STUDIA UNIVERSITATIS
BABEŞ-BOLYAI

OECONOMICA

1/2015

STUDIA
UNIVERSITATIS BABEŞ-BOLYAI
OECONOMICA

1/2015

April

EDITORIAL OFFICE OF OECONOMICA: Teodor Mihali str. no. 58-60, s. 251, 418655 Cluj-Napoca,
Phone: 0040-264-41.86.52, oeconomica@econ.ubbcluj.ro, http://studiaoeconomica.ubbcluj.ro/

EDITORIAL BOARD

ADVISORY BOARD

EDITORIAL ASISTANTS

YEAR **(Volume 60) 2015**
MONTH **APRIL**
ISSUE **1**

Studia Universitatis Babeş-Bolyai Oeconomica

1

EDITORIAL OFFICE of **Studia Universitatis Babeş-Bolyai Oeconomica**:
Teodor Mihali str. no. 58-60, s. 251, 400591 Cluj-Napoca,
Phone: 0040-264-41.86.52, oeconomica@econ.ubbcluj.ro,
http://studiaoeconomica.ubbcluj.ro/

SUMAR – SOMMAIRE – CONTENTS – INHALT

BOOK REVIEW

INTERNATIONAL MARKET, ENTREPRENEURIAL AND LEARNING ORIENTATIONS AS DRIVERS OF FIRM PERFORMANCE

Emőke–Szidónia FEDER[*]
West University of Timișoara, Romania

Abstract. For contemporary firms, strategic orientations are indispensable resources of successful internationalisation, perceived as a high potential performance ensuring strategy. The foremost strategic choices studied within the resource-based perspective are the entrepreneurial, market and learning orientations. Therefore, the study aims to assess performance allegations of the above strategic orientation trinity integrated within the international business framework. Potential individual and multiple effects included in the universal configuration research model were explored on a survey based quantitative data collected from a sample of Romanian SMEs. Investigation findings revealed the positive individual influence of foreign market and international learning orientations. Further results highlighted a greater positive explanatory power of the synergistic strategic orientation triad on the international success.

JEL Classification: L25, L26, M16

Keywords: international entrepreneurial orientation, foreign market orientation, learning orientation, international performance, configuration model, SMEs.

1. Introduction

The phenomenon of firms' strategic orientations fascinated academics from several literature streams, including management, entrepreneurship, marketing and international business due to their potential positive influences on firm performance, competitive viability and sustainability.

Recent theoretical and empirical studies (Kropp et al., 2006; Grinstein, 2008; Hakala, 2011; Laukkanen et al., 2013) argue that firms must develop processes, strategies, activities and behaviours based on multiple strategic orientations. Arguments are based on comparatively poorer performance obtained by firms focusing exclusively on a single orientation (Kropp et al., 2006) and the differentiation needed by the multifaceted deeply interrelated contemorary national markets (Laukkanen et al., 2013).

[*]Corresponding author. Address: Faculty of Economics and Business Administration, West University of Timișoara, J.H. Pestalozzi Street no. 16, 300115, Timișoara, Romania, Tel. +40-256-592-559, Email: emoke.feder@e-uvt.ro

As noted by Cadogan (2012), extant research on strategic choices as orientations is mainly domestically focused, highlighting the urgent need for empirical studies in the international business setting. Furthermore, in the European context, a significant number of SMEs compete on foreign markets too, internationalisation being an essential and indispensable strategy to gain or maintain competitiveness.

Considering the above raison d'être, the undertaken study propose to identify the most suitable distinctive unique or combination of strategic orientations contributing mostly to international competitive advantage creation, whereas being necessary in the conception and development of SME international expansion.

Kropp et al. (2006) suggest as the most important, while Hakala (2011) as the mostly researched, triad of strategic orientation choices the market, entrepreneurial and learning orientations. Consequently, the study proposes to clarify the individual and synergistic role of foreign market orientation, international entrepreneurial orientation and international learning orientation on the foreign performance, in the case of Romanian SMEs.

The majority of current studies consider the effects of a single or at most two strategic orientations on different performance measures, proving inconclusive results. The first category incorporates a large number of studies focusing on market orientation (Kohli and Jaworski, 1990; Narver and Slater, 1990; Deshpandé et al., 1993) and export market orientation (Cadogan et al., 2002, 2003, 2009; Murray et al., 2007), entrepreneurial orientation (Covin and Slevin, 1989; Lumpkin and Dess, 1996) and international entrepreneurial orientation (Covin and Miller, 2014; Feder, 2015), while to a lesser extent on learning orientation (Sinkula et al., 1997; Calantone et al., 2002; Frank et al., 2012). In the second cluster of studies, falls a narrower scope of studies, as combinations between market and entrepreneurial orientations (Gonzalez-Benito et al., 2009; Boso et al., 2012, 2013; Foltean and Feder, 2014), market and learning orientations (Baker and Sinkula, 1999; Souchon, et al., 2012), respectively entrepreneurial and learning orientations (Wang, 2008). Empirical research uniting more strategic orientations appears more as exceptions (Kropp et al., 2006; Nasution et al., 2011).

The present study contributes to the literature by creating a more comprehensive view and empirically examines the role of the primary triad of strategic orientations on a multidimensional measure of international performance in the niche of internationalised SMEs within the framework of a transition country. Its originality lay in the placement of strategic orientations in the international framework, the context of SMEs and the analysis of strategic choices in a different, less studied national setting, while its value consist in the combination of alternative and complementary approach, by highlight the individual and joint effects of strategic orientations on firm financial and marketing performance specific to the international process. The major relevance of the research consists in the idea that managers and entrepreneurs can enhance international SME performance by developing a proper combination of different orientations.

The research paper is organised in the following logic: (i) first section presents an introduction in the theme and objectives of the research; (ii) next, the theoretical background of the main strategic orientations and their implications are included, creating the path to explain the proposed research model and hypotheses; (iii) the methodological section comprise construct measurement options, data collection and analysis regarded issues; (iv) the forth section includes data analysis and discussion; (v) while the last part of the paper identifies conclusions, managerial and policy implications, limitations and further research opportunities.

2. Theoretical Background

2.1. Strategic Orientations and the Internationalisation Process of Firms

The main assumption of the resource-based view (RBV) of the firms is that organisations consist of a bundle of heterogeneous resources, capabilities and competences (Barney, 1991), as fundamental attributes and elements consisting of owned, acquirable, attainable, internally developed and/or controllable tangible and intangible resources. Any process, activity, behaviour or strategy implementation requires the allocation of an amount and a diversity of resources.

Strategic literature in management, marketing and international business recognises the unusual importance and astonishing significance of strategic orientations, as intangible resources, for business decisions and performance. Strategic orientations are directing principles of firm activities and behaviours (Hakala, 2011), mainly regarding resource allocation and coordination (Cadogan, 2012). In other words orientations are inclination, direction of thought, mechanism or culture seeking proper creation, attraction, embedment, combination and enactment of diversified tangible and other intangible resources.

Table 1. Strategic orientations in the international literature

Study / Strategic orientation	*MO*	*EO*	*LO*	*TO*	*SO*	*BO*
Grinstein, 2008; Baker and Sinkula, 2009; Gonzalez-Benito et al., 2009; Boso et al., 2012, 2013; Foltean and Feder, 2014	X	X				
Baker, and Sinkula, 1999; Grinstein, 2008; Souchon, et al., 2012	X		X			
Wang, 2008; Grinstein, 2008		X	X			
Grinstein, 2008	X			X		
Calantone et al., 2002			X	X		
Kropp et al., 2006; Nasution et al., 2011	X	X	X			
Hakala, 2011	X	X	X	X		
Hagen et al., 2012	X	X		X	X	
Laukkanen et al., 2013	X	X	X	X		X

Based on the priority of strategic orientations in the research field, Kropp et al. (2006) and Hakala (2011) consider market (MO), entrepreneurial (EO) and learning orientations (LO) the most popular choices, besides production, technological or innovation orientation (PO/TO/IO), brand orientation (BO), sales orientation (SO), relationship orientation (RO), stakeholder orientation (StO) (Cadogan, 2012).

Internationalisation is a dynamic complex process of firm presence expansion on foreign markets via activities transcending national boundaries based on identified opportunities. Even though early definitions of the internationalisation term focused on commitment of different type of resources, like tacit and explicit knowledge and experience (Johanson and Vahlne, 1977, 2006), recent re-conceptualisations perceive as “the discovery, enactment, evaluation, and exploitation of opportunities – across international borders – to create future goods and services” (Oviatt and McDougall,

2005: 540). Overall, firms comprehend internationalisation in order "to create value by the combination of a unique set of resources in order to *explore and (a.a.*) exploit an opportunity" (Jones and Coviello, 2005: 287).

The RBV conditions the initiation and progress of the internationalisation process by the availability of strategic resources (Barney, 1991). The international behaviour, manifested in foreign entry method, external target markets, pace and rhythm selection, will occur in order to mobilise, accumulate, develop, use and transfer resources between firms and countries (Peng, 2001). The specific difference of SME internationalisation consists exactly in the limited quantity and diversity of available resources and capabilities (Foltean and Feder, 2009).

Etemad (2004) considers that any model representing the internationalisation of SMEs must represent a market, firm (internal) or entrepreneurial perspective. Hence, from the firm internationalisation point of view, the triad of main strategic orientations must be adapted to the underpinning process, creating the foreign market orientation, international entrepreneurial and learning orientation.

Market orientation is conceived as the marketing concept implementation and operationalisation in the firm specific processes, actions, behaviours (Kohli and Jaworski, 1990), respectively culture (Narver and Slater, 1990). The last approach focuses on profitable serving of customers in the limits set by competitors, while the first approach of the orientation emphasizes market information processes about customers and competitors.

Cadogan et al. (2001) created the export market orientation concept, after the amalgamation of the above two perspectives, placed in the context of export transactions. More generalised for any type of international operation, foreign market orientation can be conceived as generating, acquiring, disseminating information and knowledge about the trends of external markets, foreign clients and competitors, necessary for firm response and adaptation to the markets' conditions. Seen on a continuum, firms might act passively without considering the evolvements of the external business environment, in a responsive (market-driven) manner by adapting and adjusting in time to the requirements of clients and competitive actions of players from foreign markets, respectively proactively gathering and disseminating information to create opportunities, products for future desires of clients, meanwhile increasing profitability chances (Gonzalez-Benito et al., 2009).

Entrepreneurial orientation captures the strategic approach of entrepreneurship, manifested through entrepreneurial activities and behaviours as "decisions, processes and practices that lead to a new entry" (Lumpkin and Dess, 1996: 136).

International entrepreneurial orientation appeared as a result of concept travelling of the original strategic orientation (George and Marino, 2011), perceived as "(exporters) capability to differentiate from the rest of competitors by calculated risk-taking, proactivity, aggressive competitiveness, innovation and the introduction of new products and technologies" (Boso et al., 2012: 668). As global orientation, it may manifests (Covin and Miller, 2014) by seeking proactively the discovery and exploitation of foreign opportunities before competitors in the anticipation of clients needs, by adopt innovative behaviours in terms of ideas, products, processes, technology, business model and by calculated risk-taking associated to new geographic market entry as allocation of resources to uncertain outcome projects. Entrepreneurially oriented firms adjust their strategies, operations and behaviours more easily to the dynamism of hostile environments (Covin and Slevin, 1989), shape their industry by exploring tentative new and uncertain global markets in the hope of higher returns.

Learning orientation regards firm's inclination toward learning commitment, shared vision and open-mindedness (Sinkula et al., 1997) in order to create and use all kind of knowledge necessary to predict and respond to changes in the internal and external environment (Calantone et al., 2002), respectively to perform the necessary adjustments. Sinkula et al. (1997: 314) considers that firms learn "actively or passively, by own volition or through force, as a luxury or by necessity, through systematic analysis or by trial and error, and through long-term versus short-term feedback from a dynamic or stable environment". Therefore, in the approach of learning orientation regards to both adaptive (single-loop) learning to correct incrementally firm behaviours and reactions to changes in the business environment from the domestic and foreign marketplaces, and also generative (double-loop) learning necessary to paradigm shifts regarding the internal and external business environment by continuously questioning and enhancing routines and processes.

In the context of internationalised SMEs, learning orientation is considered as attitude towards achieving knowledge and wisdom, resulting in the organisational learning process (Baker and Sinkula, 1999) from the national and foreign economies, especially when earlier behaviours do not deliver expected outcomes on the domestic market. Regarding the dimensions of the learning orientation (Sinkula et al., 1997) learning commitment is necessary to promote the learning culture of the firm, open-mindedness is indispensable for unlearning assumptions, beliefs, routines and processes, while shared vision is necessary for universal distribution of information, common understanding and proper response creation.

2.2. Strategic Orientations and Firm Performance

Strategic orientations generate those behaviours indispensable to create viable and performing organisations. Strategic orientations, as valuable, rare, inimitable and non-substitutable resources are potential sources of competitive advantage only if the combination and implementation strategy of these resources is different from that of competitors (Barney, 1991), otherwise their added value erode easily in time.

The majority of research confirms a certain level of beneficial value for firm performance in the national context. The value of strategic orientations cannot be questioned in the international context. In this sense, Cadogan (2012) considers that strategic orientations have the same importance, value and significance in the more complex environments of internationalized firms. Due to the fact that strategic orientations influences firm success, in the context of foreign markets, the international strategic orientations influences the total and international performance of firms. Certain performance metrics are considered to be more or less affected by strategic orientations.

In the case of *market orientation* the question of universally positive impact is opened. Although it is widely accepted that market orientation related activities and behaviors yield performance (Jaworski and Kohli, 1993; Narver and Slater, 1990; Langerak, 2003), some negative impact (Diamantopoulos and Hart, 1993) and insignificant influences were identified too (Murray et al., 2007). Laukkanen et al. (2013) proved positive relationship with market performance, nevertheless positive relationships regarded in particular perceived financial performance measures: sales (Deshpandè et al., 1993; Kirca et al., 2005), profitability (Narver and Slater, 1990; Deshpandè et al.,

1993), return on invested capital (Jaworski and Kohli, 1993), return on assets (Narver and Slater, 1990), international sales (Murray et al., 2007, Cadogan et al., 2009). In the case of export market orientation, the existence of positive linear (Kropp et al., 2006; Boso et al., 2012) and non-linear U-shaped (Cadogan et al., 2009) relationships were proved too along with environmental moderation.

Similar to the market orientation, empirical studies established heterogeneous results regarding the impact of *entrepreneurial orientation* on firm performance: positive (Covin and Slevin, 1989; Gonzalez-Benito et al., 2009; Laukannen et al., 2013), insignificant (Andersen, 2010) and negative links (Wales et al., 2013) under certain circumstances at dimensional level. In the export and international context, entrepreneurial orientation influences positively, in linear (Kropp et al, 2006) and U-form (Feder, 2015) the financial performance, respectively linearly the market performance (Laukkanen et al., 2013). Rauch et al. (2009) confirmed a stronger influence of entrepreneurial orientation on financial performance than on marketing performance.

Learning orientation is considered to improve firm success positively (Baker and Sinkula, 1999; Souchon et al., 2012), as short term performance (Frank et al., 2012) for both financial (Calantone et al., 2002) and marketing (Laukkanen et al., 2013) performance. In the international venture setting, learning orientation affects foreign financial performance (Kropp et al., 2006).

The results regarding the explanatory power of the studied relationships are somehow inconclusive regarding their sign and magnitude, sustaining mutually direct, mediated and moderated; linear and non-linear; positive, insignificant and even negative impact of different combinations. But in a generalising manner, international market, entrepreneurial and learning orientation relates to financial and marketing performance too.

Although market, entrepreneurial and learning orientations represent different business philosophies, which can exist independently, they can correlate being manifesting in co-habitation or synergistic interplay. Adopting a single strategic orientation is considered inadequate (Baker and Sinkula, 1999), while excluding others is a less efficient option (Barrett, Weinstein, 1998), due to their interactions and synergistic effects.

Studies regarding multiple strategic orientations may approach them in a sequential, alternative or complementary manner. Based on Hakala's (2011) framework, within the sequential approach there is a constant struggle to develop a single universally beneficial strategic orientation (e.g. Kropp et al., 2006; Hagen et al., 2012; Laukkanen et al., 2013), within the alternative approach a superlative strategic orientation fitted to the environmental factors is selected and implemented from the list of extant orientations at the disposal of managers or entrepreneurs (e.g. Gonzalez-Benito et al., 2009; Boso et al., 2012, 2013; Foltean and Feder, 2014), while within the complementary approach simultaneous strategic orientations are combined in a synergistic pattern (e.g. Nasution et al., 2011).

Firms might embrace and develop unique (Hagen et al., 2012) or multiple strategic orientations depending on their resource endowment and acceptable sacrifices. Balancing and creating resource trade-offs between several strategic orientations determines firms to find the proper combination that best works for its' internal and external environment, thus creating competitive advantage (Hult et al., 2004) and providing firm performance, generally (Grinstein, 2008) and during the internationalisation process (Kropp et al., 2006; Cadogan, 2012) too.

3. Research Framework and Hypotheses

The proposed universal configuration research model subscribes to the resource–performance logic of the internationalisation process (Peng, 2001; Kropp et al., 2006). In this sense, the model follows complementary approach of strategic orientations (Hakala, 2011), by permitting the consideration of both individual and combinatory effects of three different strategic orientation in the international business context.

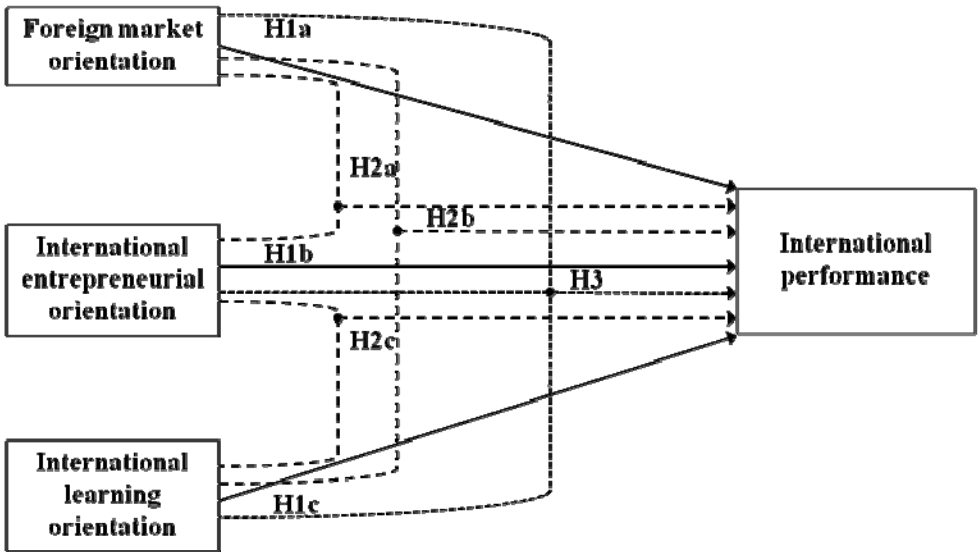


Fig. 1. Research model for performance effects of different strategic orientations within international business framework

Initial studies in the strategic orientation literature considered individual effects on strategic orientations on firm performance. Even though some exception exists, the majority of studies found positive direct relations between a given strategic orientation and firm performance (Kropp et al., 2006; Cadogan et al., 2009; Gonzalez-Benito et al., 2009; Souchon et al., 2012; Hagen et al., 2012; Laukkanen et al., 2013). Therefore, the first three hypotheses regard:

H_{1a}: Foreign market orientation positively, directly and significantly influences firm international performance.

H_{1b}: International entrepreneurial orientation positively, directly and significantly influences international firm performance.

H_{1c}: International learning orientation positively, directly and significantly influences international firm performance.

Between different strategic orientation correlation and interactions may exists. These relationships between strategic orientations can be perceived in multiple ways, also under the form of bipolar (2-way) relations, as combinations between market and entrepreneurial orientations (Keh et al., 2007; Gonzalez-Benito et al., 2009; Baker & Sinkula, 2009; Boso et al., 2012, 2013; Foltean & Feder, 2014), market and learning orientations (Baker & Sinkula, 1999; Souchon, et al., 2012), respectively entrepreneurial and learning orientations (Wang, 2008), grounding hypotheses for relationships with firm performance:

H_{2a}: International market and entrepreneurial orientations positively, directly and significantly influences international firm performance.

H_{2b}: International market and learning orientations positively, directly and significantly influences international firm performance.

H_{2c}: International entrepreneurial and learning orientations positively, directly and significantly influences international firm performance.

Research papers (Kropp et al., 2006; Nasution et al., 2011; Laukkanen, 2013) studying simultaneously 3-way interactions and higher-order synergistic combinations of strategic orientations are rare (Hakala, 2011). Without considering any type of causality, in the following hypothesis the focus is on determining multiplication effects on performance:

H_3: International market, entrepreneurial and learning orientations positively, directly and significantly influences international firm performance.

4. Research Methodology

The empirical exploratory research employed a theory based econometric model (Hair et al., 2010), structured via mathematical assertions encompassing in a sequential manner the direct and joint effect interactions of control (size and international experience) and causal variables (strategic orientations of FMO, IEO, ILO) on the same output variable (international performance).

4.1. Measurement Scales

Primary data collection was necessary from SME managers or entrepreneurs for the assessment of strategic orientations and international behaviour performance. The applied quantitative research method for the current study is grounded in a questionnaire based sample survey.

Analogous to the research of Boso et al. (2012), the measurement model was operationalised via acknowledged constructs in the international literature, included in a logical order in the research tool. All constructs included in the research model were placed in the international verbiage and the international business framework. For independent and dependent variables latent composite higher-order constructs were formed by aggregating the average value of multiple items measured on 5 point Likert scales as ordinal data.

As independent variables, foreign market orientation (FMO) was based on Cadogan et al. (2001), international entrepreneurial orientation (IEO) was founded based on Covin & Slevin (1989) as re-evaluated by Covin & Miller (2014), while the

international learning orientation (ILO) was constructed as proposed by Frank et al. (2012) developed especially for the SME context.

No agreement exists on the best way to assess international performance (Sousa, 2004). In order to match the independent variables to proper ordinal outcome, an averaged 4-item aggregate measure of perceived international subjective performance (INTL_PERF) was created. The composite INTL_PERF measured the respondents agreement regarding the satisfaction about international sales, profit, foreign market share and firm image achievements compared to initial strategic objectives on the most important foreign market.

The control variables built-in in the research for all the models regarded firm size (SIZE) and international experience (EXP) (Foltean & Feder, 2014) as categorical variables, transformed afterwards. Firm size is a largely debated topic in SME definition literature (Majocchi et al., 2005), depending on national placement specific legislation, influencing available resources and strategies. Considering the number of full time employees, as main determinant of firm size, in combination with turnover or balance sheet (OJ L124/20.05.2003), in conformity with the E.C. recommendation, micro (0-9 employees), small (10-49 employees) and medium (50-249 employees) category firms were differentiated.

4.2. Data Collection and Sample Profile

In order to obtain pertinent responses for the survey based quantitative study, data has been collected from Romanian SMEs involved in foreign commercial transactions, as research units from the investigated national population.

Primary data has been gathered through on-line self-administrated questionnaires sent out to firms included the sample frame consisting of 6792 records from the Romanian Centre for Trade and Investment, Kompass and Amadeus business directories. The sampling procedure is based on a two wave multi-stage systematic random sampling method, including in each selection iteration the 5^{th} (1358) and 18^{th} (302) SME record. From the 1660 on-line questionnaires, 122 were returned with useful responses and full completion (50 in the first and 72 in the second wave), determining an effective response rate of 7.34%, considered adequate in a national business context lacking research sustaining and comparable to similar studies (Cadogan et al., 2009; Boso et al., 2013; Laukkanen et al., 2013).

Purposeful and biased sampling was eliminated via random sampling method and heterogeneity of the activity domain and size of the respondent firms. The transversal sample includes firms from a great variety of sectors included in a decreasing manner: vehicles, machinery and electronics (26%); wood and paper (17%); textiles, apparel and footwear (15%); chemicals and plastics (12%); mineral, metal, stoneware and glass (8%); agriculture (7%); optical instruments, professional services, information technology and telecommunications services (5% each). Regarding firm size, 23 firms from the sample represents micro-enterprises (19%), 46 small businesses (38%) and 53 medium sized ones (43%).

4.3. Data Analysis Procedure

Similar to the study of Baker & Sinkula (2009), the research is based on four competing additive models, but with different components, in order to test the proposed hypotheses.

Model 1 (control model) includes exclusively the control variables (firm size and international experience) and their influence on firm international performance.

$$INTL\_PERF = \beta_0 + (\beta_1 * SIZE + \beta_2 * EXP) + \xi_1 \quad (1)$$

In Model 2 (main-effects model) the direct influence of independent variables (EMO, IEO, ILO) were added comparative to model 1.

$$INTL\_PERF = \beta'_0 + (\beta'_1 * SIZE + \beta'_2 * EXP) + (\beta'_3 * FMO + \beta'_4 * IEO + \beta'_5 * ILO) + \xi_2 \quad (2)$$

Furthermore, Model 3 (contingency model) incorporates all the lower order (two-way) interaction terms between independent variables besides the explanatory variables included in Model 1 and 2.

$$INTL\_PERF = \beta''_0 + (\beta''_1 * SIZE + \beta''_2 * EXP) + (\beta''_3 * FMO + \beta''_4 * IEO + \beta''_5 * ILO) + (\beta''_6 * FMO * IEO + \beta''_7 * FMO * ILO + \beta''_8 * IEO * ILO) + \xi_3 \quad (3)$$

Finally Model 4 (full configuration model) comprise the higher-order three-way interaction term between the studied strategic orientations along with the components of Model 1, 2 and 3.

$$INTL\_PERF = \beta'''_0 + (\beta'''_1 * SIZE + \beta'''_2 * EXP) + (\beta'''_3 * FMO + \beta'''_4 * IEO + \beta'''_5 * ILO) + (\beta'''_6 * FMO * IEO + \beta'''_7 * FMO * ILO + \beta'''_8 * IEO * ILO) + (\beta'''_9 * FMO * IEO * ILO) + \xi_4 \quad (4)$$

The first two models consider the relations between independent variables and firm performance valid under all circumstances with no possible interaction and correlation effects, while the last two models seek to identify synergic interrelations between the combinations of strategic orientations, as extent and significance.

