from the other regions. Applying One-Way ANOVA analysis, this hypothesis was confirmed (F Statistic = 13.598; Sig. 0.000). As it was also noticed from the descriptive statistics analysis, the FDI's evolution in Europe has a particular pattern. Thus, the proposed determinant factors of foreign investments were studied only for the European region (Table 6).

Table 6 Statistical estimations of the inward FDI determinants in Europe

Estimation 3:		
$\ln FDI = \alpha + \beta_1 \ln POP + \beta_2 \ln GDP_{cp} + \beta_3 EFI + \beta_4 SP + \beta_5 UEM + \beta_6 IFRS + \varepsilon$		
N = 118; R Square = 0.545; Adjusted R Square = 0.525; F Statistic = 26.819 (Sig 0.000)		
Predictors	Coefficients	Sig.
(Constant)	-9.071	0.000
Population (ln)	0.716	0.000*
GDP per capita (ln)	1.615	0.000*
Economic Freedom Index	-0.008	0.684
S&P Global Equity Indices (%)	0.001	0.840
Unemployment rate (%)	-0.005	0.794
IFRS adoption	-	-

* $p \leq 0.05$

During the analysed period, IFRS are applicable in all European countries included in the dataset, thus, the variable IFRS adoption status has no meaning for this estimation. According to this estimation, the only significant determinants of FDI inward flows are the market size and the level of economic development of the receiving countries. In contrast to the previous analyses, the degree of economic freedom is not statistically significant. The results express economic freedom by its index. The test of its individual components showed no evidence of significance for none of the components. Moreover, it was suspected by collinearity problems and thus, it was not reported.

In an attempt to explain these results, we looked at the evolution of the economic freedom index and noticed that during the studied period, European region

registered, on average, a constant degree of economic freedom. Figure 2 illustrates the evolution of economic freedom index during the period 2005-2016. On the long run, it can be observed a light increase of the degree of economic freedom in European region. However, on the short-run, the level stays constant. Such differences explain the results contradicting previous research (i.e. Tintin (2013), who analysed FDI inflows in Central and Eastern European countries in the period 1996-2009; Moussa et al. (2016), who found that, during the period 1995-2013, there was a high influence of economic freedom on FDI inflows in European countries).

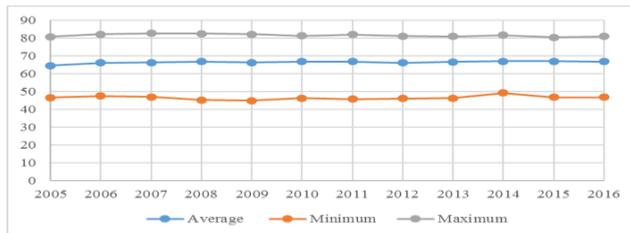


Figure 2 Economic Freedom Index in European countries during the period 2005–2016

Source: The Heritage Foundation

This study shows that, on the short-run, the primary factors of internationalisation decision of multinational companies are the market size and the level of economic development of the host countries. In addition, the degree of economic freedom is generally significant for foreign investments, but not for location decisions among European countries. Thus, these results only partially confirm the hypothesis since not all the identified determinants of FDI being representative.

5. CONCLUSIONS

This paper aimed to analyse the actual tendencies of multi-regional inward foreign direct investments based on their determinant factors.

Based on theoretical arguments and evidences from previous studies, a selection of 6 macroeconomic and institutional factors were identified as being representative for explaining the trends of FDI from the recent period. Reflecting capacities of the countries to attract and benefit from the foreign investments, these factors are the degree of economic freedom, the level of economic development, the level of development of the financial markets, market size, work availability and adoption of IFRS. Even if literature insights indicate contradictory results

regarding all of these determinants of FDI, we expected them to be significant and to have a positive influence on the foreign investments in the recent period.

The empirical study conducted on a dataset of 75 countries from all the main regions of the world, during the period 2012-2015, shows that FDI inflows are positively influenced by the market size and the level of economic development of the host countries. Moreover, in the multi-regional analysis, the economic freedom was relevant for foreign investments decision, the individual components of the economic freedom index being statistically significant, thus explaining the variation of FDI inflows being through: fiscal conditions, liberty of governmental spending, monetary freedom, trade constraints and financial freedom.

In the case of the European countries, due to the generally stable economic conditions in the short-run, the degree of economic freedom effect was not found to be statistically significant for the analysis of inward FDI. From the financial reporting and information costs perspective, IFRS adoption status of the host countries did not significantly affect FDI inflows, IFRS being partially or completely applied in most of the analysed countries. However, a significant difference in the level of FDI from the countries which apply and which do not apply IFRS was noticed. The other factors related to financial markets, labour availability do not significantly influence location decision of multinational corporations which are extending their activity abroad.

This analysis suggests that location decision of foreign investment is determined by the macroeconomic conditions of the targeted countries and by their market size. Therefore, policymakers' competition in attracting FDI has to be mainly based on the enhancement of economic development of the countries.

Our conclusions are considered specific to the analysed context and reflect the key determinant factors of the FDI from the recent years. The validity of our results is limited due to data availability and methodological constrains. However, this study offers a broad base for internationalisation decisions of multinational companies and it can guide domestic companies seeking for foreign investors and governmental authorities.

REFERENCES

1. Aissat, Salim., Boulkeroua Lotfi, Lucas Mike and Carien van Mourik (2013), "Accounting Regulation and IFRS in Islamic Countries, (in: Carien van Mourik, Walton

- Peter-Ed., *The Routledge Companion to Accounting, Reporting and Regulation*, Routledge Handbooks Online, <https://www.routledgehandbooks.com/doi/10.4324/9780203103203.ch25>. [Accessed 1.09.2016]
2. Alfaro, Laura (2016), "Gains from Foreign Direct Investment: Macro and Micro Approaches World Bank's ABCDE Conference", *The World Bank Economic Review*, pp. 1–14.
 3. Alguacil, Ma. Teresa, Cuadros Ana and Orts Vincente (2011), "Inward FDI and growth: The role of macroeconomic and institutional environment", *Journal of Policy Modeling*, Vol. 33, Nr. 3, pp. 481–496.
 4. Asongu, A. Simplice and Kodila-Tedika Oasis (2015), "Conditional Determinants of FDI in Fast Emerging Economies: An Instrumental Quantile Regression Approach", *African Governance and Development Institute Working Paper No. 15/003*.
 5. Aziz, Abdul and Makkawi Bilal (2012), "Relationship between Foreign Direct Investment and Country Population" *International Journal of Business and Management*, Vol. 7, Nr. 8, pp. 63-70.
 6. Azman-Saini, WNW, Baharumshah Ahmad Zubaidi and Law, Siong-Hook (2010), "Foreign direct investment, economic freedom and economic growth: International evidence", *Economic Modelling*, Vol. 27, Nr. 5, pp. 1079–1089.
 7. Boateng, Agyenim, Hua Xiuping, Nisar Shaista and Wu Junjie (2015), "Examining the determinants of inward FDI: Evidence from Norway", *Economic Modelling*, Vol. 47, pp. 118-127.
 8. Caetano, Jose and Caleiro Antonio (2009), "Economic Freedom and Foreign Direct Investment: How Different are the MENA Countries from the EU", *iBusiness*, Vol. 1, pp. 65-74.
 9. Chanda, Nayan (2003), "Globalinc. An Atlas of The Multinational Corporation – Review. *Yale Center for the Study of Globalization*, <http://yaleglobal.yale.edu/about/globalinc.jsp>. [Accessed 22.07.2016]
 10. Chandler, D. Alfred and Mazlish Bruce (2005), "*Leviathans. Multinational Corporations and The New Global History*" Cambridge University Press, [online] Cambridge Books, <http://dx.doi.org/10.1017/CBO9780511512025>. [Accessed 22.07.2016]
 11. Chen, J.P. Charles, Ding Yuan and Xu Bin (2014), "Convergence of accounting standards and foreign direct investment" *The International Journal of Accounting*, Vol. 49, Nr. 1, pp. 53-86.
 12. Cohen, D. Seth (2007), *Multinational Corporations and Foreign Direct Investment - Avoiding Simplicity, Embracing Complexity*, New York: Oxford University Press.
 13. Crespo, Nuno and Fontoura Maria Paula (2007), "Determinant Factors of FDI Spillovers – What Do We Really Know?", *World Development*, Vol. 35, Nr. 3, pp. 410–425.
 14. Crotti, Simon, Cavoli Tony and Wilson K. John (2010), "The impact of trade and investment agreements on Australia's inward FDI flows", *Australian Economic Papers*, Vol. 49, Nr. 4, pp. 259-273.
 15. Cuyvers, Ludo, Soeng Reth, Plasmans Joseph and Bulcke, D Van Den (2011), "Determinants of foreign direct investment in Cambodia", *Journal of Asian Economics*, Vol. 22, pp. 222–234.

16. Doytch, Nadia and Eren Mesut (2012), "Institutional Determinants of Sectoral FDI in Eastern European and Central Asian Countries: The Role of Investment Climate and Democracy", *Emerging Markets Finance and Trade*, Vol. 48, Nr. sup 4, pp.14-32.
17. Donaubaer, Julian, Neumayer Eric and Nunnenkamp Peter (2016), "Financial Market Development in Host and Source Countries and Its Effects on Bilateral FDI", *Working paper London School of Economics*,
<http://www.lse.ac.uk/geographyAndEnvironment/whosWho/profiles/neumayer/pdf/Financial%20Market%20Development%20Effects%20on%20Bilateral%20FDI.pdf>. [Accessed 1.09.2016]
18. Economou, Fotini, Hassapis Christis, Philippos Nikolaos and Tsionas Mike (2016), "Foreign Direct Investment Determinants in OECD and Developing Countries" *Review of Development Economics*,
<http://onlinelibrary.wiley.com/doi/10.1111/rode.12269/full>. [Accessed 1.09.2016]
19. Efobi, Uchenna, Nnadi Matthias, Odebiyi John and Beecroft Ibukun (2014), "Do the Rules Attract the Money? Implication of IFRS Adoption on Foreign Direct Investment", <https://ssrn.com/abstract=2460967>. [Accessed 1.09.2016 September 2016]
20. Fofana, Mory Fodé (2014), "The Influence of Measures of Economic Freedom on FDI: A Comparison of Western Europe and Sub-Saharan Africa", *Global Economy Journal*, Vol. 14, Nr. 3-4, pp. 399-424.
21. Gauselmann, Andrea and Marek Philipp (2012), "Regional determinants of MNE's location choice in post-transition economies", *Empirica*, Vol. 39, pp. 487-511.
22. Gimet, Céline and Lagoarde-Segot Thomas (2012), "Financial sector development and access to finance. Does size say it all?", *Emerging Markets Review*, Vol. 13, Nr. 3, pp. 316-337.
23. Gordon, A. Lawrence, Loeb P. Martin and Zhu Wenjie (2012), "The impact of IFRS adoption on foreign direct investment" *Journal of Accounting and Public Policy*, Vol. 31, Nr. 4, pp. 374-398.
24. Heritage Foundation (2016), *Index of Economic Freedom*,
<http://www.heritage.org/index/about>. [Accessed 2.09.2016]
25. Herzer, Dierk (2008), "The long-run relationship between outward FDI and domestic output: Evidence from panel data", *Economics Letters*, Vol.100, Nr. 1, pp. 146-149.
26. Jaba, E., Grama, A. (2004), *Analiza statistică cu SPSS sub Windows*, Iași: Polirom.
27. Javorcik, Beata Smarzynska and Spatareanu Mariana (2008), "Liquidity constraints and linkages with multinationals", *Hamburg Institute of International Economics Research Paper*, Vol. 2, Nr. 14, pp. 1-25.
28. Javorcik, Beata Smarzynska and Spatareanu Mariana (2009), "Tough Love: Do Czech Suppliers Learn from their Relationships with Multinationals?", *The Scandinavian Journal of Economics*, Vol. 111, Nr. 4, pp. 811-833.
29. Kang, Yuanfei and Jiang Fuming (2012), "FDI location choice of Chinese multinationals in East and Southeast Asia: Traditional economic factors and institutional perspective" *Journal of World Business*, Vol. 47, nr. 1, pp. 45-53.
30. Kokko, Ari (2006), "The home country effects of FDI in developed economies" Working Paper No. 225, <https://core.ac.uk/download/pdf/7092113.pdf>. [Accessed 25.09.2016].

31. Lawson, A. Robert (2008), "Economic Freedom", *The Concise Encyclopedia of Economics*, <http://www.econlib.org/library/Enc/EconomicFreedom.html>. [Accessed 25.09.2016]
32. Lee, In Hyeock and Rugman M. Alan (2012), "Firm-specific advantages, inward FDI origins, and performance of multinational enterprises" *Journal of International Management*, Vol.18, Nr. 2, pp. 132-146.
33. Lyroudi, Katerina, Papanastasiou John and Vamvakidis Athanasios (2004), "Foreign Direct Investment and Economic Growth In Transition Economies", *South Eastern Europe Journal of Economics*, Vol. 1, pp. 97-110.
34. Márquez-Ramos, Laura (2011), "European Accounting Harmonization: Consequences of IFRS Adoption on Trade in Goods and Foreign Direct Investments", *Emerging Markets Finance and Trade*, Vol. 47, Nr. sup4, pp. 42-57.
35. Merlevede, Bruno, Schoors Koen and Spatareanu Mariana (2014), FDI Spillovers and Time since Foreign Entry, *World Development*, Vol. 56, pp. 108–126
36. Moussa, Mohamed, Çaha Hawa and Karagöz Murat (2016), "Review of Economic Freedom Impact on FDI: New Evidence from Fragile and Conflict Countries" *Procedia Economics and Finance*, Vol. 38, pp. 163-173.
37. Nakano, Makoto and Purevdorj Bayanjargal (2014), *Reliance on Foreign Markets: Multinationality and Performance*, Springer, Tokyo.
38. Narula, Rajneesh and Pineli André (2016), "Multinational Enterprises and Economic Development in Host Countries: What We Know and What We Don't Know", Discussion Paper Number: JHD-2016-01, https://www.henley.ac.uk/files/pdf/research/papers-publications/JHD201601_Narula_and_Pineli.pdf. [Accessed 22.07.2016]
39. Nobakht, Mahya and Madani Seyedashkan (2014), Is FDI Spillover Conditioned on Financial Development and Trade Liberalization: Evidence from UMCs. *Journal of Business and Management Sciences*, Vol. 2, Nr. 2, pp. 26-34.
40. Onwuka, O. Kevin and Chaiechi Taha (2013), "Foreign Direct Investment, Financial Markets and Growth Dynamics in MENA Oil Producing Countries: A Panel Investigation" *Journal of Finance and Investment Analysis*, Vol. 2, Nr. 2, pp. 135-159.
41. Quazi, Rahim (2007), "Economic Freedom and Foreign Direct Investment in East Asia" *Journal of the Asia Pacific Economy*, Vol. 12, Nr. 3, pp.329-344.
42. Ramasamy, Bala and Yeung Matthew (2010), "The Determinants of Foreign Direct Investment in Services", *The World Economy*, Vol. 33, Nr. 4, pp. 573-596.
43. Roach, Brian (2005), A Primer on Multinational Corporations, (in: Chandler, Alfred and Mazlish Bruce, Leviathans-Ed., *Multinational Corporations and The New Global History*), Cambridge University Press, <http://dx.doi.org/10.1017/CBO9780511512025>. [Accessed 22.07.2016], pp.19-44.
44. Roach, Brian (2007), Corporate Power (in a *Global Economy*), *Global Development and Environment Institute, Tufts University*, <http://ase.tufts.edu/gdae>. [Accessed 23.07.2016]
45. Rugman, Alan, Verbeke Alain and Nguyen Quyen (2011), "Fifty Years of International Business Theory and Beyond", *Management International Review*, Vol. 51, Nr. 6, pp. 755–786.
46. Sghaier, Imen Mohamed and Abida Zouheir (2013), "Foreign Direct Investment, Financial Development and Economic Growth: Empirical Evidence from North African Countries", *Journal of International and Global Economic Studies*, Vol. 6, Nr. 1, pp. 1-13.

47. Soumare, Issouf and Tchana Fulbert Tchana (2015), “Causality between FDI and Financial Market Development: Evidence from Emerging Markets”, *World Bank Economic Review*, Vol. 29, Nr.suppl 1, pp. S205-S216.
48. Tintin, Cem (2013), “The determinants of foreign direct investment inflows in the Central and Eastern European Countries: The importance of institutions”, *Communist and Post-Communist Studies*, Vol. 46, Nr. 2, pp. 287–298.
49. Villaverde, José and Maza Adolfo (2015), “The determinants of inward foreign direct investment: Evidence from the European region”, *International Business Review*, Vol. 24, Nr. 2, pp. 209-223.
50. Wang, T.Danny, Gu F. Flora, Tse K. David and Yim Chi Kin Bennett (2013), “When does FDI matter? The roles of local institution and ethnic origins of FDI”, *International Business Review*, Vol. 22, Nr. 2, pp. 450–465.
51. The World Bank Group (2016), S&P Global Equity Indices (annual % change), <http://data.worldbank.org/indicator/CM.MKT.INDX.ZG>. [Accessed 22.07.2016]



LABOUR FORCE EFFECTS TO CURRENT ACCOUNT MOVEMENT OF ASEAN + 6 COUNTRIES

NI PUTU WIWIN SETYARI*, TRI WIDODO**, M. EDHIE PURNAWAN***

Abstract: *Heckscher-Ohlin-Mundell framework* suggests that if a country has unexpectedly increased the permanent labour force, *there will be* a change in the production structure. Increases in the relative proportion of labour-intensive product demand occur and, hence, decrease *the need for investment relative to domestic saving*, and encourage the current account surplus.

This paper tries to fill the empirical studies gap on the effects of the labour force, especially its utilization in the data panel of ASEAN + 6 countries using the generalized method of moments (GMM) used to capture the unobserved heterogeneity and endogeneity across countries that often arise in a panel data model. The estimation result shows that the labour force has an asymmetric shock and it only affects the country of origin, *even when the financial institution deepening as a control variable is included.* The analysis also indicates that labour regulations in these countries tend to be rigid because the speed with which the current account *adjusts* is relatively slow.

Keywords: *saving–investment, current account adjustment, labour force shocks*

JEL Classification: *E21, F32, E24*

1. INTRODUCTION

The current account imbalance has been controversial in international trade policy analysis. Debates go back to David Hume's theory which emphasizes the current account balance as a potential tool in the international shock transmission or as financial vulnerabilities. A country's current account is the difference between domestic savings and investments, equivalent to the difference of exports

* Ni Putu Wiwin Setyari, Corresponding author, Economics and Business Faculty, Udayana University, Jalan P.B Sudirman, Denpasar, Bali 80232, Indonesia, Telephone: (0361) 235970, wi2nset@yahoo.co.id

** Tri Widodo, Economics and Business Faculty, Gadjah Mada University, Jl. Sosio Humaniora Bulaksumur, Yogyakarta 55281, Indonesia, triwidodo@paue.ugm.ac.id

*** M. Edhie Purnawan, Economics and Business Faculty, Gadjah Mada University, Jl. Sosio Humaniora Bulaksumur, Yogyakarta 55281, Indonesia, edhiepurnawan@ugm.ac.id

and imports of goods and services (including revenues in the form of assets acquired abroad). Some evidence indicates that the crisis is often preceded by a considerable current account deficit, involving even some developed countries (Obstfeld 2012). Modern intertemporal approach, which emphasizes that the current account is highly dependent on domestic savings and investment decisions, is expected to give a good feedback to explain those imbalances.

A country's current account definition as an increase in net foreign assets might be a bit confusing if the current account is thought of as only the country's sum of net exports for goods and services (where exports of services, including domestic capital services abroad, as measured by the level of interest and dividend payments on the asset). It should be remembered that a country with a positive net exports needs to acquire foreign assets up to the equal value in order to succeed.. Conversely, a country with negative net exports must have the same value of loans to finance the deficit. The balance of payments has recorded country net asset sales in the capital account. .Thus, total net exports and capital account to zero. Hence, the capital account surplus is from the negative sign of the increase in net foreign asset holdings or equal to the current account (Obstfeld and Rogoff, 1996,). Sachs (1982) stressed that the current account discussion must include investment and growth therein. Empirical evidence findings confirm that a change in investment level can explain most of the current account behavior of OECD countries.

During the 1980s, most of the developing countries appeared detached from the international capital markets and experience current account surplus or deficit on a small scale. Therefore, countries referred to as the "Asian Tigers" were not affected by the debt crisis. In fact, China, Korea, Brunei, Japan and Singapore posted a current account surplus while Indonesia, Malaysia, the Philippines and Thailand experienced a moderate deficit during the period 1982 and 1990. Current account deficits in Laos, Indonesia and Thailand are the highest in the group. In 1990, the average deficit experienced by Indonesia and Thailand amounted to 3.2 % of GDP, while Laos reached 8.5 % of GDP. Starting in 1990, several developing countries began to attract foreign capital inflows, as seen from deficit on the current account. Capital inflows may affect the current account behavior through savings and investments. Current account imbalances are caused by savings and investment mismatch. If capital flows are used to increase investment, assuming a stable savings, it will result in enlargement of current account deficit.

Dynamic movement of the current account is influenced by several factors. Lane (1999) found that in the United States of America the monetary sector has a significant impact on the current account. Another source that could affect the current account is the terms of trade, which indicated a significant effect on the current account (Cashin and Mc Dermott, 1998). The shock itself can be derive from within the country as well as from outside. Several studies identify specific productivity shock as one of the main drivers of the current account movement, while the global productivity shocks had no significant effect (Glick and Rogoff, 1995; Bussière et al., 2005).

Jun and Wei (2007) present a theory about current account adjustment that puts labour market institutional system as the center of analysis. An economic adjustment to the shock involves a combination of intratemporal (changes in the composition of trade in goods) and intertemporal (changes in capital flows). When labour moves are in a specific sector (which can be interpreted as a short-term shock), the entire adjustment in a relatively small economy takes place through capital flows. But when labour is perfectly mobile within a country, each shock is reflected through changes in output composition and trade without any change in the current account. Labour regulations rigidity will reduce the transition from short-term to long-term, and hence reduce the rate of convergence of the current account to GDP ratio.

This study looks deeper into the influence of a specific country's labour force shock to the current account of the country concerned and the current account of others. The model developed by Jin (2012) reveals a positive relationship between the labour shocks in a country, including the decline in their domestic investment followed by the growing of capital outflows. This condition makes the current account surplus greater. Furthermore, the shock originating from specific countries provides different effects to other countries. However, empirical studies undertaken by Jin (2012) focuses on specific countries and does not appear to emphasize the direction of influence on others. Previous empirical studies also remarked on the shock effect spreading globally from a specific country, but tended to ignore the direction of influence.

This research extends the studies by Glick and Rogoff (1995), Bussière et al. (2005) and Jin (2012). The fundamental contribution is the emphasis on the effects of specific country labour force shock on the current account country. This factor

has a significant effect on the current account movement by using panel data analysis from ASEAN + 6 countries. In accordance with the theory, the labour force shock gives different directions effect between the originating countries where the shock occurred and other countries. Countries that have increased the labour force will encourage capital flows out because capital tends to go into capital-intensive industries (country) with higher returns. Hence, the country's current account balance will be positive. The capital outflow will then go to countries that did not experience an increase in the labour force, leading to a current account deficit.

This research used panel data from ASEAN+6 countries and it is different from previous empirical studies which tend to use time series model such as VAR or SVAR. In order to eliminate the influence of endogeneity and unobservable heterogeneity across countries which often become a problem with panel data, this study uses the generalized method of moments (GMM). The analysis was then developed to include the financial system development as a control variable and reflects the effect of monetary sector shock taking into consideration that international capital flows were enabled due to the financial institution. The analysis showed consistency with theory and previous empirical studies.

This paper is organized as follows: Section II discusses related theory study. Section III describes the data and methodology used. Section IV discusses the results, and Section V concludes.

2. LITERATURE REVIEW

Several previous studies attempt to identify some variables that can be a source of shock to the current account. Cashin and McDermott (1998) examine the relationship between the terms of trade shock on savings and current account position. It said if the relationship between these variables is ambiguous. Shock in the terms of trade may worsen or improve the current account position depending on whether the income effect result is greater or smaller than the substitution effect. The relative relationship of substitution effects is estimated using data of five OECD countries, namely Australia, Canada, New Zealand, the United Kingdom, and the United States over the period 1970-1995. The results suggest large and significant effect of this shock on the current account.

Glick and Rogoff (1995) develop an empirical model of investment and current account, then applied to the G7 country data. The results show the difference between global and specific country shock can explain the current account behavior. One puzzle that arises then the current account response to the specific country shock is smaller than response given by the investment.

Lane (1999) indicates that the monetary shock could push the current account imbalances. Using VAR analysis, monetary shock results obtained significant effect on the US current account. VAR analysis is also used by Lee and Chinn (2002) in seven countries, namely the United States, Canada, Britain, Japan, Germany, France, and Italy. Their analysis result showed a temporary shock plays a greater role in explaining the current account balance variation, while permanent shock can explain more the exchange rate variation. Temporary shock will improve the current account position. One of the assumptions used in the analysis that global shock has no effect on the current account, and only influenced by country-specific shock.

Sek and Chuah (2011) test current account dynamism in some Asian countries to analyze determinant variables in explaining current account movements, especially with the exchange rate effect. This research is motivated by changes in the current account of several Asian countries, from deficit to surplus after the 1997 crisis. By using SVAR analysis, estimation results indicate if exchange rate does not affect the current account after the crisis. The main determinants in the current account movements are a real shock and CPI. In addition to the analysis by Sachs (1982) asserted if the relationship between exchange rate and current account should be examined more closely, because the relationship between current account and depreciation can be proved in a large economy OECD countries, but not for other European countries which are relatively small.

3. DATA AND EMPIRICAL STRATEGY

Due to specialization and industrial restructuring take time, it is suggested to use a minimum five year time frame when doing analysis. This study uses time period from 1990 to 2012. Data are taken from the World Development Indicator publication from the World Bank and IMF. Included in ASEAN + 6 are all members of ASEAN, except Myanmar because of data limitations, plus six other

countries, namely India, Japan, Korea, China, Australia and New Zealand. Six countries latter, along with ASEAN, has agreed to cooperate more comprehensive regional economy, known as the Regional Comprehensive Economic Partnership (RCEP), as an effort to improve their ability in deal with the global economy.

As concluded in the beginning, a shock in labour force will encourage a country more specialized in labour-intensive sectors in its industrial structure. It will respond by increasing exports of capital intensive products in countries that tend to have greater capital to be exchanged in international trade. If all countries open in period t , a positive shock due to the increasing number of labour force will reduce capital - labour ratio in period t , which causes a change in the composition of savings to be higher compared to the investment needs. Therefore the capital will tend to flow out into the country that specializes in capital-intensive products.

Shock has two characteristics (Bajo-Rubio and Díaz-Roldán, 2011):

- In which sector that shock occurs, so that it can be distinguished between monetary shock (which reflect changes in the money supply or money demand), the real shock (which occurs because of the public sector deficit and aggregate demand), supply shock (caused by presence of changes in prices or wages, as well as labour force or productivity) and external shocks (i.e changes that occur from abroad, either in monetary, real, and supply shocks)
- Is a shock impact the same for all countries included in the analysis, in this case called asymmetric shock, or if that shock occurs in a particular country and its impact is different for each country, or so-called asymmetric shock

In accordance with above classification, monetary and external shocks will always be symmetric, unlike real and supply shocks that can be symmetric or asymmetric. Based on the assumption countries are perfectly symmetrical, asymmetric shock impact will be equally to each member and to group as a whole. The asymmetric shock effect could be different for country in which that shock occurred compared to a country in which a shock is transmitted. This is due to asymmetric shock occurs in one country can be transmitted to other countries in the same sign (locomotive effect) or with different signs (a shock that would be a beggar-thy-neighbor) depending on the transmission channel.

Terminologies used are as follows: labour force shock will be expressed by d_L . To examine the labour shock effect occurs, shock sources can be divided into

two categories. Labour force shock that comes from internal specific country hereinafter refers to L^c , and shock from the outside or global shock, hereinafter L^w . Specific country shock is the labour force growth rate of country i , meanwhile the global shock is labour force growth rate of ASEAN+6 region.

- Shock is symmetric if : $d_L \neq 0$
- Shock is asymmetric if : $d_{Lc} \neq 0, d_{Lw} = 0$ (originating from specific countries)
- Shock is asymmetric if : $d_{Lc} = 0, d_{Lw} \neq 0$ (from abroad)

Shocks multipliers analyzes here:

A. Symmetric labour force shock:

$$\frac{\partial CA_1}{\partial L} = \frac{\partial CA_2}{\partial L} = \frac{\partial CA}{\partial L} = 0 \quad (1)$$

B. Asymmetric labour force shock:

$$\frac{\partial CA_1}{\partial L_c} = \frac{\partial CA_2}{\partial L_w} > 0, \frac{\partial CA_2}{\partial L_c} = \frac{\partial CA_1}{\partial L_w} < 0, \frac{\partial CA}{\partial L_c} = \frac{\partial CA}{\partial L_w} = 0 \quad (2)$$

Firstly, we should constructed the country-specific labour force, hereinafter denoted by L_{it}^c , and global labour force variable, denoted by L_{it}^w . The global labour force growth rate (L_{it}^w) is taken from the labour force average growth rate of countries in the ASEAN+6 region. Meanwhile the country-specific labour force (L_{it}^c) is a deviation from the global average as in Glick and Rogoff (1995). Both variables, then act as independent variable and regress to current account to identify their effect. L_{it}^w is meant to see the nature of the shock, the labour force shock effects of a country to others is it symmetrical or asymmetrical. If both are significant then labour force shock is said to be symmetric. The theory expects L_{it}^c gives positive sign, while L_{it}^w is negative. However, if only one is significant, labour force is said to be asymmetric. To see role of labour force shock multiplier for current account movement in ASEAN + 6 countries we used panel data analysis. Model as follows:

$$CA_{it} = \alpha + \zeta_1 L_{it}^c + \zeta_2 L_{it}^w + \varepsilon_{it} \quad (3)$$

where:

- CA_{it} is current account ratio to GDP country i in period t ,
- L_{it}^c is country specific labour force growth country i in period t , and
- L_{it}^w is global labour force average growth rate.

