South East European Journal of Economics and Business

ISSN 2233-1999

Volume 9 (2) 2014

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The South East European Journal of Economics and Business, ISSN 2233-1999, is published semiannually by the School of Economics and Business, University of Sarajevo, Trg Oslobodjenja - Alija Izetbegovic 1, 71000 Sarajevo, Bosnia and Herzegovina.

All correspondence should be addressed to The South East European Journal of Economics and Business. School of Economics and Business, Trg Oslobodjenja-Alija Izetbegovic 1, 71 000 Sarajevo, Bosnia and Herzegovina, telephone: 00-387-33-275-965, e-mail: seejournal.efsa.unsa.ba.

Abstracting and Indexing: This Journal is regularly indexed and abstracted by databases:
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CEJSH (The Central European Journal of Social Sciences and Humanities)
Celdes
CNKI Scholar (China National Knowledge Infrastructure)
CNPIEC
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EBSCO - Business Source
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Publisher:
School of Economics and Business in Sarajevo

Content

From the Editor

The South East European Journal of Economics and Business introduces its new regular issue (Volume 9, Issue 2) containing five empirical contributions. Three papers are directly focused on the Western Balkans and Eastern Europe, one addresses emerging markets, while the last has general implications. The two economic papers concern institutional and monetary economics, while the remaining papers could be categorized as belonging to the financial, marketing and management disciplines.

The first contribution is "Money-in-the-utility-function: Model simulations and money demand estimation in the case of the Republic of Macedonia" by Ivanov, Petkovski and Naumovska. The authors investigate the money market in Macedonia with a particular focus on the interactions between money, prices and economic activity; they rely on monetary data covering the period 2002-2012. The first part of the paper simulates the property of the superneutrality of money - the real variables were mostly driven by productivity shocks, whereas monetary shocks did not have any real effects in Macedonia. In the second stage, the authors explore whether the validity of the Fisher equation holds and found that it does not. Next, they estimate the money demand equation represented by the M2 aggregate using the cointegration approach. The findings from the second stage are in line with economic theory - the estimated income elasticity is less than unity and consistent with previous studies.

"A risk metric assessment of scenario-based market risk measures for volatility and risk estimation: evidence from emerging markets", by Sitima and Hlatywayo, looks at the interdependency and concentration market risks of financial markets in terms of

how the emerging markets relate to some of the best and most advanced markets. The observed period of empirical investigation is 2000-2010. In particular, the authors address the sensitivity of the Value-at-Risk (VaR) and Expected Shortfalls (ES) approaches with respect to portfolio allocation in emerging markets. The results showed that ER has less risk tolerance than VaR based on the same scenario-based market risk measures.

Williams, Franic and Dzhekova bring us an interesting work entitled "Explaining the undeclared economy in Bulgaria: an institutional asymmetry perspective". The authors investigate whether institutional asymmetry – the mismatch between formal and informal institutions - is associated with the undeclared economy. As such, this paper contributes to the very dynamic but little explored field of institutional economics and its often neglected dimension – informal institutions. This is an empirical paper based on survey data – face-to-face interviews from 1,018 respondents in Bulgaria were conducted in 2013 - and probability modelling. The authors report that the greater the asymmetry between formal and informal institutions, the greater the likelihood of participation in the undeclared economy. A general implication is that tackling the undeclared economy requires focusing on reducing this lack of alignment between formal and informal institutions.

"Regional lifestyle segmentation in the Western Balkans", by Husić-Mehmedović, Čičić and Agić, investigates the lifestyle specifics of the Western Balkan market. More specifically, the paper explores whether current political issues and economic differences have led to dissimilar ways of living, or whether cultural similarities have prevailed and lifestyles can be defined accordingly. The empirical findings based on six underlying factors identify three lifestyle clusters for the region. Indeed, the authors report three almost identical lifestyles for Bosnia and Herzegovina, Croatia, Serbia and Slovenia that are applicable to the entire region. These findings have significant managerial implications, as potential investors can apply identical marketing strategies to target the approximately twenty million consumers in the region.

"The effects of the administrator's role in training programmes and training motivation on training maintenance" by Ismail, Afiqah, Makhbul, Abdullah and Mat examines the relationship between the administrator's role in training programmes, motivation, and maintenance based on data collected from 123 employees in Malaysia. The results of SmartPLS path model analysis reveal two important findings. First, communication and training motivation are positively and significantly related to training maintenance. Second, delivery and training motivation are positively and significantly related to training maintenance. The authors conclude that training motivation does act as an effective mediating variable in the relationship between the administrator's role in training programmes and maintenance.

In the end, we need to mention the professional support we received from our referees who helped both the authors to improve their papers and the Editorial Board in the selection process. We should also acknowledge that without the administrative and financial support of the School of Economics and Business this Journal would not be possible.