Data processing and analysis, regarding the measurement and structural model evaluation was conducted in SPSS 21, involving the following steps: (i) descriptive statistics, in the form of median, quartiles and interquartile range, as methodologically prescribed for ordinal variables, completed with mean, standard deviation and range, as generally reported in quantitative studies; (ii) scale reliability tested through α Cronbach, composite reliability (CR), average variance extracted (AVE); (iii) factor analysis via loadings with Kaiser criteria, principal component analysis and oblimin rotation; (iv) convergent and discriminant validity analysis through factorial loadings and Pearson correlations; (v) multicollinearity testing via variance inflation factor (VIF) and mean-centering of dependent and independent variables because of interrelations and joint effect computation; (vi) hypotheses testing performed via universal configuration analysis based on hierarchical regressions to determine regression coefficient (β), significance level (p), level and change in coefficient of determination (R^2, ΔR^2), respectively the significance of this change (sig. F ΔR^2).

5. Empirical Results

The statistical analysis of the collected data follows the stepwise investigation posited in the six-stage analysis algorithm, completed with non-response-bias analysis. Using a single informant as source of self-reported data, the non-response bias was assessed, as a comparison on early (75%) and late (25%) respondents (Armstrong & Overton, 1977), with no evidence of significant differences regarding the activity domain, establishment year and firm size.

5.1. Measurement Model Confirmation

The constructs of international strategic orientations and performance incorporated in the measurement model are of formative nature. In order to study psychometric properties and to create the super-ordinate composite constructs, reliability assessment, factor analysis and scale validity are indispensable stages.

Table 2. Descriptive statistics and correlation matrix

	FMO	*IEO*	*ILO*	*INTL_PERF*	*SIZE*	*EXP*
Min	1.27	1.44	1.62	1.00	1	1
Quartile: Q1 (25)	2.800	2.667	3.307	3.000	2	6
Median (50)	3.067	3.056	3.769	3.750	2	10
Q3 (75)	3.550	3.444	4.000	4.250	3	15.25
Interquartile range (IQR)	0.75	0.777	0.693	1.25	1	9.25
Max	4.93	4.67	4.54	5.00	3	53
Mean	3.173	3.067	3.644	3.572	2.250	10.430
S.D.	0.599	0.649	0.592	0.954	0.753	5.761
FMO	1	Correlation matrix				
IEO	0.167	1				
ILO	0.305**	0.252**	1			
INTL_PERF	0.098*	0.043	0.449**	1		
SIZE	0.009	-0.079	0.338**	0.378**	1	
EXP	0.125	0.027	0.314**	0.251**	0.316**	1

Note: ** sig. at 0.01 level, * sig. at 0.05 level.

In Table 2, the median as central value dividing in half the data vector is 3.067 for FMO, 3.056 for IEO, 3.769 for ILO, 3.75 for INTL_PERF, category 2 (small) for firm size, respectively 10 years for international experience. IQR is the highest for EXP (9.25 years), INTL_PERF (4 points on Likert scale) and size, differentiating mostly the upper (Q3) and lower (Q1) quartile. IQR is the lowest (<1) for the international strategic orientations (IEO, FMO, ILO), quartiles being the most appropriate.

All the independent (FMO, IEO and ILO) and dependent (INTL_PERF) variables are slightly above the average value (3), IEO having the lowest value (3.067) showing that Romanian SMEs from the sample register a smaller inclination toward innovation and proactiveness. The average size of sampled SMEs is above small firms, while regarding their international experience, SMEs have a background of 10 years of knowledge and familiarity in the domain. The EXP and INTL_PERF have larger S.D. and range (max-min), meaning that the sample group is heterogeneous in respect to firm's longevity and success on foreign markets.

The correlation matrix between main constructs highlight a statistically significant positive correlation between the strategic orientation, explicitly in the case of FMO and ILO (PC=0.305, p=0.01), respectively the IEO and ILO (PC=0.252, p=0.01), permitting the creation of interaction terms between different strategic orientations. Regarding the correlations between strategic orientations and international outcomes, significant positive correlations were established between FMO and INTL_PERF (PC=0.098, p=0.05), ILO and INTL_PERF (PC=0.449, p=0.01).

Table 3. Scale reliability statistics

	FMO	*IEO*	*ILO*	*INTL_PERF*	*SIZE*	*EXP*
α-Cronbach	0.813	0.728	0.834	0.902	-	-
CR	0.964	0.948	0.962	0.962	-	-
AVE	0.712	0.735	0.728	0.879	-	-

The value of α Cronbach, as pointer of traditional scale reliability, indicates the purity level of the measurement scale. Nunnally and Bernstein (1994) recommend 0.6 as sufficient values, therefore all scales can be considered of high reliability (>0.7) representing good internal consistency measures. CR and AVE as modern reliability indicators (Hair et al., 2010), are jointly assured over the cutting value of 0.5, being for all the measurement scales (Table 3) included in the measurement model above 0.7 in the case of AVE and over 0.9 for CR.

Table 4. Scale factor and validity analysis

	Factor analysis				Item-construct Pearson correlations			
	FMO	*IEO*	*ILO*	*INTL_PERF*	*FMO*	*IEO*	*ILO*	*INTL_PERF*
Item 1	0.712	0.606	0.701	0.901	0.666**	0.588**	0.568**	0.898**
Item 2	0.769	0.847	0.753	0.864	0.533**	0.736**	0.651**	0.859**
Item 3	0.507	0.762	0.695	0.877	0.331**	0.680**	0.622**	0.882**
Item 4	0.706	0.779	0.691	0.875	0.697**	0.447**	0.615**	0.877**
Item 5	0.953	0.651	0.848	-	0.673**	0.640**	0.389**	-
Item 6	0.789	0.750	0.589	-	0.249**	0.442**	0.261**	-
Item 7	0.578	0.713	0.724	-	0.409**	0.389**	0.664**	-
Item 8	0.566	0.728	0.519	-	0.722**	0.628**	0.539**	-
Item 9	0.708	0.776	x	-	0.457**	0.533**	x	-
Item 10	0.708	-	x	-	0.695**	-	x	-
Item 11	0.948	-	0.793	-	0.689**	-	0.644**	-
Item 12	0.701	-	0.821	-	0.579**	-	0.597**	-
Item 13	0.741	-	0.762	-	0.163*	-	0.726**	-
Item 14	0.686	-	0.832	-	0.432**	-	0.682**	-
Item 15	0.710	-	0.733	-	0.462**	-	0.530**	-

Note: ** sig. at 0.01 level, * sig. at 0.05 level.

The extent to which items and constructs are the most substantially and significantly correlated or distinguished, has been assessed and tested as both convergent and discriminate validity of the constructs. The first is assured through the positive significant factor loadings, the latter is guaranteed by significant Pearson correlation coefficients. In Table 4 factor analysis provides information about the size of factor loadings and the number of factors extracted for each construct, indicating that all the constructs have factor loadings over 0.5, except for the eliminated item 9 and 10 from ILO. Pearson correlations emphasize positive (> 0.2) and significant (two-tailed at 0.01 and 0.05 level) correlations between the items and the constructs they determine and compose.

5.2. Hypotheses and Research Model Validation

In order to test hypotheses, hierarchical linear regressions were employed aiming to evaluate significant coefficients, the level and increase of (R^2) in four models.

In order to eradicate and avoid potential multicollinearity problems from the two models including 2- and 3-way interaction effects, all the variables were mean-centred (Hair et al., 2010). Supplementary, multicollinearity was tested through variance inflation factor (VIF) for the explanatory variables. The VIF values (Table 5) are slightly over 1.1 in the case of control variables, around 1.4 in the case of individual variables and under 1.87 for interactions, in all the cases well below the critical value of 10, showing no multicollinearity problems in Model 3 and 4.

Table 5. Hierarchical regression analysis of hypotheses in configuration models

Variables	Control model		Main effects model		Contingency model (2-way interactions)			Configuration model (3-way interactions)		
	β	p	β	p	β	p	VIF	β	p	VIF
Size	.332	.000***	.209	.016**	.193	.025**	1.258	.193	.025**	1.258
Exp	.146	.100*	.081	.333	.089	.283	1.183	.088	.290	1.184
FMO			.238	.004**	.174	.044**	1.277	.152	.013**	1.489
IEO			.010	.899	.009	.911	1.155	.013	.885	1.370
ILO			.428	.000***	.355	.000***	1.571	.351	.000***	1.580
FMO*IEO					.148	.155	1.663	.151	.147	1.869
IEO*ILO					.083	.373	1.503	.095	.319	1.568
FMO*ILO					.222	.015**	1.390	.227	.103	1.406
FMO*IEO*ILO								.674	.048**	1.848
R^2	.162		.314		.352			.454		
ΔR^2 (sig. F)	.162	(.000)	.152	(.000)	.038	(.093)		.102	(.033)	
all VIF ≤	1.111		1.406		1.663			1.869		

Note: significance levels of *** p < 0.01, ** p < 0.05, *p < 0.1

The control Model 1 explain 16.2% of the variation in international performance, firm size (β=0.332, p=0.00) and international experience (β=0.146, p=0.100) being significant positive predictors in this step of the analysis.

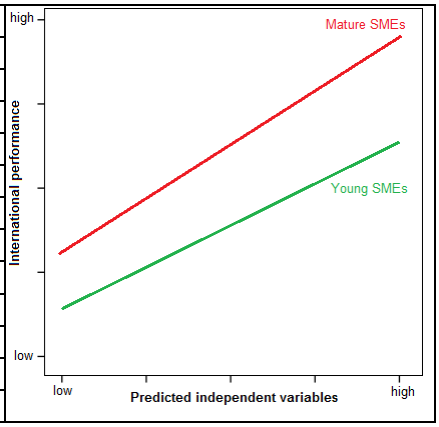
The main effects model includes the additional influence of FMO, IEO and ILO on external performance, accounting for the explanation of 31.4% of performance variation, an additional 15.2% of the variation in performance with adequate statistical significance (F=0.000). In the considered sample, just two strategic orientation has a universal positive and significant influence on international performance, FMO (β=0.238, p=0.004) and ILO (β=0.428, p=0.000), supporting both H_{1a} and H_{1c}. However, within Model 2, IEO and international experience (control variable) prove to be insignificant performance predictors, rejecting H_{1b}.

Model 3 explained a statistically significant international performance variance of 35.2%, but the explained variance gained (ΔR^2) of 3.8% is on the limit of the required statistical significance (sig. F ΔR^2=0.093). From the three 2-way interactions added, only the combination of FMO and ILO is significant with positive effect. Consequently, hypothesis H_{2b} is valid, while H_{2a} and H_{2c} are rejected.

Finally, the configuration model 4, by including the 3-way interaction term significantly increased the explained variance to 10.2% (R^2=45.4% ΔR^2=10.2%, sig. F ΔR^2=0.033). Compared to the previous Model 3, the configuration consisting of the synergistic foreign market, international entrepreneurial and learning orientations exhibits greater explanatory power, due to the positive and significant interaction term (EMO*IEO*ILO) (β=0.674, p=0.48), supporting thus H_3.

Table 6. Firm age based differentiation of research results for configuration model

	Young SMEs		*Mature SMEs*	
	β	p	β	p
Size	.081	.562	.261	.024**
Exp	.056	.660	.076	.433
FMO	.053	.376	.220	.051**
IEO	.249	.054*	.170	.246
ILO	.301	.015**	.327	.003***
FMO*IEO	.172	.370	.208	.109
IEO*ILO	.347	.036**	.156	.142
FMO*ILO	.010	.262	.257	.025**
FMO*IEO*ILO	.198	.165	.236	.049**
R^2	.303		.502	
all VIF ≤	2.570		1.946	



Note: significance levels of *** p < 0.01, ** p < 0.05, *p < 0.1

Different strategic orientations might be suitable for certain stages of SME development. Furthermore, due to the fact that IEO was not universally significant, firm age was considered for delimiting the 25 young (≤8 years) and 97 mature (≥9 years) firms from the sample (McDougall & Oviatt, 1996). One-way ANOVA proved statistical differences between the 2 clusters (F=9.299, sig=0.003), sustained also by significant Welch and Brown-Forsythe (F=8.484, sig=0.006) robustness tests. As Table 6 show, on one hand, for young SMEs IEO (β=0.249, p=0.054), ILO (β=0.301, p=0.015) and their joint effects (β=0.347, p=0.036) influence international performance. Therefore, hypotheses H1b, H1c and H2c were supported in the case of young SMEs. On the other hand, for mature SMEs size (β=0.261, p=0.024), FMO (β=0.220, p=0.051), ILO (β=0.327, p=0.003), joint effect of FMO*ILO (β=0.257, p=0.025), triple synergistic effect (β=0.236, p=0.049) affects positively the international success. Thus, hypotheses H_{1a}, H_{1c}, H_{2b} and H_3 were valid in the case of mature SMEs.

6. Conclusions, Implications, Limitations and Future Research Directions

6.1. Result Discussions

The undertaken research results suggest differential linear relationships between strategic orientations and international SME performance at construct level. The empirical results prove the crucial desirability of SMEs to develop multiple strategic

orientations and not to rely on a single one when the aim of the firm is international performance increase. Consequently, within the optimal combinations of global strategic orientations some individual and joint ones can be considered depending on the age and available resource base of the firm.

For the whole sample and mature SMEs, FMO and ILO are significant individual explanatory factors of INTL_PERF, when no interaction is possible. The study emphasized also a significant conditional role of FMO and ILO on the international performance of firms in the 2-way interaction model, the combination positively enhancing each other's positive effect on firm success. These two strategic orientations are closely connected, enhancing firms in their information processing activities, first just about the clients and competitors, later about the whole internal and external business environment from the foreign target economies. Consequently, intangible resources, knowledge, experience and intelligence, are clearly sources of competitive advantage (Ireland et al., 2009) in the international context. The study proved for mature firms that aligning market, entrepreneurial and learning orientations is a scarce, valuable and difficult to imitate resource (ΔR^2=10.2% for the whole sample) within the international business framework.

For young SMEs, IEO and ILO are significant explanatory factors of INTL_PERF, also as individual and 2-way interaction influence, the combination positively enhancing each other's positive effect on young internationalised firm accomplishments. These two strategic orientations are closely connected especially in born-global firms, enhancing rapid internationalisation for opportunity exploitation and exploration on foreign markets. Regarding the young cluster, must be mentioned that 25 SMEs is a small subgroup for generalisation purposes.

In the sequential approach proposed by Hakala (2011), in time, firms develop market orientation, followed by entrepreneurial orientation and finally learning orientation. Results of the study evidence a differential approach in the case of the sampled internationalised Romanian SMEs. In the case of young international firms, the explanatory power of IEO and ILO are more significant, while in the case of mature firms FMO and ILO influence mostly the international performance.

The study highlights that IEO is not universally significant, at least not in all kind of environments. Most often, a significant number of opportunities particularly occur in dynamic, changing, hostile and complex environments (Covin & Slevin, 1989). Differences in the explanatory power of IEO can be attributed to context specificity or relationship complexity (Feder, 2015). This is due to fact that information regarding processing the foreign markets happens generally in a reactive manner, in order to respond to solicitation of clients or behavioural adaptations due to moves of competitors. On the other hand, the IEO shed light on foreign opportunities, proactively leading the market with proactive information gathering regarding new needs of foreign clients, innovative products and competitive strategies, respectively implementing them by acting differently on better paying risk-taking projects. All of these can happen within organisations with disposition to continuously challenge and improve its information handling routines, different internal and external spinning processes.

Finally, the research conclude that firm size is a significant influencing factor and an element of differentiation for all the 4 models, while the firm's international experience is significant in the case when no other intangible resource is included.

This may occur because during information processing activities of FMO or ILO, firms increase implicitly their experience and knowledge base.

Although findings are consistent with recent research results of Kropp et al. (2006), Grinstein (2008), Laukkanen et al. (2013), the present study complementary extends previous findings by: (i) evaluating adapted measurement scales for three strategic orientations applied in the international verbiage, international business and SME framework; (ii) assessing empirically the presence of linearity in the strategic orientation–firm performance relationship within the international business framework; (iii) applying the complementary approach of strategic orientations (Hakala, 2011) for the three primarily researched strategic orientations in the international literature; (iv) empirically testing individual and synergistic joint effects in the context of young and mature SMEs within a transition CEE economy.

6.2. Research Implications

For SME entrepreneurs and managers, the empirical findings highlight some noteworthy implications. In the first hand, the decision makers within firms should identify the gap between available and required strategic orientations, as intangible resources, of successful internationalisation. Managers should select for their firms the most suitable combinations of strategic orientations supporting their vision and aims, respectively contributing to their aspirations, inclusively at performance level. Therefore, when decision makers do not consider the environmental characteristics, the study suggests a general positive individual influence of FMO and ILO on international performance, respectively the 2-way combination between them. Finally to assure proper performance to stimulate further the international process development and firm growth, managers need to consider implementing a functional combination between FMO, IEO and ILO.

For *policy developers*, even if opportunity and information facilitations and support for international operations via FMO and ILO are important public functions and responsibilities, the IEO makes the difference at performance level when considering 3-way interactions, therefore the entrepreneurial spirit development should be a continuous priority and domain of support. Moreover, there is an urgent need for more transparent and publicly available SME level statistics on international business for researchers in order to facilitate possible generalisation at population level.

6.3. Limitations and Future Research Directions

The restricted nature of the internationalised SME sample (n=122) creates the main limitation of the current research. For this reason, further studies should increase the investigated population at national or even at international level in comparative studies.

The undertaken research considered the three primarily studied representatives of firm orientations, FMO, ILO and IEO. Future studies should take in consideration interactions between a higher number of strategic orientations, like potential interplays with other strategic orientations (innovation, technological, brand, cost or relational orientations) to discover optimal strategic orientation configurations, to study sequential development of the strategic orientations and even to test mediating relationships between different strategic orientations.

Each international strategic orientation was considered as a formative umbrella concept for their multiple subdivisions of dimensions. Multiple strategic orientations may include overlapping dimensions (Hakala, 2011), imposing an alternative reflective approach with decomposed models (George & Marino, 2011) at dimensional level and analysing their differential influence (sign and magnitude) on international firm performance. Additionally, a longitudinal research design might be considered for gaining further insights on strategic orientations role in the international development of SMEs.

The dependent variable was measured as subjective international performance. In this case, future studies should consider the consequences of antecedents separately on international financial, operational and marketing outcomes.

The strategic orientation–performance relationship may not be universally advantageous; some strategic orientations are most or less beneficial under different environmental conditions. Therefore, future studies need to create contingency–dependent configuration models to identify key situational variables to analyse hypotheses robustness in the case of potential moderators, like environmental dynamism, hostility and complexity, as individual factors or in their multiple combinations.

Acknowledgement

This work was cofinanced from the European Social Fund through Sectoral Operational Programme Human Resources Development 2007-2013, project number POSDRU/159/ 1.5/S/134197 „Performance and excellence in doctoral and postdoctoral research in Romanian economics science domain".

References

Andersen, J. (2010) A Critical Examination of the EO-Performance Relationship, *International Journal of Entrepreneurial Behaviour & Research*, 16(4), 309-328.

Armstrong, S., Overton, T. (1977) Estimating Nonresponse Bias in Mail Surveys, *Journal of Marketing Research*, 14, 396–402.

Baker, W., Sinkula, J. (1999) The Synergistic Effect of Market Orientation and Learning Orientation on Organisational Performance, *Journal of Academy of Marketing Science*, 27(4), 411-427.

Baker, W., Sinkula, J. (2009) The Complementary Effects of Market Orientation and Entrepreneurial Orientation on Profitability in Small Business, *Journal of Small Business Management,* 47(4), 443-464.

Barney, J. (1991) Firm Resources and Sustained Competitive Advantage, *Journal of Management*, 17(1), 99-120.

Barrett, H., Weinstein, A. (1998) The Effect of Market Orientation and Organizational Flexibility on Corporate Entrepreneurship, *Entrepreneurship Theory and Practice,* 22(1), 57-71.

Boso, N., Cadogan, J., Story, V. (2012) Complementary effect of entrepreneurial and market orientations on export new product success under differing levels of competitive intensity and financial capital, *International Business Review*, 21(4), 667-681.

Boso, N., Cadogan, J., Story, V. (2013) Entrepreneurial Orientation and Market Orientation as Drivers of Product Innovation Success: a Study of Exporters from a Developing Economy, *International Small Business Journal*, 31(1), 57-81.

Cadogan, J. (2012) International Marketing, Strategic Orientations and Business Success. Reflections on the Path Ahead, *International Marketing Review*, 29, 340-348.

Cadogan, J., Cui, C., Li, E. (2003) Export Market-Oriented Behavior and Export Performance, *International Marketing Review*, 20(5), 493-513.

Cadogan, J., Diamantopoulos A., Siguaw, J. (2002) Export Market-Oriented Activities: Their Antecedents and Performance Consequences, *Journal of International Business Studies*, 33(3), 615–626.

Cadogan, J., Kuivalainen, O., Sundqvist, S. (2009) Export Market-Oriented Behavior and Export Performance: Quadratic and Moderating Effects Under Differing Degrees of Market Dynamism and Internationalization, *Journal of International Marketing*, 17(4), 71-89.

Cadogan, J., Paul, N., Salminen, R., Puumalainen, K., Sundqvist, S. (2001) Key Antecedents to "Export Market-Oriented Behaviors: A Cross-National Empirical Examination, *International Journal of Research in Marketing,* 18, 261-282.

Calantone, R., Cavusgil, S., Zhao, Y. (2002). Learning Orientation, Firm Innovation Capability, and Firm Performance, *Industrial Marketing Management*, 31(6), 515-524.

Covin, J., Miller, D. (2014) International Entrepreneurial Orientation: Conceptual Considerations, Research Themes, Measurement Issues, and Future Research Directions, *Entrepreneurship Theory and Practice*, 38(1), 11-44.

Covin, J., Slevin, D. (1989) Strategic Management of Small Firms in Hostile and Begin Environments, *Strategic Management Journa*l, 10(1), 75-87.

Deshpandé, R., Farley, J., Webster, F. (1993) Corporate Culture, Customer Orientation, and Innovativeness in Japanese Firms: a Quadratic Analysis, *Journal of Marketing*, 57, 23-37.

Diamantopoulos, A., Hart, S. (1993) Linking Market Orientation and Company Performance: Preliminary Evidence on Kohli and Jaworski's Framework, *Journal of Strategic Marketing*, 1, 93–121.

Etemad, H. (2004) International Entrepreneurship as a Dynamic Adaptive System: Toward a Grounded Theory, *Journal of International Entrepreneurship*, 2, 5-58.

Feder, E. (2015) International Entrepreneurial Orientation and Performance of Romanian Small and Medium-sized Firms: Empirical Assessment of Direct and Environment Moderated Relations, EMQFB2014 Conference, forthcoming in Procedia Economics and Finance, 1-8.

Foltean, F., Feder, E. (2009) Market Orientation and International Entrepreneurship, *Transformations in Business and Economics*, 8(3(18A)), 23-43.

Foltean, F., Feder, E. (2014) The Complementary Effect of Export Market Orientation and Entrepreneurial Orientation on the International Performance of SMEs, 2014 *Global Marketing Conference at Singapore Proceedings* (July 2014), http://dx.doi.org/10.15444/GMC2014.11.02.03, 2070-2079.

Frank, H., Kessler, A., Mitterer, G., Weismeier-Sammer, D. (2012) Learning Orientation of SMEs and Its Impact on Firms Performance, *Journal of Marketing Development and Competitiveness*, 6(3), 29-41.

George, B., Marino, L. (2011) The Epistemology of Entrepreneurial Orientation: Conceptual Formation, Modelling, and Operationalization, *Entrepreneurship Theory and Practice*, 30(5), p. 989-1024.

González-Benito, O., González-Benito, J., Munoz-Gallego, P. (2009) Role of Entrepreneurship and Market orientation in Firms Success, *European Journal of Marketing*, 43(3/4), 500-522.

Grinstein, A. (2008) The Relationship between Market Orientation and Alternative Strategic Orientations: A meta-analysis, *European Journal of Marketing*, 42(1/2), 115-134;

Hagen, B., Zucchella, A., Cerchiello, P., De Giovanni, N. (2012) International Strategy and Performance - Clustering Strategic Types of SMEs, *International Business Review*, 21(3), 369-382.

Hair, J., Black, W., Babin, B., Anderson, R. (2010) Multivariate Data Analysis. A Global Perspective, Prentice Hall, Upper Saddle River.

Hakala, H. (2011) Strategic Orientations in Management Literature: Three Approaches to Understanding the Interaction between Market, Technology, Entrepreneurial and Learning Orientations, *International Journal of Management Reviews*, 13, 199-217.

Ireland, R., Hoskisson, R., Hitt, M. (2009). The Management of Strategy, South-Western Cengage Learning, Mason.

Jaworski, B., Kohli, A. (1993) Market orientation: Antecedents and Consequences, *Journal of Marketing*, 57, 53-70.

Johanson, J., Vahlne, J. (1977) The Internationalization Process of the Firm - a Model of Knowledge Development and Increasing Foreign Market Commitments, *Journal of International Business Studies*, 8(1), 23-32.