The magnitude of labour force multiplier to current account can be estimated with a dynamic panel data. The Model is transformed into:

$$CA_{it} = \lambda CA_{i,t-1} + \delta_1 L_{it}^c + \delta_2 L_{it}^w + \tau_i + u_{it} \quad (4)$$

One of dynamic model advantage is able to take into account short-term and long-term effects. The coefficient λ expected to range between $0 < \lambda < 1$, which means short-term models will converge into a long-term model. This coefficient will relate to the speed of adjustment which gives information about the speed of the current account adjustment in response to imbalances due to shocks. The magnitude of the multiplier effect of country-specific labour force shock seen from number of δ_1 , while the multiplier effect of the global shock seen from the magnitude of δ_2 . τ_i capture variation effects that have not changed across times. u_{it} value is assumed to have a finite moment and $E(u_{it}) = E(u_{it} u_{js}) = 0$ for $t \neq s$

There are two sources of problems in dynamic panel model above, autocorrelation due to the presence of dependent variables lag among independent variables, $CA_{i,t-1}$, and the emergence of individual effects heterogeneity, τ_i . A technique often used to overcome this problem is generalized method of moments (GMM). The advantage of this method is able to overcome the problems caused by unobserved individual effects and endogeneity that appears in lag variables (Baltagi, 2005). That means we can assume serial correlation absences, but not have to be independent all times. Because of this assumption, the value of lag y in two periods or more can be a valid instrument in the first derivative equation. On models with $T \geq 3$, then the restriction linear moment = $(T-2)(T-1)/2$ is:

$$E[(\bar{y}_{it} - \alpha \bar{y}_{i(t-1)})y_{i(t-m)}] = 0 \quad (m = 2, \dots, (t-1); t = 3, \dots, T) \quad (5)$$

Because of independent variables are assumed to be exogenous, all of these variables can be a valid instrument in each equation so that the form of the equation becomes:

$$\Delta CA_{it} = \lambda \Delta CA_{i,t-1} + \varphi_1 \Delta L_{it}^c + \varphi_2 \Delta L_{it}^w + \Delta u_{it} \quad (6)$$

The equation model would eliminate the individual effects, τ_i , because it does not vary across time, then estimation values obtained are valid and not biased.

An estimator that uses lag as an instrument, under the assumption of white noise errors, would lose their consistency if there is serial correlation across errors. Therefore, it is important to report the test statistic validity of of the instrument

variables together with parameter estimation. There are three methods used (Arellano and Bond 1991, p.278): 1. Direct test for second-order correlation coefficient residuals: 2. Sargan test of over-identifying restrictions, and 3. Hausman specification test.

4. RESULTS AND DISCUSSIONS

4.1. Overview of Current Account in ASEAN+ 6 countries

ASEAN is said to be one of the most diverse regions in the world with a population exceeding 600 million people. The average population growth rate of ASEAN during the period 2005 - 2012 is 1.45 percent. This figure was lower than the average population growth in 1980 - 1990, which reached 2.1 percent, while in 1990-1995 the average growth of 1.8 percent. An Asian region recognized to have some natural obstacles. The ten ASEAN members have very large variations in language, religion and belief, politics and history.

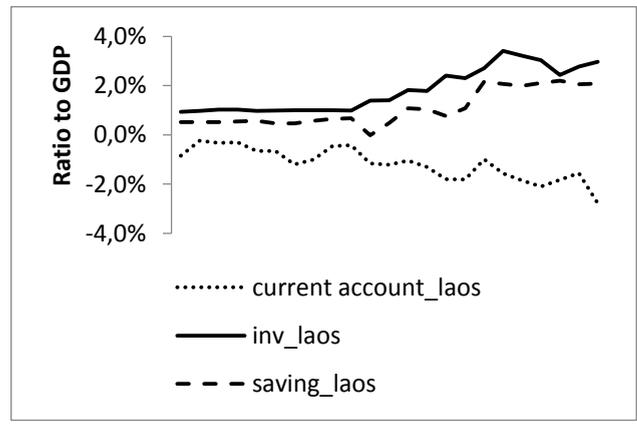
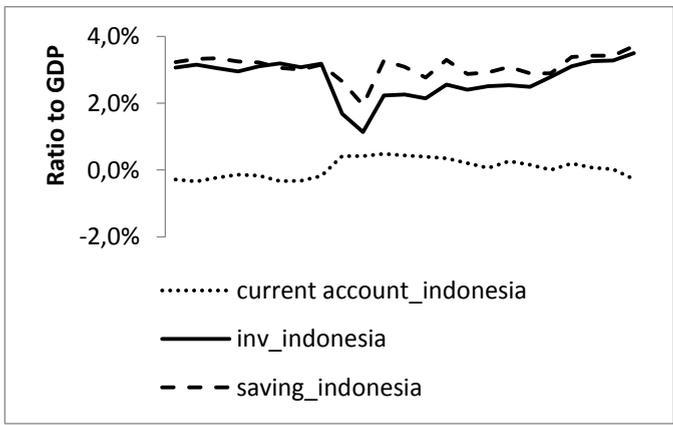
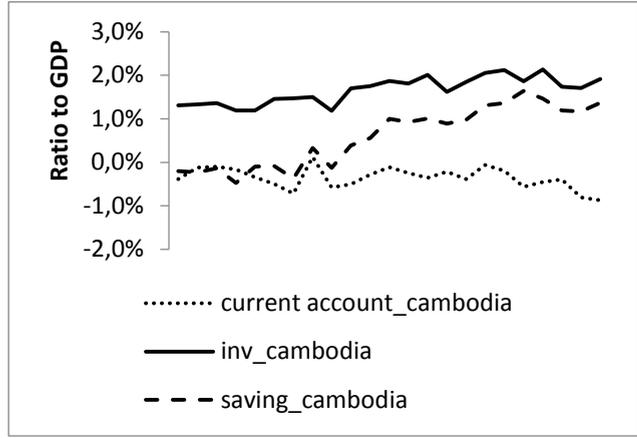
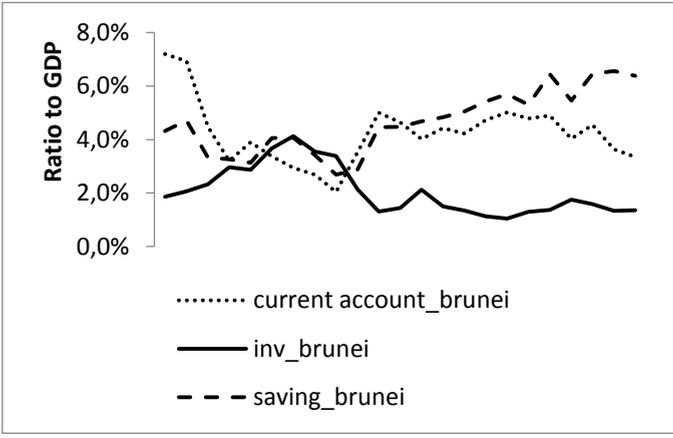
Countries in ASEAN region are developing countries, except Singapore, with large populations. Therefore, this area attracts a lot of interests both for investors who are looking for a low-cost production as well as potential markets. Countries such as Japan began to shift their investment from Korea and Taiwan, after labour costs increased in both countries and divert it to ASEAN. Multinational companies from Korea and Taiwan also respond to labour costs increase by transferring their investments to other Asian Countries. However, later because of Asia crisis in the year 1997 - 1998, China became the favorite area of foreign direct investment.

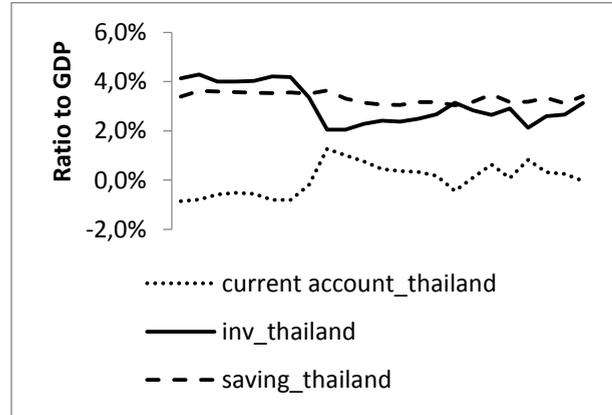
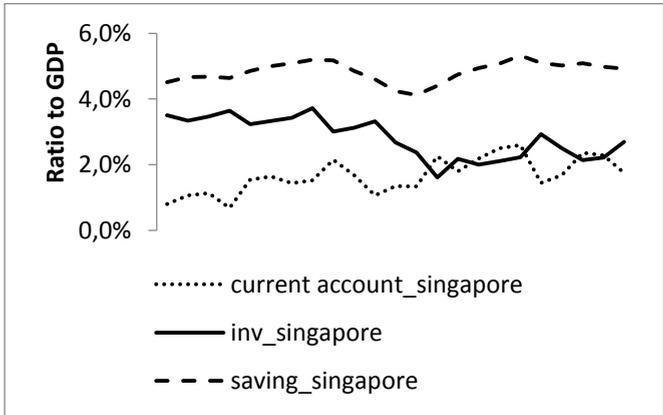
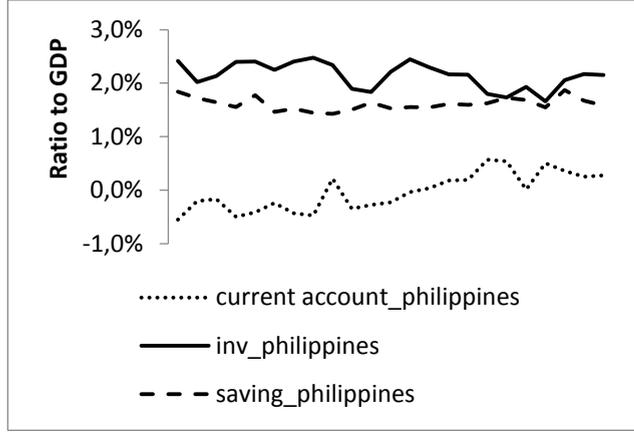
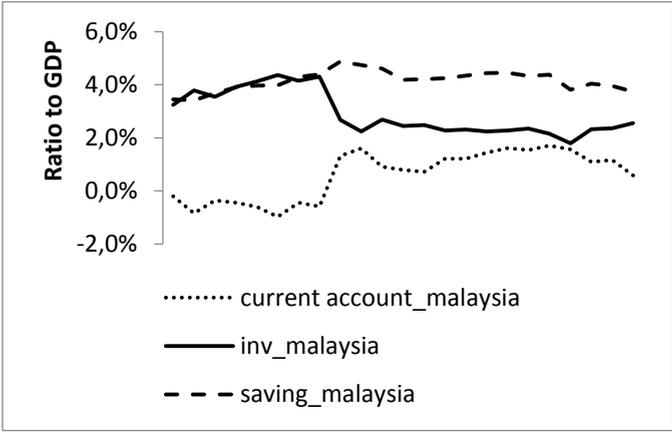
Large populations become an advantage for countries in this region in labour force supply. China and India have the largest labour force and continues to rise from early 1990 to 2012. However, Cambodia is a country with the highest growth rate, which amounted to 3.36 percent per year, followed by Singapore and Brunei with average labour force growth amounted to 2.94 percent and 2.90 percent per year.

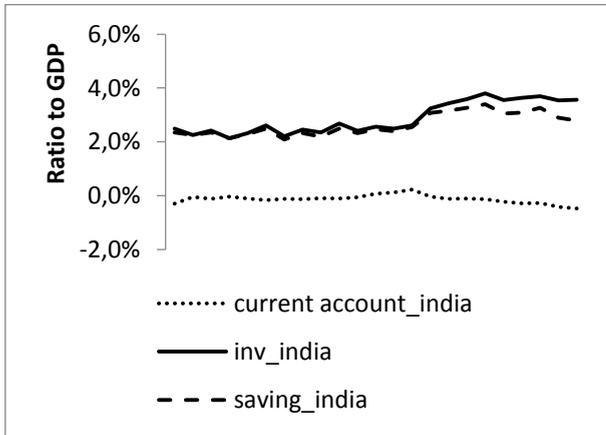
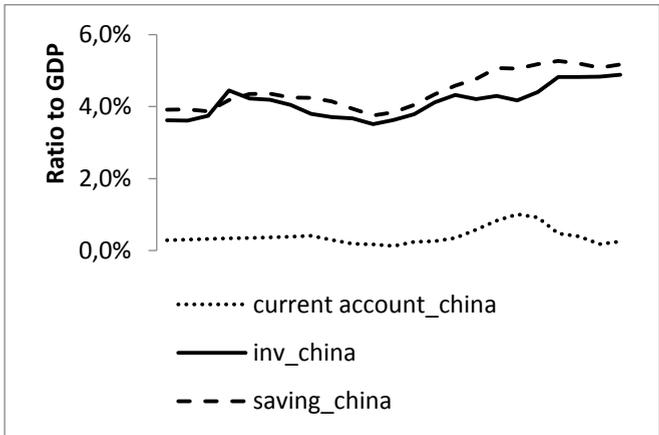
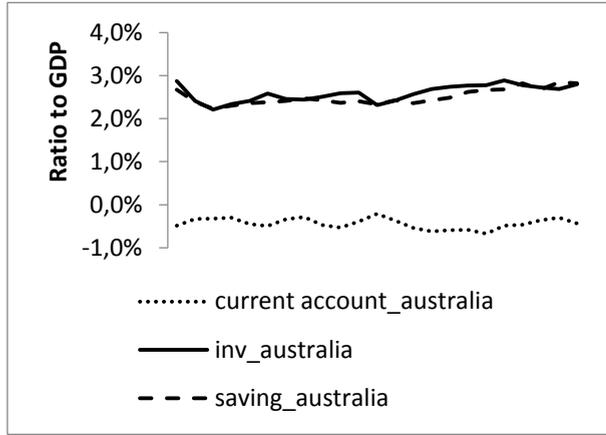
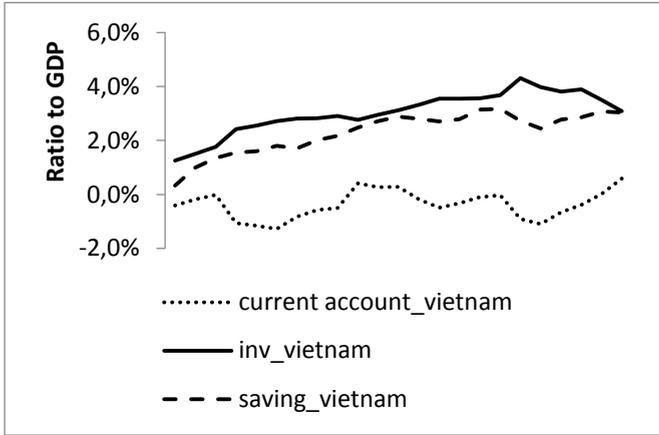
In order to provide an overview on current account in the ASEAN + 6 region, Figure 1 illustrates the movement of savings, domestic investment and the current account, in the form of a ratio to gross domestic product (GDP). The first point that can be highlighted from these figures that saving ratio in some countries, such as Brunei, Malaysia and Singapore show a relatively higher level compared to

their domestic investment. While countries such as Cambodia, Philippines, and Vietnam show a higher level of investment compared to saving. Investment level seen decreased almost in all countries after the end of 1990s, but began to rise again after 2001. Second, current account fluctuations are likely a reflection in investment movement compared to saving. Change from a large deficit in the current account become surplus for the period 1998 reflected domestic investment declining, which is then likely lower than national saving in some countries. As can be seen that the current account surplus in particular the period of 1998 related to saving stability in Malaysia and Thailand as well as saving rate declines in Indonesia and the Philippines. Investment driver then can become variables considered in current account movement.

Contradictory condition occurs in Singapore that was able to show the current account surplus during this period, as well as saving appears to be more influential than the investment. Feldstein and Horioka (1979) state that the relationship between current account and investment is evidence of financial markets opening and has nothing to do with domestic saving level. However, in their study, Caprio and Howard (1984), retest of Feldstein and Horioka thesis, discover if international capital flows are not perfect. On average, almost half of the domestic saving changes in a country (OECD) from one period to the next correlated with their current account movement.







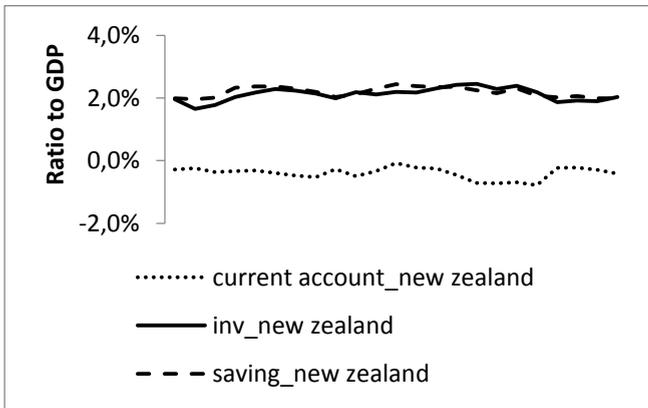
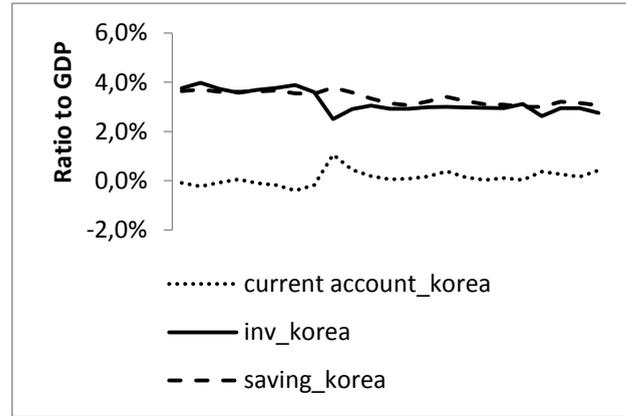
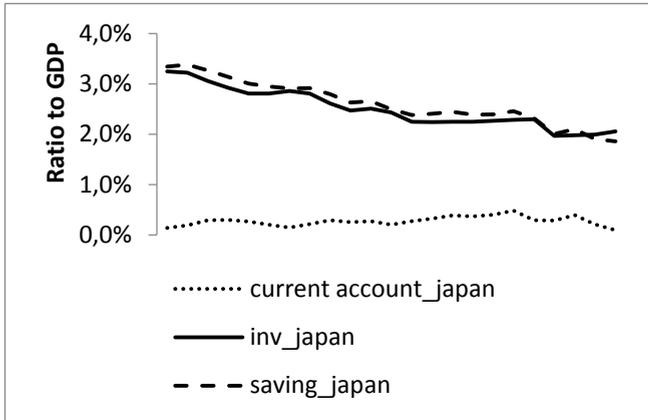


Figure 1 Current Account, Saving, and Domestic Investment in ASEAN + 6 Countries, (1990-2012)

Source: IMF and World Bank

Patterns that emerge seem inconsistent with standard view that industrialized economy countries should export capital to developing countries. Because developing countries have a high labour ratio - capital, it should have a higher marginal productivity of capital, hence attract capital from industrial countries with scarce labour. Moreover, if the developing countries are expecting higher economic growth so as to catch up with industrialized countries, then there is an incentive for them to borrow capital, and pushed the current account deficit (Gruber and Kamin 2005, p. 1).

The estimation results by Moreno (2008) showed a significant negative correlation between investment and current account in the five ASEAN countries, namely Malaysia, Indonesia, Thailand, Philippines, and Singapore, in the period 1985-2005. The negative relationship was also found using data across OECD countries by Sachs (1981). However, the simple relationship between investment and current account can not provide evidence of the integration degree magnitude of financial markets, even if it is assumed that correlation is driven entirely by productivity shock. If the shock is permanent and country-specific, the correlation will be negative. But if there are significant global component in the productivity shock and temporary, then it could be a positive correlation (Glick and Rogoff, 1995).

Tests using a serial data ASEAN + 6 countries show the results of a relatively varied, although the strong negative correlation between investment and current account cannot be denied, as shown in Table 1. Most of the estimated value shows significant effect between investment and current account, except for Cambodia, Laos, China and Japan. With the exception of Cambodia, the entire estimation results indicate a negative relationship between the two.

Table 1 Estimation Results of Investment Effects on ASEAN+6 Current Account

Country	β_0	β_1	R^2
Brunei	-2.02107	-1.1858*** (0.286573)	0.46124
Cambodia	-0.31038	0.323459 (0.290479)	0.05838
Indonesia	0.04318	-0.21253** (0.077328)	0.27415
Malaysia	0.01106	-1.094194*** (0.114693)	0.81984
Philippines	0.32204	-0.454596*	0.13021

Country	β_0	β_1	R^2
		(0.262721)	
Singapore	0.04059	-1.071108*** (0.156097)	0.70187
Laos	-0.56328	-0.335157 (0.353157)	0.04309
Thailand	-0.10777	-1.047843*** (0.080798)	0.89372
Vietnam	1.48312	-1.23796*** (0.24984)	0.55109
Australia	0.00589	-0.458059*** (0.139227)	0.35116
China	0.07661	-0.160816 (0.141869)	0.06037
India	0.02078	-0.208841** (0.082382)	0.24318
Japan	-0.13612	-0.213812 (0.181842)	0.06466
Korea	-0.23187	-1.014339*** (0.10335)	0.828069
New Zealand	-0.04019	-0.563631** (0.226014)	0.23719
Panel Data	-0.007058	-0.76511*** (0.052404)	0.422661

Note: $\Delta CA_t^i = \beta_0 + \beta_1 \Delta I_t^i + u_t^i$, time series data in 1990 – 2012. Current account and investment are in ratio to GDP. The unit root test indicates all data are stationer in first difference. Signs*** means sig. in $\alpha = 1\%$, ** sig.in $\alpha = 5\%$, and * sig. in $\alpha = 10\%$. Standard errors in parentheses.

Investment coefficient values indicate a range of values 0.323459 to -1.1858, with an average of -0.59568. This shows an average of almost 59.56 percent changes in domestic investment financed by foreign capital inflows. This value is smaller than the average change in the five ASEAN countries in the period 1985 - 2005 as predicted by Moreno (2008) in the range of 0.708. Testing with pooled regression method even predict changes in domestic investment in ASEAN + 6 by 76.51 percent funded from abroad. The highest coefficient values held by Vietnam, while the lowest was India (China excluded because of the coefficient value is not significant). Empirical studies

conducted by Bosworth and Collins (1999) found that a large portion of capital flows to developing countries are used to finance the current account deficit, which means that transfers of capital flows directly intended for investment, rather than consumption. But the results of these estimates can not demonstrate the validity of the model and assess the intertemporal regardless of the source of the shock.

Before getting into estimation stage, panel data unit root tests must be passed to ensure each data meet random walk assumption. Testing was conducted by Augmented Dickey Fuller (ADF) and Im, Pesaran, and Shin (IPS) which assumes testing at the individual level, whereas on panel data will be tested by Levin, Lin and Chu (LLC) method. ADF unit root test and the IPS techniques common to see whether there is a unit root by allowing coefficient y_{it-1} heterogeneity based on testing on average individual unit root. If it's significant, can be said partially (or entirely) of an individual does not have a unit root. Levin, Lin and Chu (LLC) assume that individual unit root tests have limited ability in testing the hypothesis with a high degree of deviation from equilibrium, particularly for panel data with small sample. LLC recommends panel unit root test better than the individual unit root test for each cross section (Baltagi, 2005). Unit root test results of variables used are presented in Table 2.

Table 2 Unit Root Test Results

Variabel	ADF		IPS		LLC	
	Null: Unit root (assumes individual unit root process)		Null: Unit root (assumes individual unit root process)		Null: Unit root (assumes common unit root process)	
	C	C and T	C	C and T	C	C and T
Current Account						
- Level	55.1101 ***	53.4665 ***	-2.7752 ***	-2.19702 **	-2.321 ***	-1.39045 *
- 1 st difference	150.144 ***	110.336 ***	-9.9108 ***	-7.5667 ***	-9.279 ***	-7.3075 ***
Country-specific Labour Force Growth (L ^c)						
- Level	72.937 ***	94.772 ***	-4.557 ***	-6.0878 ***	-4.417 ***	-6.8208 ***
- 1 st difference	181.77 ***	232.23 ***	-11.92 ***	-16.655 ***	-11.09 ***	-17.51 ***
Global Labour Force Growth (L ^w)						
- Level	32.3833	101.817 ***	-1.28936 *	-7.0991 ***	-4.108 ***	-10.936 ***
- 1 st difference	226.138 ***	177.463 ***	-14.825 ***	-12.598 ***	-16.69 ***	-14.278 ***

Note: signs *** means significant at $\alpha = 1\%$, ** significant at $\alpha = 5\%$, and * significant at $\alpha = 10\%$

Unit root test results indicate that the current account (ratio to GDP) and the country-specific labour force growth (L^c) was stationary, which means meet of random walk assumption at level in individual and panel model. Global labour force growth data (L^w) also stationary at level, but not for the entire model.

Initial estimate conducted to see the effect of country specific and the global labour force on current account of ASEAN + 6 countries. The analysis was conducted using pooled OLS and fixed effects first to compare with GMM model latter and see results robustness. The estimated coefficient values as shown in Table 3. Strict assumptions must be met in the pooled OLS equation is exogeneity, that idiosyncratic error, u_{it} , should not be correlated with any explanatory variables in the equation so as to ensure the results were not biased and efficient (Wooldridge, 2005). Another assumption must be met in order to be valid OLS is an error, u_{it} not correlated across time. If the individual effect influences the explanatory variables, then ignoring them could lead to bias. Terms that can be done is using a fixed effect model estimation method. Fixed effect model analyzes the model by including individual-specific differences in intercept by assuming same slope and constant variance across individual panels.

Table 3 *Regression Results with OLS and FE*

Dependent Variable:	Model	
	Pooled OLS	Country Fixed Effect
Current Account		
Short Term Coefficients		
L^c	0.15977	0.40930**
L^w	-0.13295	-0.65914
Long Term Coefficients		
L^c	2.3345	1.2073
L^w	-1.9426	-1.9442
λ	0.931562***	0.660979***
<i>Speed of adjustment</i>	0.068438	0.339021
R^2	0.910466	0.925465
<i>F statistic</i>	1105.027	227.8808
<i>Akaike info criterion</i>	5.55444	5.45594

Note: long-term coefficients are $(\delta_i/1 - \lambda)$. Signs*** means significant at $\alpha = 1\%$, ** significant at $\alpha = 5\%$, and * significant at $\alpha = 10\%$

Comparison between pooled OLS and fixed effect model indicates that fixed effect is better in almost all criteria. R^2 values are higher with lower AIC value indicates this model is more appropriate. λ value in line with expectations, is on $0 < \lambda < 1$, which shows short-term models will converge towards a long-term. Speed

adjustment, $(1-\lambda)$, the pooled OLS amounted to 0.068438, much lower than the speed of adjustment resulting from the fixed effect amounted to 0.339021. As predicted, when imposing the assumption of homogeneity will cause a rise of bias in coefficient of dependent variable lag (Pesaran et al., 1997, p. 13). Hence the speed of adjustment in the fixed effect model would be higher than the pooled regression model. Adjustment speed value under 0.50 shows that the current account adjustment is relatively slow and tends to be less dynamic.

Coefficient values, L^c and L^w , in above model are show dynamic multiplier of country-specific labour force shock and dynamic multiplier global labour force shock. In other words, dynamic multiplier values L^c and L^w illustrate the magnitude of current account movement because of changes in the country specific and the global labour force. Long-term coefficient of country specific labour force indicates if current account changes due to shock at country specific labour force is very elastic. While in short term, changes in the current account surplus amounted to 0.41 percent every 1 percent change in labour force growth. On the other hand, the global labour force shock has no effect on the current account.

In general, the estimation results obtained from pooled and fixed effect method was satisfactory and in accordance with the theoretical predictions. However, the above model is a dynamic equation thus pooled and fixed effect method does not account for unobserved endogeneity that arises because of the lag variable in the regression model. Techniques that can be used to overcome this problem is generalized method of moments (GMM). The results of the analysis are presented in Table 4.

Table 4 Estimation Results of GMM Model

Dependent Variable:	Model	
	1 step	2 step
Current Account		
Short Term Coefficients		
L^c	0.41627***	0.37525**
L^w	-0.74919	-0.32867
Long Term Coefficients		
L^c	1.0802	0.9901
L^w	-1.9442	-0.8672
λ	0.614671	0.621006
<i>Speed of adjustment</i>	0.385329	0.378994
<i>J statistic</i>	252.7291	12.32664
<i>Sargant test (Pvalue)</i>	0.020791	0.419816

Dependent Current Account	Variable:	Model	
		1 step	2 step
AR 1 (Pvalue)		0.0041	0.0048
AR 2 (Pvalue)		0.7544	0.6721

Note: long-term coefficients are $(\delta_i/1 - \lambda)$. Signs*** means significant at $\alpha = 1\%$, ** significant at $\alpha = 5\%$, and * significant at $\alpha = 10\%$

The instrument validity used in GMM models can be tested for consistency by using the Sargan test. The null hypothesis in this test assumes orthogonal conditions of instrumental variables used are met. The test results show if one step GMM has not met the validity test. Unlike the two steps GMM that meet this assumption, so that the instrument can be said to be valid models. Tests on the second order correlation of the error term is also not able to reject the hypothesis that there is no correlation between the error term that can be said to be valid GMM estimators (Arellano and Bond, 1991).

The speed of adjustment of one step GMM is equal to 0.385329 while the two steps GMM by 0.378994. This means about 38% of the current account gap is due to an increase in labour force will be adjusted within one period (one year). Adjustments that occurred in the current account balance into the initial pattern still relatively slow. This indicates labour regulation system in ASEAN + 6 countries tend to be rigid and less flexible in balancing the movement of labour mobility across sectors.

Overall estimation results indicate that only country-specific labour force shock has a significant effect on current account, while the global labour force shock does not affect. This indicates that if the role of labour's shock is asymmetric, only affects the specific country and has not a significant impact on other countries or region as a whole. A positive sign on the L^c value support the theory put forward by Jin (2012). If a country experienced a rapid increase in labour, then there is an increase in the income received by the younger population, which is a party to savers in the economy. Because of the interest rate yield rate in every country is the same for all periods, as a consequence of the same production technology, the savings will be allocated both at home and abroad, which led to capital outflows. It is reflecting on the current account surplus. Increased the labour force in a country will encourage them to specialize in labour-intensive products and encourage capital outflows as a demand decrease for capital in the country

Coefficient of global labour force shock is negative. This means an increase in the labour force from another country (global) will push the current account deficit in a country. Different sign coefficients of country-specific labour force with global labour force indicates if the direction of labour force shock toward to beggar-thy-neighbor, in which the shock has a different effect between the country of shock origin and the country in which the shock is transmitted. Labour force increase that occurs in one country will push the current account surplus for this country, while its influence into the current account deficit to other countries or group as a whole.

The estimation results confirm and able to explain the direction of international capital movements which are not consistent as predicted by theory. Traditional theory believes that the capital will move from rich countries to countries that lacked of capital. However, many studies found it was in an opposite pattern (Prasad et al, 2006; Schularick, 2006). It derives new results on how the global equilibrium responds to a variety of shocks and structural changes.