On behalf of Editorial Board
Efendic Adnan

University of Sarajevo
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South East European Journal of Economics and Business
Volume 9 (2) 2014, 7-20
DOI: 10.2478/jeb-2014-0006

MONEY-IN-THE-UTILITY-FUNCTION: MODEL SIMULATIONS AND MONEY DEMAND ESTIMATION IN THE CASE OF THE REPUBLIC OF MACEDONIA

Mile Ivanov, Mihail Petkovski, Elena Naumovska *

Abstract

This paper aims to reassess and analyze the dynamic interactions between money, prices and economic activity in the case of the Republic of Macedonia. The first part of the paper simulates the property of the superneutrality of money, based on Sidrauski's (1967) framework. The second part presents the money demand estimations on the monetary aggregate M2 for the period from 2002 to 2012, using the cointegration approach. Following Cziráky and Gillman (2006), we examine the validity of the Fisher equation in the case of Macedonia. The Fisher equation does not hold in the case of Macedonia, so the inflation rate must be included in the money demand specification. The estimated cointegration equation is in line with economic theory. The cointegration equation shows income elasticity less than unity (0,81), small and negative interest rate semi-elasticity (-0.17) and negative elasticity with respect to inflation. The short-run dynamics reveal that only 2,70% of the disequilibrium is corrected in a single quarter. The properties of stability imply that the M2 aggregate may serve as a proper policy indicator.

Keywords: *money- in-the-utility function, demand for money, cointegration*

JEL classification code: *E41, E17*

INTRODUCTION

During the last two decades, the role of monetary aggregates in monetary policy research has been strongly reduced. This paper aims to reassess and analyze the dynamic interactions between money, prices and economic activity in the case of the Republic of Macedonia. The stability of money demand has significant implications on the actual conduct of monetary policy. If the relationship between the money and prices is stable, monetary aggregate targeting can be appropriate monetary strategy. At the same time, the unstable demand for money reduces the ability of monetary authorities to control inflation, which is the main goal of monetary policy in the Republic of Macedonia. The monetary authorities in the Republic of Macedonia targeted the growth rate of the monetary aggregate M1 during the period from 1992 to 1995. During this period, the relationship between the growth rate of the money supply and aggregate demand was very strong (Fetai 2008). However, the results regarding the main goal of the monetary policy were unsatisfactory: the inflation rate was still

*** Mile Ivanov, MSc**
Faculty of Economics, Ss Cyril and Methodius University in Skopje
ivanov.mile89@gmail.com

Mihail Petkovski, PhD
Faculty of Economics, Ss Cyril and Methodius University in Skopje
mihail.petkovski@eccf.ukim.edu.mk

Elena Naumovska, PhD
Faculty of Economics, Ss Cyril and Methodius University in Skopje
elenan@eccf.ukim.edu.mk

relatively high. During the period of monetary targeting, the demand for money was very unstable mainly due to high dollarization (Fetai, 2008). The Republic of Macedonia abandoned the monetary targeting regime in 1995 and implemented an exchange rate targeting regime. Under this regime, money became an endogenous variable, subordinated to the stability of the exchange rate. Following the process of financial development and deepening monetization, monetary authorities in Macedonia optimized liquidity in the banking sector in order to stabilize interest rate fluctuations. A properly estimated money demand function should help monetary authorities to determine the required bank reserves in line with future economic expectations (Tillers 2004).

The Money-in-the-utility-function (MIUF) model is derived in study1 of this paper. One of the main results of the model is the property of *superneutrality*, implying that "the long-run capital stock of the economy is independent of the rate of monetary expansion" (Sidrauski 1967, p.544). Given the fact that the patterns of real output and consumption are dependent of the capital stock, their values are independent of the rate of growth of nominal money (Walsh 2010). The property of *superneutrality* is derived under the assumption that consumption and money are separable in the utility function. In the case where the utility function is non-separable, the steady-state values of the variables depend on the nominal money growth through its effects on inflation. In the case of non-separability, the household's decisions are affected by money balances, and nominal variables have real effects on the economy (Schabert and Stoltenberg 2005).

In the study 2, we derive the basic money demand equation and use the cointegration approach to test the long-run income and interest rate elasticity of the money demand in the case of the Republic of Macedonia. The majority of empirical works on the money demand functions were conducted on the case of developed countries (see for example Sriram 1999). Most of the empirical literature on developed countries represents the demand for money as a function of only two variables: aggregate income, usually represented by the real GDP, and interest rates as an approximation of the opportunity cost of holding money. It is very important to point out that this approach assumes the Fisher equation holds, and the rate of inflation is included in the money demand equation through the interest rates. However, this may not be the case with Macedonia, given the fact that the financial market is still underdeveloped and the capital mobility is limited. In order to address this issue, we followed the approach developed by *Cziráky and* Gillman (2006). First, we test whether the Fisher relationship holds in the case of Macedonia. If this relationship holds, the inflation rate is already included in the money demand equation through the opportunity cost variable. If the relationship doesn't hold, we must include the rate of inflation in the money demand estimation. Next, we estimate the money demand equation represented by the M2 aggregate using the cointegration approach. The money demand estimation is presented in the study 2 of this paper.

STUDY 1: THE MONEY-IN-THE-UTILITY-FUNCTION

Literature review

The MIUF model presented in the next section derives two popular properties: the conditions of the long-run neutrality and superneutrality of money. The conditions of the long-run neutrality (LRN) and long-run superneutrality (LRSN) of money were empirically challenged in recent decades. Some of the earlier tests include Geweke (1986) and Stock and Watson (1989). Fisher and Seater (1993) analyzed these conditions in the bivariate ARIMA framework. This framework is highly sensitive to the order of integration: if the real variables are integrated of order 1, monetary variables should be integrated of order 2. Using this framework, some studies reported evidence in favor of the LRN conditions: Weber (1994) for the G-7 countries and Wallace (1999; 2005) for Mexico and Guatemala. Telatar and Cavusoglu (2005) analyzed the LRN condition in the case of five high-inflation countries. The results show that the LRN condition cannot be rejected in the cases of Brazil, Mexico and Turkey. The LRN condition is rejected in the cases of Argentina and Uruguay.