Johanson, J., Vahlne, J. (2006) Commitment and Opportunity Development in the Internationalization Process: A Note on the Uppsala Internationalization Process Model, *Management International Review*, 46, 165-178.

Jones, M., Coviello, N. (2005) Internationalisation: Conceptualising an Entrepreneurial Process of Behaviour in Time, *Journal of International Business Studies*, 36, 284–303.

Keh, H., Nguyen, T., Ng, H. (2007) The Effects of Entrepreneurial Orientation and Marketing Information on the Performance of SMEs, *Journal of Business Venturing,* 22, 592-611.

Kirca, A., Jayachandran, S., Bearden, W. (2005) Market Orientation: A Meta-Analytic Review and Assessment of Its Antecedents and Impact on Performance, *Journal of Marketing*, 69(April), 24-41.

Kohli, A., Jaworski, B. (1990) Market Orientation: The Construct, Research Propositions and Managerial Implications, *Journal of Marketing*, 54, 1-18.

Kropp, F. Lindsay, N., Shoham, A. (2006) Entrepreneurial, Market, and Learning Orientations and International Entrepreneurial Business Venture Performance in South African Firms, *International Marketing Review*, 23(5), 504-523.

Langerak, F. (2003) An Appraisal of Research on the Predictive Power of Market Orientation, *European Management Journal*, 21(4), 447-464.

Laukkanen, T., Nagy, G., Hirvonen, S., Reijonen, H., Pasanen, M. (2013) The Effect of Strategic Orientations on Business Performance in SMEs, *International Marketing Review*, (6), 510 – 535.

Lumpkin, G., Dess G. (1996) Clarifying the Entrepreneurial Orientation Construct and Linking it to Performance, *Academy of Management Review*, 21(1), 135-172.
Majocchi, A., Bacchiocchi, E., Mayrhofer, U. (2005) Firm Size, Business Experience and Export Intensity in SMEs: A Longitudinal Approach to Complex Relationships, *International Business Review*, 14(6), 719-738.
McDougall, P., Oviatt, B. (1996) New Venture Internationalization, Strategic Change, and Performance: a Follow-up Study, *Journal of Business Venturing*, 11(1), 23-40.
Murray, J., Gao, G., Kotabe, M., Zhou, N. (2007) Assessing Measurement Invariance of Export Market Orientation: A Study of Chinese and Non-Chinese Firms in China, *Journal of Internation Marketing*, 15(4), 41-62.
Narver, J., Slater, S. (1990) The Effect of a Market Orientation on Business Profitability, *Journal of Marketing*, October, 20-35.
Nasution, H., Mavondo, F., Matanda, M., Ndubisi, N. (2011) Entrepreneurship: its Relationship with Market Orientation and Learning Orientation and as Antecedents to Innovation and Customer Value, *Industrial Marketing Management*, 40(3), 336-345.
Nunnally, J., Bernstein, I. (1994) Psychometric Theory, McGraw Hill, USA.
Oviatt, B., McDougall, P. (2005) Defining International Entrepreneurship and Modelling the Speed of Internationalisation, *Entrepreneurship Theory and Practice*, 2, 537-553.
Peng, M. (2001) The Resource-based View and International Business, *Journal of Management*, 27, 803-829.
Rauch, A., Wiklund, J., Lumpkin, G., Frese, M. (2009) Entrepreneurial Orientation and Business Performance: an Assessment of Past Research and Suggestions for the Future, *Entrepreneurship Theory and Practice*, 33(3), 761-787.
Sinkula, J., Baker, W., Noordewier T. (1997) A Framework for Market-Based Organisational Learning: Linking Values, Knowledge, and Behaviour, *Journal of the Academy of Marketing Science*, 25(4), 305-318.
Souchon, A., Sy-Changco, J., Dewsnap, B. (2012) Learning orientation in export functions: impact on export growth, *International Marketing Review*, 29(2), 175-202.
Sousa, C. (2004) Export Performance Measurement: an Evaluation of the Empirical Research in the Literature, *Academy of Marketing Science Review*, 9, 9-10.
Wales, W., Gupta, V., Mousa, F. (2013) Empirical Research on Entrepreneurial Orientation: an Assessment and Suggestions for Future Research, *International Small Business Journal*, 31(4), 357-383.
Wang, C. (2008) Entrepreneurial Orientation, Learning Orientation and Firm Performance, *Entrepreneurship Theory and Practice*, 32(4), 635-657.

ROLE OF SOCIAL MEDIA, ITS ADOPTION AND USAGE PATTERNS WITHIN ACCOUNTING FIRMS

Job DUBIHLELA *
Nelson Mandela Metropolitan University, Republic of South Africa

Rosebud RUNDORA
Vaal University of Technology, Republic of South Africa

Abstract. Technological advances continue to expand connectivity and communication, greatly assisting in social media business integration. Although social media has potential to drive the world of finance and accounting, firms in the accounting domain have predominantly remained laggards in social media adoption and usage. The usage of social media tools in accounting would be transformative; better leveraging opportunities for interaction and user engagement. This article discusses the background and significance of social media tools, projecting the overall concept of social media and offering some empirical evidence on the adoption and usage by accounting firms. The paper also discusses the potential benefits and approaches towards building a social media presence from an accounting perspective. Common reasons for not adopting social media include the fear of appearing unprofessional, posting something wrong or being misunderstood, or a lack of confidence in online skills. Future research is proposed to assess linkages between usage patterns and organizational characteristics, staff perspectives, and audience engagement

JEL Classification: M30, M31, M37, M38, M39

Keywords: Accounting firms, social media, social media adoption, social media usage, South Africa.

1. Introduction

The emergence of new technology has taken the world by storm and continues to expand within the society and business community. In contemporary business, it possible for one person to communicate with hundreds, even more of people about products and companies that provide them. Rehmani and Khan (2011) identify media technology advancement, particularly social media, as the interaction of people to

* Corresponding author. Address: Faculty of Economics and Management Sciences, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa., Tel. +27.41 504 3875, Email: jobo.dubihlela@nmmu.ac.za

create, share, exchange and communicate through virtual communities. Examples of these virtual communities include social networks such as Facebook, Flickr, Twiter, YouTube, Mxit, Netlog, Whatsapp, Myspace, LinkedIn, Orkut, Hi5, Bebo and Windows live space. These platforms provide 'electronic word of mouth' (e-WOM), a person to person communication between receivers and communicators, which the receiver perceives as a non-commercial message, regarding a brand, a product or a service. By definition, social media is the collection of individuals linked together (networked) on an online communications platform by a set of relations guided by their common understanding and acceptance of rules and procedures (Downes, 2005). It is acknowledge in contemporary business that social media is redefining the way organisations such as accounting firms communicate with customers and business prospects.

Social media has several implications (Aula, 2010) for corporate strategic and financial endeavours in terms of corporate communication, ease information search, mass-participation, minimal publication thresholds, constant dialogue, active interrelations and the prompt and broad spread of information range and linkages (Osterrieder, 2013). The adoption and usage patterns within the accounting domain is slow, yet accounting firms today need to actively use Twitter, the micro-blogging websites, to communicate directly with their target audience, by-passing traditional public relations vehicles. It has been said that accountants have been participating in the moving of transactions online, a critical dimension that reveals the extent to which online developments affect business, people and places (Karavasilis, Zafiropoulos & Vrana, 2012). It is said that social media also enhance other vital agency capabilities such as accelerating accounting information deployment (Haenlein & Kaplan, 2010) and contributing to the growing trend of contemporary issues in accounting, which serve to quickly build awareness (Vrana & Zafiropoulos, 2010) and communicate changes in financial indicators.

Although it is acknowledged that social media has become an important tool for accounting firms and accounting professionals, few studies have been conducted on its adoption and usage (Cruz & Fill, 2008), particularly in developing economies like South Africa. Thus, this study was carried out with an aim to evaluate the role of social media, its adoption and usage patterns within accounting firms in South Africa. The accounting environment is highly dynamic and the domain of accounting is gradually slipping into constant changes that intrinsically affect organisational communication processes, processes of learning accounting, accounting communications and accounting-education processes (Kalpaklioglu & Toros, 2011). A large number of other organisations are increasingly using blogs, Facebook, Twitter and other social means to reach customers in a better, more cost-effective manner than traditional media allows (Karavasilis, Zafiropoulos & Vrana, 2012). These social media platforms are also essential for communicating educational accounting material, accounting training and advisory financial information.

2. Social Media and Accounting

Businesses currently operate in the age of real-time information driven by new technology such as social media sites (Hansen, 2011). Correa, Hinsley and de Zuniga (2010) define social media as the particular consumption of digital media or

internet that has little to do with traditional information media usage. Rather it provides a mechanism for the audience to connect, communicate, and interact with each other and for mutual friends through instant messaging or social networking sites. Consequently, Kaplan & Haelein (2010) pointed that social media are “a group of internet-based applications that build on ideological and technological foundations of Web 2.0 and allows the creation and exchange of user generated content”.

The past decade has experienced exponential growth in the development of socia networks, and the most common social networking sites are Twitter, MySpace, Facebook, Flikr , LinkedIn, Bebo, Netlog, Yahoo 360, Yonja, and Orkat. Boyd & Ellison (2007) describe social networks as web-based provisions that enable users to create profiles within a constrained system. The users can communicate with a chosen list of other network-users with whom they share a connection, and can assess and navigate their list of connections within the social network system. In line with Thelwall (2008), social network sites enable communiqué amongst contacts and enable additional pleasurable activities such as sharing music, listening and posting pictures and videos. It is common knowledge that people passively consume formal information (e.g. the news) for intrinsic pleasure and satisfaction, and actively engage with social networks to satisfy some of these intrinsic needs (Osterrieder, 2013).

Social media is acknowledged as an effective viral marketing tool, defined by Cruz & Fill (2008:743) as a communication strategy that encourages individuals to transmit messages to their networks, generating possible exponential growth in product and service exposures. Eventually, the intended result of viral marketing is to spread the word of mouth (WOM) marketing; informing and coercing potential markets about the great new offerings (Cruz & Fill, 2008). Social-media-based viral marketing is a powerful means for both business and consumers to benefit from the innate helpfulness of e-conversations on social media (Subramani & Rajagopalan, 2003).

In contemporary business operations, consumers (particularly financial information users) are constantly challenging operational norms, demanding more control over their media consumption (Portola et al, 2011). Financial information users and the general consumers require information-currency and access-immediacy that culminates into their convenience (Mangold & Faulds 2009). Because of the nature of today’s living where several billions of consumers own a mobile device that can connect to the internet (Portolan, Zubrinc & Milicevic, 2011), it is imperative that social media tools possess higher and more transparent content that attracts and protects potential customers.

While making their purchase decisions, most of the customers are influenced by others’ recommendations, suggestions and personal advice (Kalpaklioglu & Toros, 2011). This is where personal information sharing and exchange is often called as word of mouth. Conducting more efficient marketing activities by organization is directed proportionate to their compliance with technology and market approaches (Kapaklioglu & Toros, 2011). Social media is redefining the way organisations market to customers and business prospects. It provides a mechanism for the audience to connect, communicate and interact with each other through instant messaging or social networks (Correa el at, 2010).

The acceptance of social media sites in formal business communication has perverted all forms of organisations, and remains critical for their strategies (Singh,

Lehnert & Bostick, 2012). Borrowing from a study by Burson-Marsteller (2010), 86% of 100 largest companies on the Fortune 500 list participated on social media and 28% of them have continued to grow their usage patterns of social media. The same study established that over 65% of large corporates use Twitter as their most popular social media site among. In the same vein, a large number of accounting firms are increasingly using some blogs, Facebook, Twitter and other social media to reach their customers as it proves to be a more cost-effective than traditional communication channels. Social media provides distinct, high involvement, intangible heterogeneous, high risk and well differentiated characteristics (Heung, 2003). As projected by Weinberg & Pehlivan (2011), social media can propel such organisations as accounting firms to better educate their clients about their service offerings (Osterrieder, 2013). It can also be to identify opinion leaders, key influencers and assist in timely responding to client needs. Furthermore, social media gives accounting firms a social presence, in that it allows them to get in touch with a large number of clients who might be interested in their service offerings. Social media is an opportunity for accountants to change negative perceptions towards online transaction. This has a potential to take away the notion that accounting is too technical and that accountants are boring (Lawrence, Low & Sharma, 2010).

The few other advantages of social media is, it gives companies opportunities to engage with customers (Portola et al, 2011), they can complain about the products and services, recommend on the site, praise the service or product of the company (Treadaway & Smith, 2010). Companies have an opportunity to engage with customers/clients through complaint portals about the products or the services; opportunity to praise the services of the company and referrals. According to Zeghal & Ahmed (1990), social media can be used to advocate an accounting firm's position, improve its image, promote customer and community relations and thus indirectly help sell or promote the products and services. Kalpalioglu & Toros (2011) emphasise that clients/customers are the pioneer factor in marketing, they demand more and more, due to their viral character. Also suggest social media sites are the best platforms for them, it ensures the communication of individuals between each other are crucial terms of persuasion of recommending the comments related to the product and ideas or services offered.

Mangold & Faulds (2009) as well as Dimtriadis (2014) posit that with social media the accounting firms have the opportunity to engage with consumers from a dialogue to a trialogue and in so doing, be able to share and exchange basic accounting service-information with prospective customers and in turn these customers could share information with one another; a self-selling process. However, common reasons for accountants to desist from engaging in social media activity include the fear of appearing unprofessional, posting some wrong information and being misunderstood (Osterrieder, 2013). It could simply be a lack of confidence in their online conversational computer skills. Treadaway & Smith (2010) highlight that negative publicity or information can spread like a wildfire and can destroy credibility and reputation of firms once it is shared on a social media sites, it can easily be contained, and everything is public and largely visible for other people to see or know.

3. Problem Statement

The impact of social media in accounting and financial services activity, like any other research domains, needs to be investigated, better analysed and exposed. Its adoption and usage is acknowledged as providing new communication competencies within organisations, which may improve accounting communication and overall firm performance. In tandem with Muhlen & Ohno-Machado (2012), it is possible that the increased and effective use of social media activities by accounting professionals would help to solve accounting and financial issues and problems. Cultivating social media communication activities and improving social media tools within accounting firms would potentially benefit recipients of accounting services and financials advice professionals as well as intra-professional information sharing. For accounting firms, social media can enable them to get in touch with large numbers of people who might be interested in their services and also serve as an opportunity to connect and establish professional networks.

Despite the many benefits that social media can bring, previous research shows that most companies, especially accounting firms, remain sceptical about the operationalization and the integration of social media in their formal business communication systems and operations. The worry about the implications of welcoming social media tools into formal accounting systems, accounting finance activities and accounting workplaces retards social media adoption and usage (Mangold & Faulds, 2009). Various antagonists of social media adoption in the accounting sphere do acknowledge the potential benefits, yet they project that the benefits are outweighed by the potential threats in terms of security and confidentiality (Lawrence et al, 2010). There remains an argument that accounting information systems could accidentally or deliberately be affected by wholesale social media, with potential leakages to external sources. The major issues of trust, privacy and the quantification of exposure remain enormous; issues of how much, what to share and how to share are lingering questions. Against this background, this study sought to investigate current social media adoption and usage patterns by accounting firms so as to be able to offer recommendations attributable to these organisations' needs within a South African setting.

4. Methodology

This study adopted a quantitative approach by means of questionnaires that were hand-delivered to the accountants, accounting officers and bookkeepers of different accounting firms operating in the Emfuleni Municipality of South Africa. The choice of Emfuleni Municiality was simply for convenience purposes. This quantitative study was carried to capture information from accountants and capture a broader perspective of information about the issues and problems concerning social media adoption and usage (Bradley, 2007). The approach provided fair measurement precision and statistical power (Vijayakumar & Brezinova, 2012). It enabled the researchers to subject the data to statistical manipulations that were meant to produce broadly representative results.

Measurement and sampling

Due to lack of a generally accepted model or approach to measure and analyze social media adoption and usage in literature, we employed a survey questionnaire in order to examine sample descriptors and constructs. The Marketing Scales Handbook Volumes I and II, which are generally considered to be the handbooks for researchers (Bruner & Hensel, 1996), were employed in thoroughly scrutinizing the survey questionnaire. The questionnaire began with the demographic information section such as the gender of the respondents, their age, their highest qualifications, their association with regards to social media and the purpose in which they use social media. The demographic section will assist in ensuring that the respondents are indeed qualified accounting officers; profiling the characteristics of the respondents in a market where where there are dire shortages of accountants. Section B included a scale of items pertaining to social media adoption and usage (the individual). Section C focused on social media at work (the firm).

The target population included accountants and accounting officers working for firms operating in Emfuleni Municipality, South Africa. The study employed convenience sampling in line with Bradley (2007) and sample members were chosen randomly for inclusion in the sample. A sample of 103 accounting firms operating in the Emfuleni Municipality of South Africa was selected according to a list (Rooney, 2011) obtained from the databases of the Vaal Information Directory and also from the Yellow Pages. In total, 72 respondents completed the questionnaire, which represented a response rate of 69.9%. This was because the survey was carried by way of face-to-face interviews, generally known to achieve substantially higher response rates than other survey methods.

5. Data analysis and results

The Statistical Package for the Social Sciences (SPSS) version 22 was used to analyse the data to enable ease of interpretation. The thrust of the analysis procedure was to provide a good profile of the sample, provide the descriptive statistical results and, through regression analysis, identify the predictive power of the key variables under investigation. Descriptive statistics also enabled the reliability and validity tests.

Profiling the participants

As reported in Table 1, the characteristics of the respondents indicate some notable sample descriptors in terms of gender, age structure and level of education. 68.1% (N=49) of the respondents were male and a mere 31.9% (N=23) were female. The majority employees of accounting firms are males and the dominating age group is the one below 30 years of age. This reflects the national picture where the males are dominating the accounting profession in South Africa, depicting the dire need for accounting skills training development and the emancipation of the South African women. The age structure of the respondents reported in Table 1 shows that the majority 63.8% (N=46) of the respondents were aged between 30 and 49 years followed by 23.6% (N=17) representing those that are under 30 years age.

Table 1. The characteristics of the respondents

	Frequency	Valid Percentage	Cumulative Percent
Gender of respondents			
Male	49	68.1	68.1
Female	23	31.9*	100.0
Total	**72**	**100.0**	
Age of respondents			
Under 30 years	17	23.6	23.6
30-39 years	23	31.9*	55.5
40-49 years	23	31.9*	87.4
50-59 years	2	2.9	90.3
Over 60 years	6	8.6	98.9
6.00	1	1.1	100.0
Total	**72**	**100.0**	
Respondents' Educational Level			
High School Certificate	9	12.5	12.5
Trade Certificate	3	4.2	16.7
Graduate (Degree/Diploma)	37	51.4*	68.1
Postgraduate	23	31.9*	100.0
Total	**72**	**100.0**	

Table 1 also provides a report on the respondents' level of education. The majority of the respondents have either obtained a degree (51.4% ; N=37) or a post graduate degrees (31.9% ; N=23). The results confirm that the accounting profession generally requires highly qualified professionals in the field of accounting, and that the firms in Emfuleni Municipality are recruiting qualified personnel within the accounting profession.

Table 2 presents information on the surveyed accounting firms with regards to the purpose for which they use social media. The reported frequencies show that 48.6% (*N*=35) use social media at work for personal professional development, while 26.4% (*N*=19) use social media for professional network. It is interesting to also note that 9.7% (*N*=7) of the respondents use it to promote their company and gather essential market data for their research.

Table 2. Purpose for use of social media

	Frequency	Valid Percentage	Cumulative Percent
Professional networking	19	26.4*	26.4
Exchange of info with peers	4	5.5	31.9
Marketing and sales promotion	1	1.4	33.3
Promotion of the company	7	9.7*	43.0
Personal/professional development	35	48.6*	91.6
News and information	6	8.4	100.0
Total	**72**	**100.0**	

Table 3 presents information regarding social media access and usage patterns at the work-places for the surveyed accounting professionals. The frequencies reported in the table show that 36.1% (*N*=26) of the respondents are prohibited from accessing social media tools. A quarter (25%; *N*=18) of the respondents reported that they have limited access to social media tools at during their working hours. The results also show a mere 9.7% (*N*=7) of the respondents reporting that their employer encourages usage of social media for work purposes. For some reason, the remainder 4.25 (N=3) were unable to access social media at work.

Table 3. Social media access and usage patterns

	Frequency	Valid Percentage	Cumulative Percent
Unable to access social media at work	3	4.2	4.2
Employer prohibits access to social media	26	36.1	40.3
Employer allows limited access to social media	18	25.0	65.3
Employer allow access to social media for work purposes only	9	12.5	77.8
Employer encourages use of social media	7	9.7	87.5
Position requires use of social media	9	12.5	100.0
Total	72	100.0	

The information presented in Table 4 reveals the popularity of both Facebook and WhatsApp with a staggering 95.8% (*N*=69) and 93.1% (*N*=67) respectively showing that the respondents are mainly active on these social networks for personal. LinkedIn (41.6%; *N*=30) and Twitter (59.7%; *N*=43) are reported to be used mainly for professional purposes. The information also shows that the majority of the respondents are not equally active on the remainder of the social media platforms examined in this study, with the Blogs being the lowest at 9.7% (*N*=7).

Table 4. Type of Social Network

	Frequency	**Percent**	**Valid Percent**	**Usage Purpose**
Facebook	69	95.8*	95.8	*Personal*
LinkedIn	30	41.6	41.6	*Professional*
Twitter	43	59.7*	59.7	*Professional*
Google +	23	31.9	31.9	*Personal*
You Tube	31	43.1	43.1	*Personal*
Four Square	11	15.3	15.3	*Personal*
Blogs	7	9.7*	9.7	*Personal*
RSS News Feeds	29	40.3	40.3	*Professional*
WhatsApp	67	93.1*	93.1	*Personal*

Regression Analysis

The analyses of data also tested the predictive power of three key variables on social media usage by running a regression analysis in the manner of Dumenco (2011), to identify the variables that predicted or provided the best explanation for the portion of the total variance in the scores of the dependent variables. Therefore, the value of the adjusted R^2 was used to interpret the results. The *F*-test was used to test whether there was a significant regression between the independent and the dependent variables. For this study, R^2 values indicated large effect and treated as practically significant (Malhotra, 2010). The three key explanatory variables that were tested in the regression analysis were personality issues (PIs), type of social network (SNt) and firm-policy flexibility (fPF). The results are presented in following Table 5.

Table 5. Regression analysis results

Variables	Unstandardised Coefficient		Std coef	*t*	*p*	*F*	Adjusted R^2	R^2
Social media usage (constant)	*b* 2.189	*SE b* 0.42	*β*	5.029	0.000	42.131	+++ 0.469***	0.76
Personality issues (PIs)	0.063	0.03	0.403	3.73	0.001			
Social network type (SNt)	0.059	0.02	0.323	3.09	0.000			
Policy flexibility (fPF)	0.113	0.03	0.374	3.94	0.002			
Social media adoption (constant)	*b* -0.331	*SE b* 0.58	*β*	-0.57	0.569	19.31	+++ 0.263***	0.53
Personality issues (PIs)	0.063	0.03	0.121	2.04	0.003			
Social network type (SNt)	0.109	0.03	0.263	3.77	0.001			
Policy flexibility (fPF)	0.114	0.04	0.008	3.08	0.678			

*** $p \leq 0.001$; ** $p \leq 0.01$ * $p \leq 0.05$, df---5,1701,
+ $R^2 \leq 0.15$ (*small practical effect*) ++ $R^2 \geq 0.16 \leq 0.25$ (*medium effect*) +++ $R^2 \geq 0.26$ (*large practical effect*)

The regression results in Table 5 reveal that the personality issues (β = 0.403; p = 0.000), type of social network (β = 0.323; $p \leq 0.001$), and flexibility of company policy (β = 0.374; p = 0.002) positively predicted 'social media usage' within the surveyed accounting firms by explaining about 47% (adjusted R^2 =0.469) of the variance. All the measures of the coefficients (beta coefficients 'β') indicate that social media usage could be explained by the annotated components (the dependent variables). These results show that those accounting firms willing to use popular social networks must have flexible communication strategies designed with the consideration and consultation of their employees.

The results also provided some light on the predictive nature of the three variables towards social media adoption; showed that personality issues (β = 0.121; p = 0.003) as well as type of social networks (β = 0.263; p = 0.001) variables, contributed significantly to the variance (26.3%), significantly predicting social media adoption among accounting firms. It was interesting, however, to note that the flexibility of organizational policy (β = 0.008; p = 0.678) was insignificant in predicting organizational adoption of social media although it could predict its usage pattern.

6. Conclusions

The study sought to examine the role of social media, its adoption and usage patterns within accounting firms in South Africa's Emfuleni Municpality. The findings in the research highlight a number of issues concerning the role of social media, with strong evidence that accountants and accounting officers are actually using social media. Although the companies have not formarly adopted social media as part of their communication strategy, it is clear that the individual accounting personnel are using it for various purposes such as professional development and professional networking. Largely, the regression results indicated that employee personalities and access to social networks are vital for organisations wishing to adopt and use social media.

Accounting firms are still sceptical about formarlly adopting social media as they just allow limited access and some do not allow the use of social media for work purposes (Vijayakumar & Brezinova, 2012). There is strong evidence that age plays a big role in the use of social media. The younger generation under the age of 30 seem to be very active on social media and spent many hours a week on Face book, You Tube, LinkedIn, WhatsApp. Facebook, WhatsApp and LinkedIn are the commonly used types of social networks and are used mainly for personal reasons. This is consistent with Hoffman and Fodor (2010) who reported that 46.4% of Facebook users are between the ages of 13-25 years old, and 26.1% are between the ages of 26-34 years old. The results provide valuable information for organizations focusing on strategically reaching out to South African's market through virtual platforms. Understanding the predictors and drivers of social media, as well as understanding the patterns within the accounting domain would prove worthwhile for the accounting firms and accounting professionals.