Two of the most important phenomena in the global economy are trade and financial integration and rapid labour force/productivity growth in emerging markets (Jin, 2012). The standard open-economy models predict a net capital inflow into developing countries. In contrast to predictions from the standard open-economy macroeconomic framework, a permanent increase in the labour-force or labour productivity in a country can induce a net capital *outflow*. Also, capital can flow from developing countries to advanced economies when these countries integrate. The underlying mechanism hinges on a new force driving international capital flows: capital tends to flow toward economies that become more specialized in capital-intensive sectors.

The estimation result also indicates if global labour force shock is not specific only in one country, but has the same effect for all members of the group (symmetric). These results are consistent with theoretical predictions. These results are similar to the analysis Glick and Rogoff (1992) with serial data of eight industrialized countries (OECD), which showed that the country-specific productivity shock will worsen the current account, while the global shock impact relatively small and symmetric. Bussiere et al. (2005) also showed similar results, if the specific country productivity shock played a key role on the current account, even though the focus of their analysis to budget deficit effect in 21 OECD countries.

Considering the movement of international capital flows is strongly associated with the development of financial institutions in the country, and then the above model was developed to control labour force shock effect using the ratio of M2 to GDP as a proxy. Ratio of M2 to GDP indicates level of financial institutions development in each country. Traditional interpretation of this variable is to measure levels of perfection of the financial system that can attract more savings. However, these variables can also be seen as a proxy for borrowing constraints that must be faced by individual agents associated with the smallest private investment. The depth of the financial system to domestic investment effects can be said unclear from the theory perspective. Hence the influence of these variables on the current account balance can only be seen empirically (Chinn and Prasad 2003, p. 51). Analysis results by the OLS and FE models are presented in Table 5.

Table 5 Estimation Results OLS and FE Regression with Ratio M2 to GDP as Control Variable

Dependent Variable:	Model	
	Pooled OLS	Country Fixed Effect
Current Account		
Short Term Coefficients		
L ^c	0.065992	0.388386*
L ^w	-0.439629	-0.319597
M2 ^c	-0.005332	-0.004908
M2 ^w	-0.009096	0.010566
Long Term Coefficients		
L ^c	0.8928	1.13809
L ^w	-5.9478	-0.93652
M2 ^c	-0.0721	-0.01438
M2 ^w	-0.1231	0.03096
λ	0.926086	0.65874
Speed of adjustment	0.073914	0.34126
R ²	0.910975	0.925553
F statistic	663.0814***	202.845***
Akaike info criterion	5.560871	5.46688

Note: long-term coefficients are $(\delta_i/1 - \lambda)$. Signs*** means significant at $\alpha = 1\%$, ** significant at $\alpha = 5\%$, and * significant at $\alpha = 10\%$

The estimation results by OLS and fixed effect generally indicate if there is no significant difference with the first regression results, where only country specific labour force growth is significant and asymmetric, even though it has been

controlled by a financial system development. The speed of adjustment still indicates if the adjustment towards current account balance pattern is relatively slow. These results then will be compared with GMM models.

Table 6 Regression Results of GMM Model with Ratio M2 to GDP as Control Variable

Dependent Variable:	Model	
	1 step	2 steps
Current Account		
Short Term Coefficients		
L ^c	0.387773**	0.551425**
L ^w	-0.30163	-0.480249
M2 ^c	-0.004485	-0.016448
M2 ^w	0.013509	0.018102**
Long Term Coefficients		
L ^c	1.01703	1.45899
L ^w	-0.79110	-1.27067
M2 ^c	-0.01176	-0.04351
M2 ^w	0.03543	0.04789
λ	0.618721	0.622052
<i>Speed of adjustment</i>	0.381279	0.377948
<i>J statistic</i>	253.3019	11.92282
<i>Sargant test (Pvalue)</i>	0.019586	0.290255
<i>AR 1 (Pvalue)</i>	0.0019	0.0015
<i>AR 2(Pvalue)</i>	0.5995	0.6394

Note: long-term coefficients are $(\delta_i/1 - \lambda)$. Signs*** means significant at $\alpha = 1\%$, ** significant at $\alpha = 5\%$, and * significant at $\alpha = 10\%$

Incorporating the financial institutions development as a control variable does not change the initial results that only country- specific labour force shock has a significant effect on the current account movement. The influence of the global M2 ratio is only seen from two steps GMM estimation. The estimation results indicate a relatively small effect of the financial system development to dynamic movement in the current account. The magnitude of the country- specific dynamic multiplier M2 only amounted to - 0.016448 which means about a 0.016 percent change in the current account deficit driven by changes in financial systems in the form of expansion of 1% the amount of money circulating in the country. The dynamic multiplier value of global shock amounted to 0.018102 indicates if an increase of one percent in the money supply abroad (global) will encourage changes in a country's current account surplus amounted to 0.018 percent. These findings similar to results of Ferrero et al. (2008) which states that if the behavior of the international variables (one of which is the current account) are relatively

insensitive to monetary shock, which different to its effects on domestic variables such as output and inflation. The elasticity of the current account changes caused by the monetary variable shock is relatively smaller than a shock from the real sector (labour force growth). Significant value to the global M2 variable indicates if the current account of a country affected by changes in policy or global monetary variables. This also shows the vulnerability of the current account movement from monetary changes in other countries or globally. This means that the system of monetary policy in the country should be more preventive in anticipation of any shock that might occur abroad (global).

In accordance with Bajo-Rubio and Díaz-Roldán predictions (2011) if the monetary shocks will always be symmetrical, unlike the real and supply shocks that can be symmetric or asymmetric. Based on the assumption of ASEAN + 6 countries are perfectly symmetric, the symmetric shock effect would be equally both for each member country and to the group as a whole. Monetary shock can be asymmetric, affecting only one member of the group, but in practice the effect of a shock as it would be the same for the country and for other group members. This is because money markets in this group are relatively similar. In other words, the asymmetric impact of monetary shock will affect the same as symmetric shock practically.

The ratio of M2 coefficient to current account has consistently shown a negative sign, indicate that financial system development negatively affects the current account. This means an increase in the financial institutions development tend to bring the current account deficit. These results are in line with other empirical studies if the developing countries financial institutions development negatively correlated with the investments that may result of this variable describes the existence and development of capital markets that can be accessed. That is better and more integrated financial markets will increase the country's ability to borrow from abroad (Chinn and Prasad, 2003).

5. CONCLUSION

This paper tries to analyze the effects of labour force shock to the current account movement of ASEAN + 6 countries. The model was applied to see the labour force effects, either from a specific country or from abroad (global) to current account. The estimation results indicate if the current account movement is only affected by country-specific labour force growth rate, without being

influenced from other countries. This shows if labour force shock is asymmetric, which only affects the country itself without affecting other countries or other group members. The relatively slow speed of adjustment indicates if labour regulation system in ASEAN + 6 countries tends to be rigid and less flexible in balancing labour mobility movement across sectors, hence the current account adjustment toward long-term equilibrium is relatively slow. Different coefficient signs indicate if the direction of labour force shock into beggar-thy-neighbor, which means an increase in the labour force that occurs in one country will have a positive influence to their current account, whereas a negative impact on other countries or the group as a whole.

Estimation model developed to include the ratio of M2 to control the differences in financial institutions development effect to the current account fluctuations. The final result shows if the financial institutions impact is relatively small and symmetric compared to labour force shock. Global monetary shock has a significant effect on the current account shows the current account vulnerability from global monetary changes. Therefore, domestic monetary policy system must be more preventive in anticipating all the monetary and financial shock that may occur abroad. It is noteworthy if this analysis is done before the ASEAN Economic Community (AEC) is implemented. When AEC began, with a more free capital flows and labour migration across countries, the current account movement could be more dynamic due to restrictions reduction in the rules of employment and foreign investment.

REFERENCES

1. Antras, P. and R.J. Caballero (2009). "Trade and Capital Flows: A Financial Frictions Perspective". *Journal of Political Economy*, Vol. 117(4), 2009, pp. 701-744.
2. Arellano, Manuel and Stephen Bond (1991). "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *The Review of Economic Studies*, Vol. 58 (2), 1991, pp. 277-297.
3. Bajo-Rubio, Oscar and Carmen Díaz-Roldán (2001). "A General Framework for the Macroeconomic Analysis of Monetary Union." Unpublished Manuscript.
4. Baltagi, Badi H (2005). "Econometric Analysis of Panel Data Third Edition." John Wiley and Sons Ltd, The Atrium, Southern Gate, Chichester, West Sussex PO19 8SQ, England.
5. Bosworth, Barry P. and Susan M. Collins (1999). "Capital Flows to Developing Economies: Implications for Saving and Investment." *Brookings Papers on Economic Activity*, No. 1/1999

6. Bussière, Matthieu, Marcel Fratzscher, and Gernot J. Müller (2005). "Productivity Shocks, Budget Deficits, and the Current Account." *European Central Bank, Working Paper Series* No. 509/August/ 2005.
7. Caprio Jr, Gerard and David H. Howard (1984). "Domestic Saving, Current Accounts, and International Capital Mobility." *International Finance Discussion Papers*, No. 266, Federal Reserve System, June 1984.
8. Cashin, Paul and C. John McDermott (1998). "Terms of Trade Shocks and the Current Account." *International Monetary Fund Working Paper* No. 177, December 1998.
9. Chinn, Menzie D. and Eswar S. Prasad (2003). "Medium-term Determinants of Current Accounts in Industrial and Developing Countries: An Empirical Exploration." *Journal of International Economics* 59, 2003, pp. 47–76.
10. Feldstein, Martin and Charles Horioka (1979). "Domestic Savings and International Capital Flows." *National Bureau of Economic Research, Working Paper* No. 310, 1979.
11. Ferrero, Andrea, Mark Gertler, and Lars E.O. Svensson (2008). "Current Account Dynamics and Monetary Policy." *National Bureau of Economic Research, Working Paper* No. 13906, April 2008.
12. Glick, Reuven and Kenneth Rogoff (1995). "Global Versus Country-Specific Productivity Shocks and the Current Account." *Journal of Monetary Economics*, 35 (1995), pp. 159 – 192.
13. Gruber, Joseph W. and Steven B. Kamin (2005). "Explaining the Global Pattern of Current Account Imbalances." *International Finance Discussion Papers*, No. 846, Federal Reserve System, November 2005.
14. Herrmann Sabine and Adalbert Winkler (2008). "Financial markets and the Current Account – Emerging Europe versus Emerging Asia." *Deutsche Bundesbank Discussion Paper Series 1: Economic Studies*, No 05, 2008.
15. Jin, Keyu (2012). "Industrial Structure and Capital Flows." *The American Economic Review*, No. 102(5), 2012, pp. 2111-2146.
16. Ju, Jiandong and Shang-Jin Wei (2006). "A Solution to Two Paradoxes of International Capital Flows." *IMF Working Paper* WP/06/178, 2006.
17. Lane, Philip R (1999). "Money Shocks and the Current Account." *Trinity College Dublin and CEPR*, February 1999.
18. Lee, Jaewoo and Menzie D. Chinn (2002). "Current Account and Real Exchange Rate Dynamics in the G-7 Countries." *International Monetary Fund* No. 130, August 2002.
19. Moreno, Ramon (2008). "Experience with Current Account Deficits in Southeast Asia." in *Current Account and External Financing*, edited by Kevin Cowan, Sebastián, Edwards, and Rodrigo O. Valdés, Santiago, Chile. 2008, Central Bank of Chile.
20. Mundell, Robert A (1957). "International Trade and Factor Mobility." *The American Economic Review*, Vol. 47(3), 1957, pp. 321-335.
21. Obstfeld, M. and K. Rogoff (1996). "*Foundations of International Macroeconomics*." The MIT Press. Cambridge, Massachusetts. London, England, 1996.
22. Obstfeld, Maurice (2012). "Does the Current Account Still Matter?" *National Bureau of Economic Research, Working Paper* No. 17877, 2012.
23. Pesaran, M. Hashem, Yongcheol Shin, and Ron P. Smith (1998). "*Pooled Mean Group Estimation of Dynamic Heterogenous Panel*", 1998.

24. Prasad Eswar, Raghuram Rajan, and Arvind Subramanian (2006). "Patterns of International Capital Flows and Their Implications for Economic Development." *Research Department, IMF*, Unpublished Manuscript.
25. Sachs, Jeffrey (1981). "The Current Account in the Macroeconomic Adjustment Process." *National Bureau of Economic Research, Working Paper No. 796*, November 1981.
26. Sachs, Jeffrey (1982). "Aspects of the Current Account Behavior of OECD Economies." *National Bureau of Economic Research, Working Paper No. 859*, February 1982.
27. Schularick, Moritz (2006). "A Tale of Two 'Globalizations': Capital Flows From Rich to Poor in Two Eras of Global Finance." *International Journal of Finance and Economics*, Vol 11, 2006, pp. 339–354.
28. Sek, S.K. and C.L. Chuah (2011). "The Dynamic of Current Account in Emerging East-Asian: Does Exchange Rate Matter?" *International Journal of Trade, Economics and Finance*, Vol. 2(4), August 2011.
29. Wooldridge, Jeffrey M (2005). "Introductory Econometrics: A Modern Approach." Fourth Edition. South Western, 2005



SOURCES OF ECONOMIC GROWTH IN THE SOUTHERN AFRICAN DEVELOPMENT COMMUNITY: ITS LIKELY IMPACT ON POVERTY AND EMPLOYMENT

MONAHENG SELETENG*, SEPHOOKO MOTELLE**

Abstract: *As a means to combat poverty, many countries still pursue high and stable rates of economic growth. In order to attain sustained economic growth, it is crucial that countries do not only accumulate a certain stock of factors of production, but demonstrate the ability to combine such factors in an efficient manner. This study attempts to investigate the key sources of economic growth in the Southern African Development Community (SADC) region, using different panel data techniques, and make inference on poverty and employment. The findings reveal that factors affecting economic growth in the region are: inflation, government expenditures, openness to trade, human capital, level of financial development, and political stability. Furthermore, from the analysis it can be inferred that a higher growth rate has a positive impact on employment and, hence, may lead to poverty reduction.*

Keywords: *convergence, economic growth, fixed effects, difference GMM, system GMM, seemingly unrelated regressions, inequality, unemployment, poverty.*

JEL Classification: *C33, E31, O43, O47, O55, J64.*

1. INTRODUCTION

Generally, economic growth is a process through which economic inputs and resources, such as skilled labour, capital, and funding for new businesses, are converted into economic outcomes such as wage growth, job creation, or new businesses (Hall and Sobel, 2006). The economic outcome generated from any specific set of economic inputs depends on the institutions (political and economic rules of the game) under which an economy operates. The growth performance during the last four decades has been diverse among countries around the world. On the one hand, rapid growth rates were experienced by the “Asian tigers”

* Monaheng Seleteng, Central Bank of Lesotho, P.O. Box 1184, Maseru, 100, mseleteng@centralbank.org.ls

** Sephooko Motelle, Central Bank of Lesotho, P.O. Box 1184, Maseru, 100, smotelle@centralbank.org.ls

between the 1965 and 1995 (De Gregorio and Lee, 1999). These “Asian tigers” experienced growth rates of around 6 % per year in per capita terms. On the other hand, many countries in Sub-Saharan Africa (SSA) and Latin America registered less than 1 % average growth rates in per capita income during the same period.

In the context of Southern African Development Community (SADC), the patterns of growth can be examined along three regional groups, namely: the Common Monetary Area (CMA), the Southern African Customs Union (SACU) and what can be called other-SADC⁹. SADC consists of 15 member states, namely; Angola, Botswana, Democratic Republic of Congo (DRC), Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa (SA), Swaziland, Tanzania, Zambia and Zimbabwe.¹⁰ The member states have differing levels of education, health provisions and other socio-economic development indicators. However, according to Nel (2004) , members of SADC are characterised by similar trade patterns. There is also evidence of intra-SADC trade, albeit very shallow. The Article 5 of the SADC Treaty highlights that the overall objectives of SADC include the promotion of economic growth and socio-economic development which will eventually eradicate poverty, and promote and maintain peace, security and democracy, through regional cooperation and integration (SADC, 2011).

The macroeconomic convergence target for real GDP growth is 7 %. Figure 1 shows that, on average, the CMA saw a steady upward trend in real GDP growth rate which recorded 2.23 %, 4.78 % and 5.67 % for the periods 1981-1990, 1991-2000 and 2001-2010, respectively. The average trend reflects the patterns of economic growth in Lesotho, South Africa and Namibia which dampened the decadal decline registered in Swaziland. Similarly, SACU realised an increasing average decadal growth rate during the same period. For this group of countries, the average real GDP growth rate was 2.05 %, 4.53 %, and 4.99 % in 1981-1990, 1991-2000 and 2001-2010, respectively. Even though Botswana and Swaziland realised average growth rates that hovered above the SADC convergence target during the 1981-1990 decade, the two countries recorded steady declines in the

⁹ CMA comprises South Africa, Lesotho, Swaziland and Namibia, while SACU adds Botswana to the CMA group.

¹⁰ Madagascar was suspended in 2009, and has since been reinstated in January 2014

growth rate of GDP from decade to decade (Figure 1). The average GDP growth rate for the group other-SADC plummeted from 3.89 % recorded for the 1981-1990 decade to 3.58 % during the 1991-2000 decade. This decline was attributable to a recession that was realised in DRC during the 1991-2000 decade. However, the average GDP growth rate accelerated to 4.53 % during the 2001-2010 decade. This recovery was driven by average growth rates registered in Angola, Mozambique and Tanzania which surpassed the SADC convergence target. The Zimbabwean recession was overshadowed by the average growth rates realised in other countries in this grouping. Overall, the SADC's average growth rate followed an upward trend, mimicking the trends observed for CMA and SACU.

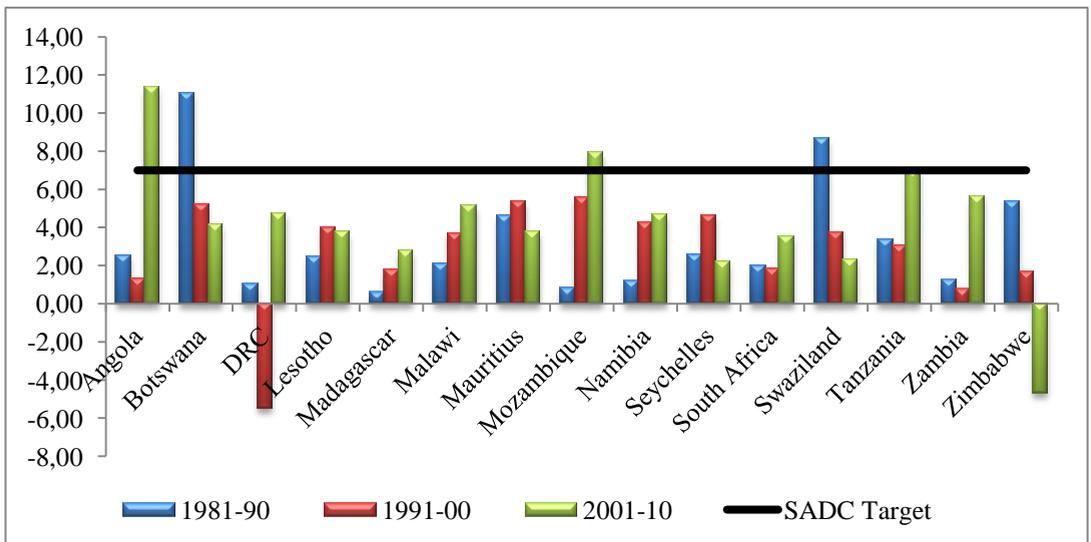


Figure 1 Trends of the real GDP growth in the SADC

Source: IMF, 2014

Figure 1 shows that disparities in the rate of growth is not unique to regional comparisons, as discussed at the outset, but are evident even within SADC. This disparity in growth rates conjures a key issue on factors that drive economic growth. Thus, the key question is: What are the sources of economic growth? The paper investigates the sources of economic growth in SADC and makes some important inferences on how the identified sources of growth may affect employment and poverty in the region. As stipulated by the SADC mission statement, the main mission of SADC is to promote sustainable and equitable

economic growth and socio-economic development through efficient productive systems, deeper co-operation and integration, good governance and durable peace and security, so that the region emerges as a competitive and effective player in international relations and the world economy (SADC, 2011). The importance of investigating the sources of economic growth in this region stems from the notion that the member states are striving towards common goals and, therefore, are likely to pursue similar macroeconomic policies. The motivation for the analysis emanates not only due to the lack of any studies investigating sources of economic growth in the SADC region, but, more generally, because of the fact that the sources of economic growth in the region may differ from the one that exists in developed countries due to the level of economic development and prudential macroeconomic policies that are being practised in those regions.

The paper contributes to the body of knowledge in the field of economics by enhancing the understanding of the sources of economic growth in the SADC region in ways that have not been done before. To the best of our knowledge, this is the only study that looks into the sources of economic growth in the context of SADC. In addition, the paper uses different panel data econometric techniques to deal with problems which are normally encountered when using cross-country data such as endogeneity, heterogeneity and cross-sectional dependence. Hence, problems encountered by previous research in this field are adequately addressed.

The rest of the paper is structured as follows: Section 2 synthesises both theoretical and empirical literature on the sources of economic growth. Section 3 outlines the methodological tools employed in the study, namely the fixed effects (FE) estimator and difference and system generalised method of moments (GMM) estimators. Section 4 provides the data analysis focusing on the entire SADC and on the members of SADC (without countries that are outliers). Section 5 makes inference on employment and poverty. Section 6 concludes and offers a series of policy recommendations.

2. LITERATURE REVIEW

2.1. Theory of economic growth

The literature on economics is replete with studies on the sources of economic growth. Classic writers such as Adam Smith, David Ricardo and Thomas

Malthus expended much effort to comprehend the concept of economic growth. According to Adam Smith countries become prosperous when they have good institutions that create favourable rules of the game – rules that encourage the creation of wealth. Since then, a vast variety of research has been carried out attempting to understand why some countries grow faster in the long run while others fail to. Neoclassical economists in the 1950s resuscitated research on economic growth. The models of Solow (1956) and Swan (1956) became pillars of the new growth theories. Application of these models culminated into a consensus on the understanding of drivers of growth by both classical and neoclassical economists. This understanding identifies technological progress as the sole lasting source of growth, given that the law of diminishing returns over time eliminates any growth that emanates from physical accumulation.

The modelling framework assumes that the production possibilities of an economy are described as follows:

$$Y = F(K, L, A) \quad (1)$$

where:

- K, L and A represent inputs, namely; capital, labour and technological progress.

The production function has two key properties. Firstly, it is able to exhibit constant returns to scale, in the sense that, if labour and capital are increased by a factor of α , output should be able to respond by the same α .¹¹ Secondly, the production function obeys the law of diminishing returns to capital. Furthermore, technical progress is exogenous and, capital and labour are substitutable. A common specification of the neoclassical production function is a Cobb-Douglas function defined as:

$$Y = AK^\lambda L^{1-\lambda} \quad (2)$$

In this case, λ represents the proportion of national income for owners of capital, and $1 - \lambda$ is the fraction due to workers. In order to account for unemployment, equation 2 is defined in terms of output per capita. Output per capita and output per worker coincide if the population is equal to the labour force. If labour (L) is divided between the total number of workers (N) and skill quality (β), then output per worker can be obtained by dividing equation 2 by N :

¹¹ This assumption is anchored on the principle of replication.

$$y = Ak^\lambda\beta^{1-\lambda} \quad (3)$$

where:

- y and k denote output per worker and capital per worker, respectively.

Equation 3 identifies sources of growth in output per worker. In other words, policymakers can increase output per worker by increasing all or one of the following: investment in physical capital and/or amount of skilled labour in the economy through education or technological progress.

The dynamics of this framework have several implications. The first one arises due to diminishing returns to capital, meaning that the rate of economic growth due to capital accumulation will slowly approach zero. Even though the economy will be richer, it would have remained stagnant.

The second implication is due to differences in the capital stocks across countries. Hence, poorer countries with smaller stocks of capital will realise higher marginal products of capital than their richer counterparts. Diminishing returns would imply that a unit increase in the stock of capital, in both a rich and poor country will result in faster output growth in the poor country than in the rich one. It is easy to realise that the poor country will gradually catch up with its richer counterpart. This phenomenon is known as the *absolute convergence hypothesis*.

The third implication involves the differences in the savings rates. Absolute convergence hypothesis assumes identical savings rates for both the poor and the rich country. However, if the savings rates differ across the two countries, then the poor country will only catch up if its savings rate exceeds that of the rich country. This is referred to as the *conditional convergence hypothesis*. Sala-i-Martin (1995) distinguishes enduring and short-lived sources of growth. He concludes that countries are able to achieve enduring growth rates over time if their main source of growth is “productivity improvements” manifested by increases in technological progress. He points out that this takes place “because knowledge has no frontiers.” However, rapid growth dependent on high savings and investment rates, attained through capital accumulation or increasing skill levels, would decelerate and eventually cease.

The neoclassical models provided a basis for what is currently understood as endogenous growth, a concept which emerged from the pioneering work of Romer (1986). Unlike the neoclassical models, which assume diminishing returns to capital, the endogenous growth model assumes increasing returns to capital.

Endogenous growth models identify the rate of accumulation of physical and human capital, and technological progress as determinants of long-run economic growth (Arrow, 1962). Investment in human capital (e.g. expenditures on education, training, and research and development) could have a positive impact on economic growth. This outcome is possible if high skills and training are accompanied by the process of innovation, which leads to a faster rate of technological progress. Hence, investment in education may not only make contribution to growth via improvements in the quality of the workforce, but also via innovation driven by research and development. On the empirical front, most studies use the share of investment to GDP as a proxy for physical capital and level of formal education (e.g. school enrolment ratio) as a proxy for human capital (Romer, 1986) and, technological progress is often represented by expenditures on research and development. Endogenous growth models identify good policies as key drivers of long-run economic growth. Unlike their neoclassical predecessors, endogenous growth theorists predict that convergence between poor and rich countries is not feasible due to the assumption of increasing returns to scale.

There are two other strands of the literature on the economics of growth, namely; the cumulative causation theory (Myrdal, 1957; Kaldor, 1970) and the new economic geography theory (Krugman, 1991). Both theories attach a significant weight to initial conditions. For example, the cumulative causation theory argues that initial conditions affect economic growth over time creating inequalities between countries. Such inequalities cannot disappear unless deliberate policy interventions are enforced. Petrakos and Arvanitidis (2008: 13) highlight that the new geography theory vividly associates economic growth with “compound effects of increasing returns to scale, imperfect competition and non-zero transportation costs.” Hence, the process of economic growth can be self-reinforcing due to spatial distribution of economic activities. There are cases where economic activities may cluster in certain locations where demand is high leading to both backward and forward linkages of firms and scale economies.

2.2. Empirical evidence on the sources of growth

There is vast empirical literature on sources of economic growth (for surveys, see Temple, 1999; Ahn and Hemmings, 2000). Growth accounting studies provide contrasting results on the sources of economic growth. For example,

Young (1994) found that in Singapore economic growth during the period 1960-1970 was a result of accumulation of physical and human capital rather than technological progress. On the contrary, Bosworth and Collins (1998) found that, during the period 1960-1970, in China, technological progress appeared to have accounted for more growth than accumulation of physical and human capital. The stark contrast indicated the complexity of the process of economic growth. Consequently, according to Bloch and Tang (2004: 245) the neoclassical approach remained limited to providing “practical guidance for sustained economic development.” They argue that neoclassical growth accounting focuses on what they call “proximate determinants” of growth, namely accumulation of capital and total factor productivity or technological progress without any reference to the sources of technological progress itself. Consequently, the literature distinguishes between proximate and deep determinants of economic growth.

The deep determinants of economic growth are institutions, openness to trade and geography. Easterly (2001) argue that *institutional quality* is crucial for economic growth such that poor institutions inhibit growth even if factors such as foreign aid, debt forgiveness, family planning infrastructural development, education and foreign investment are abundant. This finding built on North and Thomas (1973) who pointed out that lack of institutions such as protection of property rights impede investment in both forms of capital and impairs economic growth. There is also cross-country evidence of a positive association between property rights and economic growth (Hall and Jones, 1999; Rodrik, 1999). Furthermore, Knack (2002) indicates that well-defined property rights encourage technological progress and innovation and boost efficiency gains. There is evidence that socio-cultural institutions such as trust and ethnic diversity (Easterly and Levine, 1997), political institutions such as type of regime (democracy), stability of government, political violence and volatility (Bunetti, 1997) and macroeconomic policies (Barro and Sal-i-Martin, 1995) affect economic growth in one way or another. Moreover, a number of studies confirms the presence of a causal relationship between good institutions and per capita income, with causality running from the former to the latter (Acemoglu et al., 2001, 2002, 2003). Tang et al. (2003) underscores that good quality institutions accelerate technical change and enhance long run economic growth rate.

Geography is another deep determinant of economic growth. Bloch and Tang (2004: 248) highlight that the impact on economic growth is felt in several ways such as “health, population growth, food productivity, resources endowment and mobility of factors of production.” For example, there is empirical evidence that latitude (Hall and Jones, 1999) and winter frost (Masters and McMillan, 2001) stimulate economic, while tropical climate (Gallup *et al.*, 1999) and adverse disease ecology (Acemoglu *et al.*, 2001) inhibit economic growth. Areas where diseases such as malaria are rife may lose much of the labour force. In addition, Sachs and Warner (2001) observe that, between 1900 and 19.../20..., countries rich in resources grew slower than their resource-poorer counterparts because of the Dutch disease and the high probability of civil conflicts. Moreover, proximity to coastal waters provides an inexpensive highway to global markets and boosts economic growth, a fact proved by Frankel and Romer (1999), who showed that trade is lower in landlocked countries. This results shows that geography can also affect economic growth through trade openness.

The third deep determinant of economic growth is *openness to trade*. Bloch and Tang (2004) propound that trade enhances per capita income growth directly through comparative advantage. In an indirect manner, trade openness bolsters economic growth by improving efficiency through technology transfer, economies of scale and international competitiveness. In addition, there are close links between capital flows such as FDI and trade openness. Lensink and Morrissey (2006) find that FDI contributes positively to economic growth. A series of studies explore the various factors that have a bearing on trade openness which may retard its impact on economic growth. For example, trade distortions tend to decelerate economic growth (Edwards, 1998), export orientation boosts economic growth (Balasubramanyam *et al.*, 1996) and trade protectionist policies reduce influence negative labour and total factor productivity (Lee, 1996).