King and Watson (1992) provided another general framework to test the LRN condition, based on the VAR model. King and Watson (1992) criticized the Fisher-Seater framework and argued that it is subject to the Colley and LeRoy critique. Chen (2007) examined the LRN using a methodology developed by King and Watson (1992) for South Korea and Taiwan. Their results suggest strong support for the LRN condition in South Korea and only little evidence in the case of Taiwan.

The model: derivation and simulations

In the first section we derive the money in the utility function, a model introduced by Sidrauski (1967). Sidrauski (1967) assumed that real money holdings increase the welfare of economic agents and therefore that money can be incorporated directly into the household's utility functions. Derivations of the model

are similar to Walsh (2010) and Wong (2013). In the MIUF model, households optimize their holdings or real money balances (m_t) and their consumptions paths (c_t) in order to maximize the present value of their utility function:

$$W = \sum_{t=0}^{\infty} \beta^t u(c_t, m_t) \tag{1}$$

Where β represents the discount rate and $0<\beta<1$, and c_t and m_t are consumption and real money holdings in per-capita terms. The household's optimization problem is subject to the following budget constraints (Walsh 2010, p.36):

$$r_t N_t + (1-\delta)K_{t-1} + (1 + i_{t-1})\frac{B_{t-1}}{P_t} + \frac{M_{t-1}}{P_t} = C_t + K_t + \frac{M_t}{P_t} + \frac{B_t}{P_t} \tag{2}$$

Where r_t represents the per-capita real lump-sum transfers from the government, B_t denotes bond holdings, i_t denotes the interest rate and K_t denotes the stock of capital. If we divide by N_t (population), we can rewrite the equation (2) in per-capita terms:

$$f\left(\frac{k_{t-1}}{1+n}\right) + r_t + \left(\frac{1-\delta}{1+n}\right)k_{t-1} + \frac{(1+ i_{t-1})b_{t-1}+m_t}{(1+n)(1+\pi_t)} = c_t + k_t + m_t + b_t \tag{3}$$

- where π_t represents the inflation rate. Equation (3) can be formulated as a "Bellman equation," where the household's problem is to maximize the value function V by choosing optimal paths of c_t, k_t, m_t and b_t.

$$V(W_t) = \max \{u(c_t, m_t) + \beta V(W_{t+1})\} \tag{4}$$

s.t:

$$W_{t+1} = f\left(\frac{k_t}{1+n}\right) + r_{t+1} + \left(\frac{1-\delta}{1+n}\right)k_t + \frac{(1+ i_t)b_t+m_t}{(1+n)(1+\pi_{t+1})} = c_{t+1} + k_{t+1} + m_{t+1} + b_{t+1} \tag{5}$$

From Equation (5) we can rewrite for the capital (k_t) in per-capita terms as:

$$k_t = W_t - c_t - m_t - b_t \tag{6}$$

Now, we can put equation (6) and equation (5) into equation (4):

$$V(W_t) = \max \left\{u(c_t, m_t) + \beta V_{t+1}\left[f\left(\frac{W_t - c_t - m_t - b_t}{1+n}\right) + r_{t+1} + \left(\frac{1-\delta}{1+n}\right)(W_t - c_t - m_t - b_t)\right] + \frac{(1+ i_t)b_t+m_t}{(1+n)(1+\pi_{t+1})}\right\} \tag{7}$$

The representative agent has three control variables: real money balances, consumption and bond holdings. The three FOCs for the maximization problem are:

$$\frac{\partial V(W_t)}{\partial c_t} = 0 \tag{8}$$

$$\frac{\partial V(W_t)}{\partial b_t} = 0 \tag{9}$$

$$\frac{\partial V(W_t)}{\partial m_t} = 0 \tag{10}$$

And the transversality condition is:

$$\lim_{t\to\infty} \beta^t \lambda_t x_t = 0, \text{for } x_t \in \{c_t, m_t, b_t\} \tag{11}$$

The FOC with respect to consumption are:

$$\frac{\partial V(W_t)}{\partial c_t} = u_c + \beta V'(W_{t+1})\left[f_{k'}\left(-\frac{1}{1+n}\right) - \frac{1-\delta}{1+n}\right] = 0$$

$$\frac{\partial V(W_t)}{\partial c_t} = u_c - \frac{\beta}{1+n}V'(W_{t+1})(f_{k'} + 1 - \delta) = 0 \tag{12}$$

The FOC with respect to bond holdings are:

$$\frac{\partial V(W_t)}{\partial b_t} = \beta V'(W_{t+1})\left(f_{k'}\left(-\frac{1}{1+n}\right) - \left(\frac{1-\delta}{1+n}\right) + \frac{(1+ i_t)}{(1+n)(1+\pi_{t+1})}\right) = 0$$

$$\frac{\partial V(W_t)}{\partial b_t} = -f_{k'} - (1-\delta) + \frac{(1+i_t)}{(1+\pi_{t+1})} = 0 \tag{13}$$