This study confirmed that social media is actually being used by accountants; it is therefore advisable for accounting firms to bring in experts who can help them integrate social media fully within their accounting systems. Accounting firms are still hesitant to adopt social media fully, yet by better leveraging opportunities for interaction and user agreement, they could broaden their reach and reap greater benefits. Targeted investments in activities within the domain of the holistic contemporary accounting philosophy and a mind-shift are important for the adoption of media not commonly used within the accounting firms. Younger accountants are more interested in using social media as compared to the older generation. There is limited access to social media at work; hence accounting officers do not really use social media for work purposes.

Social media is a relatively a new subject in business research. There is limited published theoretical and literary discourse on this subject. Future studies might be able to find more information on social media, since it has become more

and more popular among practitioners and scholars. A notable limitation of the current study is that the research was conducted on a small sample from a heavily industrialised geographic location within South Africa. Therefore, its findings cannot be generalized to the greater population without caution. Research could be carried out into other firms that are not accounting firms but service industries or manufacturing industries. The current study used a cross-sectional survey data to test the proposed research hypotheses. A richer understanding of the relationships between this study's research constructs might be expected if say cluster, stratified longitudinal data is utilised. Further research could investigate the impact of social media adoption on the financial performance of accounting firms; could assess links between usage patterns and organizational characteristics, staff perspectives and audience engagement.

Acknowledgements

We would like to appreciate both the Nelson Mandela Metropolitan University and the Vaal University of Technology for affording us the opportunity and the funding for the data collection process.

References

Aula, P. (2010) Social Media reputation risk and ambient publicity management. *Strategy and Leadership*, 38(6): 43-49.

Boyd, D.M. & Ellison, N. B. (2007) Social network sites: Definition, History and Scholarship. *Journal of Computer-Mediated Communication*, 13(1): 210-230.

Bradley, N. (2007) Marketing research: Tools and Techniques. New York: Oxford University Press.

Bruner, G.C. & Hensel, P.J. (1996) Marketing Scales Handbook: A Compilation of Multi-Item Measures, Volume II. Chicago, IL : American Marketing Association.

Burson-Marsteller (2010) Innovation_and_insights/blogs_and_podcasts/BM_Blog/Documents/Burson-Marsteller. Available at http://www.bursonmarsteller%202010%20Global%20Social%20Media%20Checkup%20white%20paper.pdf

Correa, T., Hinsley, A. W., & De Zuniga, H. G. (2010) Who interacts on the Web?: The intersection of users' personality and social media use. Computers in Human Behavior, 26(2), 247-253.

Cruz, D & Fill, C. (2008) Marketing Intelligence and planning. *Journal of Marketing Practice and Applied Marketing Science*, 26(7): 743-758.

Dimtridias, G.T.S. (2014) Brand Strategies in Social Media. *Marketing Intelligence and Planning Journal,* 32(3): 328-344.

Downes, S. 2005. Semantic networks and social networks. The learning *organization*, 12(5): 411-417.

Dumenco, S. (2011) Metrics mess: Five sad truths about measurement right now. *Advertising Age*, 82(9): 8-9. Retrieved from http://web.ebscohost.com/ehost/detail?sid

Hoffman, D. & Fodor, M. (2010) Can you measure the ROI of social media marketing. Forbes, web, http://www.forbes.com/2010/11/08/social-media-roi-return-on-investment-leadership-managing-mitsloan_2.html. Accessed 28 Sep 2014.

Heung, V.C.S. (2003) Internet usage by international travelers: Reasons and barriers. International Journal of Contemporary Hospitality Management, 15 (7): 370-378.

Kalpaklioglu, N. U. & Toros, N. (2011) Viral marketing techniques within online social network. *Journal of Yasar University*, 24 (6): 4112-4129.

Kaplan, A.M. & Haenlein, M. (2010) Users of the World Unite! The challenges and opportunities of Social Media. *Business Horizons*, 53(1): 59-68.

Karavasilis, I., Zafiropoulos, K., & Vrana, V. (2012) A model for investigating e-Governance adoption using TAM and DOI. *Trends and Effects of Technology Advancement in the Knowledge Society*, 225.

Lawrence, S., Low, M & Sharma, U. (2010) Prem Sikka and the Media: Using the media to hold Accountants to account. *Qualitative Research in Accounting and Management*, 7(3): 249-269.

Malhotra, N. K. (2010) Marketing research: An applied orientation. Sixth edition. New Jersey: Prentice-Hall.

Mangold, W.G. & Faulds, D.J. (2009) Social Media: The new hybrid element of the promotional mix. *Business Horizons*, 52(1): 357-365.

Muhlen, M., Ohno-Machado L. (2012) Reviewing social media use by clinicians. *Journal of American Medical Information Association,* 19 (1): 777–781.

Osterrieder, A. (2013) The value and use of social media as communications tool in the plant sciences. *Plant Methods*, 9: 26–32.

Pan, J., Vorvoreanu, M. & Zhou, Z. (2014) Social Media Adoption in Disaster Restoration Industry. *Construction Innovation: Information, Process, Management*, 14 (3): 346-369.

Portolan, A., Milicevic, M. & Zubrinic, K. (2011) Concept of Mobile Device Integration in Current Travel and Tourism Industry. *Proceedings of the 10th WSEAS international conference on Applied Computer and Applied Computational Science*, 154-169

Rehmani, M., & Khan, M. I. (2011) The impact of E-media on customer purchase intention. *International journal of advanced computer science and applications*, 2(3).

Rooney, J. (2011) Loyalty innovation, now an “organic” campaign. *Advertising Age*, 82(13): 16-27. Retrieved from http://web.ebscohost.com/ehost/detail?vid=4&hid=19&sid

Singh, N., Lehnert, K., & Bostick, K. (2012). Global social media usage: insights into reaching consumers worldwide. *Thunderbird International Business Review*, 54(5), 683-700.

Subraman, M.R. & Rajagopalan, B. (2003) Knowledge-Sharing and influence in online social networks via viral marketing. *Magazine*, 46(12): 300-307.

Thackeray, R., Neiger, B. L., Hansen, C.L & McKenzie, J.F. (2008) Enhancing promotional strategies within social marketing programs. *Use of Web 2.0 Social Media*, 9(4): 338-343.

Thelwall, M. (2008) Social networks, gender and friending: The analysis of MySpace member profiles. *Journal of the American Society for Z-Information Science and Technology*, 59 (8): 1321-1330.

Tradeaway, C. & Smith, M. (2010) Facebook Marketing: An Hour a Day. Second edition. New York: Oxford University Press.

Vijayakumar, S. & Brezinova, O. (2012) An empirical study on visibility of conspicuous consumption motives of consumers in Taffna, Shri lanka. *International Journal of Trade, Economics and Finance*, 3(3): 239-244.

Vrana, V., & Zafiropoulos, K. (2010) Locating central travelers' groups in travel blogs' social networks. *Journal of Enterprise Information Management*, 23(5), 595-609.
Weinberg, B. & Pehlivan, E. (2011) Social Spending: Managing the Social Media Mix. *Business Horizons*, 54(3): 275-282.
Zeghal, D. & Ahmed, S. A. (1990) Comparison of Social Responsibility Information Disclosure Media used by Canadian Firms. *Accounting, Auditing and Accountability Journal*, 3(1): 38-53.

PRESS FREEDOM AND PREDICTABILITY OF STOCK MARKETS

Anita PLEŞOIANU[*]
Babeș-Bolyai University, Romania

Abstract. This study uses the Efficiency Index of Kristoufek and Vosvrda (2013) to investigate the relation between press freedom and the informational efficiency of 41 stock market indices over the period 1999 – 2012. We employ short memory (linear and nonlinear dependencies) and long memory as input variables for the Efficiency Index to control for different types of inefficiencies. Our panel results, supported by robustness tests, show a direct and significant relation between stock markets informational efficiency and press freedom. In addition, as expected, market capitalization and volatility are other two determinants of efficiency, whereas the degree of market openness has influence only on the long-term behavior of returns.

JEL Classification: C13, G14, G15

Keywords: predictability, press freedom, short memory, long memory, stock market indices.

1. Introduction

Media is a western concept almost universally accepted. With few exceptions, the Constitution of most countries guarantees the human right to free speech. Freedom of the press reflects the degree of freedom of journalists and media organizations in each country and the efforts of the authorities to respect and ensure the respect for this freedom. In a free environment any news immediately becomes public through various channels, print or electronic, while in a constrained or unfree environment, characterized by a low degree of disclosure, media becomes a target for those who want to control the news. The freedom of the press has experienced over time a positive evolution especially in democratic countries. However, the report of press freedom issued by Freedom House in 2014 denotes an overall pattern of decline, largely due to the situation in the Middle East and North Africa. Thus, despite the openings created by transnational media, the internet and privatizations of broadcasting, there still are various threats which restrict the ability of journalists to

[*] Corresponding author. Address: Department of Finance, Faculty of Economics and Business Administration, Babeș-Bolyai University, Teodor Mihali 58-60, 400591 Cluj-Napoca, Romania, Tel. +40.264 41 86 52, Email: anita.plesoianu@econ.ubbcluj.ro

operate and the public access to information. Analyzing the trend of the last five years (2009-2013) we observe a shift towards a middle level (50-60 points according to the ratings established by Freedom House) with constant decreases in the freer regions of Europe and America, stagnation in Asia-Pacific and gains for weaker-scoring regions of sub-Saharan Africa, Eurasia, Middle East and North Africa. This suggests that the decline generally occurs in more democratic countries while improvements are visible in countries with a less permissive regime.

In an economic environment in which the media have a high degree of freedom, agents are unable to hide negative information or disclose it gradually. In contrast, in restrictive environments, the stock markets will register a lower frequency of negative price changes, i.e. a reduction of negative asymmetry of returns, as economic agents tend not to disclose negative information to the market. In the literature there are many studies which sustain that the gradual diffusion of information among investors affects the stock prices, but very few are those that investigate the impact of press freedom on the informational efficiency of stock markets.

The Efficient Market Hypothesis (EMH) has been the cornerstone of finance for more than four decades. Jensen (1978) stated that no other hypothesis in economics had more empirical support. Testing the relation efficiency – press freedom is a challenge mainly due to the abstract nature of the definition of an informational efficient market. According to Fama (1970), a market in which the current stock prices always fully reflect available information is called efficient. In this case, the prices are in equilibrium against all this information relevant to their fundamental value and fluctuations appear only as a response to the arrival of new information on the market. The new information is random by nature and determines a random behavior of stock prices if stock prices incorporate them quickly. In other words, the stock prices are "unforecastable if they fully incorporate the expectations and information of all market participants" (Lo, 1997: xii). In contrast, if stock prices mis-react, linear and nonlinear correlations will emerge in the series of returns making them more predictable.

Focusing on the weak form of in formational efficiency, the Martingale stochastic model[1], a less restrictive version of the random walk, provides an appropriate framework for testing whether stock prices are predictable. The model refers only to the first conditional moment of the probability distribution of price changes and implies linear and nonlinear independent returns and, consequently, the current price as the best predictor of the future price. In this case, there can be no long-term profits exceeding the market profits assuming the same risk. The weak-form version of market efficiency has become the most commonly investigated criterion of the EMH in the empirical literature. However, the evidence is contradicting even for the same market because the vast majority of the empirical work is largely concerned with absolute market efficiency. Campbell et al. (1997), Lo & MacKinlay (1999) and Lo (2008) have repeatedly argued that perfect efficiency is an unattainable benchmark. Grossman & Stiglitz (1980) show that, under the presence of information costs, the investors have no incentive to trade if markets are perfectly efficient because there are not sufficient profit opportunities to compensate their cost of information gathering.

[1] The arguments concerning the sufficiency to test the if stock prices follow a Martingale model for the weak-form efficiency are found in Escanciano and Lobato (2009).

Thus, Campbell et al. (1997) introduce a more practical concept - the relative efficiency, which is the efficiency of one market measured against another. As Lim (2008) noted, an empirical measure of relative efficiency will enable the researcher not only to compare the degree of informational efficiency across countries, but also to identify the underlying factors associated with higher efficiency.

Many empirical results highlight the underreaction of prices to events such as dividend announcements (Michaely, 1995), earnings (Bernard & Thomas, 1990), splits (Ikenberry & Ramnath, 2002), and changes recommended by analysts (Womack, 1996) or tender offers (Ikenberry et al., 1995). Robinson & Levy (1996) argue that newspapers constitute the majority of media coverage and have a significant impact on investors. Bhattacharya et al. (2000) state that unrestricted insider trading determines prices to incorporate information before they become public. Brunetti & Weder (2003) show that a free press is actually an external mechanism to control corruption and fraud able to produce more externally generated transparency compared to a press affected by government intervention. Chen (2005) shows that the degree of press freedom can be a proxy for the level of asymmetry of information in an economy. Gong & Gul (2011) investigate the media coverage of China's stock market and find that financial assets with high coverage in the media tend to have a positive impact on the stock turnover. Griffin, Hirschey, & Kelly (2008) find on a sample of 33 stock markets that a freer and stronger press is associated with a more rapid information dissemination and incorporation into prices.

In a more recent study, Kim et al. (2014) investigate the impact of press freedom as a measure of externally-generated transparency on the ability of stock prices to incorporate firm-specific information. The authors distinguish between self-generated transparency produced by financial reporting and externally- generated transparency through press reporting, and show that the two do not completely overlap in affecting the informational efficiency because the firms are likely to cover up fraud, corruption or other dubious activities generating a transparency "gap" that can be filled only by external monitoring mechanisms. In other words, external monitoring mechanisms may enhance both the information effect and the investor protection effect of transparency. If a free press can act as such an external mechanism to create transparency for businesses, the ability of price to incorporate firm-specific information will increase. On a sample of 45,220 firms from 50 countries the authors find for the period 2004 – 2009 a significant relation between more press freedom and lower stock price synchronicity and a significant relation between more press freedom and the ability of stock prices to predict future earnings. In addition, the results indicate an exacerbation of the adverse effect of the lack of press freedom on efficiency in countries where the press is state-owned to a greater extent. A contradictory result is obtained by Peress (2014) who finds that the absolute values of stock returns are not diminished on strike days even though turnover is reducing, suggesting that the media are not essential for the informational efficiency of stock markets, even if it plays an important role in spreading information among investors. The rate of incorporation of news into prices reflects the forces of arbitrage: the information is incorporated into stock prices even though many investors do not trade those stocks, due to the investors who remain informed despite discontinuation of information flow and are active in the market. The press matters to investors but is not essential for the informational efficiency of stock markets.

The objective of this paper is to empirically investigate the relation between weak-form efficiency and press freedom using 41 equity indices from 1999 to 2012. This paper contributes to the literature in several ways. First, this study uses the Efficiency Index of Kristoufek & Vosvrda (2013) which takes into consideration the predictability of returns to control for various types of correlations (short memory – linear and nonlinear dependencies – and long memory). The linear dependencies are detected by the Automatic Variance Ratio (AVR) test of Kim (2009), the Generalized Spectral (GS) test of Escanciano & Velasco (2006) is employed for the nonlinear dependencies, while the long memory is investigated through the Generalized Hurst Exponent (GHE) test proposed by Barabasi & Vicsek (1991). Second, we consider the time-varying nature of efficiency by applying the short-memory tests in the rolling window approach. Third, the relation between efficiency and press freedom is investigated using different panel regressions in which we include a set of control variables that captures the characteristics of the investigated markets. Fourth, the robustness checks confirm the relation found between the weak-form efficiency and press freedom.

2. Methodology

The tests used

The unpredictability of asset returns on the basis of past price changes implies the absence of linear and nonlinear correlations in the series of returns. Therefore, we employ three tests in this study in order to detect the existence of short term – linear and nonlinear – and long term correlations.

First, we test the short term linear correlations in the series of returns using the Automatic Variance Ratio (AVR) test of Kim (2009). The test has the null hypothesis of Martingale Difference Sequence (MDS), i.e:

$$H_0: \rho_1 = \rho_2 \cdots \rho_k = 0 \tag{1}$$

where ρ_k is the autocorrelation coefficient of the return of lag k and k is the holding period. The central idea of the variance ratio test[2] is based on the observation that when returns are uncorrelated over time, the variance of the k-period return is equal to the variance of one-period return times k. When implementing the VR tests, the choice of k is important and usually is done rather arbitrarily. Thus, Choi (1999) proposes a fully data-dependent procedure based on Andrews (1991) to optimally choose k and shows that under the assumption that the returns are i.i.d.

$$AVR(k) = \sqrt{\frac{T}{k}}[VR(k) - 1]/\sqrt{2} \xrightarrow{d} N(0,1) \tag{2}$$

where $AVR(k)$ is the Automatic Variance Ratio of the k-period return, $VR(k)$ is the variance ratio of the k-period return, k is the holding period and T is the observation period.

[2] For more details, see the recent survey of Charles & Darné (2009).

Because the properties of this test in small samples under conditional heteroskedasticity were unknown, Kim (2009) improves this shortcoming by proposing the AVR test in which the critical values are determined through the wild bootstrap of Mammen, thus being robust under conditional heteroskedasticity.

Second, we employ the Generalized Spectral (GS) test of Escanciano & Velasco (2006) to investigate the short term nonlinear correlations in the series of returns. The authors suggest that in order to test the null of MDS the generalized spectral distribution function should be used. They rely on the fact that the normalized spectral density function of the stock returns which follow a MDS is equal to one at all frequencies. Unlike the previous test, the GS test is capable of capturing both linear and nonlinear dependencies. The *p*-value of the test is estimated similar to the AVR test from a wild bootstrap and is robust to conditional heteroskedasticity.

Charles & Darné (2011) show through Monte Carlo simulations that these two tests have the best performances against their competitors, the AVR being more powerful in the presence of linear dependencies and the GS test under nonlinear dependencies.

Third, we estimate the Generalized Hurst Exponent (GHE) in order to investigate the long-range dependencies in the series of returns. This method, proposed by Barabasi & Vicsek (1991) and recently re-explored for the financial time series by Di Matteo et al. (2005) and Cajueiro & Tabak (2009), is based on the q-th order moments of the increments of the process $X(t)$ (with $t = \upsilon, 2\upsilon, \dots, k\upsilon, \dots, T$):

$$K_q(\tau) = \langle |X(t+\tau) - X(t)|^q \rangle / \langle |X(t)|^q \rangle \tag{3}$$

which scales as

$$K_q(\tau) \approx (\tau/\upsilon)^{qH(q)}. \tag{4}$$

where the time-interval τ can vary between υ and τ_{max}.

We set $\tau = 19$ days and $q = 1$ to evaluate $K_q(\tau)$ (Di Matteo et al., 2007). For $q = 1$, the value of GHE is expected to be closely to the classical Hurst exponent and characterizes the scaling of the absolute deviations of the process (Di Matteo et al., 2007). $H = 0.5$ suggest an independent process or a short-term correlated process, $H \in (0.5; 1)$ suggests a persistent process (a positive return is statistically more likely to be followed by another positive return and vice versa) and $H \in (0; 0.5)$ suggests an antipersistent one (a positive return is more statistically probable to be followed by a negative return and vice versa). Through Monte Carlo simulations, Barunik & Kristoufek (2010) show that GHE is robust to heavy tails in the underlying process and provides the lowest variance and bias in comparison with other methods.

Statistical indicator of the degree of market efficiency

We follow Kristoufek & Vosvrda (2013) and use an Efficiency Index that allows us to control various types of dependencies by combining partial measures of efficiency:

$$IE = \sqrt{\sum_{i=1}^{n} \left(\frac{\widehat{M_i} - M_i^*}{R_i} \right)^2} \tag{5}$$

where M_i is the i-th measure of efficiency, $\widehat{M}_i$ is an estimate of the i-th measure, M_i^* is an expected value of the i-th measure for the efficient market and R_i is a range of the i-th measure. Thus, "the efficiency index is defined on a unit n-dimensional cube with the efficient market in the center" (Kristoufek & Vosvrda, 2013:188), i.e. $IE = 0$ for the efficient market and $IE = \sqrt{n}/2$ for the least efficient market, where n is the number of measures taken into consideration. In this study, we define IE based on the three tests employed, as follows:

$$IE = \left[\sum_{i=1}^{3} (Percent\ AVR/2)^2 + (Percent\ GS/2)^2 + (GHE - 0.5)^2\right]^{1/2} \quad (6)$$

The measures of short-term efficiency, $Percent\ AVR$ and $Percent\ GS$, have the expected value for the efficient market equal to zero, since $Percent$ reflects the proportion of windows in which the hypothesis of MDS is rejected. The measure of long-memory, GHE, must be 0.5 in the ideal case.

The panel models

To empirically investigate the relation between press freedom and the degree of informational efficiency, we estimate the following panel regressions:

$$Efficiency_{i,t} = a_0 + a_1 Press_{i,t} + a_2 MV_{i,t} + a_3 MC_{i,t} + a_4 Pf\_GDP_{i,t} c_i + \varepsilon_{i,t} \quad (7)$$

where $Efficiency_{i,t}$ is an inverse measure of informational efficiency for market i in the interval t, $Press_{i,t}$ represents a proxy for press freedom, followed by the set of control variables, namely, volatility ($MV_{i,t}$), market capitalization ($MC_{i,t}$) and *de facto* openess measure ($Pf\_GDP_{i,t}$). Note that c_i are the country effects and $\varepsilon_{i,t}$ is the error term.

The existence of the fixed effects is tested with the F test, while the random effects are tested with the Breusch-Pagan Lagrange multiplier test. To choose between the two techniques we employe a robust test proposed by Wooldridge (2002) and performed in Stata with the command *xtoverid*. The test has the null hypothesis that the preferred model is random effects versus the alternative of fixed effects. If the effects do not exist (the null hypothesis of both tests is accepted), the pooled OLS regression is favored. To account for within-group correlation and arbitrary heteroskedasticity we follow the recommendations of Petersen (2009) and use the option cluster in all models.

Because all the three tests employed in this study perform well only in large samples, of at least 300 observations for the short-memory tests (Charles et al., 2011) and 500 for the long-memory test (Barunik & Kristoufek, 2010), we divide the whole period in intervals of 2 years length and quantified the efficiency differently. Given the high temporal variability of the *p*-values, we apply the short-memory tests in a rolling window of 300 observations[3], reducing at the same time the sensitivity to the choice of the first day of the sample (Todea & Zoicaș-Ienciu, 2008). Then, we calculate in t, for each index, the percentage of time windows in which the null hypothesis of MDS is rejected (*p-value* is less than 5%), denoted as $Percent$. In contrast, we estimate the generalized Hurst exponent on the whole interval t for each index due to the higher stability in time of Hurst exponents and because the rolling window approach requires in this case a window of at least 500 observations.

[3] This length is a compromise between the need to maximize the power of the tests and the length of the interval *t*.

3. Data and Empirical Results

Data

The database comprises the daily closing values of market value-weighted equity indices for 19 developed and 22 emerging stock markets, using the classification proposed by Standard & Poor's. The time series cover the sample period from January 1999 to December 2012, except Australia, Bulgaria, Estonia, Philippines, Greece, Ireland and Israel, for which the time series starts in January 2000. All values of these indices extracted from Thomson Datastream are denominated in their local currency units. Based on the closing prices we calculate the series of continuously compounded percentage returns. Table 1 provides an overview of the sample averages.

Table 1. Summary statistics – sample averages for 1999 – 2012

Country	Index	GS (%)	AVR (%)	GHE	IE	Press	MV (%)	MC Bn $	Pf_GDP (%)
Argentina	MERVAL	64.29	10.98	0.54	0.34	43.36	2.2	78.72	5.65
Australia	S&P/ASX200	51.93	11.24	0.48	0.32	17.43	1.2	856.28	44.31
Austria	ATX	63.91	17.37	0.51	0.33	20.36	1.48	84.79	33.08
Belgium	BEL20	49.79	2.31	0.48	0.23	10.5	1.35	243.35	60.93
Bulgaria	SOFIX	78.74	27.37	0.61	0.49	33.14	1.83	5.89	1.99
Canada	S&P/TSX	62.22	6.98	0.48	0.28	17.36	1.24	1366	54.54
Croatia	CROBEX	70.6	12.35	0.56	0.38	41.93	1.59	18.45	5.52
Czech Republic	PX50	64.55	5.68	0.51	0.33	20.5	3.3	34.07	10.29
Denmark	OMXC20	58.11	2.18	0.48	0.27	10.43	1.34	163.74	52.9
Egipt	EGX30	80.95	59.43	0.57	0.53	66.5	1.8	61.07	2.51
Estonia	OMXT	90.38	39.8	0.61	0.52	17.5	1.84	3.13	13.47
Finland	OMXH25	62.72	5.59	0.49	0.31	10.38	1.64	202.56	107.36
France	CAC40	45.93	0.05	0.44	0.22	21.14	1.54	1694	52.11
Germany	DAX	56.47	0.07	0.48	0.29	15.71	1.61	1300	41.34
Grecee	ATHEX20	70.1	15.88	0.51	0.32	29.5	1.79	115.47	14.46
Hungary	BUX	65.56	16.08	0.51	0.37	24.28	3.11	23.85	12.31
India	BSE100	68.45	17.09	0.53	0.4	38.21	1.88	725.09	12.53
Indonesia	IDX	81.75	2.25	0.54	0.38	53.21	1.69	152	9.55
Irland	ISEQ	64.18	7.98	0.49	0.29	16.14	1.52	92.52	573.15
Israel	TA100	70.83	5.38	0.51	0.33	29.14	1.33	126.61	35.94
Japan	NIKKEI225	61.04	32.55	0.49	0.4	20.36	1.59	3616	25.99
Malaysia	KLCI	84.88	59.56	0.57	0.54	67.14	1.32	237.99	25.76
Mexico	IPC	67.25	32.25	0.51	0.37	49.93	1.53	267.83	12.77
Netherlands	AEX	53.71	0.26	0.48	0.26	13.07	1.58	599.22	136.43
Norway	OSEBX	58.22	2.7	0.49	0.26	9.21	1.58	171.92	65.58
Oman	MSM30	92.73	10.63	0.65	0.43	71.43	1.18	12.32	7.01
Peru	IGBVL	86.89	49.52	0.6	0.54	43.93	1.43	49.12	16.46
Philippines	HSBC	71.66	22.77	0.53	0.32	37.93	1.58	80.86	9.47
Poland	WIG	50.23	1.65	0.51	0.24	21.64	1.85	100.42	5.5
Portugal	PSI20	76.11	15.62	0.55	0.39	15.64	1.41	73.21	34.4
Romania	BET	70.01	45.04	0.57	0.45	42.79	1.85	17.43	1.72
Russia	RTS	77.28	9.37	0.54	0.36	70.57	2.74	560.94	12.87

Country	Index	GS (%)	AVR (%)	GHE	IE	Press	MV (%)	MC Bn $	Pf_GDP (%)
South Korea	KOSPI	72.99	1.78	0.49	0.34	29.5	1.88	647.67	25.08
Spain	IBEX35	50.91	0.07	0.49	0.22	21.43	1.51	932.87	31.25
Switzerland	SMI	55.2	1.25	0.46	0.27	10.93	1.27	915.44	214.55
Thailand	SET	77.5	17.44	0.54	0.43	45.57	1.53	145.74	181.8
Tunisia	TUNINDEX	89.65	60.7	0.64	0.55	77.38	0.52	5.18	4.54
Turkey	ISE100	66.46	6.68	0.52	0.41	54	1.85	157.26	5.64
U.K.	FTSE100	43.59	2.44	0.43	0.23	18.93	1.33	2800	99
U.S.A.	S&P500	47	20.51	0.45	0.32	16.36	1.36	15849	43.11
Venezuela	IBC	79.24	36.76	0.58	0.46	63.27	1.53	7.56	2.16

Source: author's calculations.
Note: The first column presents the analyzed countries; the second column indicates the index representative for each country. The percentages of rolling windows in which the MDS hypothesis is rejected are reported in the third (for the GS test) and forth (for the AVR test) columns. The fifth column contains the Hurst exponent estimated through the GHE test. The values of the Efficiency Index (eq. (6)) are in the sixth column. The last four columns present the exogenous variables employed in the panel regressions, namely press, market volatility, market capitalization (in billions of USD) and the share of foreign portfolio investment in GDP. All these variables are explained below.