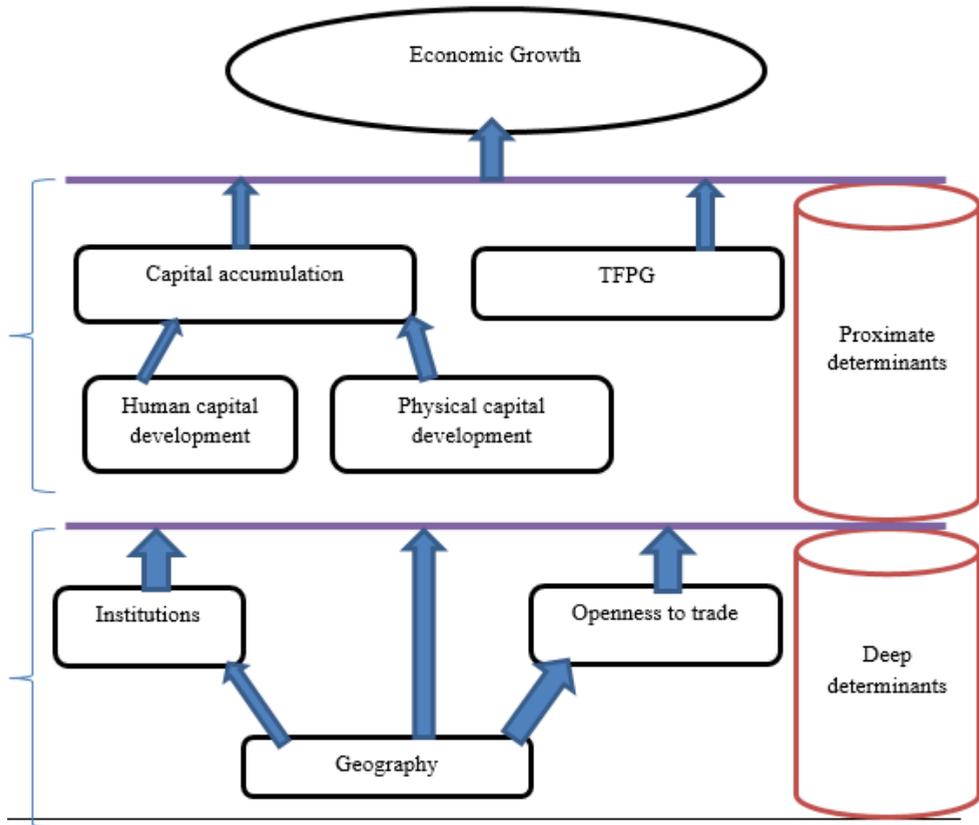


Figure 2 Structure of the sources of economic growth

Source: Authors

In the African case, the following sets of factors have been identified in the literature to have impact on economic growth. The first set of factors is classified under macro-economic fundamentals. These include inflation (Grier and Tullock, 1989; Fischer, 1991; Seleteng et. al, 2013), the degree of openness to international trade (Knight *et al.*, 1993; Frankel and Romer, 1999), the extent of financial development (Mckinnon, 1973; King and Levine, 1992) and fiscal policies (Easterly and Rebelo, 1993). The second set of factors comprise the countries' institutional environment such as political stability, civil liberties and ethnic fractionalisation (Easterly and Levine, 1997; Kormendi and Meguire, 1985). The third set includes geographic factors such as access to the sea, tropical climate and natural resource abundance (Sachs and Warner, 1997).

3. EMPIRICAL ANALYSIS

3.1. Overview of the datas

The dataset used is obtained from the World Bank Development Indicators (WDI), IMF International Financial Statistics (IFS) and Polity IV database, for the period 1980 to 2012. The growth variable used in the analysis is the growth rate of real GDP. The control variables are standard in the growth literature as discussed in Durlauf *et al.* (2005) and Levine and Renelt (1992), who used Leamer's extreme bounds analysis to analyse growth accounting regressions. Levine and Renelt (1992) found that inflation, investment's share of GDP, initial level of GDP, secondary-school enrolment rate, average annual rate of population growth and trade are robust in the growth regressions.

Following the works mentioned above, we used a set of variables which control for factors associated with economic growth (Table 1).

Table 1 Description of the variables

Variable	Acronym	Description	Source	Expected Sign
Real GDP growth	GR	Real GDP growth (annual %)	WDI	n/a
Inflation	INFL	Consumer price inflation (annual % changes in CPI)	WDI	+/-
Investment	GFCF	Gross fixed capital formation (% of GDP)	WDI	+
Openness	OPEN	(Imports + Exports) of goods and services (% of GDP)	WDI	+
Government	GOV	General government final consumption expenditure (% of GDP)	WDI	+/-
Money supply	M2	Money and quasi money(M2) [% of GDP]	IFS	+
Credit	PSC	Private sector credit extension (% of GDP)	IFS	+
Democracy	INST	Institutional variable [-10, +10] with a +10 a full consolidated democracy		
Human capital	EI	Secondary school enrolment (% of corresponding population age group)	WDI	+
Public spending on education	PSE	Public spending on education, total (% of GDP)	WDI	+
Population growth	POPGR	Population growth (annual %)	WDI	+/-
Urbanisation	UPOPSHR	Urban population (% of total)	WDI	+/-

The coefficients of these variables are expected to exhibit signs consistent with literature based on *a priori* expectations. Inflation (*INFL*) – a negative relationship is expected between inflation and growth (Fischer, 1993); the ratio of gross fixed capital formation to GDP (*INV*) - a Solow determinant and it is expected that investment positively affects growth (Bond et al, 2010); a measure of openness to trade - ratio of imports and exports to GDP (*OPEN*)– it is expected that more open economies in terms of trade display faster growth rates, mainly because higher exports imply an increased inflow of foreign exchange into the country and also imports of intermediate materials may be growth enhancing (Wacziarg and Welch, 2008). Moreover, a measure of conditional convergence namely, lagged real GDP (*YI*) is included as part of the explanatory variables; a measure of financial development, namely the ratio of private sector credit extension to GDP (*PSCE*) or ratio of liquid liabilities to GDP (*M2*) – it is expected that wider access to finance increases economic activity (Levine *et. al*, 2000).

We account institutions by using an institutional variable representing a measure of the level of democracy (*INST*) – and it is expected that more democratic countries tend to grow faster (Papaioannou and Siourounis, 2008). Moreover, Durlauf *et. al* (2005) list different group of variables that have already been regressed against growth, including a measure of the size of the government, measured as final government consumption expenditure as a share of GDP (*GOV*); public spending on education (*PSE*); school enrolment ratios - for both primary and secondary school enrolments (*EL*); urbanisation - share of urban population to total population (*UPOPSHR*); and population growth (*POPGR*). These variables were considered as part of the explanatory variable set (Table X). The number of countries included in the sample amounts to 15 (T = 33, N = 15), therefore NT = 495.

Table 2 *The correlation matrix (SADC, 1980-2012)*

	GR	INFL	GFCF	GOV	PSE	INST	M2	OPEN	POPGR
GR	1								
INFL	-0.13***	1							
GFCF	0.20***	-0.11**	1						
GOV	0.03	-0.09*	0.37***	1					
PSE	0.002	-0.04	0.14***	0.19***	1				
INST	0.15***	-0.05	0.22***	0.12***	0.58***	1			
M2	-0.05	0.001	0.24***	0.14***	0.65***	0.40***	1		
OPEN	0.21***	-0.04	0.45***	0.40***	0.17***	0.08	0.21***	1	
POPGR	0.08*	0.001	-0.17***	-0.07	-0.58***	-0.36***	-0.55***	-0.27***	1

***/**/* denotes significance at 1 %, 5 % and 10 %, respectively.

Table 2 presents the correlation matrix of the variables used, and inflation and growth depict a negative and statistically significant correlation with each other (Fischer, 1993). Other control variables (with the exception of *M2*) have the expected signs. Investment is positively and significantly correlated to economic growth (Bond et. al, 2010), as well as openness to trade (Papaioannou and Siourounis, 2008). Moreover, population growth is also positively and significantly correlated to economic growth.

Government consumption and secondary school enrolment are positively correlated to economic growth, however, not statistically significant. A measure of financial development is negatively correlated with growth, however not statistically significant either. In a nutshell, this initial inspection of data, with all its known caveats, confirms the *a priori* expectations with an exception of a measure of financial development.

3.2. Unit Root Testing

Consider the following data generating process:

$$y_{it} = \alpha + \rho y_{it-1} + \varepsilon_{it} \quad (4)$$

To check for the presence of a unit root in the panel, we use the Im, Pesaran and Shin (2003) (IPS) unit root test and the Levin, Lin and Chu (2002) (LLS) specification to test. The Levin, Lin and Chu (2002) (LLC) specification assumes a common unit root process, i.e. common ρ for all cross-sections (assumes parameter homogeneity) as opposed to the IPS test which assumes individual unit root processes, i.e. individual ρ_i 's for every cross-section (allows for heterogenous parameters). Generally, since LLC does not consider a possible heterogeneity bias present in the data, IPS would be the preferred test. However, LLC unit root test results confirm IPS test results, i.e. all variables are stationary, with the exception of *M2* and *INST*, which are stationary in first differences. Therefore, the first differences of *M2* and *INST* variable are used in the model, whereas the rest of the variables are used in levels. Results for unit root tests are reported in Table 3.

Table 3 Panel Unit Root Tests

	<i>GR</i>	<i>INFL</i>	<i>GOV</i>	<i>OPEN</i>	<i>GFCF</i>	<i>M2</i>	<i>INST</i>
IPS W-stat							
Levels	-4.67***	-3.64***	-1.97***	-1.57*	-1.85***	0.18	0.38
[P-value]	[0.00]	[0.00]	[0.02]	[0.06]	[0.03]	[0.57]	[0.35]

Differences	-12.71 ^{***}	-14.05 ^{***}	-11.82 ^{***}	-13.31 ^{***}	-11.96 ^{***}	-10.24 ^{***}	-5.86 ^{***}
[P-value]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
LLC t [*] -stat							
Levels	-3.19 ^{***}	-3.44 ^{**}	-1.34 [*]	-1.76 ^{**}	-1.39 [*]	-1.56 [*]	-1.43 [*]
[P-value]	[0.00]	[0.02]	[0.09]	[0.04]	[0.08]	[0.06]	[0.08]
Differences	-6.80 ^{***}	-10.82 ^{***}	-10.09 ^{***}	-11.21 ^{***}	-9.42 ^{***}	-9.27 ^{***}	-4.77 ^{***}
[P-value]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]

***/**/* denotes significance at 1 %, 5 % and 10 %, respectively. [P-values] are in square brackets.

All the variables are expressed in logarithmic form except for the *inst* which ranges from -10 to +10. Due to space, unit root results on other variables such as *PVT*, *PSE*, *EL*, *POPGR* and *UPOPSHR* are not reported here. All these are I(1) with an exception of *POPGR*.

4. EMPIRICAL STRATEGY

Since $T > N$, the empirical strategy used is based on panel time-series analysis. Panel time-series allows us to deal with important econometric issues such as heterogeneity, endogeneity bias and cross-sectional dependence. Panel time-series methodologies have several advantages. Firstly, it allows us to specifically analyse the SADC case, amid all its idiosyncrasies and differences inherent within, without necessarily treating it as an outlier or as a dummy, and, therefore, it provides a clear picture of the region. Secondly, the issue of statistical endogeneity (unobserved individual effects present in the error term might be correlated with the regressors), and heterogeneity of intercepts are dealt with through the two-way Fixed Effects (FE) with robust standard error estimator, which provides consistent estimates in dynamic models when $T \rightarrow \infty$. Thirdly, economic endogeneity (reverse causality) may be present, thus, for instance, higher growth might generate lower inflation, and vice versa (Kocherlakota, 1996). Therefore, the Generalised Method of Moments (GMM) is applied.

Four panel data methodologies are used and then compared in the analysis. In particular, the Fixed Effects model specification acknowledges cross-section heterogeneity and assumes a different intercept for each country included in the sample. It can be argued that there is reverse causality or economic endogeneity, implying that higher growth actually generates higher inflation and not the inverse (Bittencourt, 2012). Therefore, GMM deals with the endogeneity problem in the dataset. Countries in the SADC region are striving towards common goals and,

therefore, are likely to pursue similar macroeconomic policies, implying that there is between-country dependence. The Seemingly Unrelated Regressions (SUR) estimator deals with cross-country dependence. Before the regressions are run, unit root tests are performed in order to determine the order of integration of the variables.

Therefore, the estimated heterogeneous dynamic equation is as follows:

$$GR_{it} = \alpha_i + \beta_i INF_{it} + \gamma_i INV_{it} + \delta_i EDU_{it} + \epsilon_i GOV_{it} + \varepsilon_i OPEN_{it} + \rho_i M2_{it} + \varphi_i INST_{it} + \theta_i GR_{it-1} + v_{it} \quad (5)$$

where:

- GR denotes growth rates of real GDP,
- INF are the inflation rates,
- INV shares of gross fixed capital formation to GDP,
- EDU is the public spending on education as share of GDP,
- GOV is the share of final government consumption expenditure to GDP,
- OPEN is a measure of trade openness,
- M2 is the share of liquid liabilities to GDP and
- INST is the institutional variable which proxies the democracy level.

4.1. Fixed Effects Estimator

4.1.1. Methodology

Firstly, the Chow (1960) F-test was used to test for fixed effects. We tested the null of no individual effects ($H_0: \mu_1 = \mu_2 = \dots = \mu_{N-1} = 0$) against the alternative that individual effects are not all equal to zero. In this case, $F = 1.59$ leading to a rejection of the null at all levels of significance. Therefore, countries in the SADC region are not homogenous and, hence, these differences have to be controlled for. Secondly, in order to decide between using a fixed and random effects model, a Hausman (1978) test was used. The null hypothesis is that the preferred model has random effects versus the alternative of fixed effects. The null hypothesis was rejected at all levels of significant, hence the preferred method is fixed effects in this case (see Table 1a in the Appendix).

Consider the following two-way error component regression model:

$$\begin{aligned} y_{it} &= \alpha + X'_{it}\beta + \mu_{it} \\ \mu_{it} &= \mu_i + \lambda_t + v_{it} \end{aligned} \quad (6)$$

where:

- μ_i is unobserved individual effect
- λ_t is unobserved time effect
- v_{it} is stochastic disturbance term
- $i = 1, 2, \dots, N$
- $t = 1, 2, \dots, T$

If μ_i and λ_t are assumed to be fixed parameters to be estimated and $v_{it} \sim IID(0, \sigma_v^2)$, then (2) represents a two-way fixed effects error component model. Note further that the X_{it} is assumed independent of the stochastic disturbance term (v_{it}) for all i and t . Since $T > N$, FE is the appropriate estimator to use in this case. Furthermore, as already discussed, the FE estimator reduces statistical endogeneity and, when $T \rightarrow \infty$, FE reduces the Nickell Bias¹². The choice of a two-way fixed effects estimator is informed by the fact that countries are different and, hence, this caters for cross-sectional heterogeneity. In addition, there were periods of high inflation episodes observed in the SADC region during our sample period, hence the time-effects takes this into account through the use of time dummy variables.

4.1.2. Results

First, all the coefficients of the initial level of income are negative and statistically significant indicating that there is conditional convergence in the SADC region. Moreover, INFL estimates are negative and statistically significant against GROWTH, suggesting that inflation is detrimental to economic growth and inflation generally distorted the pace of overall economic activity in the SADC region during the period under review. For instance, dynamic inflation estimate in Model A indicates that an increase of 1 percentage point in the inflation rate leads to a decline of about 0.2 percentage points in the annual economic growth rate.

Second, *GOV* variable (proxy for the size of the government) depicts negative, but statistically insignificant effect on growth. This shows that government spending may be detrimental to economic growth if such spending is channelled towards unproductive sectors (Barro, 1998). The variable proxying trade openness (*OPEN*) is positive and statistically significant in all the models

¹² When $T \rightarrow \infty$, the bias tends to 0. Judson and Owen (1999) argue that when $T = 30$, the FE estimator provides the best alternative in dynamic thin panels.

indicating that more open economies can indeed grow faster via increased flows of goods, capital, people and ideas (Wacziarg and Welch, 2008). This result regarding openness is important amid the objective of SADC to achieve regional integration, or trade openness, combined with economic growth and development.

Table 4 FE models (using M2 as a proxy for financial development)

Dependent Variable: GROWTH				
	Model A	Model B	Model C	Model D
Constant	3.03 (1.15)	2.79 (1.02)	3.05 (1.16)	2.99 (1.14)
Y1	-0.20* (-1.77)	-0.19* (-1.63)	-0.19* (-1.74)	-0.20* (-1.76)
INFL	-0.18*** (-3.22)	-0.19*** (-3.44)	-0.18*** (-3.15)	-0.18*** (-3.24)
GOV	-0.11 (-0.57)	-0.13 (-0.63)	-0.12 (-0.61)	-0.11 (-0.56)
OPEN	0.74*** (4.55)	0.79*** (4.74)	0.72*** (4.34)	0.74*** (4.55)
INV	0.11 (0.71)	0.10 (0.62)	0.11 (0.71)	0.11 (0.67)
M2	0.12 (0.41)	0.12 (0.39)	0.10 (0.36)	0.08 (0.29)
INST	-0.01 (-0.45)	-0.01 (-0.41)	-0.01 (-0.42)	-0.01 (-0.33)
PSE	0.12 (0.37)	0.12 (0.37)		
POPGR		-0.02 (-0.13)	0.64 (1.07)	-0.04 (-0.28)
EL				0.92* (1.67)
F* test	6.30	6.83	6.10	7.24
[P-value]	[0.00]	[0.00]	[0.00]	[0.00]
# of Obs	393	390	393	390

*/**/** denotes significance at 10 %, 5 % and 1 % levels, respectively.

All variables are in logarithms with the exception of INST, which ranges from -10 to +10. Variables INST, M2, PVT, LEI and PSE are I(1), hence, they are used in first differences across the models. T-ratios are in italics and in parenthesis.

Thirdly, a proxy for physical capital, INV presents a positive but statistically insignificant effects on *GROWTH* (Bond *et.al*, 2010). In addition, the ratio of liquid liabilities, M2, amid information asymmetries and lack of experience by smaller entrepreneurs in terms of how to make better use of finance, in general

present negative and not statistically significant estimates on growth. Regressions were also estimated using PVT as a proxy for financial development and the results are essentially similar (See Table 3a in the Appendix).

The variables for level of democracy (INST), population growth (POPGR), both proxies for human capital-private spending on education (PSE) and secondary school enrolment ratio (EL) have the expected signs, yet are statistically insignificant. Finally, the F^* tests indicate that there is evidence of country fixed effects.

4.2. Difference and System GMM Estimators

4.2.1. Methodology

Difference and system generalised method of moments (DIF-GMM and SYS-GMM) for dynamic panels have gained much popularity in recent years. This is due to the fact that these estimators are able to circumvent several modelling concerns such as endogeneity of regressors, which lead to problems of inconsistent and biased estimates. Research papers that propose the use of generalised method of moment estimators include Holtz-Eakin, Newey and Rosen (1988), Arellano and Bond (1991), Arellano and Bover (1995); and Blundell and Bond (1998).

A recurring debate in the literature is that growth, inflation and investment are three endogenous variables (Temple, 2000). To investigate this, the Hausman (1978) test for endogeneity is conducted and it confirms endogeneity in the model, as we reject the null of exogeneity of the regressors with a Hausman test statistic of 18.57. Consequently, the use of DIF-GMM and SYS-GMM is necessary since these estimators are designed to deal with the endogeneity problem, and also to fit linear models with a dynamic dependent variable, additional control variables and fixed effects (Roodman, 2009). Other studies such as Cukierman *et al.* (1993) uses several indicators as instruments, including Central Bank independence and turnover of Central Bank governors. However, due to data unavailability for such indicators in the SADC region, our DIF-GMM and SYS-GMM methods use lagged values of GR, INF and INV as instruments. In particular, since growth, inflation and investment are assumed to be endogenous, they are instrumented with their first lags. Consider the following data generating process:

$$y_{it} = \alpha y_{i,t-1} + X'_{it}\beta + \varepsilon_{it} \quad (7)$$

where:

$$\begin{aligned} \varepsilon_{it} &= \mu_i + v_{it} \\ E[\mu_i] &= E[v_{it}] = E[\mu_i v_{it}] = 0 \end{aligned}$$

Cross-sectional units are indexed by i and time is indexed by t . A vector of control variables is represented by X and this may include lagged values for both dependent variable and controls. The fixed effects and idiosyncratic shocks are represented by μ_i and ν_{it} , respectively. The panel has $(N \times T)$ dimension and may be unbalanced. When $y_{i,t-1}$ is subtracted from both sides of (3), we get an equivalent equation of growth presented as:

$$\Delta y_{it} = (\alpha - 1)y_{i,t-1} + X'_{it}\beta + \varepsilon_{it} \quad (8)$$

In DIF-GMM, estimation occurs after the data is differenced once in order to eliminate the fixed effects, while the SYS-GMM augments the DIF-GMM by estimating both in differences and in levels (Roodman, 2009). Therefore, SYS-GMM augments the DIF-GMM by making an assumption that first differences of instrument variables are uncorrelated with FE and, thus, allows for the introduction of more instruments, thereby improving efficiency. Therefore, the extra moment conditions embedded within the SYS-GMM estimators render it to be a better estimator. When using these two estimators, caution needs to be exercised with respect to the number of instruments used. In particular, numerous instruments can overfit the endogenous variables and, therefore, the results will not be robust. This paper uses the Sargan (1958) test (an equivalent of Hansen (1982) test) to check for over-identification of restrictions.

4.2.2. Results

The results from the difference and System GMM models, which takes care of endogeneity among the variables, closely reflects the results of the FE models. Coefficients for initial level of income, inflation, government expenditures and openness to international trade, all depict the correct signs and are statistically significant at all levels. The results depict that openness to trade has a significant impact on economic growth across the SADC region. The significance in the openness indicator suggests that a 1 % increase in average growth rate of the trade sector raises real GDP growth by about 0.6-0.7 % across all the four GMM models estimated. The coefficient of financial development variable as proxied by M2 was found to be statistically insignificant. The estimations were also carried out using private sector credit extension as a proxy for financial development and the results are similar (See Table 3a in the Appendix).

There is evidence that a faster growing government sector (proxied by government expenditures to GDP ratio) is associated with slower economic growth. A 1 % increase in the annual growth rate of the government expenditures to GDP ratio decreases the annual economic growth rate by about 0.46- 0.56 %. Higher inflation is also found to affect economic growth detrimentally, with a 1 % increase in inflation rate retarding economic growth rate by about 0.19-0.21 %. There is also evidence of conditional convergence in the region, meaning that poorer countries in the SADC region are likely to grow faster and catching up with richer countries in the region.

Table 5 Dynamic DIFFERENCE GMM models (using M2-proxy for financial development)

Dependent Variable: GROWTH				
	Model A	Model B	Model C	Model D
GROWTH (-1)	0.01 (0.11)	0.02 (0.20)	0.01 (0.09)	0.03 (0.20)
Y1	-0.54*** (-2.96)	-0.53*** (-2.99)	-0.54*** (-2.80)	-0.53*** (-2.88)
INFL	-0.19*** (-2.66)	-0.21*** (-2.96)	-0.20*** (-2.63)	-0.21*** (-2.91)
GOV	-0.55*** (-3.24)	-0.46*** (-2.50)	-0.56*** (-3.39)	-0.47 (-2.66)
OPEN	0.72*** (2.21)	0.61*** (2.02)	0.71*** (2.00)	0.60** (1.83)
INV	0.22 (1.12)	0.24 (1.36)	0.22 (1.05)	0.25 (1.27)
M2	0.09 (0.24)	0.08 (0.21)	0.10 (0.25)	0.08 (0.22)
INST	0.001 (0.04)	-0.003 (-0.09)	-0.001 (-0.02)	-0.005 (-0.15)
PSE	0.05 (0.11)	0.09 (0.21)		
POPGR		-0.10 (-0.67)		-0.10 (-0.65)
EL			0.08 (0.08)	0.18 (0.20)
Wald χ^2	85.50	68.40	87.74	74.09
[P-value]	[0.00]	[0.00]	[0.00]	[0.00]
# of Obs	303	303	303	303

Note: See the remarks for Table 4.

Contrary to the DIF-GMM results, the SYS-GMM models depict that coefficient for GOV still has the correct sign although it is not statistically

significant. In addition, POPGR and EL are now statistically significant and have the expected signs, meaning that investing in human capital has positive implications on economic growth in the SADC region, as suggested by economic theory. In a similar fashion, PVT was used and the results are more or less the same (see Table 4a in the Appendix).

Table 6 *Dynamic SYSTEM-GMM models (using M2 – proxy for financial development)*

Dependent Variable: GROWTH				
	Model A	Model B	Model C	Model D
Y1	-0.07*** (-4.68)	-0.05*** (-3.20)	-0.07*** (-4.51)	-0.05*** (-3.20)
INFL	-0.06* (-1.73)	-0.11*** (-2.81)	-0.07** (-1.90)	-0.11*** (-2.80)
GOV	-0.09 (-0.93)	-0.11 (-1.12)	-0.09 (-0.87)	-0.10 (-1.05)
OPEN	0.06 (0.68)	0.14* (1.65)	0.07 (0.83)	0.15* (1.66)
INV	0.007 (0.08)	0.02 (0.22)	-0.02 (-0.15)	-0.0002 (-0.00)
M2	0.20 (0.24)	0.16 (0.67)	0.15 (0.61)	0.12 (0.48)
INST	0.01 (0.44)	0.01 (0.51)	0.01 (0.48)	0.01 (0.52)
PSE	0.18 (0.59)	0.10 (0.33)		
POPGR		0.20*** (2.74)		0.18*** (2.41)
EL			1.39*** (2.72)	1.21*** (2.33)
AR (1)	-6.58	-6.82	-6.07	-6.25
[P-value]	[0.00]	[0.00]	[0.00]	[0.00]
Sargan Test χ^2	556.36	435.00	427.91	416.98
[P-value]	[0.00]	[0.00]	[0.00]	[0.00]
# of Obs	346	346	346	345

Note: See remarks for Table 4.

The second-order serial correlation test developed by Arellano and Bond (1991) depicts that there is no second-order serial correlation present, both in DIF-GMM and SYS-GMM models. In addition, the Sargan (1958) test for over-identification of restrictions was used and the results indicate that the restrictions are not over-identified and, therefore, the results are robust and not weakened by many instruments.

4.3. Seemingly Unrelated Regression (SUR) Estimator

4.3.1. Methodology

This estimator was proposed by Zellner (1962) and it allows for cross-sectional dependence, capturing efficiency due to the correlation of the disturbances across country-specific equations. As discussed earlier, countries in the SADC region are striving towards common goals and, therefore, are likely to pursue similar macroeconomic policies, implying that there might be *cross-country dependence* in the sample. The reason for the interdependence emanates from the fact that over the years countries experience increasing economic and financial integration, which implies strong interdependence among countries (Baltagi, 2008). The presence of cross-sectional dependence implies that FE estimators are still consistent although inefficient, hence the standard errors are biased. Therefore, Seemingly Unrelated Regressions (SUR) estimator deals with cross-country dependence. The SUR estimator is based on large-sample properties of large T ($T \rightarrow \infty$) and small N datasets. Hoyos and Sarafidis (2009) points out that panel data sets usually exhibit cross-sectional dependence, which usually arise due to the presence of common shocks and unobserved components that become part of the error term.

Therefore, testing for cross-sectional dependence is important in estimating panel data models. For this paper, $T = 33$ and $N = 13$ ($T > N$) and the appropriate test is the Breusch-Pagan (1980) Lagrange Multiplier (LM) test. In this case, the null of no cross-sectional dependence was rejected for the CMA, SACU and SADC regions, indicating that there is cross-sectional dependence in these regions and this warrants the use of a SUR models (See Tables 6 and 7). As highlighted by Bittencourt (2012), the SUR estimates different country time series, which are then weighted by the covariance matrix of disturbances. Therefore, this methodology further disaggregates the analysis for a more in-depth view of the effects of the several variables on growth in the region.

4.3.2. Results

Contrary to our *a priori expectations*, when we further disaggregate the analysis and make use of the SUR estimator which takes into account any between-country dependence present in the data, the findings are mixed. Table 7 shows that there is no β -convergence in the CMA region, meaning that smaller countries in the region are not growing fast enough to catch up with the bigger country (i.e. South

Africa). However, the salient feature of the results is that, for most countries in the CMA region, spending on physical capital, the high extend of financial development, and faster population growth rate have the expected signs. Investment has a positive impact on economic growth for Lesotho, South Africa and Swaziland, meaning that these countries' economic growth depends also to higher spending on physical capital. In Namibia, we observe a positive significant association between inflation and growth. This positive significant association can potentially be interpreted that despite increases in inflation, Namibia still managed to register positive growth rates, although these growth rates may still be below its potential growth rates. Public spending on education and the government spending seems to have depicted expected positive impact on economic growth only in Namibia.

Table 7 SURE results for CMA

Dependent variable: GROWTH				
	Lesotho	Namibia	South Africa	Swaziland
Y1	0.54	0.34***	1.63	-0.12
INFL	0.72	1.12***	-1.04**	0.25
GOV	0.74	4.09***	-6.96**	-1.01
OPEN	-3.77***	-3.12***	-5.18	0.16
GFCF	1.53***	-1.87***	3.86***	1.79**
M2	3.68***	1.67	8.52**	-1.14
INST	0.26***	-	1.04	-
PSE	-2.48***	10.21***	-11.89***	0.27
POPGR	-2.39***	-2.49***	-1.59	0.65*

Breusch-Pagan test of independence: $\chi^2(6) = 11.9$, P-value = 0.0642

Note: See remarks for Table 4 .

The results in the SADC region are mixed. There seems to be β -convergence in Angola, Mozambique, Seychelles and Zimbabwe. Inflation is detrimental to economic growth in countries such as Angola, Seychelles, South Africa and Swaziland. For the others, inflation has a positive impact on economic growth. Government spending can both affect economic growth positively or negatively, depending on whether such spending is channeled towards productive sectors. In the case of South Africa, government spending has a positive effect on growth, while for Mauritius, the impact is negative. The other findings are self-explanatory, though mixed (SURE results for SACU and other SADC countries are available in the Appendix).