The FOC with respect to real money holdings holdings are:

$$\frac{\partial V(W_t)}{\partial m_t} = u_m + \beta V'(W_{t+1})\left(f_{k'}\left(-\frac{1}{1+n}\right) - \left(\frac{1-\delta}{1+n}\right) + \frac{1}{(1+n)(1+\pi_{t+1})}\right) = 0$$

$$\frac{\partial V(W_t)}{\partial m_t} = u_m - \frac{\beta}{1+n}V'(W_{t+1})\left(f_{k'} + 1 - \delta - \frac{1}{1+\pi_{t+1}}\right) = 0 \tag{14}$$

Taking partial derivative with respect to Wt yields to:

$$\frac{\partial V_t(W_t)}{\partial W_t} = \beta V'_{t+1}(W_{t+1})\frac{\partial W_{t+1}}{\partial W_t} \tag{15}$$

and

$$\frac{\partial W_{t+1}}{\partial W_t} = f_{k'}\frac{1}{1+n} + \left(\frac{1-\delta}{1+n}\right) \tag{16}$$

Now, equation (15) can be rewritten as:

$$\frac{\partial V_t(W_t)}{\partial W_t} = \beta V'_{t+1}(W_{t+1})\left[f_{k'}\frac{1}{1+n} + \left(\frac{1-\delta}{1+n}\right)\right]$$

$$V'_t(W_t) = \frac{\beta}{1+n}(f_{k'} + 1 - \delta)V'_{t+1}(W_{t+1}) \tag{17}$$

$$V'_{t+1}(W_{t+1}) = V'_t(W_t)\left[\frac{\beta}{1+n}(f_{k'} + 1 - \delta)\right]^{-1} \tag{18}$$

Making use of the equation (18), equation (12) can be written as:

$$u_c = V'(W_t) \tag{19}$$

And equation (14) :

$$u_m - \frac{\beta}{1+n}V'(W_{t+1})(f_{k'} + 1 - \delta) + \frac{\beta}{1+n}\frac{1}{1+\pi_{t+1}}V'(W_{t+1}) = 0 \tag{20}$$

$$u_m - u_c(c_t, m_t) + \frac{\beta}{1+n}\frac{1}{1+\pi_{t+1}}u_c(c_{t+1}, m_{t+1}) = 0$$

$$u_m + \frac{\beta}{1+n}\frac{1}{1+\pi_{t+1}}u_c(c_{t+1}, m_{t+1}) = u_c(c_t, m_t)$$

$$\frac{u_m(c_t,m_t)}{u_c(c_t,m_t)} + \frac{\beta}{1+n}\frac{1}{1+\pi_{t+1}}\frac{u_c(c_{t+1},m_{t+1})}{u_c(c_t,m_t)} = 1$$

$$\frac{u_m(c_t,m_t)}{u_c(c_t,m_t)} = 1 - \frac{1}{(1+n)(1+\pi_{t+1})}\beta\frac{u_c(c_{t+1},m_{t+1})}{u_c(c_t,m_t)} = 1 \tag{21}$$

Assuming that $r_t = f_{k'} - \delta$ and making use of equation (17):

$$u_c(c_t, m_t) = \frac{\beta}{1+n}(1+r)u_c(c_{t+1}, m_{t+1})$$

$$\frac{u_c(c_{t+1},m_{t+1})}{u_c(c_t,m_t)} = \frac{1+n}{\beta(1+r)} \tag{22}$$

Finally, we can rewrite equation (21) by plugging equation (22) into it:

$$\frac{u_m(c_t,m_t)}{u_c(c_t,m_t)} = 1 - \frac{1}{(1+n)(1+\pi_{t+1})}\beta\frac{1+n}{\beta(1+r)} = 1$$

$$\frac{u_m(c_t,m_t)}{u_c(c_t,m_t)} = \frac{i}{(1+i)} \equiv \omega \tag{23}$$

Here, we assume that $(1+i_t)=(1+r_t)(1+\pi_{t+1})$, or that the *Fisher relationship* holds. (Walsh 2010). Equation (23) is the key relation in the MIUF model: the intertemporal substitution between consumption today and tomorrow is a function of the interest rate. Finally, we have to assume the production function to be able to solve the model:

$$y_t = e^{z_t} k_{t-1}^{\alpha} \quad (24)$$

- where the productivity can be defined as an autoregressive (AR1) process:

$$z_t = \rho_z z_{t-1} + \varepsilon_{z,t} \quad (25)$$

And $\varepsilon_{z,t}$ is a white noise technology shock. The steady state values of the variables and the set of log-linearized equations are presented in appendices 1 and 2.