In this study we employed the following variables:

Press freedom ($Press_{i,t}$) – as proxy for press freedom we use the ratings established annually by Freedom House. They are determined based on scores assessed to a set of 23 questions that try to capture the different ways in which pressure can be exert on the flow of information and the ability to broadcast without fear of repercussions. Issues considered include the legal environment, the degree of control over news content, political influences on transmission and access to information, the ability of the public to access various sources of information, economic pressures on content and the dissemination of news. The ratings reflect not only government actions and policies, but also the behavior of the press itself in more restrictive environments. Each country obtains a score[4] between 0 (most free) and 100 (least free) which serves to designate its state as regards press freedom: free (0-30 points), partly free (31-60 points) or not free (61-100 points). Of the 41 countries analyzed in this study, 24 are free, 11 partly free and 6 not free, with Norway at the top of the ranking and Tunisia at the bottom. It is important to note that since 2012, Tunisia has moved from the 'not free' to 'partly free' category. The Constitution's new draft gives greater importance to freedom of expression while the repression of journalists is declining. However, the authorities have increased the number of legal cases against journalists using unreformed libel laws and exorbitant fees for renewal of licenses. Of the six countries where the press is not free, four are of Islamic origin (Egypt, Malaysia, Oman and Tunisia), while the other two are Russia and Venezuela. In the case of Venezuela, the new president continued his predecessor's efforts to control the media, while the media environment in Russia is distinguished by actions to prosecute independent journalists, impunity for the physical harassment of journalists and continuous state control over almost all traditional media outlets.

[4] For more methodological details, see http://www.freedomhouse.org/ report/freedom-press-2014/ methodology.

The share of foreign portfolio investment in GDP ($Pf\_GDP_{i,t}$) – the first control variable is a *de facto* measure of the degree of market openness and quantifies the presence of foreign investors in the market. The foreign portfolio investments have an impact on stock prices because the foreign investors hold information that is not yet incorporated into prices, or have a superior ability to process information. Todea & Pleșoianu (2013) find a direct and significant relation between foreign portfolio investment and efficiency, regardless of considering short or long run dependence. Foreign investors will hold only domestic stock if their returns are more attractive than those of external stock (Dornbusch, 1988) because they are concerned about the inherent risks such as macroeconomic and political instability, corruption, war, and so on (Senbet & Otchere, 2010). The data for portfolio investment is obtained from the database of Lane and Milesi-Ferretti. We consider both portfolio equity assets and portfolio equity liabilities. The top 10 positions in the ranking are dominated by European stock markets (with two exceptions – Thailand and Canada ranked second and ninth place). The least preferred stock market by foreign investors is the Romanian market, followed at a short distance by the Bulgarian market.

Market capitalization ($MC_{i,t}$, in logarithmic form) – is the second control variable used as a proxy for market size. A high market capitalization indirectly reflects the level of investors' participation in that market and we expect this to have a positive impact on informational efficiency.

Volatility ($MV_{i,t}$) – the third control variable is measured as the standard deviation of daily returns of stock markets in the interval t. As regards the sign of the link between volatility and efficiency there is no consensus in the literature. In the sample analyzed the emerging markets are more volatile than the developed markets, with few exceptions: the stock markets from Tunisia, Oman, Peru, Philippines, Mexico, Thailand and Venezuela which, although an apparently attractive alternative for risk aversion investors, do not provide high freedom of information.

For the endogenous variable, $Efficiency_{i,t}$, we use four proxies:

- $Efficiency_{i,t} = log\big(Percent\ AVR_{i,t}/\big(1 - Percent\ AVR_{i,t}\big)\big)$, when we account for linear dependencies only;
- $Efficiency_{i,t} = log\big(Percent\ GS_{i,t}/\big(1 - Percent\ GS_{i,t}\big)\big)$, when we consider just the nonlinear dependencies;

In this two cases we apply a logistic transformation to $Percent$ which is bounded within the interval $(0; 1)$, so that $Efficiency_{i,t}$ takes values between $-\infty$ and $+\infty$.

- $Efficiency_{i,t} = \big|GHE_{i,t} - 0{,}5\big|$, when we investigate the long memory;
- $Efficiency_{i,t} = IE_{i,t}$, when we employ the generalized measure of efficiency proposed by Kristoufek and Vosvrda (2013).

Figure 1 presents graphically the deviation from efficiency for the all of the proxies used to assess the informational efficiency.

The centers of the circle represent no deviation from the efficient market. The further the red line is from the center, the higher the deviation. The figures are rescaled to make the results more obvious. From the Efficiency Index, we find that France, Spain and Belgium have the most efficient stock markets, whereas Malaysia, Peru and Tunisia have the least efficient ones. To see the contribution of the partial measures of the Index to the overall ranking, we calculate Spearman's rank correlation. For the

linear dependencies and the long-term memory, the rank correlations are 0.44 and 0.36, respectively, while for the nonlinear component the rank correlations is 0.86. Therefore, it seems that the nonlinear dependencies are the main driver of the potential inefficiency of stock markets. This could have been conceive from the high percentages of rolling windows in which the null hypothesis of MDS of the GS test is rejected and also from the average values of the Hurst exponents which fluctuate around 0.5, with small deviations downwards in the case of developed stock markets and upwards for the emerging ones. In practice, it is hard to believe that stock indices would be persistent as such persistence would be quickly arbitraged out by profit-seeking traders (Kristoufek, 2014).

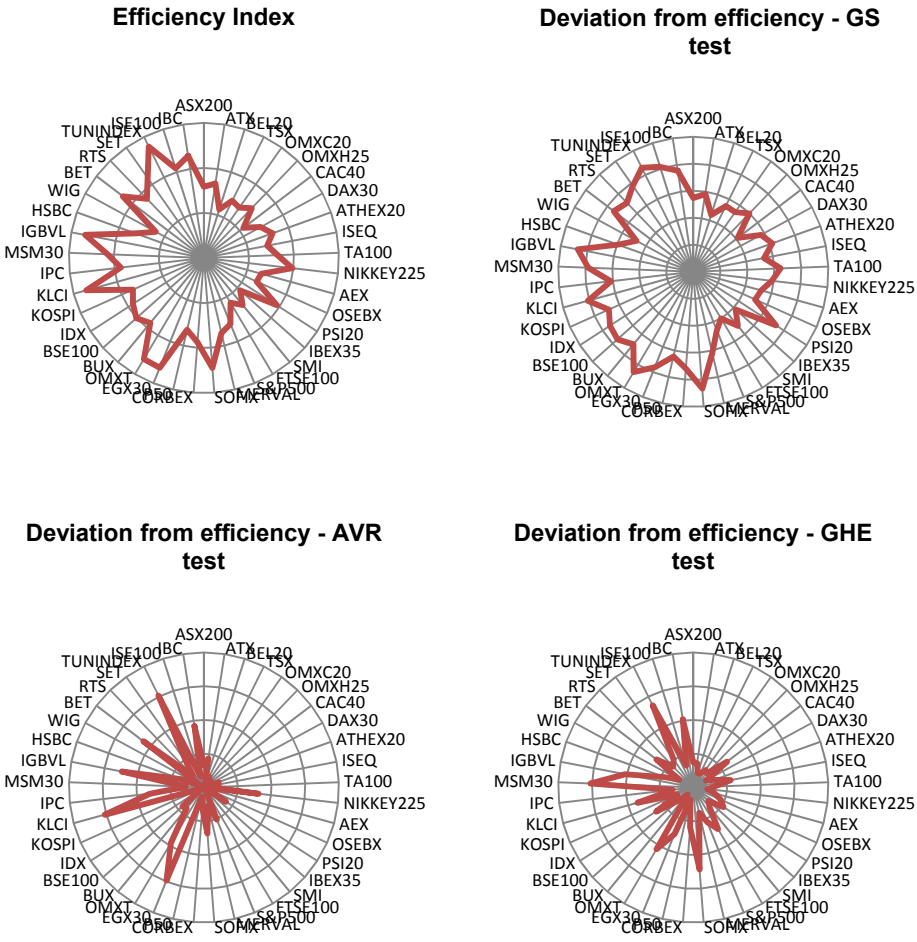


Fig. 1. Deviation from efficiency – Efficiency Index, GS, AVR and GHE tests
Source: author's calculations

Main results

Table 2 presents the results of panel regressions in which we included all four proxies of informational efficiency. Since the dependent variable ($Efficiency_{i,t}$) is an inverse measure of informational efficiency and the independent variable ($Press_{i,t}$) is an inverse measure of press freedom the positive sign of the estimated parameter of the variable $Press_{i,t}$ indicates a significant direct link between informational efficiency and freedom of the press. This suggests that an independent press increases the stock prices' ability to incorporate all available information. Regardless of how we estimate the efficiency the relation remains significant and increases in intensity when we consider only the short-term behavior of returns. Because the dependent variable is an inverse measure of informational efficiency for country *i* in the interval *t*, the negative sign of the estimated parameters indicates a direct relation between the informational efficiency and the exogenous variables

Table 2. Press freedom and efficiency – main results

Efficiency	**IE**	**GS**	**AVR**	**GHE**
Press	0.0022*** (3.99)	0.0147*** (5.87)	0.0193*** (2.70)	0.0009*** (6.26)
MV	-5.1382*** (-3.66)	-40.3819*** (-4.25)	-32.7614** (-2.27)	-1.7448*** (-3.59)
MC	-0.0258*** (-3.92)	-0.2457** (-2.51)	-0.2514 (-1.22)	-0.0026 (-0.51)
Pf_GDP	-0.0052 (-1.37)	-0.0114 (-0.30)	-0.0914 (-1.50)	0.0030* (1.67)
Constant	1.0262*** (5.87)	0.6725*** (3.78)	-1.5944*** (-4.51)	0.0462*** (4.55)
Prob > F	0.0001	0.1444	0.0000	0.2198
Prob > chi-square	0.0058	0.2895	0.0001	0.1265
xtoverid	0.1033	-	0.1190	-
Cross-section effects	Random	None	Random	None
R^2	0.2904	0.2297	0.1549	0.2123

Source: author's calculations.

The negative sign of the other estimated parameters indicates a direct link between the informational efficiency and the control variables since $Efficiency_{i,t}$ is an inverse measure of informational efficiency. The relation is significant in case of volatility and market capitalization. The direct link between efficiency and market capitalization is in line with our expectations and the theoretical literature: the higher the degree of development of stock markets (the higher the market capitalization) the faster is their response to new information. The direct relation between volatility and efficiency is consistent with Sentana and Wadhawani's (1992) model prediction which sustains that during volatile periods positive feedback traders exert a greater influence on price movements, resulting a higher degree of predictability. $Pf\_GDP_{i,t}$

is the only insignificant variable, with one exception: when the degree of informational efficiency was estimated only on the basis of long-term behavior of returns. In this case, the relation between efficiency and the degree of market openness is an indirect one suggesting that the presence of investors in the market induces long memory. One possible explanation is based on the fact that the interaction between investors with different investment horizons generates various effects like volatility cluster or trend persistence.

Robustness checks

We noticed that the dependent variable, $Efficiency_{i,t}$, regardless of how it is defined in this study, does not follow a normal distribution, but is closer to a beta distribution. The beta distribution is defined on the interval $[0;1]$ by two positive parameters α and β which do not correspond directly to either the mean or variance of the distribution, but appear as exponents of the random variable and control the form of the distribution. Furthermore, the mean and variance of a beta distribution are functions of the two parameters, and therefore estimating α and β by maximum likelihood as a function of the whole set of covariates should generate better estimates of the data.

To investigate the relationship between press freedom and informational efficiency with this method, the endogenous variable should take values in the interval $[0;1]$. Thus, when we took into account only the linear correlations $Efficiency_{i,t} = Percent\ AVR$ and we considered the nonlinear correlations $Efficiency_{i,t} = Percent\ GS$. The other two proxies remain unchanged, respectively $Efficiency_{i,t} = IE_{i,t}$ and $Efficiency_{i,t} = \left|GHE_{i,t} - 0{,}5\right|$, but we applied a transformation in the end so that the variables take values between 0 and 1. The results in Table 3 confirm the significant direct link between press freedom and informational efficiency, and between efficiency and two of the control variables - market capitalization and volatility. As in the previous case, the presence of investors matters only in the long term.

Table 3. Press freedom and efficiency – robustness tests

Efficiency	IE	GS	AVR	GHE
Press	0.0146** (5.58)	0.0169*** (4.85)	0.0147*** (2.69)	0.0163*** (6.88)
MV	-29.3714*** (-3.33)	-46.5679*** (-3.94)	-23.2797 (-1.25)	-25.3091*** (-2.69)
MC	-0.1299*** (-4.91)	-0.4185*** (-2.96)	-0.1462 (-0.55)	-0.0104 (-0.09)
Pf_GDP	-0.0367 (-0.80)	-0.0125 (-0.21)	0.0586 (0.33)	0.0665* (1.79)
Constant	3.2522*** (4.55)	5.0102*** (5.39)	-0.8969** (-2.12)	-2.4438*** (-12.27)
Wald chi-square	93.40	50.22	10.49	55.25

Source: author's calculations.

4. Conclusions

To the best of our knowledge this study is the second (after Kim et al., 2014) to investigate the relationship between informational efficiency and press freedom on a sample of 41 stock markets over the period 1999 - 2012. Our major contribution is the use of an Efficiency Index proposed by Kristoufek and Vosvrda (2013) which combines partial measures of efficiency controlling for different types of correlations (short term - linear and nonlinear - and long term). In the simplest approach, an efficient market is a market in which there is no correlation structure of returns. Thus, we can determine the expected values of long memory and of percentage of windows in which linear or nonlinear dependencies occur for an efficient market to construct an efficient measure based on distance from the efficient market state. The empirical results indicate that nonlinear dependencies occur with greater intensity than the linear or the long term dependencies. But regardless of how we quantify the degree of informational efficiency, we find a direct relation between press freedom and efficiency which is confirmed by the robustness tests also. Market capitalization and volatility are two other determinants of efficiency whereas the degree of market openness has influence only on the long-run by generating long memory in series of returns. These results warrant the attention of investors to choose the best trading strategy (active or passive), of regulatory authorities to optimally design the trading protocols and of policymakers to encourage the freedom of expression with positive implications on the allocation of investment resources.

Acknowledgements

This work was co-financed from the European Social Fund through Sectoral Operational Programme Human Resources Development 2007-2013, project number POSDRU/159/1.5/S/142115 „Performance and Excellence in Doctoral and Postdoctoral Research in Romanian Economics Science Domain”.

References

Barabasi A.L., Vicsek T. (1991) Multifractality of self-affine fractals, *Physical Review A*, 44, 2730-2733.

Barunik J., Kristoufek L. (2010) On Hurst exponent estimation under heavy-tailed distributions, *Physica A*, 389, 3844-3855.

Bernard V.L., Thomas J.K. (1989) Post-Earnings-Announcement Drift: Delayed Price Response or Risk Premium?, *Journal of Accounting Research*, 27, 1-36.

Bhattacharya U., Daouk H., Jorgenson B., Kehr C.H. (2000) When an Event is Nor an Event: The Curious Case of an Emerging Market, *Journal of Financial Economics*, 55, 69-101.

Brunetti A., Weder B. (2003) A free press is bad news for corruption, *Journal of Public Economics*, 87, 1801-1824.

Cajueiro D.O., Gogas P., Tabak B.M. (2009) Does financial market liberalization increase the degree of market efficiency? The case of the Athens stock exchange, *International Review of Financial Analysis*, 18, 50-57.

Campbell J.Y., Lo A.W., MacKinlay A.C. (1997). The Econometrics of Financial Markets. *Princeton: Princeton University Press.*

Charles A., Darné O. (2009) Variance-ratio tests of random walk: an overview. *Journal of Economic Surveys*, 23, 503-527.

Charles A., Darné O., Kim J.H. (2011) Small sample properties of alternative tests for Martingale difference hypothesis, Economics Letters, 110 (2), 151-154.

Chen G., Cheng L.T.W., Gao N. (2005) Information Content and Timing of Earnings Announcements, *Journal of Business Finance and Accounting*, 32(1), 65-95.

Choi I. (1999) Testing the random walk hypothesis for real exchange rates, Journal of Applied Econometrics, 14, 293-308.

Di Matteo T. (2007) Multi-scaling in finance, *Quantitative Finance*, 7(1), 21-36.

Di Matteo T., Aste T., Dacorogna M. (2005) Long-term memories of developed and emerging markets: Using the scaling analysis to characterize their stage of development. *Journal of Banking and Finance*, 29, 827-851.

Dornbusch R. (1988) Balance of Payments Issues in Dornbusch R., Leslie F., Helmers C.H. (eds.), The Open Economy: Tools for Policy Makers in Developing Countries, EDI Series in Economic Development, The World Bank, *Oxford University Press*.

Escanciano J.C., Lobato, I.N. (2009) Testing the Martingale Hypothesis, In Patterson K. and Mills TC (eds.), *Palgrave Hand-book of Econometrics*, Palgrave, MacMillan.

Escanciano J.C., Velasco C. (2006) Generalized spectral tests for the Martingale difference hypothesis, *Journal of Econometrics*, 134, 151-185.

Fama E.F. (1970) Efficient capital markets: a review of theory and empirical work, *Journal of Finance*, 25, 383-417.

Freedom House (2014) 2014 Freedom House Report: Global and Regional Rankings, Freedom House (http://www.freedomhouse.org/).

Gong S.X., Gul F.A (2011) Chinese Media Coverage, Divergence of Opinion, and Stock Market Outcomes, Working paper.

Griffin J.M., Hirschey N.H., Kelly P.J. (2011) How Important is the Financial Media in Global Markets?, *Review of Financial Studies*, 24(12), 3941-3992.

Grossman S.J., Stiglitz J.E. (1980) On the impossibility of informationally efficient markets, *American Economic Review, 70*(3), 393-408.

Ikenberry D.L., Lakonishok J., Vermaelen, T. (1995) Market underreaction to open market share repurchases, *Journal of Financial Economics*, 39,181-208.

Ikenberry D.L., Ramnath S. (2002) Underreaction to self-selected news events: the case of stock splits, *Review of Financial Studies*, 15, 489-526.

Kim J.B., Zhang H., Li L., Tian G. (2014) Press Freedom, Externally-generated Transparency and Stock Price Informativeness: International Evidence, *Journal of Banking and Finance* (2014),
doi: http://dx.doi.org/10.1016/j.jbankfin.2014.05.023.

Kim J.H. (2009) Automatic variance ratio test under conditional heterosckedasticity, *Finance Research Economics Letters*, 6, 179-185.

Kristoufek L., Vosvrda M. (2013) Measuring capital market efficiency: Global and local correlations structure, *Physica A*, 392, 184-193.

Kristoufek L., Vosvrda M. (2014) Measuring capital market efficiency: Long-term memory, fractal dimension and approximate entropy, *European Physical Journal B*, 87, art. 162

Lane P., Milesi-Ferretti M. (2007) The External Wealth of Nations Mark II: Revised and extended estimates of foreign assets and liabilities, 1970-2004, *Journal of International Economics*, 73, 223-250

Lane P., Milesi-Ferretti M. (2014) Global Imbalances and External Adjustment after the crisis, Working paper 14/151

Lim K.P. (2008) Efficiency tests of the UK financial futures markets and the impact of electronic trading systems: a note on relative market efficiency. *Applied Economics Letters*, 16 (11): 1129-1132.

Lo A.W. (1997) Market efficiency: Stock Behaviour in Theory and in Practice. *Cheltenham: Edward Elgar Publishing Limited.*

Lo A.W. (2008) Efficient markets hypothesis. In S.N. Durlauf & L.E. Blume (Eds.), *The New Palgrave Dictionary of Economics Online* (2nd edition, doi: 10.1057/9780230226203.9780230220454). New York: Palgrave Macmillan.

Lo A.W., MacKinlay A.C. (1999) A Non-random Walk Down Wall Street. *Princeton: Princeton University Press*.

Mammen E. (1993) Bootstrap and wild bootstrap for high dimensional linear models, *The Annals of Statistics*, 21, 255-285.

Michaely R., Womack K. (1999) Conflict of interest and the credibility of underwriter analyst recommendations, *Review of Financial Studies*, 12, 653-686.

Peress J. (2014) The Media and the Diffusion of Information in Financial Markets: Evidence from Newspaper Strikes, *American Finance Association*, 69 (5), 2007-2043.

Petersen M. (2009) Estimating standard errors in finance panel data sets: comparing approaches, *Review of Financial Studies*, 22, 435-480.

Senbet L. W., Otchere I. (2010), African Stock Markets – Opportunities and Issues in Marc Quintyn and Genevieve Verdier (eds.), African Finance in the 21st Century, *Palgrave Macmillan*, International Monetary Fund.

Sentana E., Wadhwani S. (1992) Feedback traders and stock return autocorrelations: evidence from a century of daily data, *Economic Journal*, 102, 415-425.

Todea A., Pleșoianu A. (2013) The influence of foreign portfolio investment on informational efficiency: Empirical evidence from Central and Eastern European stock markets, *Economic Modelling*, 3, 34-41.

Todea A., Zoicaş-Ienciu A. (2008) Episodic dependencies in Central and Eastern Europe stock markets, *Applied Economics Letters*, 15, 1123-1126.

Womack K.L. (1996) Do brokerage analysts' recommendations have investment value?, *Journal of Finance*, 51 ,137-168.

Wooldridge J.M. (2002) Econometric Analysis of Cross Section and Panel Data. London: MIT Press, Cambridge, Massachusetts and London, England.

THE ANALYSIS OF FORECASTS ACCURACY FOR MACROECONOMIC VARIABLES IN ROMANIA

Mihaela SIMIONESCU[*]
Institute for Economic Forecasting of the Romanian Academy, Romania

Abstract. The main objective of this study is to select the most accurate forecasts for several macroeconomic indicators in Romania (GDP deflator, GDP in comparable prices, inflation rate, private consumption, unemployment rate, exports rate, exchange rate). A comparative analysis was developed for the predictions provided by two experts in forecasting (E1 and E2) on the horizon from 2004 to 2013. The selection and the use of the best forecast will improve the strategies of National Plan of Development for Romania. Moreover, the assessment was made also separately in pre-crisis period and during the economic crisis. The accuracy tests provided contradictory results. Some of these are also different from the results given by U1 Theil's coefficient. Therefore, the human judgment intervened to combine the information of the two types of methods used in assessing the accuracy (U1 coefficient and accuracy tests). According to this approach, E1 provided most accurate predictions on all horizons.

JEL Classification: C10, C53, E17

Keywords: forecasts, accuracy, Dobrescu model, economic crisis, U1 Theil's coefficient

1. Introduction

The main goal of this study is to establish which expert provided the most accurate predictions of macroeconomic indicators for Romania. Therefore, two forecasters were selected (Centre for Macroeconomic Forecasting that made up Dobrescu model and an expert in forecasting that did not use any econometric model) and seven main macroeconomic variables were selected: GDP deflator, GDP in comparable prices, inflation rate, private consumption, unemployment rate, exports rate, exchange rate.