Table 8 SURE results for the SADC countries

Dependent Variable: GROWTH									
	Y1	INFL	GOV	OPEN	GFCF	M2	INST	PSE	POPGR
AGO	-2.50***	-1.74***	-1.45	15.64***	5.39	-10.76***	7.32***	-39.08***	-12.11***
BWA	0.02	-0.06	-2.68	-1.11	4.17	-0.34	-	-5.26	2.22
DRC	-0.31	0.06	0.62**	1.17***	0.72***	0.44***	0.73***	-0.55	-0.71
LSO	1.31***	0.78***	-0.79	-4.43***	-0.68	3.39***	-	-3.91***	0.80
MDG	-0.44	-0.44	1.01	6.88***	-2.77***	0.19	-	-0.55	-9.70
MWI	1.57***	3.21***	2.29***	-15.45***	6.13***	5.12***	1.48***	7.69***	0.48***
MAU	0.18	-0.15	-8.48***	2.96***	1.87	-9.42***	-	3.07***	0.57***
MOZ	-0.16**	-0.16	-0.43	2.13***	-0.46***	-1.44***	-	1.54***	-0.92***
NAM	-0.06	1.49***	7.51***	-4.94***	0.47	0.03	-	6.95***	-5.41***
SYC	-0.61***	-0.42***	3.02***	-1.78**	4.94***	-8.95***	-	5.64***	-1.24***
SA	-3.25	-4.62**	20.65**	-10.05**	18.53***	40.81***	2.05***	-31.36**	2.04
SWA	0.88***	-12.16***	-15.88***	0.55	14.21***	-18.92***	3.75***	26.11***	14.21***
TZN	0.01	1.31***	5.72***	3.61***	-0.28	-0.50	-	12.44***	-29.68***
ZMB	1.03***	2.66***	-6.95***	-13.74***	9.46***	-3.59***	-0.49***	-10.92***	21.81***
ZWE	-1.08***	2.27***	2.09***	6.02***	-5.50***	1.46	0.72***	-3.25***	6.15***

Breusch-Pagan test of independence: $\chi^2(15) = 33.32$, P-value = 0.0042

Note: AGO (Angola), BWA (Botswana), DRC (Democratic Republic of Congo), LSO (Lesotho), MDG (Madagascar), MAU (Mauritius), MOZ (Mozambique), NAM (Namibia), SYC (Seychelles), SA (South Africa), SWA (Swaziland), TZN (Tanzania), ZMB (Zambia), and ZWE (Zimbabwe).

*/**/*** denotes significance at 10 %, 5 % and 1 % levels, respectively.

All variables are in logarithms, except INST which ranges from -10 to +10.

Variables: INST, M2, and PSE are I(1), hence, used in first differences.

5. INFERENCE ON EMPLOYMENT AND POVERTY

Poverty has now become a subject of global interest. In fact, the first goal in the Millennium Development Goals (MDGs) scheme was to halve poverty by 2015 (Fosu, 2010). The general agreement shows that aggregate income growth is necessary to reduce poverty (World Bank, 1990). In particular, macroeconomic variables such as inflation, unemployment, government expenditure and economic growth have been proven to have an impact on poverty (Kashi and Shahiki Tash, 2014). In order to reduce poverty, economic growth has to be reflected in higher family incomes generated through productive jobs at adequate wages. Employment is the main source of household income, thus job creation and improved labour productivity are the fundamental mechanisms whereby economic growth can be reflected in poverty reduction, and growth can then be translated into better incomes (Islam, 2004; Osmani, 2002).

There are several studies that emphasize the importance of inequality in determining the responsiveness of poverty to growth. For instance, Easterly (2000) evaluated the impact of the Bretton Woods Institution's programmes by specifying growth interactivity with the level of inequality in the poverty-growth equation and found that the effect of the programmes was enhanced by lower inequality. Adams (2004) provided elasticity estimates showing that the growth elasticity of poverty is larger for the group with the smaller Gini coefficient.

Due to lack of comparable data over time and across the SADC region, this section focuses on making simple inferences on how growth, unemployment and poverty reduction are interlinked in the SADC region.

Figure 3 depicts that most countries in the SADC region that experienced higher average economic growth rates during a ten-year period, also had lower unemployment rate levels. This implies that there is a negative relationship between economic growth and unemployment, and ultimately lower unemployment levels are conducive for poverty reduction. The same pattern can be observed when a ten-year period, ranging from 1991–2011, is taken into consideration (see Appendix).

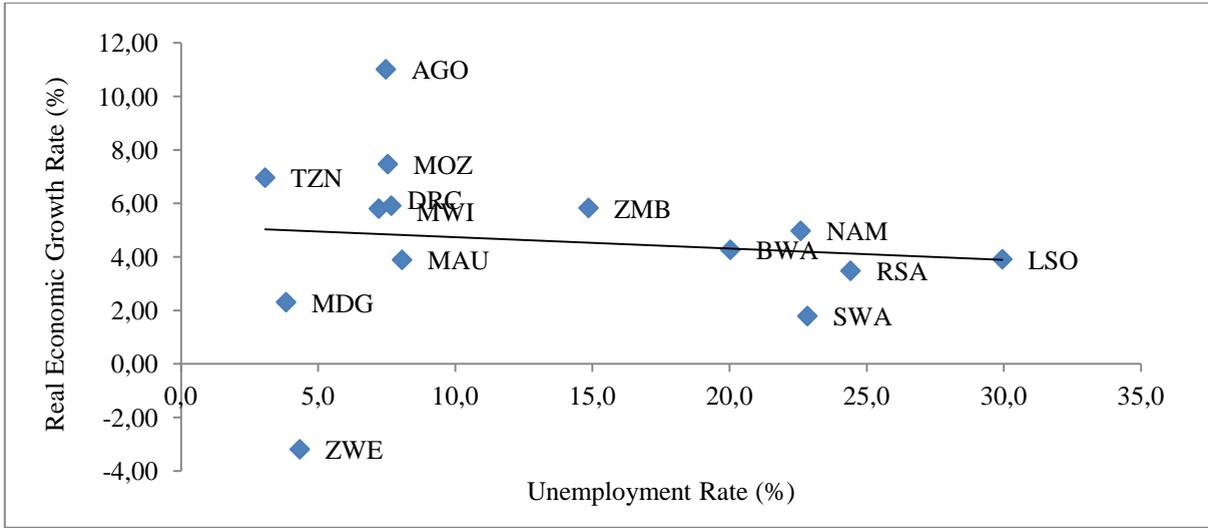


Figure 3 Real economic growth rate versus unemployment rate (2002–2012)

Source: World Bank Development Indicators

Ali and Thorbecke (2000) used cross-country African data and found that poverty is more sensitive to income inequality than it is to income. Therefore, faster economic growth tends to lead to lower inequality through employment creation (inclusive growth). Employment lies at the heart of the concept of inclusive growth. Ianchovichina and Lundstrom (2009) justified that employment is a means through which all excluded individuals are able to achieve sustainably higher (er) income levels. Hence, it can be deduced that higher economic growth leads to lower income inequality between the rich and the poor, and, therefore, leads to poverty reduction. Figure 4 depicts that the income inequality between the rich and the poor has been wide for most of the SADC countries. The inequality of income has been high in countries such as Namibia, Seychelles and South Africa, and low in countries such as Tanzania.

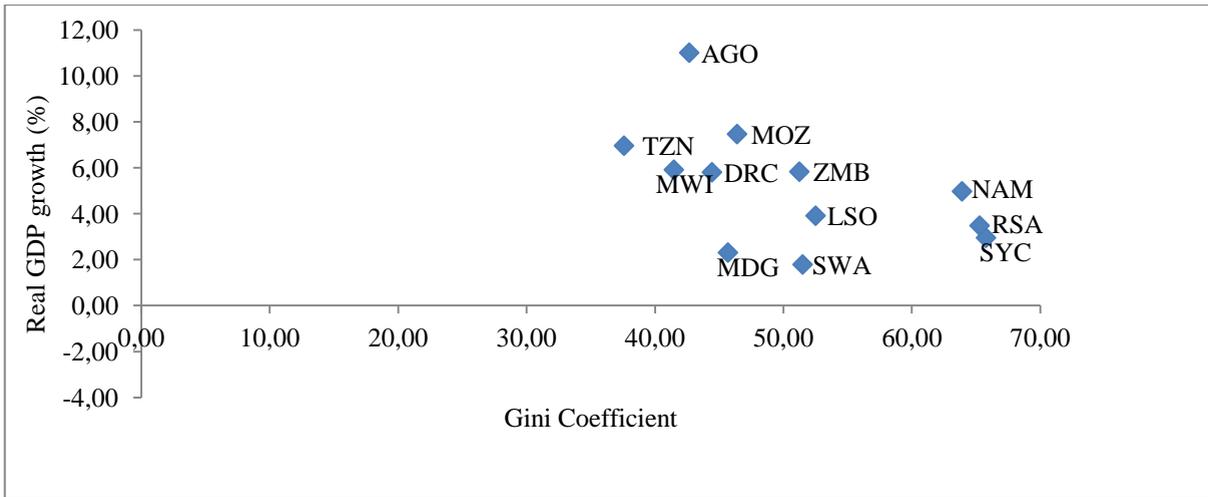


Figure 4 Real GDP growth versus Gini Coefficient (2002–2012)

Source: World Bank Development Indicators

Figure 5 shows that most of the countries in the SADC registered high poverty headcount ratios as percentage of total population. When looking at the 10-year averages from 2002-2012, only Botswana, Namibia, Mauritius, Seychelles and South Africa registered poverty headcount ratios below 50 % of their respective total populations. It further shows that most countries which registered lower economic growth rates, also depicted higher poverty headcount ratios. Hence, to a certain extent, there is a negative relationship between economic growth and poverty. The picture is similar to the ten-year averages for 2001-2001 (see Appendix).

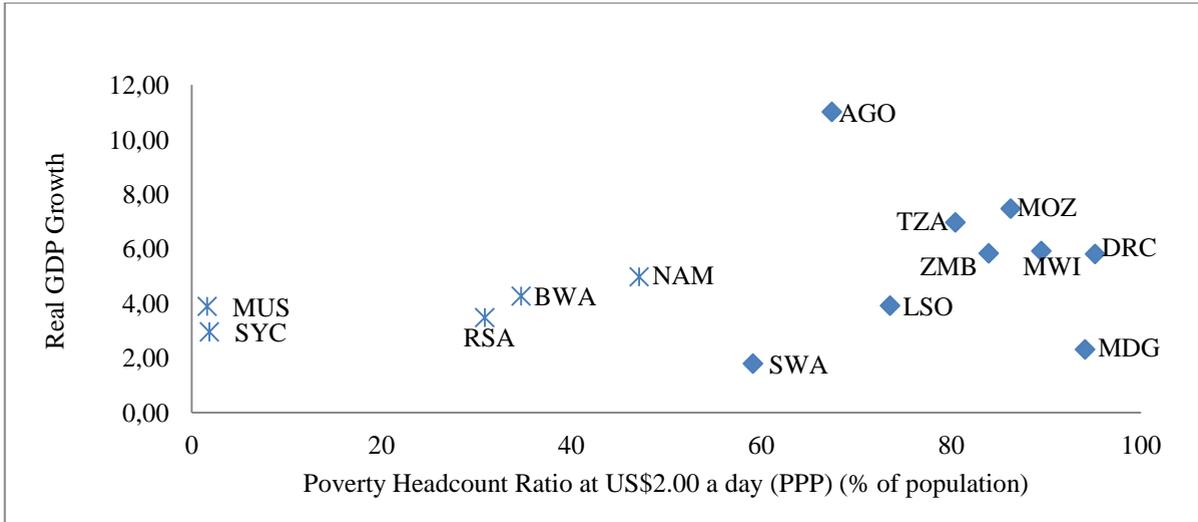


Figure 5 Poverty headcount ratio; US \$ 2/day (PPP) versus real economic growth (2001-2011)

Note: Countries with asterisks are those with poverty headcount ratio below 50 %

Source: World Bank Development Indicators

6. CONCLUSION AND POLICY RECOMMENDATIONS

Several conclusions can be drawn from the empirical results. On the positive side, there is evidence of conditional convergence among the SADC countries, meaning that poorer countries tend to be growing faster and catching up with richer countries in the region. Furthermore, there is evidence that countries which are more open to international trade are likely to experience higher economic growth. The development of the financial sector also significantly promotes countries' growth rates. Human capital is also found to significantly influence economic growth in the region.

On the negative side, factors such as inflation, government spending in unproductive sectors, and political instability are found to retard economic growth in the region. This is because inflation in the economy will cause production to slow down since production will sustain higher prices. Inflation also increases the welfare cost to society, reduces international competitiveness of a country because of more expensive exports, thereby reducing economic growth in the long-run (Khan and Senhadji, 2001). These findings are similar to those of Fischer (1993) and De Gregorio (1993). A measure of the size of the government was found to

have a negative and statistically significant impact on economic growth. The negative sign is indicative of a notion that high government spending may not necessarily fuel economic growth, in fact it may retard economic growth, if such spending is made on non-productive sectors of the economy (Bittencourt, 2012).

The policymakers need to keep in mind that low inflation in the SADC region is a precondition for economic activity, and also that high inflation affects mostly the welfare of the poor. Therefore, low inflation is not just a necessary condition for economic activity, but also a sufficient condition for macro-economic stability. On the international trade front, policymakers in the SADC region should focus their efforts to ease restrictions on international trade, design strategic trade policies, and intensify efforts in trade negotiations to enable better access for exports. On the human capital front, policymakers in the region should continue to promote education policies (such as Free Primary and Secondary Education) and enhance the quality of the existing human capital stock.

The quality of the evidence presented is, to a certain extent, robust because we avoid using averages and take advantage of panel time-series analysis, which deals with important empirical issues, such as heterogeneity bias in dynamic panels and endogeneity in relatively thin panels. Essentially, this analysis is important because it allows to study the SADC region, without treating the region as a dummy or as an outlier to be removed from the sample. Therefore, the analysis conducted here represents a step forward in achieving insightful estimates, and in

REFERENCES

1. Acemoglu, D., Johnson, S. and Robinson, J.A. (2001), "Colonial origins of comparative development: an empirical investigation," *American Economic Review*, 91: 1369–401
2. Acemoglu D., Johnson S. and Robinson J. (2002), "Reversal of fortune: geography and institutions in the making of the modern world income distribution," *Quarterly Journal of Economics*, 117(4): 1231–1294
3. Acemoglu, D., Johnson, S., Robinson, J. and Thaicharoen, Y. (2003), "Institutional causes, macroeconomic symptoms: volatility, crises and growth," *Journal of Monetary Economics*, 50: 49–123
4. Adams, R. (2004). Economic Growth, Inequality and Poverty: Estimating the Growth Elasticity of Poverty. *World Development*. 32 (12): 1989-2014
5. Ahn, S. and Hemmings, P. (2000), "Policy Influences on Economic Growth in OECD Countries: An Evaluation of the Evidence," *OECD Economics Department Working Papers*. No, 246.

6. Ali, A., and Thorbecke, E. (2000). The State and Path of Poverty in Sub-Saharan Africa: Some Preliminary Results. *Journal of African Economies*, 9 (Suppl. 1), 9 -40.
7. Arellano, M., and Bond, S. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *Review of Economic Studies*, 58, 277-297.
8. Arellano, M., and Bover, O. (1995). Another Look at Instrumental Variables Estimation of Error Components Models. *Journal of Econometrics*, 68, 29-51.
9. Arrow, K.J. (1962). "The Economic Implications of Learning by Doing," *Review of Economic Studies*, 29: 155-173.
10. Balasubramanyam, V.N., Salisu, M. and Sapsford, D. (1996), "Foreign direct investment and growth in EP and IS countries," *Economic Journal*, 106: 92-105
11. Baltagi, B. (2008). *Econometric Analysis of Panel Data* (4 ed.). John Wiley and Sons, Ltd.
12. Barro, R. and Sala-I-Martin, X. (1995), *Economic Growth*, New York, McGraw-Hill
13. Barro, R. (1996). Inflation And Economic Growth. *Federal Reserve Bank Of St.Louis Review*, 78, 153-69.
14. Barro, R. (1998). *Determinants of Economic Growth: A Cross-Country Empirical Study*. Cambridge, Massachusetts. The MIT Press.
15. Bittencourt, M. (2012). Inflation and Economic Growth in Latin America: Some Panel Time-Series Evidence. *Economic Modelling*, 29, 333 - 340.
16. Bittencourt, M. (2012). Financial Development and Economic Growth in Latin America: Is Schumpeter Right? *Journal of Policy Modeling*, 34(22), 341 - 355.
17. Bloch, H. and Tang, S. H. K. (2004), "Deep determinants of economic growth: Institutions, geography and openness to trade," *Progress in Development Studies*, 4(3): 245-255
18. Blundell, R., and Bond, S. (1998). Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. *Journal of Econometrics*, 87, 115-143.
19. Bond, S., Leblebicioğlu, A., and Schiantarelli, F. (2010). Capital Accumulation and Growth: A New Look At The Empirical Evidence. *Journal of Applied Econometrics*, 25, 1073 - 1099.
20. BOSWORTH, B. and COLLINS, S. (1998), "Accounting for economic growth," Brookings Institution, Washington DC
21. Breusch, T., and Pagan, A. (1980). The Lagrange Multiplier Test and its Application to Model Specification in Econometrics. *Review of Economic Studies*, 47, 239 - 253.
22. Brunetti, A. (1997), "Political Variables In Cross- Country Growth Analysis," *Journal Of Economic Surveys*, 11(2): 163-190
23. Bruno, M., and Easterly, W. (1998). Inflation Crises and Long-run Growth. *Journal of Monetary Economics*, 41, 3-26.
24. Cukierman, A., Kalaitzidakis, P., Summers, L., and Webb, S. (1993). Central Bank Independence, Growth, Investment and Real Rates. *Carneige-Rochester Conference Series on Public Policy*, 39, 95-140.
25. De Gregorio, J., and Lee J-W. (1999), "Economic Growth in Latin America: Sources and Prospects," *Harvard University and Korea University*.
26. Durlauf, S., Johnson, P., and Temple, J. (2005). *Handbook of Economic Growth-Growth Econometrics Chapter 8, 1, Part A, 555 - 677*.
27. Easterly, W. (2000). The Effects of IMF and World Bank Programs on Poverty. Mimeo. Washington D.C.: World Bank.

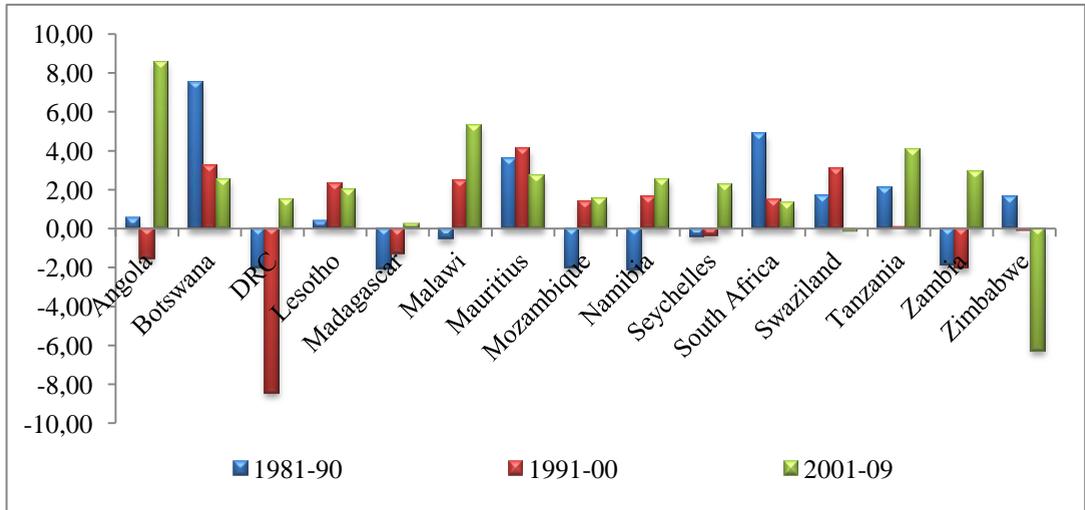
28. Easterly, W. (2001), *The elusive quest for growth: economists' adventures and misadventures in the tropics*, Cambridge MA: MIT Press
29. Easterly, W., and Levine, R. (1997). *Africa's Growth Tragedy: Policies and Ethnic Divisions. Quarterly Journal of Economics*, 112,1203-1250.
30. Easterly, W., and Rebelo, S. (1993).Fiscal Policy and Economic Growth: An Empirical Investigation. *Journal of Monetary Economics*, 32(3), 417-58.
31. Edwards S. (1998), "Openness, Productivity and Growth: What Do We Really Know?" *Economic Journal*, 108(447): 383-398
32. Fischer, S. (1991). Growth in Macroeconomics and Development. *National Bureau of Economic Research Working Paper*. No.3702. Cambridge MA.
33. Fischer, S. (1993). The Role of Macroeconomic Factors in Growth. *Journal of Monetary Economics* , 32, 485-512.
34. Fosu, A. K. (2010). Income, Inequality, and Poverty: Comparative Global Evidence. *Social Science Quarterly*. Vol 91(5)
35. Frankel, J.A. and Romer, D. (1999). Does Trade Cause Growth? *American Economic Review*. Vol.89. 379-399.
36. Gallup, J., Sachs, J. and Mellinger, A. (1999), "Geography and Economic Development" *International Regional Science Review*, 22(2): 179-232
37. Grier, K.B. and Tullock, G. (1989). An Empirical Analysis of Cross-National Economic Growth, 1951-80. *Journal of Monetary Economics*. Vol. 24. 259-276.
38. Hall, R.E. and Jones, C. I. (1999), "Why do some countries produce so much more output per worker than others?" *Quarterly Journal of Economics*, 114(1): 83-116
39. Hall, J.C. and Sobel, R.S. (2006), "Public Policy and Entrepreneurship," *Center for Applied Economics Technical Report* 06-0717. Kansas City.
40. Hansen, B. (1982). Large Sample Properties of Generalized Method of Moments Estimators. *Econometrica* , 50, 1029-1054.
41. Hausman, J. (1978). Specification Tests in Econometrics. *Econometrica* , 46, 1251 - 1271.
42. Holtz-Eakin, D., Newey, W., and Rosen, H. (1988). Estimating Vector Autoregression with Panel Data. *Econometrica* , 56 (6), 1371-1395.
43. Hoyos, R., and Sarafidis, V. (2009). Testing for Cross-sectional Dependence in Panel Data Models. *The Stata Journal* , 6 (4), 482-496.
44. Ianchovichina, E. and Lundstrom. S. (2009). Inclusive Growth Analytics: Framework and Application. World Bank Policy Research Working Paper No. 4851
45. Im, K., Pesaran, M., and Shin, Y. (2003). Testing for Unit Roots in Heterogeneous Panels, *Journal of Econometrics.*, 115, 53 - 74.
46. Islam, R. (2004). The Nexus of Economic Growth, Employment and Poverty Reduction: An Empirical Analysis. *ILO Discussion Paper* No.14. Geneva, International Labour Organisation.
47. Kaldor, N. (1970), "The Case for Regional Policies" *Scottish Journal of Political Economy*, 17: 337-348
48. KASHI, F.K., and SHAHIKI TASH, M.N. (2014). Effects of Macroeconomic Variables on Poverty in Iran (Application of Bootstrap Technique). *Theoretical and Applied Economics*. Vol XXI. No.5(594). 85-96.
49. King, R., and Levine, R. (1992). Financial Indicators and Growth in a Cross-Section of Countries. *World Bank Working Papers*. WPS 819. Washington D.C.

50. Kight, M., Loayza, N., and Villanueva, D. (1993). Testing the Neoclassical Theory of Economic Growth: A Panel Data Approach. *IMF Staff Papers*, 40(3), 512-541
51. Knack, S. (2002), "Institutions and economic performance: property rights and contract enforcement," IRIS homepage. <http://www.iris.umd.edu/NEWS/conferences/conf1b.html>
52. KORMEDI, R.C. and MEQUIRE, P.G. (1985). Macroeconomics Determinants of Growth: Cross-Country Evidence. *Journal of Monetary Economics*. Vol.16. 141-163.
53. Krugman, P. (1991) "Increasing returns and economic geography," *Journal of Political Economy*, 99: 183-199
54. Lee, J. (1996), "Government interventions and productivity growth," *Journal of Economic Growth*, 1: 391-414
55. Lensink, W. And Morrissey, O. (2006), "Foreign Direct Investment: Flows, volatility and the Impact on Growth," *Review of International Economics*, 14(3): 478-493
56. Levin, A., Lin, C.-F., And Chu, C.-S. (2002). Unit Root Tests in Panel Data: Asymptotic and Finite-Sample Properties. *Journal of Econometrics* , 108 (1), 1-24.
57. Levine, R. And Renelt, D. (1992). A Sensitivity Analysis of Cross-Country Growth Regressions. *The American Economic Review* 82 (4), 942-963.
58. Levine, R., Loayza, N. And Beck, T. (2000). Financial Intermediation and Growth: Causality and Causes. *Journal of Monetary Economics*. 46(1).
59. Masters, W. And Mcmillan, M. (2001), "Climate and Scale in Economic Growth," *Journal of Economic Growth*, 6: 167-186
60. Mckinnon, R.I. (1973). Money and Capital in Economic Development. *The Brookings Institution*. Washington D.C.
61. Myrdal, G. (1957). Theory and Underdeveloped Regions, Hutchinson, London
62. Nel, L. (2004). The Prospect of a Monetary Union between SADC and SACU: A Critical Analysis. Masters of Commerce Dissertation. University of Pretoria.
63. NORTH, D.C. and THOMAS, R.P. (1973). The Rise of the Western World: A New Economic History. Cambridge: Cambridge University Press
64. Osmani, S.R. (2002). Exploring the Employment Nexus: Topics in Employment and Poverty, document prepared by the Task Force on the Joint ILO-UNDP Programme on Employment and Poverty. New York.
65. Papaioannou, E., and Siourounis, G. (2008). Democratization and Growth. *The Economic Journal*. 118 (532), 1520-1551.
66. Rodrik, D. (1999), "Where did all the growth go? External shocks, social conflict and Growth collapses," *Journal of Economic Growth*, 4(4): 385-412.
67. Romer, P.M. (1986), "Increasing Returns and Long-Run Growth," *Journal of Political Economy*, 94(5): 1002-1037.
68. Roodman, D. (2009). How to Do xtabond2: An Introduction to Difference and System GMM in Stata. *Stata Journal* , 9 (1).
69. SACHS, J.D. and WARNER, A.M. (1995). Natural Resource Abundance and Economic Growth. *National Bureau of Economic Research Working Paper*. No. 5398. Cambridge MA.
70. Sachs, J. and Warner, A. (1997), "Sources of slow growth in African economies" *Journal of African Economies*, 6(3): 335-376
71. Sachs, J. and Warner, A. (2001). Natural resources and economic development: the curse of natural resources. *European Economic Review*. 45: 827-3
72. SADC. (2011). Retrieved from SADC Website: www.sadc.int.

73. Sargan, J. (1958). The Estimation of Economic Relationship using Instrumental Variables. *Econometrica*, 26, 393-415.
74. Seleteng, M., Bittencourt, M. and Van Eyden, R. (2013). Non-Linearities in Inflation and Economic Growth Nexus in the SADC Region: A Panel Smooth Transition Regression (PSTR) Approach. *Economic Modelling*, 30, 149-156.
75. Swan, T. W. (1956), "Economic growth and capital accumulation," *Economic Record*, 32 (November): 334-61
76. Tang, S.H.K., Groenewold, N. and Leung, C.K.Y (2003), "Institutions, technical change, and macroeconomic volatility, crises and growth: a robust causation," <http://www.cuhk.edu.hk/econo/staff/hktang/personal.htm>
77. Temple, J. (1999). The New Growth Evidence. *Journal of Economic Literature*. 37(1): 112-156
78. Temple, J. (2000). Inflation and Growth: Short Stories and Tall. *Journal of Economic Surveys*, 14 (4).
79. Wacziarg, R., and Welch, K. (2008). Trade Liberalization and Growth: New Evidence. *World Bank Economic Review*, 22, 2.
80. World Bank. World Development Report 1990 - Poverty. Oxford University Press. Oxford.
81. Young, A. (1994), "The tyranny of numbers: Confronting the statistical realities of the East Asian growth experience," *The Quarterly Journal of Economics*, 110(3): 641-680
82. Zellner, A. (1962). An Efficient Method of Estimating Seemingly Unrelated Regressions and Tests of Aggregation Bias. *Journal of American Statistical Association*, 500-509.

APPENDIX

1. GDP per capita growth



Source: IMF 2014

Table 1a Hausman fixed versus random

	Coefficients			
	(b) fixed	(B) random	(b-B) Difference	Sqrt(diag(V_b-V_B)) S.E.
linfl	-0.1645377	-0.1506016	-0139361	-
lgov	-0.0246287	-0.1190631	0.0944344	0.0528856
lopen	0.509149	0.5485584	-0.0394095	0.0528856
lgfcf	0.1278662	0.1079211	0.019945	-
lpopgr	0.0849156	0.115459	-.0305434	0.0677153

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\chi^2(5) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

$$= 39.07$$

$$\text{Prob}>\chi^2 = 0.0000$$

(V_b-V_B is not positive definite)

Table 3a: FE models (using PVT as proxy for financial development)

Dependent Variable: GROWTH				
	Model A	Model B	Model C	Model D
Constant	2.99 (1.14)	2.72 (1.00)	3.01 (1.14)	2.89 (1.05)
Y1	-0.20* (-1.76)	-0.19* (-1.62)	-0.19* (-1.73)	-0.19* (-1.62)
INFL	-0.18*** (-3.24)	-0.19*** (-3.50)	-0.18*** (-3.21)	-0.20*** (-3.49)
GOV	-0.11 (-0.56)	-0.13 (-0.62)	-0.12 (-0.61)	-0.14 (-0.69)
OPEN	0.74*** (4.55)	0.79*** (4.76)	0.72*** (4.36)	0.76*** (4.51)
INV	0.11 (0.67)	0.10 (0.62)	0.11 (0.71)	0.11 (0.68)
PVT	0.12 (0.12)	0.01 (0.05)	-0.01 (-0.05)	-0.03 (-0.19)
INST	-0.01 (-0.50)	-0.01 (-0.40)	-0.01 (-0.43)	-0.01 (-0.34)
PSE	0.10 (0.31)	0.10 (0.32)		
POPGR		-0.01 (-0.11)		-0.03 (-0.26)

Dependent Variable: GROWTH				
	Model A	Model B	Model C	Model D
EL			0.66 <i>(1.08)</i>	0.94* <i>(1.70)</i>
F* test	6.34	6.81	6.11	7.18
[P-value]	[0.00]	[0.00]	[0.00]	[0.00]
# of Obs	393	390	393	390

*/**/** denotes significance at 10 %, 5 % and 1 % levels, respectively. All variables are in logarithms, except INST, which ranges from -10 to +10. Variables *INST*, *M2*, *PVT*, *LEI*, and *PSE* are I(1), hence, they are used in first differences across the models. T-ratios are in italics and in parenthesis.