Calibration

In order to simulate the main properties of the model, we use the "calibration" technique developed by Kydland and Prescott (1982). Following this technique, the values of the parameters are based on the averages of the aggregate data or on the previous microeconomic studies. In this paper, the values of the parameters are chosen to represent the characteristics of the Republic of Macedonia. We use the value of the gross capital formation as a percentage of GDP as approximation of the capital ratio (α). The computed average share of gross capital formation in the real GDP in Macedonia for the period from 2002 to 2012 is 23,87% (table 1), so the value of the parameter α is set to 0,2387. Following Petkovska (2008), the parameter for the rate of depreciation is set according to the amortization data for the Republic of Macedonia. The value of the rate of depreciation is set to 0,025 (quarterly) or 10% on annual basis, which is in accordance with the amortization data from the State Statistical Office of Macedonia (Petkovska 2008). Parameter β (subjective rate of discount) is based on the data for the average real interest rates in Macedonia. The real interest rates are estimated as the bank's lending rates adjusted for the inflation rate. The subjective discount rate is set to 0,979 to match the average real interest rate of 8,25% (table 2). The value for parameter ρ_z (autoregressive parameter) is based on our estimations on the monetary aggregate M2, as an autoregressive process. The value of the autoregressive parameter ρ_z in the money growth process is set to 0,52 and the standard deviation is set to 0,046 based on our estimations for the M2 nominal money growth as an AR(1) process on a quarterly data from 2002 to 2012.

$$\Delta LM2 = 0{,}52\,\Delta LM2(-1) + \varepsilon_t$$

The remaining parameters are set according to Walsh (2010) and Brzoza-Brzezina (2011). We proceed with simulations of the MIUF model, estimated and simulated using the DYNARE platform developed by Michael Julliard.

Simulations

In this section, we analyze the simulated responses of the output, inflation and interest rate on productivity and money growth shocks. The simulated impulse responses reveal the main property of the money-in-the-utility function – the *superneutrality* of money. The responses of the variables to 1% positive innovation shocks in technology and nominal money supply are presented in the pictures 1 and 2, respectively.

Immediately after the shock in productivity, prices fall and output increases (picture 1). The simulations imply that the real variables (consumption, output and capital stock) are largely driven by productivity

Table 1: Gross Capital formation in Macedonia as a share of GDP for the period 2002-2012.

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Average
20,6	19,1	22	21,3	21,5	24,6	26,8	26,2	24,9	26,2	29,4	23,87