In Romania there are very few studies that treated the problem of forecasts accuracy. Excepting some studies of Simionescu (2013), there are not deep preoccupations for prediction accuracy analysis because the researchers are more

[*] Corresponding author. Address: 13, Calea 13 Septembrie, District 5, Bucharest., Tel. +004021.318.81.48, Email: mihaela_mb1@yahoo.com

interested in constructing some forecasts. The topic has a huge importance for a country. Only by choosing the institute with the most accurate predictions, the policy making decision will improve. The government, the National Bank and other institutions are directly interested by the use of the most accurate forecast. Moreover, the forecaster should understand if it is necessary to advance more efforts for improving the forecasting process. A recent study of Dobrescu (2014) tried to assess the accuracy for the prognoses provided by Dobrescu macromodel and National Commission for Prognosis.

The literature is oriented to the comparison of forecasts made be international organizations or to the comparison of these predictions with those made by national forecasters. Therefore, this study brings as novelty the comparison between two national institutes of forecasting from Romania. The accuracy assessment is made by the U1 statistic of Theil and some accuracy tests. The two methods conduct us in many cases to different results. Therefore, the subjective judgment was introduced and the results were different from those of the objective model. It seems that Dobrescu model predicted better all the macroeconomic variables. The introduction of this judgment is a novelty in literature, covering the limits of the quantitative methods. There are strong chances that Dobrescu model provides better forecasts for the next years.

In Romania, the National Plan for Development (NPD) is the main instrument for reducing the disparities from the social and economic point of view with respect to the European Union. NPD is a specific concept for economic and social cohesion and follows the social and economic development of Romania in accordance with the Cohesion Politics of European Union. The NPD strategy is based on macroeconomic forecasts provided by the National Commission for Prognosis. However, in Romania more public forecasters exist and it is important to choose the predictions with the highest accuracy. This fact will help Romania in achieving the goals of NPD, among them being the increase of competitiveness.

2. Literature review

Many of the international institutions build own macroeconomic forecasts for different countries. Most of the comparisons between predictions take into account these institutions anticipations (European Commission, OECD, IMF, World Bank, SPF etc.) and those of other international organizations, the accuracy assessment being made. Only few studiesmake the comparison with official forecast of the government. In general, the prediction errors for these institutions are found to be large non-systematic. However, other providers of forecasts are statistical institutes, ministries of finance, and private companies like banks or insurance companies.

International Monetary Fund (IMF) and Organisation for Economic Co-operation and Development (OECD) publish twice per year predictions for macroeconomic variables in spring and autumn. Vogel (2007) showed that the predictions for the current year are more accurate than those for the next year, checking this assumption for OECD and IMF forecasts.

Literature usually makes comparisons between OECD and IMF forecasts and Consensus Economics ones or private predictions. The accuracy is evaluated according to different criteria: forecasts errors and associated accuracy measures, comparisons with naïve predictions that is based on random walk, directional accuracy evaluation.

Three international institutions (European Commission- EC, IMF and OECD) made predictions using macroeconomic models, but these forecasts failed to anticipate the downturn from 2007. Therefore, Bezemer (2009) considered the replacement with account models that could forecast the economic crisis.

Loungani (2000) observed a high similarity between private predictions and those of IMF, OECD and the World Bank for 63 industrialized and developing countries on the horizon from 1989 to 1998. One-year-ahead forecasts made by OECD and national institutes for inflation rate and GDP growth rate in 13 European countries are assessed by Öller & Barot (2000). In their study, the authors showed that inflation forecasts are more accurate than GDP growth rate predictions. For GDP forecasts made by IMF and OECD, Pons (2000) analyzed the size and nature of errors for G7 countries. Batchelor (2001) compared the accuracy of predictions made by OECD and IMF for G7 countries, the benchmark being the forecasts' mean of Consensus Economics. The private forecasters provided more accurate predictions for most of the macroeconomic forecasts. For G7 the government deficit forecasts were compared on accuracy criterion the alternative predictions being provided by European Commission, IMF and OECD, Artis and Marcellino (2001) recommending the use of an asymmetric loss function. Glück & Schleicher (2005) compared the forecasts performance of IMF with that of OECD, evaluating the errors between G7 countries.

Krkoska & Teksoz (2005) compared the changes in the EBRD (European Bank for Reconstruction and Development) predictions for transition countries with those made byother institutions (commercial and academic forecasters). They showed that the EBRD made on average higher changes in its earlier forecasts. Later, Krkoska & Teksoz (2007) showed for 25 transition countries that the EBRD predictions during 1994-2004 improve in accuracy with the progress in transition. These predictions accuracy for late GDP is better than of other institutions with around 0.4 percentage points. The Russian crisis seems to be the only structural break.

The European Commission's forecasts analyzed on the horizon from 1998 to 2005 are comparable in terms of accuracy with those of Consensus, IMF and OECD for variables like inflation rate, unemployment rate, GDP, total investment, general government balance and current account balance as Melander et al. (2007) stated.

Abreu (2011) assessed the forecasts accuracy for predictions made by international organizations like IMF, European Commission and OECD and by private institutions (Consensus Economics and The Economist). The author made also the assessment of directional accuracy. Forecasters from Netherlands used the macroeconomic model of the Netherlands Bureau for Economic Policy Analysis (CPB) to make predictions that were compared to experts' anticipations. The results over the period 1997-2008 indicated that CPB model provided superior forecasts in terms of accuracy, the results being presented by Franses *et* al. (2011).

González *et* al. (2012) studied the forecasts accuracy of the predictions provided by European Commission before and during the recent economic crisis. They compared these forecasts with those provided by Consensus Economics, IMF and OECD. The Commission's forecasts errors have increased because of the low accuracy from 2009 for variables as GDP, inflation rate, government budget balance, and investment.

For OECD and three experts predictions of Germany real GDP rate and inflation rate, Heilemann & Stekler (2013) evaluated the accuracy, but they did not observed an improvement in accuracy. The private experts in forecasting placed their

predictions with three months away from IMF and OECD as Frenkel et al. (2013) observed. The private inflation predictions, including Survey of Professional Forecasters forecasts, were outperformed by Greenbook ones, according to Liu and Smith (2014).

In Romania, there are too few studies regarding the forecast accuracy comparisons, some works in this field belonging to Dobrescu (2014) and Simionescu (2013). Some accuracy measures were described by Ghizdeanu (2010). Dobrescu model provided the best unemployment rate predictions during 2001-2012.

3. Methodology. Forecasts accuracy tests

A. *Morgan-Granger-Newbold test (MGN test)*

Let us consider the actual values of a variable $\{y_t\}, t = 1,2, \dots, T$ and two predictions for it $\{\hat{y}_{t1}\}, t = 1,2, \dots, T$and $\{\hat{y}_{t2}\}, t = 1,2, \dots, T$. The prediction errors are computed as: $e_{it} = \hat{y}_{it} - y_t$, i=1,2. The loss function in this case is calculated as:

$$g(y_t, \hat{y}_{it}) = g(\hat{y}_{it} - y_t) = g(e_{it}) \quad (1)$$

In most cases this function is a square-error loss or an absolute error loss function.

Two predictions being given, the loss differential is:

$$d_t = g(e_{1t}) - g(e_{2t}) \quad (2)$$

The two predictions have the same degree of accuracy if the expected value of loss differential is 0.

The assumptions are formulated as:

$$H_0: E(d_t) = 0, \text{for any } t$$

$$H_1: E(d_t) = \mu \neq 0$$

This test works if the loss function is quadratic and the predictions errors are: independent, Gaussian, zero mean and contemporaneously uncorrelated. Granger and Newbold test uses these assumptions, excepting the lack of contemporaneous correlation. This test

$$x_t = e_{1t} + e_{2t}$$

$$z_t = e_{1t} - e_{2t} \quad (3)$$

The accuracy equality of forecasts is equivalent to null covariance of $x_t$and z_t, where $cov(x_t, z_t) = E(e_{1t}^2 - e_{2t}^2)$. The MGN test statistic follows a t distribution (T-1 degrees of freedom) and it is calculated:

$$MGN = \frac{r}{\sqrt{\frac{1-r^2}{T-1}}} \quad (4)$$

In this case r is defined as:

$$r = \frac{x^{'}z}{\sqrt{\frac{x^{'}x}{z^{'}z}}} \quad (5)$$

x, z- vectors (dimension Tx1)

MGN test is used only for one-step-ahead predictions with errors following a white noise. The test must have a squared error loss.

B. ***Harvey-Leybourne-Newbold test (HLN test) makes a regression with variables from MGN test. It checks if the slope is zero or not.***

$$x_t = \beta z_t + \varepsilon_t \tag{6}$$

It uses the same MGN statistic:

$$MGN = \frac{b}{\sqrt{\frac{s^2}{z'z}}} \tag{7}$$

$$b = \frac{x'z}{z'z} \tag{8}$$

$$s^2 = \frac{(x-bz)'(x-bz)}{T-1} \tag{9}$$

For heavy-tailed distribution of forecast errors, HLN test is modified, the statistic having the following form:

$$MGN^* = \frac{b}{\sqrt{\frac{\sum z_t^2 \hat{\varepsilon}_t^2}{(\sum z_t^2)^2}}} \tag{10}$$

$\hat{\varepsilon}_t$- OLS residuals at moment t

The variance of b is estimated using a White-correction for heteroskedasticity.

The initial MGN test and HLN test are limited to one-step-ahead forecasts.

C. ***Meese and Rogoff test (MR test)***

The MR test admits that the errors are contemporaneously and serially correlated, assuming squared error loss function.

$$\sqrt{T}\hat{\gamma}_{xz}(0) \to N(0, \varphi)$$

$$\hat{\gamma}_{xz}(0) = \frac{x'z}{T}$$

$$\varphi = \sum_{k=-\infty}^{\infty} [\gamma_{xx}(k)\gamma_{zz}(k) + \gamma_{xz}(k)\gamma_{zx}(k)] \tag{11}$$

$$\gamma_{xz}(k) = cov(x_t, z_{t-k}),\ \gamma_{xz}(k) = cov(z_t, x_{t-k})$$

$$\gamma_{xx}(k) = cov(x_t, x_{t-k}),\ \gamma_{zz}(k) = cov(z_t, z_{t-k})$$

$$\hat{\varphi} = \sum_{k=-m(T)}^{m(T)} \left(1 - \frac{|k|}{T}\right) [\hat{\gamma}_{xx}(k)\hat{\gamma}_{zz}(k) + \hat{\gamma}_{xz}(k)\hat{\gamma}_{zx}(k)]$$

The MR test statistic is:

$$MR = \frac{\hat{\gamma}_{xz}(0)}{\sqrt{\frac{\hat{\varphi}}{T}}} \tag{12}$$

D. *Diebold-Mariano asymptotic test (DM test)*

For DM the null assumption of equal accuracy checks if the expected value of differential loss is zero: $E(d_t) = 0$. The covariance stationary been given, the distribution of differential average follows a normal distribution. The DM statistic under null hypothesis is:

$$S_1 = \frac{\bar{d}}{\sqrt{\hat{V}(\bar{d})}} \to N(0,1)$$

$$\bar{d} = \frac{\sum_{t=1}^{n} d_t}{n} \quad (13)$$

$$\hat{V}(\bar{d}) = \frac{\hat{\gamma}_0 + 2\sum_{k=1}^{n-1} \hat{\gamma}_k}{n}$$

$$\hat{\gamma}_k = \frac{\sum_{t=k+1}^{n} (d_t - \bar{d})(d_{t-k} - \bar{d})}{n}$$

Instead of estimating the variance we can study the prediction error auto-covariances. This test does not suppose restrictions like forecast errors with normal distribution, independent and contemporaneously uncorrelated predictions errors.

E. *Standard sign test*

There is a class of non-parametric tests for comparing the accuracy of forecasts. The standard sign test is based on the restriction of independent and identically distributed loss differential data series. Under the null assumption of null median of loss-differential repartition, the number of positive loss-differentials (N) follows a binomial distribution. T is the number of trials and the probability of success is 0.5. The test statistic is:

$$SIGN = \frac{(N - 0.5T)}{0.5\sqrt{T}} \to N(0,1) \quad (14)$$

F. *Wilcoxon's signed rank test*

Wilcoxon's signed rank test is based on the sum of the ranks for the absolute values of positive prediction differentials:

$$WSR = \sum I(d_t > 0) rank(|d_t|)$$

$$I(d_t > 0) = 1 \; if (d_t > 0)$$

For T going to infinity, under the null assumption, the Wilcoxon's signed rank test has the following statistic:

$$\frac{SR - T(T+1)/4}{\sqrt{\frac{T(T+1)2T+1}{24}}} \to N(0,1) \quad (15)$$

G. *Pesaran and Timmermann test*

Pesaran and Timmermann test (PT test) is based on the sign of the dependent variable and on the number of correct predicted signs. The distributions of the variables are independent, continuous and unchanged in time.

$p =$ proportion of times that the predictand sign is correctly anticipated

$$\pi_1 = \Pr(y_t > 0)$$

$$\pi_2 = \Pr(\hat{y}_t > 0)$$

$p_1 =$ proportion of times that real y is greater than 0

$p_2 =$ proportion of times that forecast y is greater than 0

Under the null assumption that the values for predictions do not forecast the sign of predictant, the number of correct sign forecasts follows a binomial distribution (T trials and probability of success $\pi_* = \pi_1\pi_2 + (1-\pi_1)(1-\pi_2)$. For unknown π_1 and π_2, we compute $p_* = p_1p_2 + (1-p_1)(1-p_2)$. For known π_1 and π_2, the PT statistic is:

$$PT = (p - \pi_*)/\sqrt{\frac{\pi_*(1-\pi_*)}{T}} \quad (16)$$

For unknown π_1 and π_2, the test statistic is:

$$PT' = (p - p_*)/\sqrt{\widehat{var}(p) - \widehat{var}(p_*)}$$

$$\widehat{var}(p) = \frac{p_*(1-p_*)}{T} \quad (17)$$

$$\widehat{var}(p_*) = \frac{(2p_1-1)^2 p_2(1-p_2)}{T} + \frac{(2p_2-1)^2 p_1(1-p_1)}{T} + 4p_1p_2\frac{(1-p_1)(1-p_2)}{T^2}$$

4. The comparison of accuracy for alternative macroeconomic forecasts in Romania

The National Plan for Development uses forecasts for macroeconomic variables and it is essential to use the predictions with the highest accuracy. The macroeconomic forecasts in Romania are correlated with the government provisions, the national, sector and regional strategies and the trends in national and world economy. From our point of view, these correlations are not enough. An accuracy evaluation is necessary for alternative predictions. The use of the most accurate predictions will improve the assessment of the main measures of economic politics on economic growth by using the objectives of the regional and national programs for development. A better elaboration of the Plan of programs and investment objectives will be made in order to include them in multi-annual budgets.

A comparison between the forecasts based on Dobrescu's model (E1) and the subjective predictions of an expert (E2) is made using the forecasts accuracy tests on the horizon from 2004 to 2013, on the period that covers the recent economic crisis (2009-2013) and before the economic crisis (2004-2008). According to economic theory, the forecast accuracy should decrease during the crisis compared to the previous period. We will test this hypothesis by evaluating the prediction accuracy before and during the recent economic and financial crisis.

The first version of the Dobrescu model appeared in 1996, the predictions being made from 1997. The Center for Macroeconomic Forecasting (CMF) uses Dobrescu (2013) model, the last version of it being released in 2012. The integrated system of the model includes: output gap and macroeconomic production, labor market branches, capital, monetary variables, including prices, general consolidated budget, external debts, domestic absorption, balance of payment, foreign trade, the structure of the national economy, consumption of primary energy, and emissions of CO2.

In this study the accuracy of macroeconomic one-step-ahead forecasts in Romania for several variables is assessed (inflation rate, unemployment rate, export rate, exchange rate, GDP, GDP deflator and private consumption). The expert inflation rate has a tendency of slow decrease on the horizon from 2010 to 2013. Dobrescu model anticipated a decrease in the period from 2010 to 2012, for 2013 being proposed a higher inflation rate than the value predicted for 2012. The unemployment rate predictions have an obvious tendency of decrease that was perturbed in 2008 and 2009 by the anticipation of the economic crisis. A slow decrease was observed in the predictions made for GDP and GDP deflator, the lowest values being proposed for 2009 by both experts. Negative rates were anticipated for exports, only for 2013 Dobrescu model indicating a positive rate. It is interesting that during the crisis E2 anticipated a slow decrease of exchange rate while CMF predicted a constant increase of the indicator. The private consumption is in decrease according to national forecasters, but E2 predicted an increase for 2013.

For making comparisons between forecasts, the U1 Theil's indicator is used.The U statistic takes into account both positive and negative changes in a variable:

$$U_1 = \frac{\sqrt{\sum_{t=1}^{n}(a_t - p_t)^2}}{\sqrt{\sum_{t=1}^{n} a_t^2} + \sqrt{\sum_{t=1}^{n} p_t^2}} \tag{18}$$

a- the actual values
p- the predicted values
t- time
e- error (e=a-p)
n- number of time periods in the forecasts horizon

Table 1. The values of U1 Theil's coefficient for macroeconomic forecasts in Romania

Variable	Horizon: 2004-2013		Horizon: 2009-2013		Horizon: 2004-2008	
	Dobrescu model	E2	Dobrescu model	E2	Dobrescu model	E2
GDP deflator	0.0984	0.3974	0.098	0.091	0.159	0.908
Private consumption	0.0376	0.4084	0.026	0.489	0.045	0.034
GDP	0.0746	0.0737	0.084	0.081	0.065	0.067
Inflation rate	0.0101	0.0102	0.009	0.007	0.011	0.012
Unemployment rate	0.1293	0.1061	0.099	0.095	0.159	0.121
Exports rate	0.7873	0.9721	0.508	0.992	0.998	0.751
Exchange rate	0.0098	0.0205	0.025	0.048	0.007	0.032

Source: author's computations

On the overall horizon, only for GDP and unemployment rate the E2 provided better forecasts than Dobrescu's model, but the differences are insignificant for GDP. In the period before the crisis (2004-2008), E2 offered more accurate predictions than Dobrescu's model for private consumption, unemployment rate and exports rate.

In the period corresponding to actual economic crisis, according to U1 coefficient, for GDP deflator, GDP, unemployment rate and inflation rate, the E2 provided more accurate predictions than Dobrescu's model did. One reason of this failure might be the fact that the model did not taken into account all the shocks in the economy. For private consumption, exports rate and exchange rate, Dobrescu's model generated better predictions.

For GDP deflator predictions it is interesting that during the crisis period the accuracy was superior in comparison with the previous period for both forecasters. For private consumption, inflation rate, unemployment rate and exports rate, Dobrescu's model predictions are more accurate during the crisis than in the previous horizon with the same length. For inflation rate and unemployment rate, E2 provided more accurate forecasts during the crisis.

For Diebold-Mariano test the maximum lag is selected according to Schwartz criterion and the kernel is uniform. The criterion s the mean squared error and the test is applied in Stata.

The results of the accuracy tests and the proper conclusions are applied in the following table. For the final decision the results of U1 indicator were taken into account if differences were observed between forecasts.

For GDP deflator and private consumption predictions on the overall horizon, all the accuracy tests indicated that Dobrescu model is the best. Only HLN and DM test indicated that E2 forecasts for GDP are better, the other tests showing no significant differences in accuracy. For the inflation rate and unemployment rate forecasts only DM test showed that E2 provided more accurate forecasts, while the other tests indicated no differences. For the exports rate only MR test showed that there are not differences in accuracy degree, the other ones suggesting that Dobrescu model was more suitable for predicting the variable. For exchange rate non-parametric tests showed no significant differences between predictions, while the other tests recommended the use of Dobrescu model.

As we can observe, there are contradictory results between tests and between tests and U1 indicator. Therefore, we will analyze simultaneously the results and we will get a single decision regarding the superiority of the accuracy. Actually, these objective methods of assessing forecasts accuracy will be combined with human judgment.

Table 2. The results of forecasts accuracy tests (Horizon: 2004-2013)

Test	Statistic value for predictions made by:	Decision-more accurate predictions provided by:
GDP deflator		
MGN test	-6,822	Dobrescu's model
HLN test	-5,267	Dobrescu's model
MR test	-3,5054	Dobrescu's model
DM test	S(1) = -2.724 p-value = 0.0064	Dobrescu's model

Test	Statistic value for predictions made by:	Decision-more accurate predictions provided by:
Standard sign test	chi-squared = 10.821 probability = 0.0010	Dobrescu's model
Wilcon's signed rank test	z = -3.290 Prob> |z| = 0.0010	Dobrescu's model
PT test	2.2056	Dobrescu's model
Private consumption	E2	
MGN test	-21,448	Dobrescu's model
HLN test	-53,130	Dobrescu's model
MR test	-7,0172	Dobrescu's model
DM test	S(1) = -1.641 p-value = 0.1009	Dobrescu's model
Standard sign test	chi-squared = 6.223 probability = 0.0126	Dobrescu's model
Wilcon's signed rank test	z = -2.495 Prob> |z| = 0.0126	Dobrescu's model
PT test	3.0324	Dobrescu's model
GDP	E2	
MGN test	-0,700	No differences
HLN test	-3,354	E2
MR test	0,5691	No differences
DM test	S(1) = .3721 p-value = 0.7098	E2
Standard sign test	chi-squared = 0.143 probability = 0.7055	No differences
Wilcon's signed rank test	z = -0.378 Prob> |z| = 0.7055	No differences
PT test	0.9784	No differences
Inflation rate	E2	
MGN test	0,068	No differences
HLN test	0,082	No differences
MR test	0.1458	No differences
DM test	S(1) = .0118 p-value = 0.9906	E2
Standard sign test	chi-squared = 3.721 probability = 0.0537	No differences
Wilcon's signed rank test	z = 1.929 Prob> |z| = 0.0537	No differences
PT test	0.7846	
Unemployment rate	E2	
MGN test	0,631	No differences
HLN test	1,941	No differences
MR test	0,0857	No differences
DM test	S(1) = 1.051 p-value = 0.2933	E2
Standard sign test	chi-squared = 0.367 probability = 0.5449	No differences
Wilcon's signed rank test	z = 0.605 Prob> |z| = 0.5449	No differences
PT test	0.7125	No differences

Test	Statistic value for predictions made by:	Decision-more accurate predictions provided by:
Exports rate	E2	
MGN test	-39,135	Dobrescu's model
HLN test	-6,727	Dobrescu's model
MR test	0,0324	No differences
DM test	S(1) = -1.871 p-value = 0.0613	Dobrescu's model
Standard sign test	chi-squared = 9.143 probability = 0.0025	Dobrescu's model
Wilcon's signed rank test	z = -3.024 Prob> |z| = 0.0025	Dobrescu's model
PT test	2.0248	Dobrescu's model
Exchange rate	E2	
MGN test	-2,452	Dobrescu's model
HLN test	-6,851	Dobrescu's model
MR test	20,2007	Dobrescu's model
DM test	S(1) = -1.942 p-value = 0.0521	Dobrescu's model
Standard sign test	chi-squared = 0.572 probability = 0.4495	No differences
Wilcon's signed rank test	z = 0.756 Prob> |z| = 0.4495	No differences
PT test	0.5567	No differences

Note: The critical value for MGN test is 2.262
Source: author's computations

In pre-crisis period, MGN and MR tests indicates no significant differences in accuracy between the two types of forecasts for GDP deflator, while the other tests stated that Dobrescu model predicted better than E2.

MGN and DM tests recommend E2 for consumption predictions in pre-crisis period, while the other tests showed no differences. For GDP and inflation rate predictions, only DM test suggests the superiority of Dobrescu model, while all the other tests indicated the lack of significant accuracy differences. For the unemployment rate DM test recommends the E2 predictions as better, while the other tests did not identified significant differences. MR and MGN for exports rate forecasts considered that Dobrescu model is better, while the rest of accuracy tests did not identify differences. The non-parametric tests did not indicated differences in accuracy for exchange rate forecasts, while the other tests recommended the use of Dobrescu model in pre-crisis period.

Only HLN and DM test indicated that E2 forecasts for GDP deflator are better, the other tests showing no significant differences in accuracy during the crisis period. On the horizon from 2009 to 2013, Dobrescu model predicted better the private consumption, only HLN test showing no differences in accuracy. According to all the tests, excepting DM that sustains the superiority of E2 predictions during the crisis, all the other tests did not evidenced large differences. For exports rate the parametric test recommends Dobrescu model while the non-parametric one did not identified differences. Exchange rate is better predicted by Dobrescu model, according to DM test, all the other methods indicating no differences in accuracy.