Table 4a Dynamic difference GMM models (using *PVT* as proxy for financial development)

Dependent Variable: GROWTH				
	Model A	Model B	Model C	Model D
GROWTH (-1)	0.02 <i>(0.16)</i>	0.02 <i>(0.24)</i>	0.02 <i>(0.18)</i>	0.02 <i>(0.25)</i>
Y1	-0.53*** <i>(-2.82)</i>	-0.53*** <i>(-2.92)</i>	-0.53*** <i>(-2.66)</i>	-0.53*** <i>(-2.78)</i>
INFL	-0.21*** <i>(-3.03)</i>	-0.21*** <i>(-3.30)</i>	-0.21*** <i>(-3.01)</i>	-0.21*** <i>(-3.03)</i>
GOV	-0.59*** <i>(-3.25)</i>	-0.49*** <i>(-2.51)</i>	-0.59*** <i>(-3.34)</i>	-0.51 <i>(-2.63)</i>
OPEN	0.73*** <i>(2.29)</i>	0.63*** <i>(2.13)</i>	0.73*** <i>(2.03)</i>	0.63** <i>(1.91)</i>
INV	0.22 <i>(1.13)</i>	0.25 <i>(1.34)</i>	0.22 <i>(1.06)</i>	0.24 <i>(1.26)</i>
PVT	-0.07 <i>(-0.56)</i>	-0.05 <i>(-0.48)</i>	-0.06 <i>(-0.49)</i>	-0.06 <i>(0.45)</i>
INST	0.006 <i>(0.17)</i>	0.001 <i>(0.03)</i>	0.0004 <i>(0.01)</i>	-0.003 <i>(-0.09)</i>
PSE	-0.002 <i>(0.00)</i>	0.06 <i>(0.12)</i>		
POPGR		-0.09 <i>(-0.62)</i>		-0.09 <i>(-0.59)</i>
EL			0.10 <i>(0.11)</i>	0.19 <i>(0.22)</i>
Wald χ^2	64.85	64.57	51.37	42.70
[P-value]	[0.00]	[0.00]	[0.00]	[0.00]
# of Obs	303	303	303	303

*/**/** denotes significance at 10 %, 5 % and 1 % levels, respectively. All variables are in logarithms, except INST, which ranges from -10 to +10. Variables *INST*, *M2*, *PVT*, *LEI*, and *PSE* are I(1), hence, they are used in first differences across the models. T-ratios are in italics and in parenthesis.

Table 8(a) *SURE results for SACU*

Dependent variable: GROWTH					
	Botswana	Lesotho	Namibia	South Africa	Swaziland
Y1	-0.33	0.62**	0.33***	1.75**	-0.12
INFL	-1.15***	0.60	1.07***	-1.15***	0.22
GOV	0.93	0.57	4.07***	-7.41**	-0.91
OPEN	0.24	3.98***	-3.104***	-5.78**	0.13
GFCF	2.31***	1.54***	-1.87***	4.47***	1.77**
M2	-0.24	3.55***	1.55	8.34***	-1.16
INST	-0.31	-0.25***	-	1.27	-
PSE	-5.68	-2.59***	10.07***	12.71***	0.42
POPGR	0.21	-2.34***	-2.47***	-1.65	0.66**

Breusch-Pagan test of independence: $\chi^2(10) = 14.316$, P-value = 0.0491

*/**/** denotes significance at 10 %, 5 % and 1 % levels, respectively. All variables are in logarithms, except INST which ranges from -10 to +10. Variables: INST, M2, and PSE are I(1), hence, they are used in first differences.

Table 8(b) SURE results for other SADC countries (Excluding SACU)

Dependent Variable: GROWTH									
	Y1	INFL	GOV	OPEN	GFCF	M2	INST	PSE	POPGR
AGO	-0.99 ^{***}	-1.26 ^{***}	-0.33	6.72 ^{***}	0.13	-2.89 ^{***}	-3.31	-1.48	-1.14
DRC	0.51 ^{**}	0.59 ^{***}	-0.67	0.96 ^{**}	0.87	-0.07	1.19 ^{***}	-0.31	-16.82 ^{***}
MDG	-0.47 [*]	1.06 ^{**}	1.88	4.21 ^{***}	-1.19 ^{**}	3.46 ^{***}	-	0.29	-8.59
MWI	-0.19	-0.22	1.93 ^{**}	-0.02	0.89	-0.28	0.16	-2.41	-1.28 ^{***}
MAU	0.37	-0.05	-5.78	1.24	0.67	5.03	-	1.53	-0.26
MOZ	0.03	-0.26 ^{**}	-1.96 ^{***}	2.17 ^{***}	-0.60	-6.53 ^{***}	-1.24	0.25	-0.25
SYC	-0.48 ^{**}	-0.44 ^{***}	2.71 ^{***}	-2.11 [*]	4.69 ^{***}	-8.81 ^{***}	-	4.14 ^{**}	-1.26 ^{**}
TZN	0.24 ^{***}	0.71 ^{***}	-3.32 ^{***}	-1.53 ^{**}	5.52 ^{***}	7.70 ^{***}	0.22	2.08	-7.99 ^{***}
ZMB	-0.02	0.95 ^{**}	-3.55 ^{***}	-3.32 ^{***}	3.53 ^{***}	0.47	-0.18 ^{***}	-0.12	12.91 ^{***}
ZWE	-0.77 ^{***}	-2.03 ^{***}	1.39	4.96 ^{***}	5.18 ^{***}	-0.35	0.56 ^{***}	2.58 ^{***}	4.96 ^{***}

Breusch-Pagan test of independence: $\chi^2(10) = 11.978$, P-value = 0.0566

Note: AGO (Angola), DRC (Democratic Republic of Congo), MDG (Madagascar), MAU (Mauritius), MOZ (Mozambique), SYC (Seychelles), TZN (Tanzania), ZMB (Zambia), and ZWE (Zimbabwe).

*/**/*** denotes significance at 10 %, 5 % and 1 %, respectively. All variables are in logarithms, except INST, which ranges from -10 to +10. Variables INST, M2, and PSE are I(1), hence, they are used in first differences.

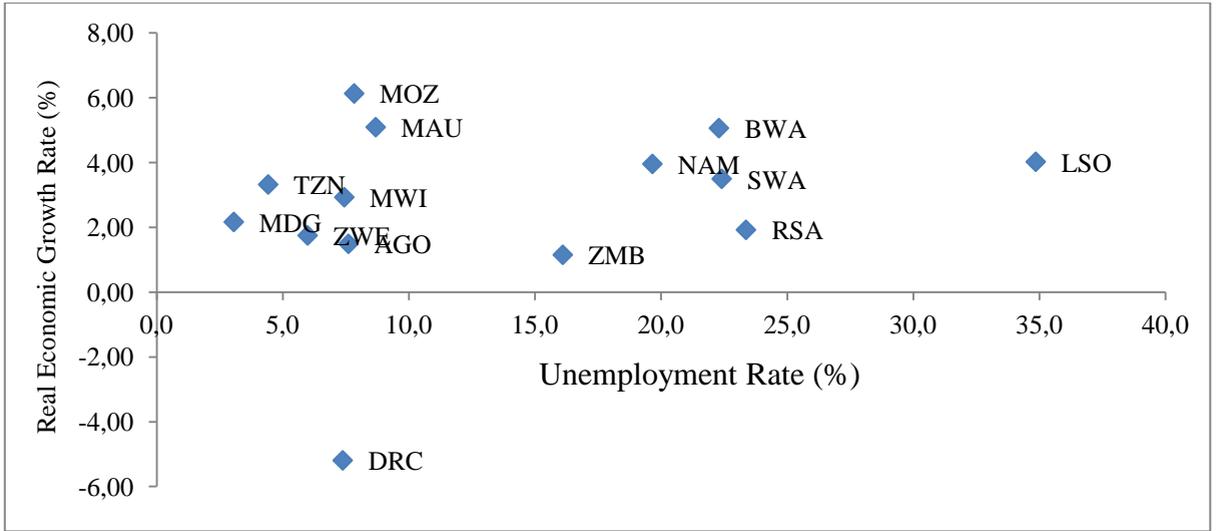


Figure 6 Real economic growth rate versus unemployment rate (1991–2001)

Source: World Bank Development Indicators

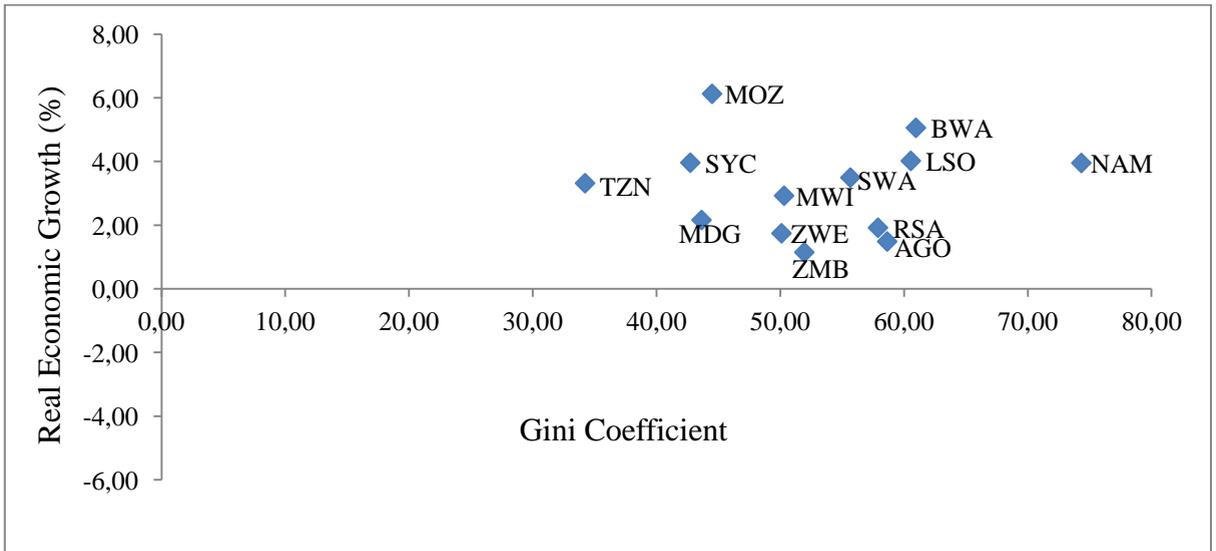


Figure 7 Real GDP growth versus Gini Coefficient (1991-2001)

Source: World Bank Development Indicators

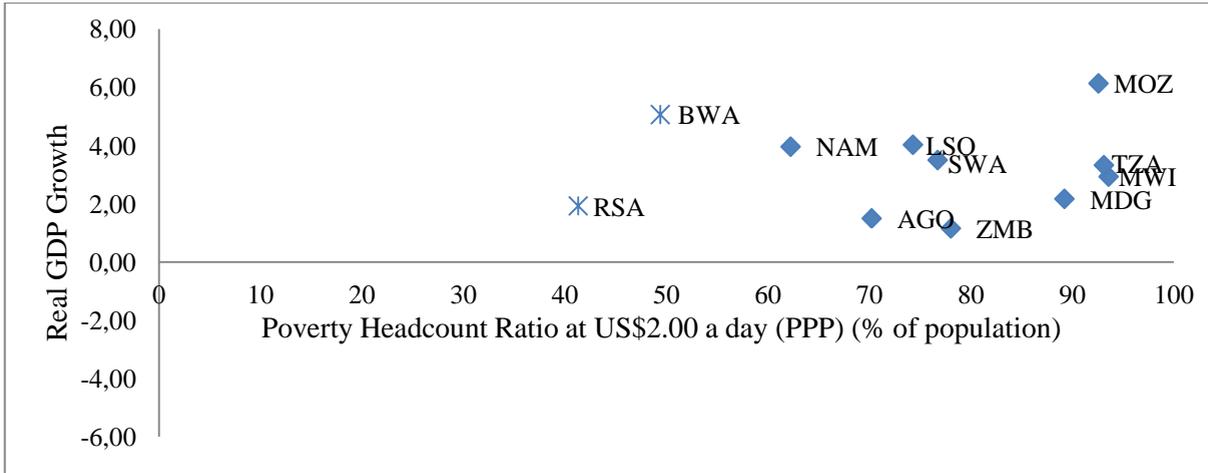


Figure 8 Poverty headcount ratio; US \$ 2/day (PPP) versus real economic growth (1991-2001)

Note: The countries with astericks are those with poverty headcount ratio below 50 %

Source: World Bank Development Indicators

CASE STUDY



ISSUES OF ORGANIZATIONAL CULTURE IN ROMANIA – A CASE STUDY

DUMITRU ZAIȚ*, ADRIANA ZAIȚ

Abstract: *The present paper analyzes, through a case study, the organizational culture of a typical Romanian company from the textile industry. The company resulted from the privatization process, being a successful example in its field. The initial, socialist enterprise from which the analyzed company was created, had a long history prior to 1989; thus, although the newly created company has about 20 years of evolution, actually, the mother-company from which it was privatized has more than a decade of tradition.*

In order to collect data, we used two methods: direct, non-participative observation, together with a sociological survey based on a semi-structured interviewing technique. The interviews were conducted with the top managers - the strategic management and the managers from the human resources department, sales and purchasing departments. The observation and the interviews were undertaken during the period 2011-2012. For the analysis of the collected data, we used a systemization method and a theme-based organization of answers (specific to content analysis).

The identification and analysis criteria for the typologies of the organizational culture were those used by Sonnenfeld (1988) and Quinn (1991). A protocol was established for all stages, including exploration, description of the situation, data analysis, typological classification of the organizational culture and interpretation. We conclude that the analyzed company has a mixed personality and hesitates between rigorous control and permanent adaptation, between the real and ideal image, between independent action and the need to wait for directions and reassuring control, a rather general characteristic of the Romanian culture.

Although the managers seem to be in favor of a permanent and free adaptation to the threatening environment, control is always used as a precautionary measure. Moreover, the strategy of the company seems to privilege the maintaining of its structure and procedures and not the adaptation to the environment. The company is placed in different categories, for both models, at stated level comparing to the actual one, oscillating between Club and Baseball (for the Sonnenfeld typology) and between Hierarchical and Innovative (for the Quinn typology of organizational culture).

* Dumitru Zaiț, Corresponding author; Universitatea "Alexandru Ioan Cuza" Iași, dzait@uaic.ro, Tel. (+40)740 002234, Fax (+40)232 201437

1. CULTURAL SPECIFICITY AS SUPPORT FOR THE ROMANIAN MANAGEMENT

The management of Romanian companies is still going through a continuous change, adaptation and consolidation, as a function of both general and specific, local conditions, between standardization and individualization. At a philosophical level, as methods, practices, strategy and action, as well as from the point of view of activating different structures and mechanisms in order to accomplish the organization's mission and objectives, Romanian management is neither unique, nor utterly different.

Its main characteristics were often analyzed by Romanian specialists, in order to obtain, if possible, a specific typology (Nicolescu (1998); Ionescu (1999); Abrudan et alii (1998)). Adding these to more general references (as Hofstede, Trompenaars or GLOBE, for example), as well as to other studies on cultural specificity, we can extract some specific factors of influence for the management of the Romanian companies.

- a. From a strictly geographic sense, the space covered by the Romanian population had, probably, the highest stability. The Dacians, Romans, and other populations living within the borders of the so called Carpathian-Danubian area gave birth to the Romanian people. The closeness and limitation of the area, a certain isolation alternated with occasional openness and unplanned bursting and confrontations with unexpected enemies. The space is a mixture of difficult and attracting places, rather miraculous and surprising, offering protection and surviving conditions in rough times – characteristics transferred also to the people living here.

Being Christianized relatively early, following a long period of primitive paganism, the local people understood the new religion as a salvation, although orthodoxy was just a continuation of their former relationships with divinity. A lack of genuine culture or an inconsistent one, a lack of systematic writing science did not favour a real understanding of the new God or morality, thus the people remained rather mystical and mysterious, excessively dogmatic, without sufficient logic and rationality in approaching and mediating the relationship with the divinity. A certain ideological indoctrination, an inhibitory humiliation, as well as certain duplicity were necessary for the local people to survive. Moreover, the Orthodox Church left average people outside the initiation process, and did not

create schools or other training facilities, because ignorant people were easier to manage.

- b. As a succession of facts and events with certain relevance, history was rough and consuming for the people, without being a product of their initiatives. Initially, Romanians were not eager to step outside their borders, living in a rather peaceful isolation, trying to run away and hide in front of warrior enemies; only from time to time, lead by ambitious and courageous commanders, did they try to fight back, without the need of dominating other people. This is why people lacked the advantage of real innovation, being rather good at improvising and adapting. Less aggressive, with the fear of uncertainty and unknown, people minded their business, preferring to strategically retract and even loose material belongings instead of confronting others. Only later on did homogeneous communities develop, governed by powerful princes or rulers, willing to defeat their principles and autonomy, independence and freedom. Moreover, schools started to develop relatively late, at the same time with the state structures and rules. Although full of passion and intelligence, Romanian people were less attracted by novelty quests and scientific conquests, preferring to imitate, improvise and adapt. This is why, later on, when trying to fight for freedom and autonomy, we were somehow unsure and hesitant, not used with strategic thinking and diplomacy. These roots are still present nowadays, making Romanian managers good and willing to perform well, but almost always surprised by events and not sufficiently prepared for the future.
- c. Socially speaking, the evolution of the Romanian population was far from linear and less conformal to the logic of history of other European people. Outside the family, the other social entities did not really have a consistent value. Local people almost always perceived group organization and community as being natural, without building and applying certain rules or philosophies. Even nowadays the social is an extension of the natural evolution and less of an expression of rational organization and intervention. Family is still the basic cell, but the individual is rather superficially connected, although he/she sometimes depends on this family until quite late, even after the necessary separation required to form a new family. From here, probably, we get a late maturation of Romanians, their need for tutoring and guidance, for help in taking decisions and acting.

The consequences of this natural conception remain visible at group and social class level. We have a rather particular social stratification, extremely fractured, with high percentages at the base (peasant population, not only without material resources, but also not cultivated), with a less developed and inconsistent middle class, hesitating between the ideology of winning through work and that of a stable and equal distribution of wealth, and a highly contested upper class, sometimes rich, but most certainly uneducated.

Another important social category, intellectuality, was always almost decimated, either through an insufficient orientation of the leading political parties, the crimes of the continuously changing government systems or even the attitude of intellectuals themselves (i.e. less altruistic and less prone to social compromises). The intellectual elite, the most dynamic and influencing one, was insufficiently promoted, and when it threatened to access the necessary critical mass, it was excluded from the society, incarcerated, exiled and even killed.

The corresponding management system was built and supported by hesitant managers, anchored in the present and less preoccupied by the enigmas of the future and its incertitude, adaptable but very fearful and shy in front of changes, productive as individuals, but looking for a refuge in collective decisions when problems are too complex, full of imagination and able to obtain spectacular results, but also failures, with a logic based on a reduced abstractisation power, with a stronger intuition rather than rigorous calculus, conflictual as well as pacifist, at the same time, able to improvise and less sensible to constructive criticism.

- d. The political environment is a consequence of culture and cultural specificity and has, in turn, a particular influence on the education, training and development of individuals. Romanians developed very late their political philosophy and democracy arrived quite late in the conscience and behavior of this people. Political ideology developed late, in the XX century and just shortly, being destroyed and deformed, distorted by the communist system. This is why the Romanian manager is rather mimetically acting in terms of politics. We still lack a certain consistency and stability of the political thinking and practices, at local, national or international level.
- e. From the economic development point of view, Romania became important towards the end of the 19th century. With a wealth of resources, a rather numerous population, even if not well educated, better administered under

the newly installed monarchy following the independence, Romania started to attract attention from the civilized world and, thus, obtain a better place within the developed nations.

Education became better, industry more productive, agriculture a more modern one. Romanians became more cultivated and willing to consolidate their positions, as individuals and as a group. Unfortunately, it did not last long, and communism put a stop to these positive tendencies. Evolution was oriented towards a depersonalized one, and the whole attitude towards work and human resources were distorted, the management and the managers became less explicit, quite different from the Western concepts, and new principles (i.e. centralism, socialist planning and political dirigisme) were developed – those of. The Communist Party's, imposed at central level, decisions were the most important ones, even when they had nothing to do with economic and social needs or realities.

After 1989 and the fall of the communist system in Romania, the return to a market economy had a tremendous opportunity cost. The restructuring and reconstruction of the economy based on market principles did not benefit from the much useful and necessary support of a professional managerial system.

The manager's job, previously distorted, had to be reconsidered. The whole process was specific to the agitated history of the country: shy and hesitating, slow, with a lot of improvising and short term actions, with a lot of imitations and not appropriate adaptations. The Romanian management system and managers seem not to have had the necessary time to create and develop an articulated and efficient conception, philosophy and mechanisms for a profitable business on medium and long term, proactive instead of passive on the international market.

From a cultural point of view, the evolution of the population was also less linear. Although the Latin part, dominant, is the most visible one, other cultures produced strong influences – especially the Slavic, Turkish, and Hungarian ones. This also involved a certain attitudinal and behavioral ambiguity of Romanians, certain introversion, as well as duplicity, a bigger risk and incertitude aversion.

2. CHARACTERISTICS OF THE ROMANIAN PRESENT MANAGEMENT

The experience accumulated during the transition period (following 1989 - the year the communist regime fell) allowed the Romanian enterprise to evolve, not always positively, but in connection with international changing markets.

Compared to other former socialist countries (i.e. Poland, Hungary, Czech Republic or Slovakia), transition was longer and more difficult. The success, as well as the failures of this transition process could be largely explained by the quality of the management. From this point of view, Romania is paradoxical.

The management of local companies was exposed to specific constraints, going further than the managers' knowledge or experiences. Management has an important place among success factors, but in transitional economies this fact was rather ignored. The lack of financial resources and the low level of technological development were usually evocated in order to explain the failure of many companies, especially the state owned or those for which privatization was delayed. Management was extremely rarely taken into consideration as a possible cause of these failures, and this is somehow natural or explainable since managers do not like to admit that their actions lack consistence or coherence, or that their decisions were not the best ones.

We can talk about four categories of managerial factors, which we labeled as incitation factors (1), motivations (2), inhibiting factors (3) and competencies (4). The following description is based on the analysis of several Romanian companies, as well as on informal interviews with foreign companies' managers which had worked with Romanian businesses.

2.1. Incitation factors

Without any regard to what the official position or convictions of managers were, the transition to the market economy was real and inevitable,. As a general way, the initial incitation for the transition was superficial, even for managers, for smaller or bigger companies. They thought that the access to the developed capitalism and a state of well being would be easier, especially hoping that developed countries would help, interested by a rapid progress of Romania. Very few managers were aware of and willing to talk about the real difficulties of transition, sometimes without knowing how fragile the whole management system was. The new "bosses", directors and administrators, did not raise the issue of their managerial competences within the new economic framework in which major decisions are the essential attribute of management. The new managers, elected through democratic mechanisms or named by official structures or political hierarchies, replaced the former managers and, usually, contested by trade unions

and employees, but they did not necessarily have more experience or better knowledge than the former ones. Very few people thought about the necessary strategic vision at micro or macro level, and even less were preoccupied to train good managers for the companies that needed to be efficient actors on a highly competitive market. Over time, they discovered the need to develop and adapt new managerial methods and mechanisms, but a lot of time was already wasted.

The perspective of a rapid accumulation of capital was the major incitation of transition. Over time, launching a business became a challenge for many. Immediately following the 1989 Revolution, a general economic degrading took place and pushed people into the adventure of trade exchanges. Attracted by the miracle of a rapid enrichment through commerce and business tourism (in neighbor countries, less expensive and easier as access), many Romanians developed such businesses, which proved to not always be very profitable, yet easy to launch.

Another incitation was the legislation vacuum during the first years following the Revolution. Many laws and rules became obsolete, other were contested and abrogated, and others were simply not respected. As a matter of fact, even the law guardians were interested by the profit they could make. The rhythm in which new laws were promulgated by the Parliament was sometimes contradictory – it was slow and lacking methodological procedures. The impression was that everyone was interested in delays because capitalism meant disorder, anarchy and a frenetically run towards wealth and richness. There were even jokes about the Romanian, “original” capitalism. Efforts of organization and regulation were often blocked or delayed by interested parliamentarians.

The money obtained during this time was only rarely transformed in direct capital investments. Most of it was consumed, the owners preferring to buy luxury goods and expensive vacations. Very little was reinvested, usually in the same sector from which the money was initially obtained (i.e. commerce). Because no investments were done in industry, agriculture or public works, a profound structural disequilibrium appeared, and the successive governments were not able to deal with this. Failures and bankruptcies grew in number and the majority of the public enterprises were in difficult positions. Public investments were derisory, imports grew up and the external debt as well.

During the first years of the transition there were small inciting factors in terms of fiscal taxes for newly created businesses and deductions for foreign

investors, which produced some positive effects. Unemployment and inflation, the decrease in real salaries and the increase of the price of production factors pushed people to find solutions and get into businesses. After a while, realities became quite different compared to the initial hope, disappointment and despair taking the lead, and people started to consider that transition was bad. The image of capitalism changed, transition became something imposed by the Western world in order to make all Romanian businesses fail and the incitations for businesses disappeared, without any interest in acquiring management knowledge and abilities.

2.2. Motivations

Besides classical motivations (i.e. need for power, desire to become rich, need for autonomy and independence, desire to challenge own's abilities), specific motivations can also be identified. A strong motivation, rarely admitted, is politics – or what we might call “political love”, if love and politics can be associated.

In fact, it is about a combination of economics and politics. Following the beginning of the transition period, politicians (i.e. those who were initially involved in politics, without being real politicians, according to the Western acceptance of the word) realized, quite easy, the interdependencies between economics and politics. With regard to the electoral campaigns, the political success was strongly connected to the available resources (derived from various businesses) while the business' success was possible through the political help (i.e. public offers to specific persons, special laws, etc.). If the first elections were won just by chance, the following belonged to those who knew exactly how to take advantage of the relationship between the economical, social and political factors. Political fights became economic fights. The richest and most powerful businessmen are politicians, and the most capable politicians are also rich businessmen.

Another specific motivation for the Romanian transition belongs to the psychological and sociological field and could be labeled “unconscious egocentrism”. Apparently, socialism was a system for social and socializing behaviors. In reality, individuals were permanently frustrated since their own personality was anishing due to the fact that decisions were taken by persons who controlled everything (i.e. positions, attitudes, opinions and behaviours). Because individuals did not have the possibility to express themselves, they ended up exploding following 1989. The sad show of the Romanian Revolution was an

effect of this explosion. In business, also, the new freedom allowed individuals to test their qualities and ambitions. Launching into business was sometimes an unconscious act, and a considerable number of such individuals had no any idea whatsoever about how a business could or should be managed, therefore, it should not come as a surprise that most businesses failed.

2.3. Inhibiting factors

For Romanians, the most important inhibiting factor in business was and still is the lack of an entrepreneurial mentality. Previously impregnated by egalitarian references towards property, Romanians have not fully adapted to the conditions and exigencies of the market competitive environment. In order to do business, one has to take risks and give up a part of consumption in order to make investments and obtain profits. However, for people who were told that deriving profit meant exploiting human resources and that an entrepreneur is voracious and exploits the poor population, producing inequalities, it was hard to develop an entrepreneurial spirit. During the communist, egalitarian and totalitarian period, the spirit of entrepreneurship almost completely disappeared, leaving Romanians unprepared and sometimes hostile towards such business approaches.

Moreover, the idea of wisely gaining from intelligent businesses was and continues to be rejected. Having certain laziness, people prefer to save money using bank deposits, for which risks are perceived to be lower than other forms of investments. A mentality which constitute a serious obstacle during the transition period, and which was far more common in Romania than in other Eastern European countries, was the concept that money obtained as interest payments was not regarded as profit, than

Another inhibiting factor is the instability of the juridical system, together with its inconsistency. Except for the Constitution, almost every regulation went through frequent and significant changes, the most terrifying fluctuation being registered for vital fields such as property protection, security and stimulation of investments, sanctions applied in case of economic infractions, monopoly and competition, business ethics, and consumer protection.

A serious inhibiting factor is the inconsistency of managerial instruments. The accounting system, for example, is just a support for the fiscal policy, dominated by a static vision. For example, a company facing difficulties, even

without liquidities, with important debts, could have, on paper, benefits – and so would have to pay taxes on profit, because money appear on the bill, even if they were not actually cashed.

Other inhibiting factors can be found in the administrative bureaucracy, in corruption and the tolerant attitude towards bribing – Romania registering lately a regress in terms of the corruption index.

2.4. Competencies

The issue of managerial competencies could be approached from several points of view. Taking into consideration the type of manager and the size of the business, as well as their involvement in international activities, we could talk about four groups of enterprises and managers, which we labeled as (a) “cooperatives”, (b) “infatuated”, (c) “lions of international bureaucracy” and (d) “new arrivals”.

- (a) The “cooperatives” group, apparently less significant, is constituted by the ancient associative enterprises, quite frequent before 1989, mostly in agriculture, and some exceptions for the services or small industry. They were administered at the edge between autonomy and centralization. Their management was assumed by small decision groups and was a strange combination of routine, conventions and personal relations. After 1989, these administrators were among the first entrepreneurs – they became owners of the small cooperatives. Having the necessary experience and empirical abilities, together with a natural dynamism and a network of business relationships, sometimes with former important members from the Communist Party, they succeeded quite well in business. They rarely had the ambition to create big businesses, preferring to develop in small steps, to individually accumulate capital and invest less and with extreme caution, keeping their businesses as family-run ones. They tried to evaluate with the same discretion as before, finding ways of avoiding the fiscal taxes and keep in the shadow. They didn’t even develop brand names, but despite this oversight, for quite a while, these businesses were really successful.
- (b) The “infatuated” group or the “nose in the wind” consisted of former administrators, directors, chief accountants or chief engineers from the former state companies. They were nominated for those positions by hierarchical superior structures, with the Communist Party’s approval. They were people appreciated by the party, but besides this political influence,

they had to have at least some basic competencies, even if such nominations were not primarily based on people's technical abilities. Before the 1990s, most managerial positions were held, by engineers who despite having professional competencies, most certainly lacked managerial. Several training structures for managers at all levels existed, organized by the communist party, in which a mixture of professional, managerial and especially political formation (in the sense of political indoctrination) was offered. This is how basic managerial abilities were acquired, and everything was conceived for a company that represented a small piece within the bigger mechanism of the national economy. Even accounting and financial instruments were politicized and rigid, the rules of the communist party being the most important ones. If knowledge was available in the technical field or those of stocks management and production and operations management, this was not the case for sales management, marketing and promotion or human resources management – which were practically inexistent. In some universities there were courses, sometimes disguised, through which professors tried to introduce students to these subjects, usually in the field of economic training. This category of administrators and managers took the main managerial positions for the big companies; they were nostalgic, rigid and fond of their experiences, and constituted the biggest barrier against transition. According to them, the centralized system was infallible, the big decisions had to be taken by superior hierarchies, and major changes were neither possible, nor necessary. Their managerial knowledge was supposed to be the best, and when their companies were on the brink of bankruptcy, they cried for help and governmental support and waited for debts to be exonerated and for someone (it was not clear exactly who) to solve their problems.