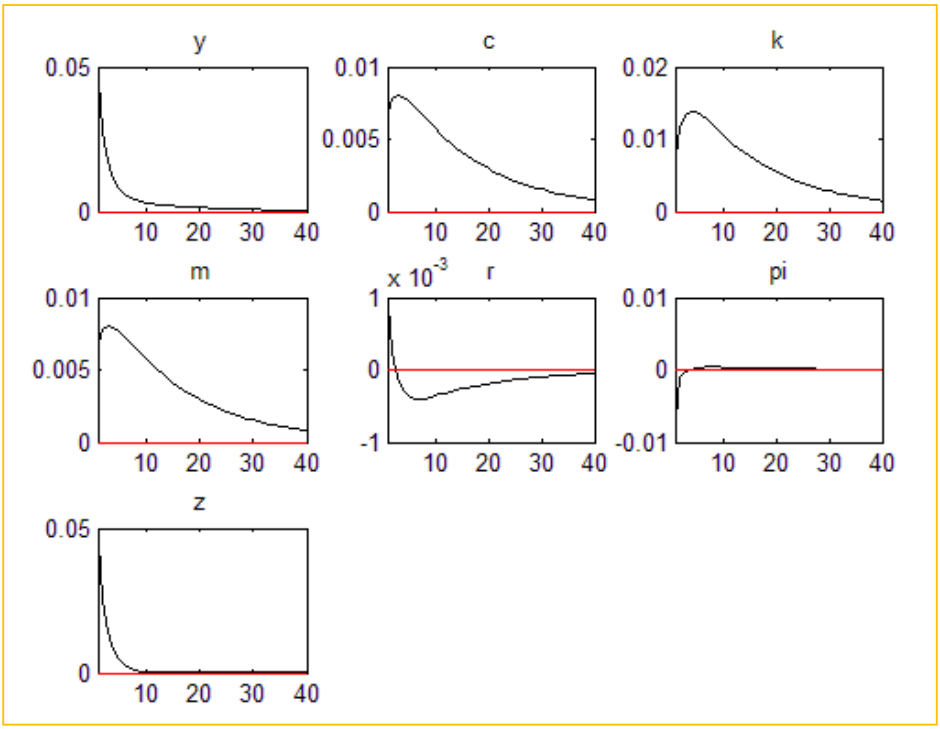
Source: *NBRM.*

Table 2: Real interest rates (%) for the period 2002-2012

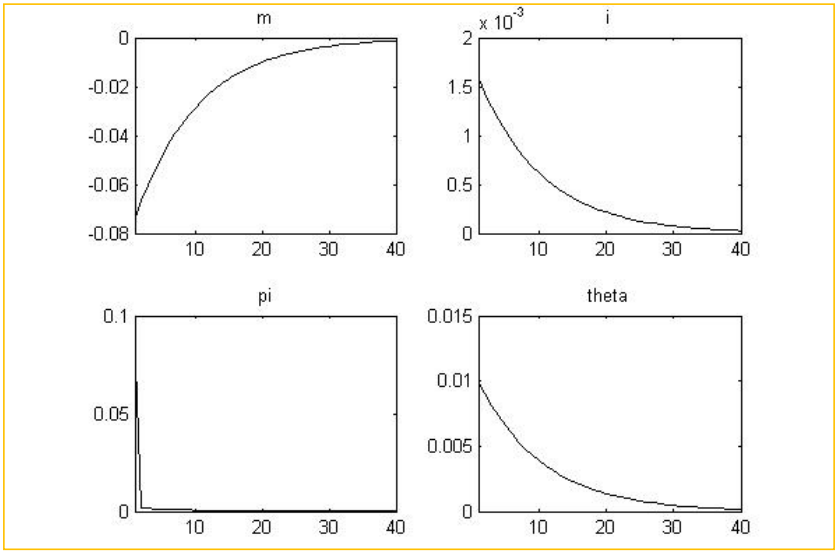
2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
14,81	12,84	11,64	8,06	7,9	1,39	10,87	7,88	4,96	5,17	5,25
Average real interest rate						8,25				

Source: NBRM, International Financial Statistics and author's calculations.

Picture 1: IRFs to a productivity shock



Picture 2: IRFs to a money supply shock



shocks. On the other hand, the real variables (except real money balances) are unaffected by the growth rate in the nominal money supply and the inflation rate (Picture 2). The inflation and nominal interest rates rise immediately after the shock in the nominal money supply, but the patterns of consumption are unaffected by the changes in the rate of inflation (Picture 2). However, the positive correlation between the inflation and the nominal interest rates is inconsistent with the empirical findings of the "liquidity effect" of money on the interest rates: in the short-run there is a negative response in the interest rates on the shocks to monetary supply (Friedman 1968; Cagan 1972). Here, the simulations imply that the effects of "anticipated inflation" dominate the "liquidity effects." The nominal interest rates rise following a positive money supply shock because of the higher anticipated inflation.

The property of *superneutrality* is derived under the assumption that consumption and money are separable in the utility function. In the case of *non-separability*, the steady-state values of the variables will depend on the nominal money growth through its effects on the rate of inflation. The issue of separability

has been empirically tested by some authors. Andrés, López-Salido and Vallés (2006) confirm the separability between the real balances and consumption in the case of the Euro Zone data. The results show that fluctuations in production and prices are largely driven by shocks in the real variables. Similar to Andrés, López-Salido and Vallés (2006), Ireland (2004) found only a limited effect from money on the fluctuations of output and prices in the case of the United States. The basic MIUF model has been extended to introduce the property of *non-supernautrality*- the growth rate of the nominal money and the inflation rate have real effects on the steady state values of real variables (Walsh 2010). One way to generate this property is to add a labor-leisure choice, while the other is to add non-separable preferences (see for example Heer 2004; Schabert and Stoltenberg 2005).

STUDY 2: MONEY DEMAND ESTIMATION

During the last two decades, the role of the monetary aggregates in the monetary policy research has been strongly reduced. Many studies, particularly those made in the case of developed countries, focused on interest rates as the main channel of the transmission mechanism of monetary policy. However, long-run aggregate economic activity and inflation dynamics are affected by the disequilibrium in the demand for money. The disequilibrium in the demand for money may affect the efficiency of the interest rates as the most important channel of monetary policy in developed countries (Valadkhani and Alludin 2003). This implies that interest rates can be indirectly affected by money demand through its effect on the output gap.

This paper applies the Vector error-correction model to identify both short-run and long run-equilibrium dynamics between the M2 aggregate and its determinants. In this stage, a properly specified money demand function is of critical importance for the validity of the estimation process. In specifying the money demand function, we follow the approach developed by Cziráky and Gillman (2006). Following Cziráky and Gillman (2006), we test whether the Fisher equation holds in the case of the Republic of Macedonia. If the Fisher relation holds, the inflation rate is already included in the money demand equation through the interest rates. If the Fisher relation doesn't hold, we must include inflation in the money demand specification.

Literature review

The majority of empirical works on money demand functions use cases of developed countries. However, during the last two decades the money demand function was also estimated for Central and Eastern European countries.

Siliverstovs (2007; 2008) estimated the money demand in Estonia and Latvia using the VEC model. Slavova (2003) analyzed the demand for money in Bulgaria for the period of hyperinflation and for the period of macroeconomic stabilization. The empirical research on the demand for money in Croatia includes Babic (2000), Payne (2003), Cziráky and Gillman (2006) and Skrabic and Tomic-Plazibat (2009). The procedure for estimating demand for money in Macedonia used in this paper will be similar to the procedure developed by Cziráky and Gillman (2006). There is also a vast literature investigating money demand in the case of Central Europe. These include Buch (2001) for Hungary and Poland, Hsing (2007) for Poland, Kollarova and Carsky (2007) for Slovakia, and Komárek and Melecký (2001) for the Czech Republic. Dreger, Reimers and Roffia (2007) estimated the money demand function in ten EU Member States using panel cointegration. Dreger, Reimers and Roffia (2007) included the exchange rate in the money demand equation as a part of opportunity costs. Similar to Dreger et.al (2007), Fidrmuc (2009) employed a panel cointegration method for the case of six CEE countries.