Table 3. The results of forecasts accuracy tests before crisis (Horizon: 2004-2008)

Test	Statistic value for predictions made by:	Decision-more accurate predictions made by:
GDP deflator		
MGN test	-2,677	No differences
HLN test	-3,512	Dobrescu's model
MR test	0,0571	No differences
DM test	S(1) = -27.88 p-value = 0.0000	Dobrescu's model
Standard sign test	chi-squared = 6.818 probability = 0.0090	Dobrescu's model
Wilcon's signed rank test	z = -2.611 Prob> |z| = 0.0090	Dobrescu's model
PT test	3.0215	Dobrescu's model
Private consumption		
MGN test	1,978	No differences
HLN test	-35,420	E2
MR test	0,1091	No differences
DM test	S(1) = 1.848 p-value = 0.0646	E2
Standard sign test	chi-squared = 0.884. probability = 0.3472	No differences
Wilcon's signed rank test	z = 0.940 Prob> |z| = 0.3472	No differences
PT test	1.0247	No differences
GDP	E2	
MGN test	-2,057	No differences
HLN test	-2,236	No differences
MR test	-0,0173	No differences
DM test	S(1) = -.6683 p-value = 0.5039	Dobrescu's model
Standard sign test	chi-squared = 0.535 probability = 0.4647	No differences
Wilcon's signed rank test	z = -0.731 Prob> |z| = 0.4647	No differences
PT test	1.2247	No differences
Inflation rate	E2	
MGN test	0,782	No differences
HLN test	0,055	No differences
MR test	0,0899	No differences
DM test	S(1) = -3.29e+07 p-value = 0.0000	Dobrescu's model
Standard sign test	chi-squared = 3.153 probability = 0.0758	No differences
Wilcon's signed rank test	z = 1.776 Prob> |z| = 0.0758	No differences
PT test	0.4671	No differences
Unemployment rate		
MGN test	0,130	No differences
HLN test	1,294	No differences
MR test	0,0190	No differences
DM test	S(1) = 1.051 p-value = 0.2933	E2

Test	Statistic value for predictions made by:	Decision-more accurate predictions made by:
Standard sign test	chi-squared = 1.098 probability = 0.2948	No differences
Wilcon's signed rank test	z = 1.048 Prob> |z| = 0.2948	No differences
PT test	1.1497	No differences
Exports rate		
MGN test	2,076	No differences
HLN test	-4,484	Dobrescu's model
MR test	-0,0136	No differences
DM test	S(1) = -46.65 p-value = 0.0000	Dobrescu's model
Standard sign test	chi-squared = 6.818 probability = 0.0090	Dobrescu's model
Wilcon's signed rank test	z = -2.611 Prob> |z| = 0.0090	Dobrescu's model
PT test	4.032	Dobrescu's model
Exchange rate		
MGN test	-4,437	Dobrescu's model
HLN test	-4,567	Dobrescu's model
MR test	8,3052	Dobrescu's model
DM test	S(1) = -1.40e+08 p-value = 0.0000	Dobrescu's model
Standard sign test	chi-squared = 0.098 probability = 0.7540	No differences
Wilcon's signed rank test	z = 0.313 Prob> |z| = 0.7540	No differences
PT test	1.5542	No differences

Note: The critical value for MGN test is 2.776
Source: author's computations

All in all, before the crisis we can conclude that for the mentioned variables there are not large differences between Dobrescu's forecasts and E2 predictions. In this period, the economy is quite stable and it is easier to predict the future evolution.

Table 4. The results of forecasts accuracy tests for crisis period (Horizon: 2009-2013)

Test	Statistic value for predictions made by:	Decision-more accurate predictions made by:
GDP deflator		
MGN test	2,597	No differences
HLN test	-4,489	E2
MR test	-0,0066	No differences
DM test	S(1) = 7.34e+07 p-value = 0.0000	E2
Standard sign test	chi-squared = 1.844 probability = 0.1745	No differences
Wilcon's signed rank test	z = -1.358 Prob> |z| = 0.1745	No differences

Test	Statistic value for predictions made by:	Decision-more accurate predictions made by:
PT test	1.8746	No differences
Private consumption		
MGN test	-26,160	Dobrescu's model
HLN test	2,057	No differences
MR test	7,6992	Dobrescu's model
DM test	S(1) = -1.481 p-value = 0.1387	Dobrescu's model
Standard sign test	chi-squared = 6.818 probability = 0.0090	Dobrescu's model
Wilcon's signed rank test	z = -2.611 Prob> |z| = 0.0090	Dobrescu's model
PT test	2.4173	Dobrescu's model
GDP		
MGN test	0,203	No differences
HLN test	-2,060	No differences
MR test	0,4386	No differences
DM test	S(1) = 1.316 p-value = 0.1883	E2
Standard sign test	chi-squared = 0.273 probability = 0.6015	No differences
Wilcon's signed rank test	z = -0.522 Prob> |z| = 0.6015	No differences
PT test	0.9974	No differences
Inflation rate		
MGN test	1,122	No differences
HLN test	0,981	No differences
MR test	0,0064	No differences
DM test	S(1) = 1.679 p-value = 0.0931	E2
Standard sign test	chi-squared = 0.535 probability = 0.4647	No differences
Wilcon's signed rank test	z = 0.731 Prob> |z| = 0.4647	No differences
PT test	1.4517	No differences
Unemployment rate		
MGN test	0,752	No differences
HLN test	0,437	No differences
MR test	0,0211	No differences
DM test	S(1) = 1.855 p-value = 0.0636	E2
Standard sign test	chi-squared = 0.000 probability = 1.0000	No differences
Wilcon's signed rank test	z = 0.000 Prob> |z| = 1.0000	No differences
PT test	1.7842	No differences
Exports rate		
MGN test	-31,394	Dobrescu's model
HLN test	6,095	Dobrescu's model
MR test	23,0307	Dobrescu's model

Test	Statistic value for predictions made by:	Decision-more accurate predictions made by:
DM test	S(1) = -1.69e+08 p-value = 0.0000	Dobrescu's model
Standard sign test	chi-squared = 2.455 probability = 0.1172	No differences
Wilcon's signed rank test	z = -1.567 Prob> |z| = 0.1172	No differences
PT test	1.3364	No differences
Exchange rate		
MGN test	-1,070	No differences
HLN test	-2,320	No differences
MR test	-0,6751	No differences
DM test	S(1) = -1.10e+08 p-value = 0.0000	Dobrescu's model
Standard sign test	chi-squared = 3.172 probability = 0.0749	No differences
Wilcon's signed rank test	z = 1.781 Prob> |z| = 0.0749	No differences
PT test	0.8462	No differences

Note: The critical value for MGN test is 2.776
Source: author's computations

Analyzing all these results, our subjective judgment is used in order to establish what provider predicted better a variable during and before the crisis, but also on the overall horizon. The results of U1 coefficient are combined with the accuracy tests and the subjective appreciation. The results are presented in the following table:

Table 5. The final conclusions regarding the forecasts accuracy assessment

Variable	Before the crisis	During the crisis	Overall horizon
GDP deflator	Dobrescu model	No differences	Dobrescu model
Private consumption	No differences	Dobrescu model	Dobrescu model
GDP	No differences	No differences	No differences
Inflation rate	No differences	No differences	No differences
Unemployment rate	No differences	No differences	No differences
Exports rate	No differences	No differences	Dobrescu model
Exchange rate	Dobrescu model	Dobrescu model	Dobrescu model

Source: author's computations

According to our procedure, it seems that even if E2 is recommended for some predictions in certain time periods, the differences between its forecasts and Dobrescu model's ones are not significant. All in all, Dobrescu model should be used for making predictions for the seven macroeconomic variables.

These results are very useful for the future predicting process. Our assumptions are not for sure, but provide us important hints for establishing the decision process. The government could use these results in order to establish the macroeconomic policies. The central bank is also interested in these results to select the best monetary policy. It is important to emphasize that this is an empirical study and the results are applied for a specific country with specific evolutions of macroeconomic variables, this being Romania.

4. Conclusions

The evaluation of forecast accuracy at the macroeconomic level does not lack practical importance for Romania. The National Plan of Development is based on macroeconomic forecasts and has among its objectives the reduction of economic and social gaps between Romania and European Union. Nowadays, in Romania the government tries to achieve this objective and it uses the predictions of Finance Ministery that are made within the National Commission for Prognosis. Taking into account that in Romania alternative predictions are offered for the same macroeconomic indicator, it is necessary to make a discrimination and to choose the prediction with the highest accuracy. Therefore, this research proposes an accuracy analysis using real predictions offered by two providers.

In the study, we proposed to investigate the forecasts accuracy of two national providers from Romania: Dobrescu model proposed by Center for Macroeconomic Forecasting and a forecaster that did not use any econometric model. The accuracy was assessed using the U1 Theil's coefficient and the accuracy tests. The results indicated by the two methods are in most cases contradictory. Therefore, our subjective judgment had the final role in proposing the final results regarding the comparative analysis of accuracy. This judgment had an essential role, because it established that Dobrescu model provided the most accurate forecasts for all predictions of the seven variables in all the periods: during the crisis, before the crisis and on the overall horizon.

This information is very useful for government in policy making process, for Central Bank in monetary policy establishment and for other national and international institutions. Even the researchers and the public opinion are very interested in these results. This means that they will consider from the proof of history, that Dobrescu model will continue to provide better forecasts than E2. The novelty of this study is also brought by the fact that there are not analyses in the literature that compare only the national providers' forecasts. Before the crisis we can conclude that for the mentioned variables there are not large differences between Dobrescu's forecasts and E2 predictions. In this period, the economy is quite stable and it is easier to predict the future evolution.

A future direction of research would be to make comparisons between Dobrescu's predictions and European Commission anticipations or other international organizations that make forecasts for Romania.

References

Abreu I. (2011) International organisations' vs. private analysts' forecasts: an Evaluation, *Banco de Portugal*, *5*(7) : 78-83.

Artis M., Marcellino, M. (2001) Fiscal forecasting: The track record of the IMF, OECD and EC, *The Econometrics Journal*, *4*(1) : 20-36.

Batchelor R. (2001) How useful are the forecasts of intergovernmental agencies? The IMF and OECD versus the consensus, *Applied economics*, *33*(2) : 225-235.

Bezemer, D. J. (2009). No One Saw This Coming: Understanding Financial Crisis Through Accounting Models, MPRA Paper, 15892 : 1-50.

Franses P.H., Kranendonk H., & Lanser, D. (2011) One Model and Various Experts: Evaluating Dutch Macroeconomic Forecasts, *International Journal of Forecasting*, 27: 482-495.

Frenkel M, Rülke J.C., & Zimmermann L. (2013) Do private sector forecasters chase after IMF or OECD forecasts?, *Journal of Macroeconomics*, 37: 217-229

Ghizdeanu. I. (2010), Prognoză regională, Editura Mustang, Bucureşti.

Glück H., Schleicher S. P. (2005) Common biases in OECD and IMF forecasts: Who dares to be different. In *A Real Time Database for the Euro-Area workshop in Brussels*.

González Cabanillas L., Terzi A. (2012) The accuracy of the European Commission's forecasts re-examined, *Economic Papers,* 476.

Heilemann U., Stekler H. O. (2013) Has The Accuracy of Macroeconomic Forecasts for Germany Improved?, *German Economic Review*, 14: 235–253.

Krkoska L., Teksoz U. (2005) *Accuracy of growth forecasts for transition countries: assessing ten years of EBRD forecasting*.

Krkoska L., Teksoz U. (2007) Accuracy of GDP growth forecasts for transition countries: Ten years of forecasting assessed, *International Journal of Forecasting*, 23(1): 29-45.

Liu D., Smith J. K. (2014) Inflation forecasts and core inflation measures: Where is the information on future inflation?, *The Quarterly Review of Economics and Finance*, *54*(1), 133-137.

Loungani P. (2000) How Accurate Are Private Sector Forecasts? Cross-Country Evidence from Consensus Forecasts of Output Growth, *IMF Working Paper*, WP/00/77.

Melander A., Sismanidis G., Grenouilleau D. (2007) The track record of the Commission's forecasts-an update, *Directorate General Economic and Monetary Affairs (DG ECFIN),* 291.

Öller L. E., Barot B. (2000) The accuracy of European growth and inflation forecasts, *International Journal of Forecasting*, 16(3): 293-315.

Pons J. (2000) The accuracy of IMF and OECD forecasts for G7 countries, *Journal of Forecasting*, 19(1): 53-63.

Simionescu M. (2013) The Performance of Unemployment Rate Predictions in Romania.Strategies to Improve the Forecasts Accuracy, *Review of Economic Perspectives*, 13(4): 161-175.

Vogel, L. (2007). *How do the OECD Growth Projections for the G7 Economies Perform?: A Post-Mortem* (No. 573). OECD Publishing.

THE TRANSPORTATION AND LOGISTICS SECTOR'S PERFORMANCE AND THE SOCIAL DEVELOPMENT – A COMPARISON WITHIN THE EUROPEAN UNION

Cristian BÎZOI, Alexandra POPESCU (BÎZOI)[*], Gabriela ȘIPOȘ, Ciprian ȘIPOȘ
West University of Timișoara, Romania

Abstract. Economic and social development is influenced also by the performance of the logistics and transportation sector. This sector's performance enhances at its turn trade performance, but also increases incomes and employment gains, leading to the diminishing of poverty rates. In our paper we analyzed the influence of the transportation and logistics' performance on social development, by comparing EU's former communist countries and the other 18 countries (namely three indicators - the LPI, the HDI, and the IHDI). Our results allowed us to conclude that European countries with performing transportation and logistics sector are also the countries recording the highest levels of social development.

JEL Classification: C44, F66

Keywords: logistics, LPI, social development, Human Development Index, Inequality-adjusted Human Development Index

1. Social development and the performance of transportation and logistics

Efficient logistics facilitate transportation in international trade, and therefore, trade. The need for performing transportation and logistics sectors is vital, as developed nations engage increasingly in international vertical specialization. Performing transportation and logistics sector improve a country's competitiveness, by reducing transport costs, including countries situated far from major markets within global supply chains (Korinek & Sourdin, 2011).

Essential components of modern global supply chains are performing transportation & logistics industries. A series of economic actors (logistics service providers, shipping companies and other transportation companies) move both people and products facilitating trade (PwC, 2015). The global supply chains will evolve

[*]Corresponding author. Address: West University of Timisoara, Faculty of Economics and Business Administration, 16, Pestalozzi str., 300115, Timisoara, Romania, Tel. +40.256.592.505, Email: alexandra.bizoi@e-uvt.ro

and reconfigure in accordance with the new trade corridors between Asia and South America, Asia and Africa and within Asia. The global marketplace will include reconfigured least developed countries and "trade volumes will shift towards emerging markets". The evolution of the world economy is influenced heavily by the transport and logistics operators in the emerging markets. These operators will radically change trading networks, in their expansion to new markets, strengthening the transport links between their domestic markets and the world (PwC, 2015).

The aim of our paper is to analyze the influence of transportation and logistics performance on social development at EU level, by comparing the former communist countries and the other EU member states in terms of social development and transportation and logistics performance. Our paper has five parts. In the first part, we present the connections between logistics performance and social development as reflected by literature. In the second part, we shortly present the three main indicators: Logistics Performance Index (LPI)[1], Human Development Index (HDI), and Inequality-adjusted Human Development Index (IHDI)[2], the indicators we will use in our analysis. Thirdly, we use an econometric analysis to test the relationship between the three selected indicators. We apply a linear regression in order to establish the correlations between the indicators and afterwards we present the main results. Further on, we focus on the influence of logistics performance on social development, as a comparative study between the levels of LPI, and the IHDI of the EU former communist countries and the other EU18 countries. Therefore, we split the EU into two parts: the group of the former communist countries – member countries of the EU, and the group with the rest of the EU countries. For these countries, we will analyze the logistics performance index and some specific indicators of social development. Our paper ends with the concluding remarks.

The sector of transportation and logistics is a key factor in global supply chains and global value chains (GVC), having the role to connect countries, spread technology and promote best practices, improving the overall performance of different economic sectors. Global supply chains and global value chains include developing countries, low-income countries and least-developed countries. According to Ben Shepherd (Shepherd, 2013) countries with higher logistics performance, have a tendency to specialize in manufacturing GVCs.

There are numerous links between the transportation and logistics sector and economic and social issues. Transportation and logistics improve the performance of trade, fact which leads to higher incomes, employment gains, reduction of poverty, the economic empowerment of women, increases in exports and imports, diversifications of exports, increases of economic growth, and higher environmental sustainability (Shepherd, 2013). In this article, we will focus on six impacts of logistics and transportations' performance on social development.

Firstly, one impact of transportation and logistics' performance on social development is *poverty alleviation*. Hertel & Winters (2005) consider that rich countries influence poor countries, throughout international trade. For this reason, in their view, this is the most direct economic mean to exercise this influence. In their work, Hertel and Winters analyze the effects of trade (the Doha Development Agenda - DDA) on poverty. Their findings refer to mixed results on a near-term. However, there are

[1] Provided by the World Bank

[2] The later two provided by United Nations Human Development Programme

countries which experience small poverty increases, while others important declines. Their conclusion is that the provisions of the DDA reduce poverty on the long-term and that in order to increase the positive effects of trade, complementary domestic reforms are mandatory. Shepherd (2013) refers to an article written by Nina Pavcnik, in order to demonstrate a correlation between productivity growth in developing countries and trade liberalization. Productivity growth is a source of economic growth and technological upgrading. In conclusion, international trade is a factor that can contribute to the reduction of poverty. In their report, Hertel & Winters (2005) enumerate some key determinant components of poverty:

- the incomplete transmission of world prices to rural households,
- workers' mobility barriers,
- national tax instruments' incidence meant to compensate the loss of tariff revenue.

The methods to reduce poverty would be the encouragement of households to benefit from the advantages of DDA market opportunities and the stimulation of economic growth. Trade reforms should address not only merchandise tariffs, but also the barriers of services trade and investment. Empirical evidence from different authors (Hertel & Winters, 2005; OECD, 2012) suggest that poverty can reduce itself throughout trade liberalization, only accompanied by appropriate complementary policies. OECD reports (OECD, 2012) state that trade affects differently the economic activity of the country. If particular households are net buyers or net sellers of goods in liberalized sectors determines the effect of trade liberalization on poverty.

Secondly, another impact of transportation and logistics' performance on a social development goal - an important human development outcome is the distribution of vaccines. Based on preliminary economic evidence, Pasadilla & Shepherd (2012) suggest that better logistic performance determines higher vaccination rates. The authors included in their analysis also the impact of national income levels, the proportion of income spent on health by local governments and the government's effectiveness on vaccination rates. The most important factor which determines the rates of vaccination remains the performance of transportation and logistics, as vaccines are highly sensitive products, retained in strict conditions in order to be effective. Therefore, in a country with good logistics and transportation, vaccination rates are higher, because vaccination programs can be carried out easily in interconnected population centres. However, the interconnection between the performance of transportation and logistics sector and the vaccination rates is stronger in poorer countries than in richer ones (Pasadilla & Shepherd, 2012).

Thirdly, the performance of transportation and logistics influences other socially important goods, the speed and cost, of which goods can be moved within a country. Transportation and logistics can reduce the distance between markets, contributing to the increase of consumer price, which can be returned to the producer. In this manner, the incomes of some of the poorest members of society increase, and food becomes affordable to them, alleviating hunger (OECD, 2012). Porto et al. (2011) show that, in African countries, the improvement of infrastructure increases the income of smallholders. They underline the idea that transportation and logistics facilitate the access of farmers to new local, regional or international markets.

Fourthly, the performance of transportation and logistics is a source of employment, also contributing to human development goals. The different production technologies explain the fact that logistics and transportation operations tend to be

labour intensive especially in developing countries. Increasing the employed population is mandatory in developing countries, where unemployment rates are high, and a lot of activities are from the underground economy. Shepherd (2011) mentions transportation and logistics as a mean to transform the country's economy from low-income to middle-income. The explanation is that developed, specialized logistics and transportation companies lead to multiple outsourcing opportunities at lower costs, in cases in which the activities were previously conducted in-house, with higher costs. In conclusion, besides vaccine distribution, the access to employment is also critical, from both economical and social perspective. For the poorest developing countries, this sector can contribute to the phenomena of job creation, employing a significant number of people.

The job creation process defines another important human development outcome, related to the performance of the transportation and logistics sector, namely women economic empowerment throughout trade. This fifth connection refers to a significant progress, in which women producers take part in Fair Trade markets. In their report, Jones, Smith, & Wills (2011) found that in the countries included in their research, trade strengthened the livelihood of women's households. It also enabled their contribution to their families' financial needs, fact which improved their overall status in their personal and their social life. These women organized themselves in production groups and trade, which enabled their access to productive resources and markets. Although still facing enormous gender constraints and also socio-cultural, economic, political and institutional barriers their activity is changing legislative frameworks and enabling human development.

A final linkage between the transportation and logistics sector and development refers to the area of governance and anti-corruption. Unfortunately, this sector is subject to corruption (police, customs agents, other officials), as it has numerous constraints and procedures which need to be respected according to legal provisions. Unofficial payments are a way to avoid binding constraints and a sign of poor supply chain governance. "Speed money" is a method used to expedite business (Shepherd, 2009), common in some developing countries (Olken & Barron, 2009), fact confirmed also by the OECD/WTO data.

The performance of transportation and logistics has an influence also on the government's capacity to provide human development goods to the population in all needed areas, at the best possible cost. World Bank and OECD/WTO data points out the determinants of the transportation and logistics' value chain performance:

- Infrastructure – is improving around the world. However, it is a constraint in many developing countries.
- Customs and Other Border Procedures – the improvements in this domain are noticeable. However, other border agencies still need to improve their supply chain performance, as this improvement influences the value chains from developing countries.
- Private Services and Regulation – is a sector in which improvements are noticeable as well. However, the improvement of regulatory measures with impact on the private sector's performance is not as constant.
- Red Tape – this sector remains a serious issue, according to the World Bank's Doing Business project, an issue that affects a considerable number of exporters and importers. The documentary formalities still need serious improvements, as reductions

have been few. In order to counterfeit these issues, countries are doing efforts to rationalize their red tape burden, in order to reduce the delays and improve their supply chain performance.

- Governance – in many developing countries, similar to infrastructure, governance is a constraint. The improvement of governance is undermined by unofficial "speed money" payments, done by operators to avoid red tape. As a consequence of the uncertainty associated to poor supply chain governance, these operators face higher indirect costs (Shepherd, 2013).

In order to contribute to the economic and social development of the countries, efforts are being made all around the world to improve the value chains associated to the transportation and logistics sector. Domestic and foreign investment, but also development assistance, could be appropriate sources to finance the development of the transportation and logistics value chain, according to a OECD/WTO survey.

According to the Aid for Trade, key factors that influence the performance of the transportation and logistics sector remain for the future:

- The hard infrastructure – developing countries need to focus their investment efforts into basic infrastructure and the future maintenance of that infrastructure.
- The soft infrastructure – the two infrastructures complete each other. Therefore, transportation regulation, customs and border procedures, and private sector development need to be further improved.
- Coordination and collaboration – the performance of the transportation and logistics sector depends largely on the development of the private sector, but it requires coordinated efforts from different sources.

Although, at EU level we do not have low-income countries, similar to those in Africa, included in some of the arguments, we can still find differences in terms of social development and logistics and transportations' performance, also at the level of the EU, fact which symbolises that EU's socio-economic cohesion must be further developed. The connections between the transportation and logistics sector's performance and socio-economical development are multiple, both direct and indirect.

2. Data and methodology

The transportation and logistics' sector performance is a determinant factor of social development, and we will analyze the impact of this sector on social development at the level of the EU (which we will divide in former communist countries member of the EU and the rest of 18 member countries).

The World Bank defines social development, as the need towards prioritizing the importance of the human being, within the development process. In their definition, poverty is more than low income associated, as they underline the exposure to violence, vulnerability, unaccountable institutions, exclusion and isolation, powerlessness, features also connected with poverty. Therefore, the World Bank promotes sustainable social development, characterized by cohesion, inclusion, accountability, resilience and citizen security. The projects dedicated to promoting social development lead to a better quality of life and to better growth. The concept of social development incorporates the activities meant to improve the complex relationships between communities, societies and states, including the poor (World Bank, 2015).

At the level of the EU, disparities still exist, especially after all the years of crisis. This fact if confirmed by the 2014 Employment and Social Developments in Europe Review, which finds that an important task following the crisis, is to restore the socio-economic convergence, particularly in the Southern and peripheral 15 EU member states, by deepening the economic and monetary union, and also by strengthening the social dimension. In the EU, Member States are promoting a social investment model, relying on people potential to support their lives and labour market participation. Reforms in the EU, like bringing women and older people into work have helped, and stress the further need to continue labour market reforms, and social protection modernization (EC, 2014). As we mentioned before, a manner in which disparities can be diminished involves international trade - a labour intensive economic activity in which transportation and logistics represent the backbone.

In order to prove the relationship between social development and the performance of the transportation and logistics' performance, we will present the three indicators we are going to use in our analysis:

- the LPI – the logistics performance index – as an indicator of the transportation and logistics performance,

- and the HDI and IHDI - as indicators of social development.

The trade and transportation infrastructure, the perceptions on a country's logistics efficiency in terms of customs operations, logistics services, shipments, merchandise traceability and on time delivery are the defining components of the LPI, according to World Bank. The highest performance of the indicator is symbolized by the value 5, and its values range from 1 to 5 points.

In LPI surveys, the LPI is calculated by the World Bank, in partnership with institutions from the academic and international field, private companies, and individuals acting in logistics. In the 2009 version of the survey approximately 1000 international transportation actors from 5000 countries were assessed. Eight markets were assessed with the help of a six dimensions scale (from 1 to 5). There were different selection criteria for a market in accordance with the degree of trade freedom from a country: the importance, on import and export in a respondent's country and random selection, for a free country and the neighbouring countries connecting them internationally, for a landlocked country. The World Bank (World Bank, 2014) enumerates the six crucial dimensions of the survey referring to the clearance process, the trade and transportation-related infrastructure, priced shipments, logistics services, tracking of consignments, shipments reaching the consignee at expected delivery time.

A single score, which uses all the components, is obtained in the end by averaging and aggregating the scores obtained from the six areas.