For such managers the ideas of competition and business opportunity did not exist. They were full of vanity, incapable of accepting any lesson, allergic to the idea that their principles could or should change, in order to adapt to the market economy and a new type of management. Perceiving the danger of disappearance of the state companies they managed, some, ended up creating their own, very similar, companies, either to ensure survival or enrichment. They fought against privatization, waiting for the retirement and willing to continue cashing extremely large salaries. Nowadays, there are still representatives of this category, their

elimination being impossible, because they still have the support of power structures from the Parliament, Government, local administration etc.

- (c) The “lions of the international bureaucracy” is the most powerful and restricted group. They are ancient bureaucrats from the external trade and export companies which existed as autonomous entities or as entities within various Ministries. With a good education, having political support and a rich experience in international trade, this group quickly succeeded to valorize previously created relationships, by ending up possessing important parts of their former companies. Initially discrete, yet totally open afterwards, they succeeded to expand these companies and monopolize entire sectors (e.g.: furniture industry, hospitality services, textile companies, electronic commerce and others). Being good managers, tenacious and extremely mobile, having also a better cultural sensitivity, due to their former international experiences, they soon became the richest and most influent Romanian businessmen. They were intelligent and ambitious, able to estimate and take risks, but at the same time voracious and unscrupulous. They generally created teams of managers with a good professional level, wisely invested in human resources, created distribution channels, borrowed and spent important amounts of money, making big profits and strengthening their positions.
- (d) The “new arrivals” are young and ambitious graduates, having quite often had stages in foreign universities or foreign companies after 1989. Without having good perspectives in their initial profession (being sometimes overqualified), they succeeded either being employed by joint ventures and multinational companies, or creating their own businesses. Most of them had the ability to go over the difficulties of the start-up period and are a visible reality of the Romanian economic stage. Well dressed and modern, with a coherent and consistent discourse, the new arrivals imposed themselves through their knowledge and efficacy of actions, even in front of the old “morgue” directors. They have high managerial knowledge and abilities, they keep learning and are fond of continuous education, creating and developing relationships with the academic, business and political environment, at the same time. Their youth, their good perception of the reality, together with a strong independence and power desire are good complements for their formation. The teams in which they work or which they lead are good and serious and they use Western managerial techniques

and take advantage of business intelligence. They are all the time in contact with the market and their clients and they even succeeded to arrive at the same level as the old bureaucrats, dinosaurs or lions, especially in niche fields (i.e. electronics and micro-electronics, IT, communications and constructions).

In a rather stratified Romanian society, the successful new arrivals represent a minority, but this minority should be able to evolve quickly enough in order to reestablish the economic and, especially, social equilibrium, contributing to the development of a middle class capable of intelligently invest in order to push forward the Romanian economy.

3. CASE STUDY

The case study we will present identifies and analyses the organizational culture of a Romanian company, situated in the North Eastern part of the country and having a favorable position on the internal market, with good sales on the external market, as well. The company resulted from the privatization process, being one successful example for the textile filed. We will call it TEXTIL Ltd., to protect its real identity and conform to the ethical protocol necessary in order to have access to the company data. The initial, socialist enterprise from which TEXTIL Ltd was created had a long history before 1989; so, although the newly created company has 20 years of evolution, in fact, the mother company from which she was privatized has over 100 years of tradition.

In order to collect data, we used two methods: direct, non-participative observation, together with a sociological survey based on a semi-structured interviewing technique. The interviews were conducted with the main managers of the company - the strategic management and the managers from the human resources department, sales and purchasing departments.

The observation and the interviews were realized during a period of two years, 2011 and 2012. For the analysis of the collected data, we used a systemization method and a theme based organization of answers. The identification and analysis criteria for the typologies of the organizational culture were those used by Sonnenfeld (1988) and Quinn (1991).

For the entire approach a protocol was established for all stages, including exploration, description of the situation, data analysis, typological classification of the organizational culture and interpretation.

TEXTIL Ltd. is a Romanian company, part of a Commercial Services Group, together with 18 other businesses, with various fields of activity. The Group officially launched into business in 1993. TEXTIL Ltd. started in 1993 as a very small company with two employees and a small social capital. After 20 years, the whole business has about 2400 employees and makes 85 million euro per year. As part of the Group, our analyzed company has about 250 employees.

TEXTIL Ltd. was created from the most important private company in the textile field, with an experience of over 100 years in the industry. The company cooperated with more than 20 countries from Europe, Asia, Central and North America, and this is a guarantee for its clients, as far as quality and competence are concerned. More than 80 % of the entire production is exported. Production is fixed through contracts with important clients, their demand being precise and determined. The textile market, very dynamic and fluctuating, highly competitive, is less watched by the responsible people from the company, the whole market analysis being rather done by the main beneficiaries, especially big furniture companies. The company's management is ensured by the General Assembly of the Shareholders, who decides on aspects regarding the main activities, the economic and commercial strategy. This GA also elects an Administration Council, consisting of shareholders' representatives and coordinated by the President of the Council. Current activities are assured by the General Director, nominated by the Administration Council – or more specific, the main, majoritary shareholder. There is a specific administrative and managerial hierarchy, in which confidentiality is the most important principle.

3.1. The TEXTIL Ltd. environment

The market of textiles went through important changes recently, of which the most important are the following:

- at international level, two countries have a strong competitiveness – China and India – and they won a market share more important than the European Union, USA and Canada;
- at national level, a decrease of the market share of Romanian companies was registered (85 % of the textile products are imported);

- the market is strongly fluctuating and volatile;
- the financial and economic crisis lead to a decrease in the population's purchasing power and, as a consequence, to a decrease in the demand of textiles for the home-country;
- a certain movement of the national companies towards the internal market can be observed, together with the tendency to develop their own brands;
- changes in the consumers' preferences can be observed – especially the fact they became more quality oriented and sensitive to the way products are presented;
- the market is very dynamic, and this creates difficulties in terms of rapid adaptation;
- there are important European standards which have to be respected;
- qualified workers are less readily available due to migration, retirement and lack of training;
- it is difficult to buy specialised new and up-to-date equipment;
- there is a strong dependency on a limited, small number of big, important clients.

In this context, TEXTIL Ltd. tries to closer supervise the own market share, to invest in modern equipments, to provide high quality products, to increase human resources' qualification and to permanently adapt to the market dynamics.

3.2. The TEXTIL Ltd. organization

The organization is strongly hierarchical, with a weak delegation of responsibility, only towards persons of high confidence. Control and surveillance are permanent. There is a clear task allocation between hierarchical levels, but less at the operational level. Direct supervision is used, even if people move from one operation to another. A severe hierarchical control for all activities is also established. Most low-skilled employees were trained within the company, even if, at the time they were recruited, they were required to be specialists. This is the most vulnerable issue for human resources management, because employees are easily tempted by higher salaries in other companies.

Shareholders were rather constant, since the creation of the group. The company did not make major investments in equipment, marketing campaign, public relations and image creation. The distribution network is old, the logistic system incomplete, the relationships with the clients is sporadic, usually for negotiations and contracts. A certain tendency to invest in the personal comfort, in luxurious offices and cars can be observed, and less for improving working conditions.

3.3. Mission, vision and strategy of TEXTIL Ltd.

3.3.1. Mission

“TEXTIL Ltd. wants to valorize the quality and the conception of products in line with the market’s exigencies; we exist in order to satisfy the most diverse and precise needs of our clients, through the assurance of a complex assortment, with modern technology and according to the latest tendencies of the international market.”

3.3.2. Vision

TEXTIL Ltd.

- will be a solid organization, stable, oriented towards performance, capable to use modern technologies in a productive, equilibrated and adaptable structure, delivering dynamic and efficient products;
- will develop environmentally friendly technologies;
- will have a constant communication with the internal and external environment, in order to always be connected with the changes in the field;
- will maintain its policy of networking with main partners (suppliers and clients), based on respect and promptitude.

3.3.3. Strategy

- keep track of and integration of EU’s layouts and stipulations from the sectorial programs directed to the subventions of different sectors’ development;
- creation of new products for the national and international market;
- favorable positioning on the market for existent products;
- investing in performant equipment, logistics and distribution network;
- creating of its own innovation center and pilot station for micro-production;
- obtaining all necessary quality and environmental certificates;
- creation of its own company brand;
- identification of the possible market share increases through information gathering and strategic analysis;
- reducing existent stocks of products by working with specialized warehouses;
- creating warehouses for all component units of the group;
- adapting own prices through comparison with the main competitors;
- assuring the necessary qualified and experienced personnel for key positions in order to increase the company’s performance;
- improving relationships with the main suppliers.

3.4. Organizational culture of TEXTIL Ltd.

There is no awareness and no internal formalization of a specific organizational culture of the analyzed company. However, a form of spontaneous and evolving internal culture exists, dominated by a few elements deduced from the interviews and informal discussions with employees, suppliers and clients.

The main values of TEXTIL Ltd. are the technical and managerial performance, the focus on clients (i.e. it was claimed that the clients' needs are the priority), product quality, work attachment, respect for the engagements made, commitment for the environment, discipline, honesty and fairness. These are all declarative values (i.e. stated ones), and most of them can be found in the company's actions and activities, but deviations can be observed as well.

The main characteristics of the organizational culture, identified through both observation and interviews can be categorized in the following specific zones:

1. **Efficiency and efficacy as basic principles of leadership:** *profitability is the main task for the management team; cost reduction is part of the basic strategy.*
2. **Innovation as necessary activity for growth and competitive advantage:** *employees' activities, through which improvements are possible, for the development of the company, are appreciated; important rewards are given for innovation ideas/solutions.*
3. **Work quality:** *it is compulsory to provide employees information concerning quality standards and rules.*
4. **Respect of the client:** *deadlines, product quality, trust and openness towards clients' needs and desires.*
5. **Work security:** *zero tolerance for accidents; organization of specific programs dedicated to informing new employees and keeping all employees updated.*
6. **Care for the employees:** *serious preoccupation for solving employees' material, financial and moral problems.*
7. **Respect and power of the hierarchy:** *notwithstanding the degree of importancy, it is mandatory to call for the appropriate hierarchical approval/support; reduced participation in decision taking (i.e. trade unions participate only in employee-related decisions);*
8. **Discipline:** *internal organization regulations exist, with explicit rules and sanctioning procedures.*
9. **Care for environmental protection:** *compliance with national and European norms and regulations.*

10.Symbols: *the logo and the slogan are creating an image displaying the client orientation (the slogan is “Comfortable for you”)*

11.History: *it is considered a guaranty for quality and compliance with commitments, as well as conformity.*

3.5. Organizational culture diagnostic

For the diagnosis of the organizational culture we used the models suggested by Sonnenfeld (1988) and Quinn (1991), which are more appropriate for the Romanian culture, characterized by a high level of incertitude avoidance and a high hierarchical distance. For comparison, we also used a typological correspondence frame based on the model suggested by Mintzberg (1992), so that the reader could be oriented towards a larger and more complex approach for the analysis of the organizational culture of the Romanian company. We followed a case study methodology as suggested by Zaiț et al (2015).

The identification and analysis of the organizational culture are difficult and risky for the present Romanian companies. There are two main sources of potential errors:

- (1) as starting point and basic framework for the analysis of any organizational culture from within this space; we used the general feature of the Romanian culture, (i.e. heterogeneous, complex and paradoxical), and
- (2), the inconsistency of Romanian managers' quests and options for certain values, norms, methods or strategic actions for their companies. As we were able to observe, TEXTIL Ltd is rather prototypical with regard to this behaviour. Thus, we will observe a heterogeneous mixture of attitudes, positions and actions of the managers and employees alike.

The Sonnenfeld model has two positioning axes: characteristics of the business environment (which varies between stale and unstable) which can affect company's strategies, and the dominant manner of action or expected contribution from the members of the organization (collective or individual) (Figure 1). An unstable external environment is dominated by incertitude and by the need for a serious and rigorous orientation of the company to the exterior in order to correctly handle threats. A stable environment is associated with good knowledge, making possible the internal orientation of the strategy and the actions of the company. Collective contribution has the following main characteristics: loyalty, support for others, length of time spent in the company and statute, while individual

contribution valorizes the person and individual creativity, considered the essential support for obtaining value and added value in the company.

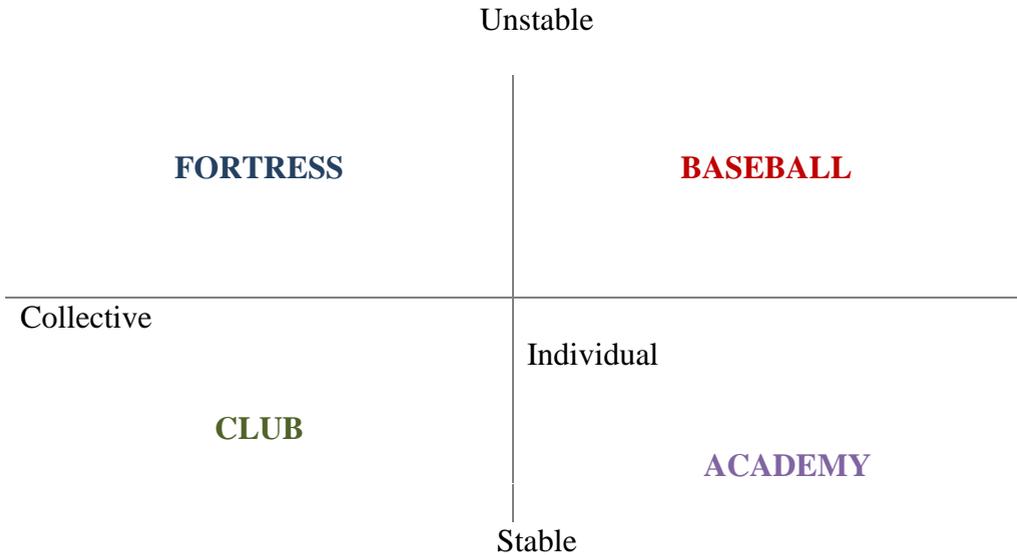


Figure 1 Sonnenfeld model of organizational culture

The *academy type* company exposes employees to various jobs, so that they can move around within the organization and gather experiences. Employees are usually highly qualified, tend to remain in the organization, having promotion opportunities, because the organization provides a good and stable environment for personal development. The *club type* company is concerned with how well people will fit. In this case, employees start at the bottom and stay with the organization, which highly values seniority. The *baseball company* builds teams of talented people, highly skilled, even stars, who are heavily rewarded for their accomplishments. However, these employees are in high demand and they tend to quit if a better opportunity comes along (i.e. a better job is offered elsewhere). The *fortress type* company is an organization preoccupied mainly with survival. These organizations usually undergo massive reorganization, and employees are in a risky position, they do not know if they will be laid off or kept within the company.

Before moving to the case study we mention that organizational culture exists at two levels:

- surface level: observable (i.e. visible characteristics);
- underlying level: true culture, comprising values, assumptions and beliefs.

At the declarative or stated level, things differ, compared to the existent level.

Keeping such distinctions in mind and using the Sonnenfeld model, TEXTIL Ltd. could be paradoxically placed somewhere between two organizational cultures physiognomies: Baseball and Club. At a declarative level, the company would be placed in the Baseball box, while in reality, the company is rather in the Club box. At the declarative level, TEXTIL Ltd. encourages innovation and risk taking, recognizes and rewards individual contributions. At the real level, TEXTIL Ltd. highly values seniority, loyalty and commitment to the group, and social fitting is crucial.

The company's market is very dynamic and volatile, thus decisions have to be rapid and flexible. People need talent, creativity, initiative and good professional skills in order to work in such a company. This is why managers state they preferred competitive and creative employees. However, in practice, the company is not very flexible towards its environment and market, it is rather passive, waiting for someone else to solve its problems and this lack of proactivity remains specific for the Romanian culture. The crisis and other external factors are always blamed for the less spectacular evolution of the company. The reasons for this hesitating position can be found in the manner in which managers approach and deal with the two diagnostic elements – environment and human resources. A decisional, philosophical and acting duplicity is almost always present. The environment is perceived as dynamic and threatening, but the approach at the managerial level is not precise, things being left to be solved by chance or hazard (“what will come, will come”, “that is life”, “we will wait and see” or “we will leave and we will see what will happen” being frequent expressions).

The strategy, not very precise and rather inconsistent, just vaguely integrates elements representing potential solutions to the external threats from the market. The company does not really have an active strategy of market prospecting, of potential new clients identification, rather waiting for the interested clients to contact the company.

Initiatives rarely appear, in critical situations – a few times during the previous years. TEXTIL Ltd heavily depends on a small number of very important clients (sometimes 80 % of the whole production is for just one client). The environment is perceived as unstable, but managers do not seem able or willing to suggest and integrate in the company's strategy the necessary corresponding methods for dealing with incertitude and threats, for ensuring a certain continuity

and security. We did not identify any elements for a medium and long term strategy, and this makes management extremely vulnerable.

At the level of employees' relationships, management is also still hesitating, sometimes confusing and contradictory. Although on paper and at the declarative level there is a philosophy of innovation and creativity, this does not actually work in reality. Individuals are placed in groups, offered standard salaries, no matter what their real contribution is, they are considered easily replaceable, with no specific identity in the organization. It is the group and not the individual that really counts. As a consequence, there is a great work force fluctuation, which sometimes brings the company in difficulty of finding the appropriate, skilled employees. People come and go, not being motivated enough, and the commitment to the company's values is rather low.

The Quinn model suggests that organizational culture should be identified along values situated on two axes: orientation (internal/external) and adaptation (control/flexibility) (Figure 2).

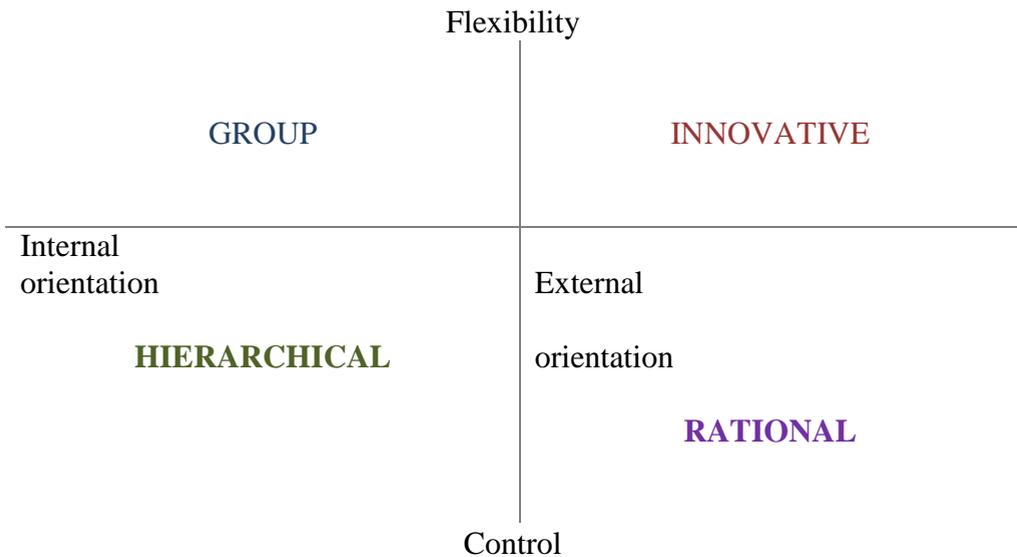


Figure 2 *Quinn model of organizational culture*

The **group type** company has, as basic values, confidence, involvement and the feeling of “family” belonging. The main motivational factors are tradition, moral norms and social cohesion. These companies are oriented towards the

development of human resources and place a strong accent on the loyalty of the employees. The dominant style of management is participatory and encourages teamwork and interaction between employees.

The *innovative type* company is based on values such as creativity, innovation, dynamism, and entrepreneurial spirit. As motivational factors, we find risk taking and initiative. These companies are highly entrepreneurial and competitive, looking for expansion and diversification possibilities. Managers are usually risk taking and oriented towards innovation and new resources attraction.

The *rational type* company emphasizes such values as competitiveness and employees' involvement in order to be performant, and encourages competition and compliance with performance standards. Competitive advantage and market superiority, together with profitability and efficient investments form the basis of their strategy. As for the managerial style, managers are experts, technocrats with high qualities, appreciated by their subordinates.

The *hierarchical type* company has, as basic values, discipline, order, permanent activity assessment and continuity of activities. Job security is the most important motivational factor. These companies look for stability and continuity, always apply rules and procedures. The manager is mainly an administrator, less willing to take risks, trying to ensure stability and constant, albeit small, profit.

For the analyzed company, TEXTIL Ltd., most of the recognized characteristics come from the hierarchical zone: stability, continuity, compliance with rules, internal efficiency, uniformity and order as basic values. Managers are focused on control and administration, looking for stability and risk minimization. Although the hierarchical organizational culture is dominant, we can also find a few elements from the innovative type: innovation is declared strategic priority, dynamism and adaptability are considered significant values, innovation and reactivity are recognized as important for employees' motivation; moreover, the leader declares his willingness to assume necessary risks, in order to develop new markets and obtain new resources. Again, we notice this double personality - the company is innovative as a managerial desiderate, in statements, yet, in reality, hierarchical. It is all about this double dimension of the company's existence, between what it really is and what the manager would like it to be.

As a managerial philosophy and immediate actions, as well, the managers seem to push people towards innovation and creativity, leaving space for

interpretation for the distantly motivated employees. This explains why we cannot see the results of this permanent managerial urge for innovation. The control is continuous and obedience almost absolute.

3.6. Final analysis and interpretation

After using two models for the organizational culture diagnostic, we conclude that the analyzed company has a mixed personality and hesitates between rigorous control and permanent adaptation, between the real and the ideal image, between independent acting and the need to receive directions and reassuring control – a rather general characteristic of the national, Romanian culture. Although the managers of TEXTIL Ltd. seem in favour of a permanent and free adaptation to the threatening environment, control is always used as a precautionary measure. Moreover, the strategy of the company seems to support maintaining its structure and procedures, without adapting to the environment.

The company is placed in different categories at declarative level comparing to the real one oscillating between Club and Baseball for the Sonnenfeld typology and between Hierarchical and Innovative for the Quinn typology of organizational culture. A synthesis of these observations is presented in Table 1.

Table 1 Organizational culture of TEXTIL Ltd. - synthesis

	Sonnenfeld Model	Quinn Model
Perception about relationships with the environment	<ul style="list-style-type: none"> ➔ Between stable and unstable ➔ Reduced consideration of competition in the elaboration of the strategy ➔ Shy initiatives of collaboration with clients 	<ul style="list-style-type: none"> ➔ Reduced preoccupation for adaptation ➔ Focus on the internal side, with shy quests in the exterior
Perception about human resources relationships	<ul style="list-style-type: none"> ➔ Between individual and collective ➔ Group is privileged ➔ Individuals are considered replaceable and interchangeable 	<ul style="list-style-type: none"> ➔ Permanent control and sanctions ➔ Reduced motivation for initiative and creativity ➔ Respect for the hierarchical authority
Category from the specific typology	Baseball – Club	Hierarchical - Innovative

If we consider the criteria suggested by Mintzberg (1992; 2009) five more categories could be identified: entrepreneurial, missionary (divisional or diversified), bureaucratic (machine type), adhocracy (innovative) and professional.

Entrepreneurial companies have a loose organizational structure and are characterized by forward-thinking ideals, energy and enthusiasm, but also by poor task discipline, inefficiency and controlling management. **Missionary or divisional companies** are usually large corporations, with multiple business units and product lines, sometimes organized into divisions that promote specific management for each division, with a centralized control. **Bureaucratic or machine type companies** have structure, consistency and longevity as strengths, and limited openness to new perspectives, together with inefficiencies resulting from bureaucratic processes as common weaknesses. **Adhocracy or innovative companies** have an organizational structure allowing for cutting-edge leadership, common in new industries or when companies want to become innovative leaders. They are characterized by decentralized decision making, and leaders are allowed to make judgments with efficiency in mind. As disadvantages, we have the potential for leadership conflict and uncertainty over authority. Finally, **professional companies** (sometimes called **professional bureaucracy companies**) have a level of bureaucracy similar to the machine type, but are characterized by a high degree of professional, competent knowledge workers, able to drive the economic engine. These capable workers usually have specialized skills and considerable autonomy in their work, allowing more decentralized decision making than is prevalent in the machine type.

The correspondences between the categories suggested by Mintzberg (1992) and those of Sonnenfeld (1988) and Quinn (1991) are presented in Table 2.

Table 2 Comparative analysis of organizational culture

Mintzberg	Quinn	Sonnenfeld
Entrepreneurial	Group Innovative	Fortress
Missionary	Group	Club
Bureaucratic	Hierarchical	Club Academy
Adhocracy	Innovative	Baseball
Professional	Rational	Academy

Considering Mintzberg classification, TEXTIL Ltd. is a mixture of bureaucratic, missionary and adhocracy organizational culture, the first two being more distinguishable at the real level, the last one at the declarative and ideal level.

To conclude, TEXTIL Ltd. is representative for the Romanian present development, characterized by the production and commercialisation of products from a well identified and represented sector. It has a long tradition in the field – almost 100 years, was privatized in 1993 and became part of a national business group, and has a good international image. The company underwent major changes, being now oriented towards demands from singular beneficiaries, well seen in their field. The company is searching to adapt and expand solutions, without a clear strategy. With the present number of employees – approximately 250, comparing to 2000 during the flourishing years before 1989, the company can deal with the present demand, without major challenges in terms of structure and growth. The management of the company is aware of the instability and complex dynamics of the market, environment, demand and competition, but does not seem fully capable of adapting. The efforts made are neither systematic, nor consistent and coherent on medium and long term. The labor market is not favourable because skilled employees prefer to work in more stable and better paid field, or to leave the country and work abroad. The employees do not have a privileged statute, despite the managers' statements and good intentions; actions in favour of these employees are shy, unclear when they are undertaken due to inefficient internal communication. Research and development activities are at the lower limit of the national and European regulations, and this is why the company becomes less visible on national and local level. Through all these characteristics and managerial hesitations, the organizational culture of TEXTIL Ltd. can be placed between the Baseball and the Club types (the dominant Club coming from the desired and stated actions, and not from the real, concrete ones, identifiable at strategic level), between Innovative and Hierarchical – with a dominant of the last type, control being a major preoccupation of the general manager. At the expected contribution level, the company seems oriented towards the individual, from whom ideas, creativity and innovative solutions are expected, paradoxical when looking at the national culture, collectivist and group oriented. But the orientation towards the individual is simply declared since the individual does not receive the necessary resources to accomplish its mission and responsibilities. This approach leads to

negative consequences for the company's performance, the individual being considered in a way which is not adequate to its original culture. A double personality is observed – a stated/desired and a real one – it is obvious that the managers would like to impose principles specific to an individualist and innovative culture for individuals coming from a collectivist culture, without offering them the appropriate resources in order to change and adapt.

There are implications also for the foreign companies willing to do business with such a Romanian company. Potential partners should know that there are often differences between stated and real behaviors, between on paper and on reality objectives, strategies and actions. Understanding the real nature of the Romanian company will reduce communication risks and will allow the development of a mutually efficient business relationship.

REFERENCES

1. Abrudan I. (1999), *Premise și repere ale culturii manageriale românești*, Cluj Napoca, Editura Dacia.
2. Ionescu Gh., Toma A.(1999), *Cultura organizațională și managementul tranziției*, București, Editura Economică.
3. Hofstede G., Hofstede J.G., Minkov M., Vinken H., VSM 08. Values Survey Module 2008, *Release 08-01*, January 2008, www.geerthofstede.nl
4. Mintzberg, H. (1992), *Structure in fives: Designing effective organizations*. Upper Saddle River, NJ: Prentice Hall.
5. Mintzberg, H. (2009), *Tracking strategies: Toward a general theory of strategy formation*. New York, NY: Oxford University Press.
6. Nicolescu O.(1998), *Management comparat. Uniunea Europeană, Statele Unite ale Americii și Japonia*, București, Editura Economică.
7. Nicolescu O. (coord.) (1998), *Sistemul decizional al organizației*, București, Editura Economică.
8. Onea Angelica-Nicoleta (2011), *Diversitatea culturală în management. O abordare regională*, Iași, Editura Universității „Alexandru Ioan Cuza”.
9. Quinn Robert E., 1991, *Beyond Rational Management. Mastering the Paradoxes and Competing Demands of High Performance*, San Francisco, Jossey Bass.
10. Sonnenfeld Jeffrey A., 1988, *The Hero's Farewell: What Happens When CEOs Refire*, New-York, Oxford University Press.
11. Trompenaars, F., Hamden-Turner, C. (1997), *Riding the waves of culture*, Second Edition [Online] Available at: <http://khurrambukhari.files.wordpress.com/2012/02/riding-on-the-waves-of-culture.pdf>.
12. Zaiț D. (2012), *Diagnostic intercultural*, Iași, Editura Universității „Alexandru Ioan Cuza”.
13. Zaiț D., (coord.)(2002), *Management intercultural. Valorizarea diferențelor culturale*, București, Editura Economică.

14. Zaiț D., (2005) L'entreprise roumaine en transition, contexte des affaires et specificites culturelles, en Pierre Dupriez (sous la direction de) *Entreprises roumaines en transition. Etudes de cultures organisationnelles*, Paris, L'Harmattan.
15. Zaiț, D., Spalanzani, A., Zaiț, A. (2015), *Construcția strategică a cercetării. Opțiuni metodologice – între logic și euristic*, Editura Sedcom Libris, Iași.



PERCEIVED USEFULNESS OF OPEN SOURCE INFORMATION IN THE ARABIC LANGUAGE FOR AN ORGANIZATION: A CASE STUDY

CRISTIAN OBREJA*, GABRIEL CUCUTEANU**

Abstract: *The Case Study assesses the method by which theoretical concepts associated with collection and use of information on competition may be put into practice so as to enable the beneficiary organization having interests in countries in the MENA region[#] get advantage of the best business intelligence services provided based on open sources^{##} available in Arabic language for top management decision-making.*

This study aimed to follow a three-month long evolution of a crisis in an organization reflected in the Arabic mass media in a country in which an organization has business interests. Articles and reviews making references to the analyzed crisis have been translated and analyzed. The materials were assessed and summarized and then the organization was provided with two information newsletters on this topic.

After disseminating and discussing the content of informative newsletters within an organization, we asked its decision makers to fill out a feedback questionnaire and later in-depth interviews were held with the members of the board of directors aimed to establish the perceived usefulness of business intelligence for strategic decision-making.