There have been studies of money demand functions in the case of Macedonia, mainly focused on the monetary aggregate M1. Petrevski and Jovanovski (2010) analyzed the long-run and short-run dynamics of the money demand function in the case of Macedonia using the VEC model. They use the M1 monetary aggregate as an approximation of money, and a quarterly frequency over the period from 1994 to 2008. The results suggest a stable demand for money over the analyzed period. The estimated long-run income elasticity is lower than unity (0.64) and high semi-elasticity with respect to the interest rate. Kjosevski (2013) used a VEC model and monthly data over the period from 2005 to 2012. Similar to Petrevski and Jovanovski (2010), Kjosevski finds a stable demand for M1, long-run income elasticity lower than unity, and slow adjustment to the equilibrium. However, Kjosevski (2013) finds a significantly lower interest elasticity (-0.25), but we should note that the authors estimated the demand for money over two different periods.

In this paper, we will examine the demand for money on the case of Macedonia as represented by the broader monetary aggregate M2.

Data and modelling

Variable selection and data transformations

The selection of appropriate variables to be included in the money demand estimation is of critical importance. Sriram (1999) points out that the selection of opportunity cost variables is the main factor for the differences of the estimated money demand functions.

To estimate the money demand function in the case of Macedonia, we use quarterly data over the period from 2002 to 2012, taken from the *International Financial Statistics database*. The quarterly time series are: the M2 monetary aggregate (nominal); the consumer price index (CPI); deposit interest rates and real GDP. The series for the rate of inflation are constructed as a first difference of the consumer price index.

The time series for the real GDP, M2 and CPI were seasonally adjusted using the Census X12 filter available in eViews7 software. All data except the deposit interest rates were transformed as a natural logarithm. In order to properly estimate the money demand function, we must transform the nominal M2 into real M2. The consumer price index (CPI) is used to transform the nominal money balances (M2 aggregate) into real money balances (M2 adjusted for the inflation - M2/CPI). Contrary to the previous studies in the case of Macedonia, here we use a broader measure of money (M2). According to Valadkhani and Alludin (2003), the M2 monetary aggregate is less distorted by the process of financial innovation and has a closer relationship with the measures of economic activity. The M2 monetary aggregate "includes the monetary aggregate M1 and short-term deposits" (NBRM 2013, p.18). Deposit interest rates represent the interest rates paid by commercial banks on demand, time, or savings deposits. Using the long-term interest rates seems appropriate for the broader monetary aggregates, in order to capture financial asset substitutions (Valadkhani and Alludin 2003). Real GDP series are used to represent the aggregate income (Y) and deposit interest rates and the rates of inflation are used as proxies for the opportunity cost of holding money (i). The Real GDP variable represents the transaction or wealth effects and economic theory predicts a positive relationship between money and output (Sriram 1999). At the same time, economic theory predicts a negative relationship between money and the variables representing the opportunity costs of holding money. As we mentioned earlier, we included the rate of inflation after testing the validity of the Fisher equation.

Some authors also use the exchange rate in the money demand specification to capture the effects from the substitution between domestic and foreign money (Dobnik 2011). However, we excluded the exchange rate from the money demand specification given the fact that the denar-euro exchange rate remained fixed for the analyzed period.

The Augmented Dickey-Fuller (1979) test was carried out to test for unit root. The ADF test shows that all variables except the inflation rate are integrated of order (1) (Table 3).

Table 3: ADF: Unit Root Test

Variable	Symbol	Level (t-stat)	First diff. (t-stat)	result
real money balances	$m-p$	-2,2228	-5,2708	**I (1)**
cpi	P	1,1090	-3,4622	**I (1)**
deposit interest rate	R	-2,3592	-4,6022	**I (1)**
inflation	Π	-2,6671	-4,1273	**I (1)**
real GDP	Y	-0,9222	-9,0900	**I (1)**

The Fisher equation

In order to specify the money demand equation, we follow the approach developed by Cziraky and Gillman (2006). First, we need to test the validity of the Fisher equation in the case of Macedonia. If the Fisher equation holds, the inflation rate is included in the money demand equation through the nominal interest rate (Dreger, Reimers and Roffia 2007). In this case, the inflation rate should be excluded from the money demand equation. If the Fisher equation does not hold, we need to include the inflation rate in the money demand function. The Fisher equation represents the relationship between nominal and real interest rates, and it was derived in the money-in-the-utility function model (Study 1). The fisher equation can be written as: (Cziraky and Gillman 2006)

$$r_t = \rho_t + \pi_t \tag{34}$$

where r represents the nominal interest rate, ρ represents the real interest rate and π represents the inflation rate. We assume that the real interest rate equals:

$$\rho_t = \hat{\alpha} + \hat{\varepsilon}_t \tag{35}$$

Where α term is a constant and $\hat{\varepsilon}_t$ is a white noise process. Following Cziraky and Gillman (2006) the Fisher equation can be rewritten as:

$$r_t = \hat{\alpha} + \pi_t + \hat{\varepsilon}_t \tag{36}$$

The empirical estimation of the validity of Fisher effect can be presented as:

$$\ln(r_t) = \hat{B}_0 + \hat{B}_1 \ln(\pi_t) + \hat{\varepsilon}_t \qquad (37)$$

where r_t is represented by the deposit interest rates and π_t is represented by the rate of inflation. To test for cointegration, here we apply the Engle-Granger two-step procedure. First, we need to estimate the Fisher effect and then we will perform an Augmented Dickey-Fuller (ADF) test on the residuals from the estimated Fisher equation. The estimated Fisher equation can be presented as:

$$\ln(r_t) = 6{,}68 - 0{,}13 l\pi_t + \hat{\varepsilon}_t$$

The ADF test on the residuals from the estimated Fisher equation suggests that the residuals are integrated of order 1 (Table 4). Since the residuals are non-stationary, the results imply that the Fisher equation does not hold in the Republic of Macedonia. Based on the results, following Cziraky and Gillman (2006), we will include the inflation rate in the specification of the long-run money demand function.