Besides the economic growth, the HDI (Human Development Index) includes characteristics of people and their capabilities, reflecting also the outcomes of national policy choices, as countries with similar levels of economic development (GNI per capita) do not have also same levels of human development[3]. The people dimension of the HDI is a measure for the average levels of some fundamental human development issues: standard of living, education, and life expectancy. The

[3] The GNI (gross national income) is one of the three pillars of the HDI and not a social development indicator itself. Data from Human Development Report show a strong correlation between the HDI and (log) GNI (r=0.94), a coefficient of determination of 0.88, fact which indicates that 88% of the observed HDI variation is determined by (log) GNI. Therefore, income is an important determinant of development (economic and social).

latter three components are calculated as a geometric mean of their normalized indices. Life expectancy at birth ranges from a minimum of 20 years to a maximum of 85 years and is considered to be a sign of the health dimension. Education is measured, for 25 years aged adults, in average years of schooling, and the children's expected years of schooling when entering school (UNESCO Institute for Statistics provides theses means based on the educational data available from censuses and surveys). 18 years are the mean expected years of schooling. The two indicators mentioned before are normalized using 0 (minimum value) and 15-18 (maximum aspirational value). Later on, using the arithmetic mean, the two indices are used to create a third index, the educational index. The GNI measures the standard of living ranging from minimum values of 100$ (PPP) to maximum values of 75.000$ (PPP). The (log) GNI reflects the diminishing importance of income in increasing GNI. By using the geometric mean the three dimensions is aggregated into a composite index. However, the HDI does not depict the inequalities, the poverty, human security and empowerment, reason for which they created the IHDI. As opposed to the HDI, the Inequality-adjusted Human Development Index (IHDI) reflects the distribution of the average achievements of the country's health, education and income, among its population. The average value of each of the three components is afterwards discounted, in accordance with its level of inequality. This index is the distribution-sensitive average value of human development. However, due to its composition, the IHDI can be equal to HDI (in situations of equality) and has a lower level if the inequality increases. The main difference between the two indexes is the cost of inequality, the manner in which inequality affects human development. Reflecting inequality directly, one of the major advantages of this index, is its capacity to inform policies how to reduce inequality and the influence of those policies on the human development cost. This index is calculated in 145 countries, and the values range from 5.5% (Finland) to 44% (Angola), having an average value of 22.9%.

Our analysis means to find a correlation between the logistics and transportation performance, as signs of human development and the IHDI, in former communist countries as opposed to the rest of the EU countries. We want to prove that countries with higher levels of LPI have lower levels of IHDI.

3. The correlations between logistics performance and social development within European Union

In this part, we analyze the relationship between the logistics performance and social development based on an econometric analysis. The sources of data are the World Bank for the LPI and United Nations Development Programme for the HDI and IHDI. The database includes most recent available data: LPI calculated for the year 2014 and the HDI and IHDI calculated for the year 2013. In the analysis, we included the EU28 countries.

Firstly, we present the results of econometric analysis, based on a linear regression model between logistics performance and Human Development Index across the European Union countries, in the following table:

According to the results of the econometric analysis, we found a strong relationship between the LPI and HDI across the EU countries. The LPI significantly influences the social development of the EU countries, as the value of the correlation coefficient is quite high. In addition, *R Square* and *Adjusted R Square* values are, as well, high.

Table 1. The relationship between LPI and HDI within EU28

Dependent variable: *HDI*				
Least Squares Method				
Sample: 1 28				
Observations: 28				
Equation: $HDI = \alpha_0 + \alpha_1 * LPI$				
	Coefficients	*Standard Error*	*t-Stat*	*P-value*
α_0	0,5387551	0,0458803	11,742625	6,76715E-12
α_1	0,0893273	0,0128327	6,9608676	2,16625E-07
Correlation Coefficient	0,806715	*F-stat*		48,45367
R Square	0,650789	*Significance F*		2,17E-07
Adjusted R Square	0,637358			

(Source of primary data: World Bank & United Nations Development Programme, 2014)

The econometric model is valid, as the Student and Fisher statistical test values show. Even if the *P-values* and the *Significance F* are very small, the model is statistically correct as the *t-Stat* and *F-Stat* values are sufficiently high.

Thereby, the parameters of the econometric model evidence a strong relationship between logistics performance and social development within European Union, quantified by HDI. For sure, the inverse relationship is also valid, since logistics performance is more developed in the countries with higher social development standards.

The line fit plot of the relationship between LPI and HDI within EU28 is presented in Figure 1:

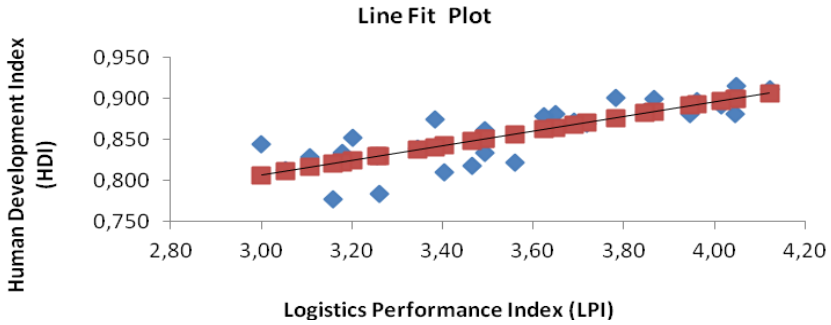


Figure 1 – The correlation between LPI and HDI within EU28
(Source of data: World Bank & United Nations Development Programme, 2014)

The Figure 1 shows that the econometric analysis, built on EU28 data, evidences a significant correlation between the level of logistics performance index and social development, quantified by HDI.

Secondly, we present the results of the econometric analysis based on a linear regression model, between logistics performance and Inequality-adjusted Human Development Index across the European Union countries in the following table:

Table 2. The relationship between LPI and IHDI within EU28

Dependent variable: *IHDI*				
Least Squares Method				
Sample: 1 28				
Observations: 28				
Equation: $IHDI = \beta_0 + \beta_1 * LPI$				
	Coefficients	*Standard Error*	*t-Stat*	*P-value*
β_0	0,4191712	0,06143723	6,822756	3,05287E-07
β_1	0,1022289	0,01718409	5,949047	2,80794E-06
Correlation Coefficient	0,759266	*F-stat*		35,391164
R Square	0,576486	*Significance F*		2,81E-06
Adjusted R Square	0,560197			

(Source of primary data: World Bank & United Nations Development Programme, 2014)

The results of our econometric analysis show a slightly weaker relationship between LPI and IHDI than in the case of HDI, fact which allows us conclude that the influences of the LPI on the social development quantified by the IHDI, is not so strong (as implied by the value of the correlation coefficient, which is a bit smaller). Also, the *R Square* and *Adjusted R Square* values are smaller than in the case of HDI.

Nevertheless, the econometric model is valid, as implied by the values of the Student and Fisher statistical tests. The *t-Stat* and *F-Stat* values are sufficiently high to state that the model is statistically correct, although the *P-values* and the *Significance F* are very small.

The difference between parameters of econometric models in the case of HDI, respectively, IHDI is given by the extent in which the social development is affected by inequality in the European Union countries.

We include the line fit plot of the relationship between LPI and IHDI within EU28 in the Figure 2 as follows:

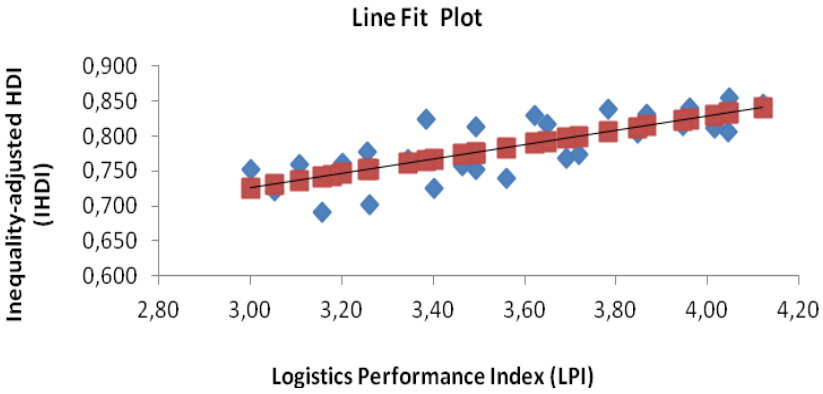


Figure 2 – The correlation between LPI and IHDI within EU28
(Source of data: World Bank & United Nations Development Programme, 2014)

The econometric analysis built on EU28 data evidences a significant correlation between the level of logistics performance index and social development, quantified, in this case, by IHDI, as pictured in Figure 2.

Based on these findings we continue the analysis throughout a comparative study between the levels of logistics performance and social development within the EU28.

4. A comparative study between the logistics performance and social development within the European Union

In this part of our paper, we present the results of the analysis, which focuses on the influence of logistics performance on social development, as a comparative study between the levels of Logistics Performance Index and Inequality-adjusted Human Development Index, from the EU former communist countries, and the other 18 EU countries.

We made a grouping of the EU28 member states, according to the values of LPI, respectively, of IHDI as presented in the Figure 3:

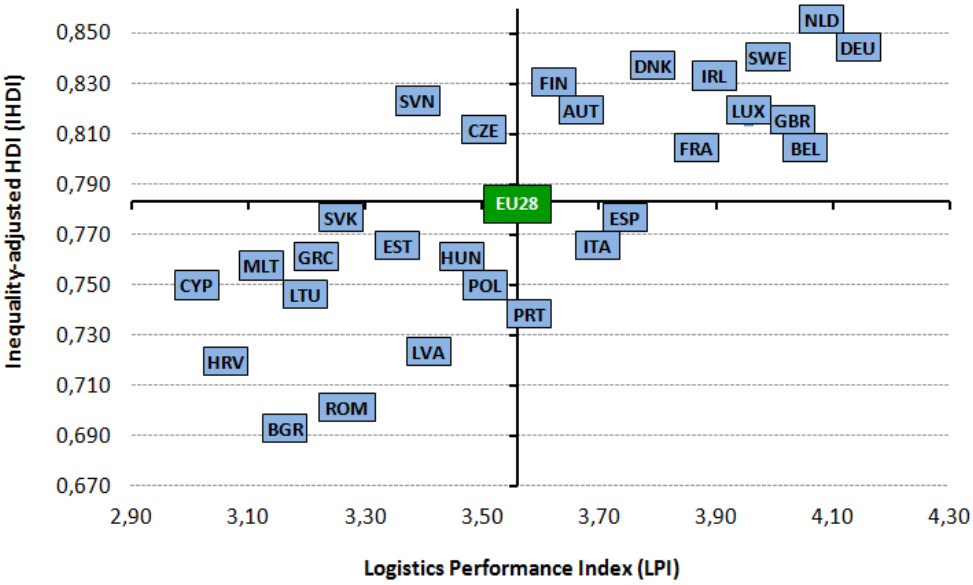


Figure 3 – Grouping the EU28 countries based on values of LPI and IHDI
(Source of data: World Bank & United Nations Development Programme, 2014)

We can see in Figure 3 that the European countries position themselves into four groups based on the values of LPI and IHDI. Two of these groups are more consistent – one in the upper right quadrant and one in the lower left quadrant, with two other two groups of the rest of the countries, positioned intermediate, between the main groups.

The upper right quadrant consists of very developed EU countries. This is the first main group of countries, characterized by very high levels of social development and a very good logistics index, with both the values of LPI and the IHDI above the EU28 averages. Within this group, we can highlight the superior position of Germany and the Netherlands, followed by Belgium, the United Kingdom, and Sweden. Within this group the levels of the fundamental human development values - education, life expectancy, and standard of living are very high.

The second main group of countries, located in the lower left quadrant consists of less developed EU countries. This group characterizes itself by low levels of social development and a poor logistics index. The values of LPI and IHDI are both below the EU28 averages. The better positions of Slovakia, Estonia, Hungary, and Poland can be emphasized, within the second group. The last in this group, and practically the last of entire EU28, are the newest members, Bulgaria, Romania and Croatia. It is easy to see that most of the former communist countries from the EU situate themselves in this second group. The last in this group, and practically the last of entire EU28, are the newest members, Bulgaria, Romania and Croatia. It is easy to see that most of the former communist countries from the EU situate themselves in this second group. However, along with these countries, we have to mention the poor positioning of Greece, Cyprus, and Malta in the same group. Within this group, the levels of the fundamental human development values - education, life expectancy, and standard of living - are low and correlated with poor logistics performance.

However, we should emphasize the special positions of the countries situated between those two main groups. Firstly, we can observe the particular positions of Slovenia and Czech Republic. Both are former communist countries, situated significantly above EU28 average in the terms of social development, even if their logistic performance index is below the average EU28. Their social development index rivals the indexes of many highly developed countries from the first group.

Secondly, Spain, Italy, and Portugal have another particular positioning. They are below the EU28 average in the terms of social development, while their logistic performance index is above the EU28 average. Although, in recent decades, these countries, significantly expanded logistics infrastructure, particularly with the help of European funding, they failed to perform also in terms of social development. This fact is noticeable when analyzing the social issues encountered within these countries in the last years.

5. Conclusions

The results of our analysis show a strong relationship between the LPI and the HDI, fact which underlies that in the EU, the LPI strongly influences the social development. Logistics performance is higher in the countries with improved social development standards, proving the inverse relationship also valid. The econometric analysis shows a slightly weaker relationship between the LPI and the IHDI than in the case of HDI, fact which implies that the influence of the LPI on social development, quantified by IHDI is not so strong. The explanation lies in the extent in which the social development is affected by inequality in the European Union countries.

The comparative analysis on EU28 data evidences a significant correlation between the level of logistics performance index and social development, quantified, in this case, by IHDI. Although situated into four groups based on the values of LPI and IHDI, two of these groups are more consistent, namely the one in the upper right quadrant and the one in the lower left quadrant. There are a few countries which find themselves in intermediate positions, between the two quadrants.

Located in the upper right quadrant, the first main group of countries consists of very developed EU countries. Very high levels of social development and a very good logistics index characterize this group. Both the values of LPI and IHDI are above the EU28 averages. In this group, Germany and the Netherlands, followed by Belgium, the United Kingdom, and Sweden have superior positions. In these countries the levels of fundamental human development values - education, life expectancy, and standard of living are very high.

Located in the lower left quadrant, the second group comprises the less developed EU countries. Low levels of social development and a poor logistics index characterize this group, in which the LPI and the IHDI record values below the EU28 averages. In this second group, Slovakia, Estonia, Hungary, and Poland have superior positions. The newest members of the EU, Bulgaria, Romania and Croatia are the last in this group and practically the last of the entire EU28. We emphasize the fact that most of the former communist countries from the EU situate themselves in this second group, still recording similar development patterns. In this group, we found a surprising positioning of Greece, Cyprus, and Malta. Low levels of the fundamental human development values - education, life expectancy, and standard of living - are low correlated with poor logistics performance characterize this second group.

Special positions outside the two main groups are recorded by former communist countries Slovenia and Czech Republic, situated significantly above EU28 average in the terms of social development, but with a logistic performance index below the EU 28 average. Their social development index rivals the indexes of many highly developed countries from the first group.

We found another particular positioning for Spain, Italy, and Portugal, countries below the EU28 average in the terms of social development, with a logistic performance index above the EU28 average.

Finally, we can say that transportation and logistics sector's performance is highly correlated with the social development of the country. The comparative analysis conducted in the EU28 countries on very recent data is relevant in this regard. Unfortunately, after all these years, we can still see the important distances between the former communist countries and the developed countries. It is noteworthy that in terms of social development, some of the former communist countries (Slovenia and the Czech Republic), reached and exceeded the levels of social development, as opposed to more developed countries. On the other hand, countries as Spain, Italy, and Portugal situate themselves above the EU28 average in the terms of social development, fact that raises some questions about social security in these countries.

However, countries with a low index of social development, usually, have a low logistics performance, as evidenced by the positions of most of the former communist countries. The newest members of the European Union, namely Bulgaria, Romania, and Croatia have the poorest positions in the entire EU28. In these

circumstances, it appears that significant further efforts are needed to improve the logistics performance of developing countries and through it also improve their general level of social development. Only by reducing disparities within the European Union, global economic and social performance can be achievable.

A possible level which could help reduce the disparities is trade. With the help of trade, the gap between emerging and developed countries, from a socio-economical perspective, will narrow. The transportation and logistics sector, which represent the backbone of global trade, will have to adjust and prepare for new market structures. In a future research we intend to extend our study and include more countries in the analysis, which will enable us to make a wider comparison, in terms of the performance of the transportation and logistics sector and its impact on social development.

Acknowledgement

This work was co-financed from the European Social Fund through Sectoral Operational Programme Human Resources Development 2007-2013, projects numbers POSDRU/ 159/1.5/S/134197 and POSDRU/159/1.5/S/142115 „Performance and excellence in doctoral and postdoctoral research in Romanian economics science domain".

References

Arvis, J.F., Mustra, M. A., Ojala, L., Shepherd, B., Saslavsky, D. (2012) Connecting to Compete. Trade Logistics in the Global Economy. The Logistics Performance Index and Its indicators Available at: http://siteresources.worldbank.org/TRADE/Resources/239070-1336654966193/LPI_2012_final.pdf, Accessed on August 2014.

Arvis, J.F., Mustra, M. A., Ojala, L., Shepherd, B., Saslavsky, D. (2010) Connecting to Compete. Trade Logistics in the Global Economy. The Logistics Performance Index and Its indicators Available at: http://siteresources.worldbank.org/INTLAC/Resources/ConnectingtoCompete.pdf, Accessed on August 2014.

Arvis, J.F., Mustra, M. A., Panzer, J., Ojala, L., Naula, T. (2007) Connecting to Compete. Trade Logistics in the Global Economy. The Logistics Performance Index and Its indicators Available at: http://siteresources.worldbank.org/INTTLF/Resources/lpireport.pdf, Accessed on August 2014.

Arvis, J.F., Saslavsky, D., Ojala, L., Shepherd, B., Busch, C., Raj, A. (2014) Connecting to Compete 2014. Trade Logistics in the Global Economy. The Logistics Performance Index and Its indicators Available at: http://www.worldbank.org/content/dam/Worldbank/document/Trade/LPI2014.pdf, Accessed on August 2014.

Hertel, T., Winters, L., (Eds.) (2005) Poverty and the WTO: Impacts of the Doha Development Agenda. Washington, D.C.: World Bank.

Jones, E., Smith, S., Wills, C. (2011) Trading our way up: Women organizing for Fair Trade, Published by Women in Informal Employment: Globalizing and Organizing (WIEGO) A Charitable Company Limited by Guarantee – Company No. 6273538, Registered Charity No. 1143510, ISBN number: 978-92-95095-03-8

Korinek, J., Sourdin, P. (2011) To What Extent Are High-Quality Logistics Services Trade Facilitating?, Available: http://www.oecd-ilibrary.org/docserver/download/5kggdthrj1zn.pdf?expires=1429193507&id=id&accname=guest&checksum=07ABA58D13C7EFEBDBC59840841B02A8, Accessed: April, 2015.

OECD (2012) Global Food Security: Challenges for the Food and Agriculture System, Document TAD/CA/APM/WP (2012)18/FINAL, OECD.

Olken, B., Barron, P. (2009) The Simple Economics of Extortion: Evidence from Trucking in Aceh, Journal of Political Economy, 117(3): 417-452.

Pasadilla, G., Shepherd, B. (2012) Trade in Services and Human Development: A First Look at the Links, In P. Sauvé, G. Pasadilla, and M. Mikic (Eds.). Service Sector Reforms: Asia-Pacific Perspectives. Bangkok: United Nations.

Pavcnik, N. (2002) Trade Liberalization, Exit, and Productivity Improvement: Evidence from Chilean Plants, Review of Economic Studies, 69(1): 245-276.

Porto, G., N. Depetris Chauvin, Olarreaga, M. (2011) Supply Chains in Export Agriculture, Competition, and Poverty in Sub-Saharan Africa. Washington, D.C.: World Bank.

Shepherd, B. (2009) Speed Money: Time, Corruption, and Trade." Working Paper. http://mpra.ub.uni-muenchen.de/17337/.

Shepherd, B. (2011) Logistics Costs and Competitiveness: Measurement and Trade Policy Applications, Transport Research Support Working Paper, World Bank. http://siteresources.worldbank.org/INTTRANSPORT/Resources/336291-1239112757744/5997693-1294344242332/Logistics_costs.pdf.

Shepherd, B. (2013) Aid for Trade and value Chains in Transport and Logistics, OECD/WTO, Available at: http://www.oecd.org/dac/aft/AidforTrade_SectorStudy_Transport.pdf, Accessed on August, 2014.

*** European Commission, 2014, 2014 Employment and Social Developments in Europe Review, Available: ec.europa.eu/social/BlobServlet?docId=13404&langId=en, Accessed: April, 2015

*** Human Development Report 2014, United Nations Development Programme, http://hdr.undp.org/en/content/human-development-index-hdi, Accessed on August, 2014

*** PricewaterhouseCoopers, http://www.pwc.com/gx/en/transportation-logistics/, Accessed on April, 2015

*** PricewaterhouseCoopers, Transportation & Logistics 2030. Volume 3: Emerging Markets – New Hubs, new spokes, new industry leaders?, Available: http://www.pwc.com/en_GX/gx/transportation-logistics/tl2030/emerging-markets/pdf/tl2030_vol3_final.pdf, Accessed: April, 2015.

*** World Bank Data, http://data.worldbank.org/, Accessed on August, 2014

*** world Bank, 2015. Available: http://www.worldbank.org/en/topic/socialdevelopment/overview#1, Accessed: April, 2015.

Book review

PIKETTY Thomas, Capital in the Twenty-First Century,
The Belknap Press of Harvard University Press, 2014, p. 119, ISBN 978-067-443-000-6

A few people have heard about Thomas Piketty[1] till recently, but for now on, they will be more numerous; thanks to his new book ***Capital in the Twenty-First Century.*** The book brings into the public attention a very intriguing subject: wealth and inequality. In almost 600 pages, the author tries to track and explain the roots of inequalities. The novelty here is that the inequalities are analyzed not between the poor and the rich ones, but between the poor and the very rich ones, the so called "one percent".

The book is structured in 4 major parts, covering the issues of income, capital and above all the inequality.

In Introduction the author raise the first major question regarding the wealth: is the wealth distributed according to the 19th century theory of Marx or to the 20th century theory of Kuznets? In order to answer this question and the result to be relevant, the author is using data for 20 countries, covering almost three centuries. As novelty, the author is using tax records, instead of surveys as was used to, for economic inequality data. Tax records are going back in late 18th century, unlike income surveys that run back in 1947 (for USA). Another useful tool is the historical overview of previous thinking about these issues, passing from Malthus to Young and French Revolution, from Ricardo to Marx, and finally to Kuznets.

Part 1 *Income and Capital*, brings into discussion a thorny subject, but not necessary contemporary: what share of income should go in wages and what share in profits, or in a simpler way toward labour or capital? Although the economists stated that the share of capital and labour in national income was pretty much around same numbers over the long run, Piketty demonstrates that this is not necessary correct, especially in the 20th century. In supporting this, in Chapter 1, are defined and presented the notions and concepts like national income, labour and capital, capital/income ratio and global distribution of production. The theoretical aspects are supported by numbers/data, so there are 5 figures and one table, showing what the author thought is important and relevant: the distribution of world population or output, exchange rates etc. In Chapter 2 is made and presented an evolution of growth rates over the time, actually a very long time, since Industrial Revolution, but there are data for comparison even from Antiquity.

Having the background settled, in Part 2 the author take a step ahead and brings into discussion *The Dynamics of the Capital/Income Ratio*. In Chapter 3, interweaving literature and real facts, the author reveals the metamorphose of capital. The starting point is the equation: National Capital=farmland + housing + other domestic capital + net foreign capital (Piketty, 2014) and based to this there are 2 Figures Capital in Britain respective France, 1700-2010 that prove the statement

[1] Thomas Piketty – Professor of Paris School of Economics

we mentioned before: the capital/income ratio was stable in the 18th and 19th century, but had wide fluctuations during the 20th century. Other subjects discussed here are the foreign capital, public and private wealth and public debt and their implications. Chapter 4 leads the reader *From Old Europe to the New World*, from Germany to America, meaning both USA and Canada. The conditions in North America are very different from old Europe: land was abundant, so cheap, work force was provided by slaves, and the amount of capital accumulated by this region was smaller than Europe's. Eleven figures make the things more comprehensible. Based on this, in Chapter 5, are discussed the fundamentals of capital/income ratio in long term. The first fundamental law of capitalism $\alpha=r*\beta$, was presented in first chapter, as basic notion. The second fundamental law of capitalism $\beta=s/g$ is discussed now (especially its limits), along with issues like private savings and the capital in rich countries after '70s. In the end of the chapter, the author answers the question: what will be the capital/income ratio in the 21st century. Chapter 6 makes the transition from capital/income ratio to capital-labor split. For this is necessary to be defined the notion of return on capital, its historical perspective, and other notions and concepts related to capital (real and nominal assets, marginal productivity of capital, Cobb-Douglas production function etc.).

Part 3 deals with *The structure of inequality*. As expected, the Chapter 7 begins with some Preliminary Bearings about Inequality and Concentration. In the middle of attention now is the distribution of wealth to the individual level, unlike the analysis from previous chapters that were at national levels. Starting from Balzac (yes, Honore de Balzac – Pere Goriot) the author raise a legitimate question: Work or Inheritance?. (An ample approach of this subject could be found in Chapter 11). To best illustrate the magnitude of inequality and concentration, there is a table that comprise *Inequality of labour income across time and space*, covering Scandinavia – as low inequality, Europe – medium and USA – high, between 1970s and 2010, making some prognosis for 2030. A more extent analysis is made in Chapter 9. The inequalities with respect to capital are also discussed here and extended in Chapter 10. For the picture to be complete, the inequality of total income is also taken into consideration. In Chapter 8, helped by 8 figures the author is making an incursion till 19th century, around the world, actually two worlds – Europe and America, for a historical evolution of inequality. The last chapter (12) of Part three is about inequality in the 21st century. An interesting thing here is the analysis made on return on university endowments.

Part 4 focuses on *Regulating capital in the 21st century.* Based on history lessons drawn by the previous parts of the book, in this one, the author is trying to predict the features of 21st century regarding the distribution of wealth and inequality. If in the 20th century the wars played a major role related to inequality, in 21st century what will be? May be the progressive taxation of incomes as a powerful force limiting inequality?

As a *Conclusion* the author resume all to *r* versus *g*—the rate of return on capital versus the rate of economic growth. Also, it seems that social and political forces can play a bigger role rather than strictly economic forces. The bottom line here is that now we haven't just gone back to nineteenth-century levels of income inequality, but we're also on a path back to "patrimonial capitalism," in which family dynasties overpass talented individuals.

Mihaela Rovinaru