The study conclusions emphasize that business intelligence products obtained from open sources in Arabic language in countries where organizations have business interests may contribute to a great extent to supporting strategic decision-making. Also, the costs of obtaining this type of information are quite high as a huge amount of information must be translated and then analyzed and summarized. These activities require the use of qualified and experienced personnel.

Keywords: *Business Decision-making, Competitive Intelligence, Information Management, Knowledge Management, Organizational Intelligence.*

* Cristian Obreja, PhD, Economics and Business Administration Faculty, Alexandru Ioan Cuza University of Iași, Romania, obreja.feaa@yahoo.ro

** Gabriel Cucuteanu, PhD, Doctoral School of Economics and Business Administration, Alexandru Ioan Cuza University of Iași, Romania, gabriel.cucuteanu@uaic.ro

[#] Middle East and North Africa

^{##} Unclassified information deliberately searched selected, filtered and disseminated for a specific audience to meet a specific demand. EX: mass-media, Internet, research journals, patents, conferences, etc.

1. INTRODUCTION

Global competitiveness, dissolution of monopolies, development of information technology and communications, including mobile technology, decrease in the price of IT equipment, expansion of social networks, global circulation of knowledge and ideas (from private, academic and institutional areas) and the economic crisis have generated significant changes both in the behavior of consumers and companies.

Speed of information generation and transmission is greater, the volume of transferred data has increased tremendously and subscription prices for internet and data services have been lowered; the Internet have already made a huge impact on the „global village” of McLuhan.

According to Internet World State, as of mid-2016 more than half of the world population, 89% in North America and 73.9% in Europe had access to the Internet. The same source reports that 56.3% of Romanian population had access to Internet as of November 30, 2015. The growth rate of internet users has increased tremendously since 2000: 485.2% in Europe, 1515.2% 7448.8% in Asia and Africa.

In this context, the exponential growth in supply of information increases the need to identify on time business opportunities and make appropriate decisions. We are facing a real informational „flood” due to „explosion” of open sources and fluctuations in the new security environment. This „informational overload“ tends to redirect the efforts from searching information to refining the tools for its interpretation.“ (Nițu I., 2011)

Nowadays, managers cannot limit themselves to collecting information from newspapers and other sources of information if they want to constantly be informed on what the competition does and how. Key information collected for the use of the general director) for example: what are the risks and threats faced by the company, what are the main latest operations of competing companies) should be included into the information sheet made by personnel and bodies specialized in gathering, checking and processing information. (Obreja C., Rusu C, 2009)

Business intelligence community in the US recognized long time ago the potential of open source information and took specific measures for collecting and using information from this type of sources. The programs using open source information were extended and improved over time due to a constantly changing environment. Compared to traditional or secret tools, open source information

could be collected more quickly, cheaper and more efficiently and could be more reliable. It was estimated that in the year 1957 between 75 and 90% of economic, scientific and geographic information obtained by CIA in the former Soviet bloc were based on analyzing open sources of information. Electronic and photographic tools may have reduced the percentage especially in the two last categories but the real contribution of open sources to collecting information is still extremely high.

The main challenge for open source information analyst is to identify quickly relevant information and to transform it into summaries and translations. This aspect enables some users to get more benefits than others from the use of open sources.

Considering the increase in the volume of data and operations needed to collect the, Croom stated back in 1969 that using automatic recording methods would become mandatory in the future and management and use of all open source information should be done centrally by an agency that could operate openly working for the nation as a whole including the intelligence community. Such an agency could operate more efficiently and with less cost using a single, flexible and automatic system for data processing and it could provide flexibility and coverage by using contractors.

The authors of this study started from the perspective of such a contractor; they started from a hypothesis that there was an order for information placed by a large organization in Romania having interests in a country from the MENA region. The decision-makers of such an organization were interested in intelligence products aimed to support their decision-making that should have been obtained from open sources of the region available in the Arabic language referring to a critical situation for the organization.

2. METHODOLOGY

Generally, methods are viewed as scientific as they are based on empirical evidence that can be observed (directly or indirectly) and measured. The data should be subject to principles of logic and be repeatable.

Scientific methods of inquiry are based on problem formulation, data collection, analysis (including hypothesis testing) and dissemination.

Even though research in the area of competitive intelligence differs from other areas of scientific inquiry, the principles of scientific research remain the

same. As in other areas, information analysts present hypotheses and research methods aimed to explain phenomena of the real world. The objectivity of employed methods is another important feature of scientific research.

In academic areas, such as sociology, psychology, history, political science and economics, the results are disseminated in academic journals and special conferences. So, knowledge is cumulative and all research community benefits from the results of research and at the same time peers may critique methods and interpretations used in a study to control its quality by means of peer review.

It is difficult to implement in case of research in the area of business intelligence as these results are often confidential.

While business intelligence quantitative research is based on the observations of made by the analyst that may be measured by a measurement tool, qualitative research may broaden the knowledge and suggest causal explanations. In this case, the analyst should collect data in an unstructured way, without using standardized or limiting questionnaires (“boxes to check.”)

Even though some qualitative research may use a set of uniform questions, the answers are not structured as in quantitative research. In business intelligence qualitative research, data are collected by direct or indirect observation using journals, magazines, interviews or focus groups, etc. Sources of secondary data are numerous; documents being available in a multitude of forms. In business intelligence research, qualitative data may also be used for a pilot study or to develop a theory (e.g., grounded theory research) that could later be tested using quantitative data. (Prunckun, 2010 p. 55)

„Case studies are studies of single issues or problems and can be manifested in a person, a group, an incident, or an event. It is a systemic way of examining a problem extending beyond the use of a limited number of variables by providing an in-depth investigation into the target phenomena. Case studies can be single or multiple cases and need not be solely qualitative. Instead, they can use a quantitative paradigm or a mixed approach.“ (Prunckun, 2010 p. 57)

In-depth interview is similar to a focus group but includes only one or two respondents. Even if an in-depth interview has an unstructured format, the analyst will formulate a set of open questions to open the discussion needed to obtain data for answering the research question. In-depth interviews are appropriate if research

involves sensitive, confidential or even classified issues. This is the reason why the required information makes the group format be inadequate. (Prunckun, 2010 p. 58)

3. OVERVIEW OF RESEARCHED ORGANIZATION

The organization for which the research was conducted is a large Romanian entity that has 1250 employees with an annual income exceeding 33,37 million €. It has business interests in the MENA region.

For this reason, based on the working hypothesis, the decision makers of the organization were interested in receiving intelligence products from open sources in the region in order to support the decisions of top management.

4. RESEARCH DESCRIPTION

During a period of three months, the evolution of a critical situation for the organization was monitored in the press in a country in which the organization has special interests. All online open source information making reference to the situation was studied. Then, both the articles and the comments making reference to the situation were translated. The obtained materials were analyzed, summarized and then two information sheets covering the topic were delivered to the organization.

After disseminating and discussing the content of the information sheets within the organization, its decision makers were asked to complete a feedback questionnaire and the in-depth interviews were held with the members of the board of directors in order to establish the perceived usefulness of competitive intelligence in the process of strategic decision-making.

To identify the way in which the organization relates to competitive intelligence (especially information on competitors and market coming from open or official sources supporting managers in their decision making, the perception of the general manager were assessed by means of a questionnaire.

5. RESEARCH OUTCOMES

The questionnaire completed by the general manager on the way the organization relates to complete business intelligence showed that the organization has slow orientation towards business intelligence.

Even if the management of the organization felt the need to be informed in the process of decision-making related to competitors and the information on macro-environment, technological innovation, competition, clients was viewed as extremely important for the organization, this type of data were searched and obtained to a very low extent at the date of when the study was carried out

In what regards methods of obtaining data from online sources, we discovered that online publications (newspapers, magazines, studies, articles) were the main source of information. The organization was not using blogs or social networks for obtaining business information.

On the date of this research, intelligence capacity (capacity to obtain information from the competitive environment) of the organization was viewed by the general manager as basic, being sometimes forced to get personally involved in collecting and analyzing information.

The management of the organization agreed that the open source information improve significantly the efficiency of the organization (e.g.: the information obtained from mass media, the Internet, research journals, patents, conferences, etc.).

By analyzing the feedback questionnaires and the in-depth interviews with the management of the organization on received information sheets, their form, content and utility were discovered.

So, the expectations of the Board of Directors on the information sheets were matched to a great extent or even were exceeded for some members of the board.

Regarding the relevance of informational content included into information sheets, the majority of the board members viewed it as being relevant. The relevance is reflected by the effect the information produces on its user, the extent to which it meets the expectation of users in their decision-making.

Graphic format of information sheets, type A4 brochures, paginated in two columns, included text and relevant photos on the subject was well-received and easy to read.

The information presented in the information sheets was generally easy to understand by all members of the board of directors. It was discussed that the language should be simple to make the information usable, clear, concise and readable by those who need it and are authorized to get access to it. It should be noted that often people appointed to know and access this information lack training in the field of business intelligence. Also, we should take into account that some

information useful for one level of management may be too general or too detailed for another level of management.

The information included into information sheets was generally viewed as relevant to support decision-making in the organization. The interviewed members of the board of directors reported that the information sheets provided them new elements related to the analyzed situation without containing unimportant or meaningless aspects.

The information included in the information sheets initially influenced to a lower extent the decision-making of management. The interviewed subjects stated that the information should be complete, include enough data in order to influence alone the decision-making process. To meet the need of the management, be complete and 100% secure, it is important that the information reflected a detailed picture of the analyzed event to enable it to support the top management make correct decisions and plan efficiently the organization's response and operations.

Taking into account that the information sheets could contain sensitive organization for the organization, the members of the board of directors generally agreed that such materials should be confidential. The discussions showed that the access to such information sheets should be allowed to people based on their position in the organization and upon the approval received from senior management by observing the principle „need to be informed“.

The members of the board of directors mostly think that such information sheets should be disseminated just to top management. The discussions also revealed that the transmission of confidential information to other people in the organization should be allowed only if they are authorized to have access to such information. The transmission of this type of information outside the organization should be authorized by the general manager or the delegated personnel. Also, it should be noted that the authorization access given to people, whose behavior, attitude or manifestations could impact the security of confidential information, should be immediately withdrawn.

The information sheets contained also the elements of novelty. Generally, the members of the organization knew the situation quite well. The new information compared the pre-existing one included the way the information about the organization, independently from what happens actually in the organization, was received and impacted the target environment from the countries in the MENA region. We identified

the main means of spreading key information referring to facts, phenomena, events that could have become threats or sources of risk for the organization.

To be able to supply relevant information, in a concise manner and easy to understand, the members of the board of directors to a great extent viewed that it would be useful that the information sheets contained a summary with the most relevant elements for the organization.

Most members of the board of directors thought that it would be useful that they were able to ask that such information sheets be made to support their strategic decision-making. They were interested in the possibility to be able to ask for such information sheets that would contain data on changes on the market or in the operations of their competitors.

Respondents believe that in a situation of crisis such information sheets would be extremely useful and that they would want to get them periodically. They viewed as beneficial in the future to have permanent monitoring and get early warnings on a set of external indices and indicators (economic and financial, social, political, transnational and informational describing situations with a potential of risk or opportunity for the organization's goals and strategy. Benchmarking studies conducted to investigate and understand the best practices and working methods used by the competition in order to adopt them in your own operations as to increase efficiency were also viewed as important.

The information presented in the information sheets were considered by the members of the board of directors as being very reliable.

Most members of the board of directors gave high reliability to the content of information presented in the information sheets which means that the information was acknowledged also by other independent sources and previous knowledge. Only one person gave relative reliability to the content of the information sheet, the content being acknowledged also by other independent sources and just partially by previous knowledge. The informational content was not rejected also by other independent sources and previous knowledge of respondents.

The information presented in the information sheets were considered conclusive by the members of the board. The information provided in the information sheets contained enough elements describing the event and the operation in a specific context.

The layout of the information sheets was reported to be good or excellent and the volume of the delivered information was also viewed as being good. Respondents described the information contained in the information sheets as being useful, high quality, valuable, practical and important. A slightly lower score was recorded for relevance and reliability of the provided information.

6. CONCLUSIONS

The top management of the organization often felt the need to have access to information on competition for their decision-making process. Nevertheless, the organization had a low orientation towards business intelligence and its capacity to obtain information from the competitive environment was very limited as its managers lacked experience and skills in this area.

Intelligence products obtained from open sources in the Arabic language in the countries where the organizations have special interests may greatly contribute to supporting strategic decision-making.

If the leadership of an organization lacks an adequate business intelligence culture, it may have a tendency to give high credibility to content of information sheets. Therefore, it is important that the analyst presented correct the limitations of obtaining information only from open sources due to limited possibility to check their accuracy. To increase the value of the information, it is important that business intelligence products be obtained legally sing all sources specific to business intelligence.

As there are so many theoretical approaches, the study is important as it showed in practice how a business intelligence product could be made covering organization's needs and contributing significantly to supporting strategic management decisions. Also, the experience of the authors was enriched by practical knowledge needed to produce intelligence products from open sources in the Arabic languages in the countries of the MENA region that may be used and adopted for specific contexts, for sources available in Russian, Ukrainian, etc. in less accessible areas but where organizations have business interests or provide humanitarian aid.

Also, such operations may be required by organizations having solid financial means as costs for obtaining this type of information may be high amounting to thousands of Euro. Huge volume of information should be translated and then

summarized and analyzed. These operations require the use of qualified personnel having experience in collecting, storing and analyzing business information.

REFERENCES

1. Agarwal, K. N. (2006). Competitive intelligence in business decisions - an overview. *Competition Forum*, 4(2), 309-314
2. Croom, Herman L., The Exploitation of Foreign Open Sources, *Studies in Intelligence*, 1969, volume 13, number 3, pp. 129-136
3. Franco et al., Competitive intelligence: a research model tested on portuguese firms, *Business Process Management Journal*, Vol 11, Nr 2, 2011, pp. 332-356
4. Gilad, Ben. "The Future of Competitive Intelligence: Contest for the Profession's Soul", *Competitive Intelligence Magazine*, 2008, 11(5), 22
5. Grooms, T.F., *Marketing Intelligence: Executive Management Perceptions of Value*, Henley Management College, Brunel University, 2001
6. McLuhan, Marshall (1962). *The Gutenberg Galaxy: the making of typographic man*. Toronto, Canada: University of Toronto Press
7. Nițu I. – coordonator, *Ghidul analistului de intelligence – Compendiu pentru analiștii debutanți*, Ed. Academiei Naționale de informații „Mihai Viteazul”, București, 2011
8. Obreja C., Rusu C., *Protejarea și promovarea intereselor firmei prin Intelligence*, Editura Expert, București, 2009
9. Obreja C , Cucuteanu G., *Need for Intelligence of Romanian Managers*, 7th DSEBA Conferences, Iași, 24-25 May 2013
10. Prunckun, Hank, *Handbook of scientific methods of inquiry for intelligence analysis*, Scarecrow professional intelligence education series ; no. 11, Scarecrow Press, 2010
11. Yap, C. S., Md Zabid, A. R., & Dewi, A. S. (2013). Perceived environmental uncertainty and competitive intelligence practices. *Vine*, 43(4), 462-481.

BOOK REVIEW



A REVIEW OF 'BRAIN COMPUTATION AS HIERARCHICAL ABSTRACTION'

BODO HERZOG*

Abstract: *This article is a review of the book 'Brain Computation As Hierarchical Abstraction' by Dana H. Ballard published by MIT press in 2015. The book series computational neuroscience familiarizes the reader with the computational aspects of brain functions based on neuroscientific evidence. It provides an excellent introduction of the functioning, i.e. the structure, the network and the routines of the brain in our daily life. The final chapters even discuss behavioral elements such as decision-making, emotions and consciousness. These topics are of high relevance in other sciences such as economics and philosophy. Overall, Ballard's book stimulates a scientifically well-founded debate and, more importantly, reveals the need of an interdisciplinary dialogue towards social sciences.*

Keywords: *computational neuroscience, book review, link to social sciences*

JEL Classification: *D87, D70, D80, C70, M20*

1. INTRODUCTION

The book 'Brain Computation As Hierarchical Abstraction' by Dana H. Ballard has certainly not been recognized as one of the big surprises in the recent book market. Of course, it is rather an academic book than a novel for ordinary people, containing aspects that require more visibility especially in social sciences because it may be able to shape future theory. The book has nearly 400 pages, but despite its length and bulky topic, it is discussed in a lively and interesting manner. It contains good illustrations and, thus, makes it accessible for academics of all scientific fields. So far, the book is most likely sold to experts in the field, but I will argue that it is as important to social scientists as it is to neuroscientists.

* Bodo Herzog, 1. Department of Economics, ESB Business School, Reutlingen, Germany, 2. IFE – Institute of Finance and Economics, Reutlingen University, Germany, 3. RRI Reutlingen Research Institute, Reutlingen, Germany

2. BRAIN COMPUTATION: RESULTS

The main theme of the book is about computational neuroscience. It is not easy to measure the relevance of research publications across scientific disciplines. Usually, measures include impact factors, number of citations or journal rankings, however, such standards have limitations, especially for books. In fact, measuring the overall attention of a book from a different discipline requires a more comprehensive approach. One unique measure of attention is Google search data (Da et al. 2011). Figure 1 denotes the public attention of three major fields in neuroscience: behavioral, cognitive and computational neuroscience.

Generally, computational neuroscience has the lowest public attention in comparison to other subfields. The public's attention on behavioral and cognitive neuroscience is not just higher, but also displays interesting cyclical patterns. This pattern does not appear in the Google data. Of course, the different cyclical patterns are interesting, but this is itself a topic of research and remains to be further studied. One hypothesis might be that computational neuroscience is a more recent subfield than the others. Another conjuncture is that computational neuroscience requires more interdisciplinary skills and dialogues. Thus, the book under review tends to belong to a rather closed niche in neuroscience and social sciences.

In fact, computational neuroscience literature goes almost unnoticed in social sciences despite its groundbreaking developments and new contributions on modeling behavioral aspects of humans. However, there is a subfield called neuro-economics which focuses on these issues, yet despite the fundamental insights of neuroscientific discoveries, mainstream economists, sociologists or political scientist do not have sufficient knowledge. Undoubtedly, this is one of many books with potentially major implications for social sciences.

Certain chapters, especially 9-11, provide explicit information on important phenomena for social scientists such as the modelling of brain processes during decision-making. This aspect is a major research field in economic and business theory as well. For the last half a century, the role of emotions in decision-making has been applied in behavioral economics. Consequently, the volume is more than a book on brain computation, it is an interdisciplinary volume for scientists in other fields such as social sciences too.

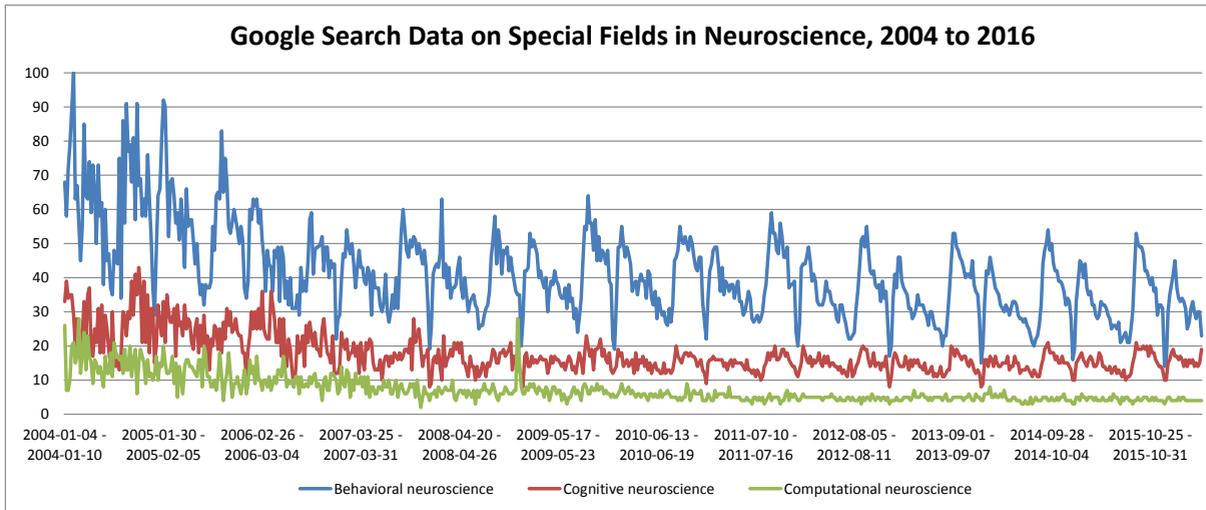


Figure 1 Google Trends Statistics, 2004-2016

Source: Google Data, own computations.

2.1. What can be learned from the book?

Ballard's book has a logical structure and it is accessible to readers with no knowledge of neuroscience. The book consists of four parts.

Part I is about the structure and function of the brain, as well as its relationship (i.e. similarities and differences) to silicon computers of today. The reader has the opportunity to learn about the main brain parts and operations, processes and networks.

So far, brain computation 'was thought that a [neuron] spike was a binary pulse, but recent experiments suggest' that it is in the order of a byte' (p. 21). However, the major evidence is that 'nerve cells communicate 10 million times slower than silicon transistors' (p. 22). This detail is interesting because, so far, economists believed in the concept of rational humans, yet rationality assumes that our brain processes all information in a fast manner. Consequently, the challenge is not the understanding of speed, but rather the brain code. Economists probably have to learn that rationality is more than maximizing utility subject to constraints under complete information.

What makes the brain so efficient despite its inherent slowness? The book discusses this issue in more detail. Still it is questionable whether the brain is more powerful than a computer. Chapter 2 elaborates the neuroscientific underpinning of

the human brain. The author provides an excellent introduction of the brain functions. In addition, the author is clearly stating when it is a scientific fact or speculation. On brain memory, he stated that ‘the exact limits of cortical memory are completely unknown’ (p. 54).

Rather interesting features tend to be hidden in particular issues of interest for social scientists. In fact, economists model decision-making within a rigorous utility framework. This modelling is somehow analogous to the reward-error-prediction model in neuroscience. The author describes that our brain is ‘never creating brand new programs’ but, according to the situation, it is ‘modifying existing programs’ (p. 57). Hence, a rigorous mathematical model, such as utility maximization, is most likely not flexible enough according to recent neuroscientific evidence.

On p. 58, he refers to a well-known discovery in philosophy. Already I. Kant (1781) stated that ‘...”you see what you want to see.”, however this statement was not based on neuroscientific evidence (Allais, (2004). The interpretation of the outside world is based on a program’s internal expectations’. The neuroscientific evidence of brain processes confirms that ‘expectations almost always get the upper hand’ (p. 58 & p. 378, Baum 2004, Hawkins 2004). Even this insight is not completely new in psychology. For the last four decades, psychologists have studied topics such as framing, biases, and heuristics (Tversky and Kahneman 1973). Similar examples are discussed in the book (e.g.: Rubins Vase on p. 149, the Blue Disk illusion on p. 147). The neuroscientific underpinning of brain processes is quite striking and certainly has a major impact of modelling human behavior in the future. In my opinion, these aspects have been, up until today, underestimated in mainstream economics, business and social sciences.

Modern neuroscience also reveals lessons for philosophical debates. One is about whether our world is discrete or continuous (VanRullen and Koch (2003), Hintikka (1966)). According to the author, ‘our continuous perception of the visual world is somehow created from the series of discrete instants lasting about 300 milliseconds’ (p. 62, p. 128). This would be evidence that the perceived continuous world is rather discrete. Therefore, modeling human behavior by using continuous mathematical tools has its own limitations. Another debate is the neuroscientific underpinning of learning. Learning ‘cannot be complete done without sleep’ and it requires that the new things are ‘filed near similar experiences’ in our brain (p. 73).

Karni et al. (1994) find that the sleep cycle is essential for the hippocampus to do its encoding and downloading work.

Part II is about neurons, circuits and systems; in short, the brain structures. These structures make us special in comparison to silicon computers. Here, for the first time, the reader gets some mathematical and computational background of the human brain. Unfortunately, the mathematical discussion is rather brief. A more comprehensive and rigorous derivation of the mathematical models would be beneficial. Indubitably, more empirical hypothesis, together with the respective testing based on neuroscientific data would enhance the computational aspects of the book. At least several case studies provide an overview about these issues. A rather good discussion in the book is about risk. It turns out that handling risk can be achieved by making it less rewarding, which has the effect of modulating serotonin levels (Doya and Kimura 2009). This insight may have an implication on financial regulation in future.

Part III is about embodiment of behavior especially the role of routines in our brain. The reader learns how expectations can be processed by computational formalism such as in optimal feedback control theory (Shadmehr and Mussa-Ivaldi 2011, Scott 2012). In fact, there is neuroscientific evidence that our brain processes information in a congruent way aligned with the reinforcement learning theory (Schulz et al. (1997)). In the end, 'the brain's dopaminergic system codes an internal reward signal in terms of deviations from expectations' (p. 255). Once again, the computational oriented reader does not get all mathematical or computational details and is looking for more real empirical testing of this neuroscientific evidence.

The final is about highly relevant notions of social and behavioral issues such as decision-making, emotions and consciousness. These topics are closely related to social sciences (i.e. psychology and economics; Tversky and Kahneman (1973)). Recent progress in neuroscience makes it possible to study in detail such topics. The separation of the brain's states with new neuroscientific techniques allows a better understanding of the brain networks, but there are still divergent views on issues such as consciousness.

Chapter 9 (on decision-making) discusses (p. 322-325) the computational aspects and coding of reward values, uncertainty and discounting. The author makes reference to game theory, commonly used in economics. This discussion

reveals the need for a closer interdisciplinary dialogue. In fact, the author does not refer to recent research in economics, which has implications on the computational aspects discussed in the book. For instance, Nagel (1995) showed that humans are less rational than suggested by game theory. Hence, human decision-making is based on second- or third-degree beliefs. Nevertheless, under the assumption of infinite-order beliefs, mainstream economists still mainly focus on fully rational agents. Although Nagel's evidence (Grosskopf and Nagel 2008, Costa-Gomes and Crawford 2006) is a well-proven result in experimental game theory, it has not been included in the book.

Of course, in almost any book on neuroscience there is a chapter about conscious free will. The author elaborates on such issues and the computational aspects in Chapter 10. It turns out that a stochastic model may be a reasonable approach to model the perceived concept of free will. In addition, the different philosophical theories on this issue (p. 392) provide a rather interesting discussion. The author suggests that consciousness is likely generated by mental simulations using the same neural circuitry in everyday actions, as proposed by Merleau-Ponty (1962) and Barsalou (1999). If we obtain evidence for this hypothesis one can assume that philosophic and economic theories will have to be rewritten.

In the wake of this book, several ideas pass through the reader's mind. Although there is no concluding chapter that pools all issues in a comprehensive model, it is a stimulating reading. Of course, given the brain's complexity, to conclude such a book is almost impossible. But science is continuously progressing by trial and error, thus scientists should favor to establish a testable hypothesis rather than none at all.

How the book can be further promoted? Firstly, it should emphasize the scientific approach (i.e. utilize the unique neuroscientific data to develop testable models). Secondly, it should include a more rigorous and comprehensive mathematical treatment of the computational aspects. Thirdly, redefining the rather unappealing title. Lastly, recommendations are highly welcomed.

3. CONCLUSION

In summary, the book '*Brain Computation As Hierarchical Abstraction*' is a stimulating source about the computational aspects of human brains. It is continuing the debate about the mathematical modelling of human behavior. The

informed reader wants to see more hypotheses based on neuroscientific evidence. This probably requires a further closer interdisciplinary scientific dialogue. Nevertheless, the book is well structured and recommendable to researchers in other scientific fields. As a result, Ballard's work is not just a book on computational neuroscience, but rather a remarkable study on brain modelling. It sheds light on almost all aspects of human behavior and thus, provides insights for academic researchers and interested readers alike.

ACKNOWLEDGEMENTS

I am grateful for financial support provided by the Reutlingen Research Institute (RRI). I thank Chiara Fritsch for editing a preliminary version of this paper. Finally, I am grateful for the comments from anonymous referees. All remaining errors are my responsibility.

REFERENCES

1. Allais, L. (2004), "Kant's one world Interpreting 'Transcendental Idealism'", *British Journal for the History of Philosophy*, Vol. 12, No. 4, pp. 655-684.
2. Barsalou, L.W. (1999), "Perceptions of perceptual symbols", *Behavioral and Brain Sciences*, Vol. 22, p. 637.
3. Baum, E.B. (2004), *What is Thought?*, MIT Press.
4. Costa-Gomes, M.A. and V.P. Crawford (2006), "Cognition and Behavior in Two-Person Guessing Games: An Experimental Study", *The American Economic Review*, Vol. 96, No. 5, pp. 1737-1768.
5. Da et al. (2011), "In Search of Attention", *Journal of Finance*, Vol. 66, No. 5, pp. 1461-1499.
6. Doya, K. and M. Kimura (2009), "The basal ganglia and the encoding of value", (in: *Neuroeconomics: Decision Making and the Brain*, ed. P.W. Glimcher, and E. Fehr), Academic Press, pp. 407-414.
7. Grosskopf, B. and R. Nagel (2008), "The two-person beauty contest", *Games and Economic Behavior*, Vol. 62, Issue 1, pp. 93-99.
8. Hawkins, J. (2004), *On Intelligence*, Times Books.
9. Hintikka, J. (1966), "Aristotelian Infinity", *The Philosophical Review*, Vol. 75, No. 2, pp. 197-218.
10. Kant, I. (1781), *Kritik der reinen Vernunft*.
11. Karni et al. (1994), "Dependence on REM sleep of overnight improvement of a perceptual skill", *Science*, Vol. 265, pp. 603-604.
12. Merleau-Ponty, M. (1962), *Phenomenology of Perception*, Routledge & Kegan Paul.
13. Nagel, R. (1995), "Unraveling in Guessing Games: An Experimental Study". *The American Economic Review*, Vol. 85, No. 5, pp. 1313-1326.
14. Scott, S.H. (2012), "The computational and neural basis of voluntary motor control and planning", *Trends in Cognitive Sciences*, Vol. 11, pp. 541-549.

15. Shadmehr, R. and S. Mussa-Ivaldi (2011), *Biological Learning and Control: How the Brain Builds Representations, Predicts Events, and Makes Decisions*, MIT Press.
16. Schulz, W. et al. (1997), "A neural substrate of prediction and rewards", *Science*, Vol. 275, pp. 1593-1599.
17. Tversky, A. and D. Kahneman (1973), "Availability: A heuristic for judging frequency and probability", *Cognitive Psychology*, Vol. 5, Issue 2, pp. 207-232.
18. VanRullen, R. and C. Koch (2003), "Is perception discrete or continuous?", *Trends in Cognitive Sciences*, Vol. 7, No. 5, pp. 209-212.