Table 4: Engle-Granger test for cointegration

ADF test on residuals	
Augmented Dickey-Fuller test statistic	-2,3777
Critical value at 5% level	-2,9331
p-value	0,1540

Money demand estimation: results and discussion

We employ a VEC model to capture the long–run and short-run interactions between M2 and its determinants. The long-run money demand equation can be specified as:

$$(m - p) = \alpha y + \beta r + \psi \pi \qquad (38)$$

where α represents income elasticity and β represents the semi-elasticity of money demand with respect to deposit interest rate.

To determine the appropriate lag length to be included in the test for the rank of cointegration, we carried out a lag length test on the unrestricted VAR model (Enders 2009). Here, we choose the two lags based on the Final prediction error (FPE) criteria (Table 5).

Table 5: VAR Lag Order Selection Criteria

Lag Order Selection Criteria (Unrestricted VAR)				
Lag	FPE	LR	AIC	SC
0	0.000460	3,667747	3,836635	3,728811
1	4.28e-07	-3,318222	**-2,473782***	**-3,012899***
2	**3.65e-07***	-3,504455	-1,984463	-2,954874
3	3.69e-07	**-3,559580***	-1,364036	-2,765741
4	4.28e-07	-3,543851	-0,672756	-2,505754

The cointegration approach requires all variables to be integrated in the same order (Hafer and Jansen 1991, Enders 2009, Brooks 2002). In our case, all of the variables included in the money demand specification are integrated of order 1. The Johansen test rejects the hypothesis of no cointegration. The results from the Johansen test indicate two cointegration vectors based on the Trace test and one cointegration vector based on the Maximum Eigenvalue test (Table 6). We proceed with the estimation of Vector Error Correction model based on one cointegration equation.

Table 6: Johansen Cointegration test

Johansen Cointegration test						
number of lags	2					
test	Trace			Maximum Eigenvalue		
No. of CE(s)	Trace Statistic	0.05 Critical Value	Prob. (5%)	Max-Eigen Statistic	0.05 Critical Value	Prob. (5%)
None *	53,685	40,175	0,001	28,465	24,159	0,012
At most 1	25,219	24,276	0,038	14,444	17,797	0,149
At most 2	10,776	12,321	0,090	10,099	11,225	0,078

The estimated long-run relationship (cointegration equation) can be presented as:

$$(m - p) = 0{,}81y - 0{,}17r - 0{,}38\pi$$

s.e	(0,074)	(0,117)	(0,077)
p-value.	[0.000]	[0.110]	[0.000]

The estimated long-run coefficients are in line with economic theory. The income elasticity is less than unity (0,81) and highly significant. The estimated elasticity is slightly lower than the value reported by Kjosevski (0,92) and higher than the value estimated by Petrevski and Jovanovski (2010) (0,60). However, the results are sensitive to the choice of sample period, the frequencies of the data, the variables chosen to represent the opportunity costs of holding money and to the number of lags (Mulligan and Sala-I-Martin

1992). Also, we use a broader measure of money demand (M2 aggregate) which we believe is a better definition of money. According to the quantity theory of money, an income elasticity lower than unity implies the increasing velocity of money. However, these findings are inconsistent with the data for the Republic of Macedonia, which suggests a declining velocity of money (Appendix 4). As Judd and Motley (1984) suggest, as economic agents become more responsive to interest rates, money demand reacts more aggressively to the changes in the interest rates, leading to the declining velocity of money. The trend of declining velocity is also consistent with the process of financial and economic development (Chowdhury 1994). As Chowdhury (1994) pointed out, the velocity should decline at a slower rate at higher levels of economic development. This implies that estimated income elasticity should decline in the future. The estimated semi–elasticity with respect to deposit interest rates is small and negative (-0,17), indicating that economic agents are willing to decrease their money holdings when opportunity costs rise. Although the estimated coefficient carries the expected sign, it is statistically insignificant at 5%, and almost significant at 10% (p=0,11). Compared to previous studies (Petrevski and Jovanovski 2010, Kjosevski 2013), the estimated interest elasticity for M2 is lower. According to Nell (1999), interest elasticity for the broader monetary aggregates is likely to be much smaller than those for narrow money. The results indicate negative elasticity with respect to inflation rate (-0,38), implying that economic agents decrease their money holdings less than proportionally as the inflation rises. The coefficient before the inflation rate is significant at 1%.

The short-run dynamics reveal that only 2,70% of the disequilibrium is corrected in a single quarter. The expected negative sign on the error-correction term is highly significant. This relatively slow adjustment to the equilibrium level is consistent with the previous findings based on M1. The short-run dynamics are presented in the Appendix 3.

Finally, we perform diagnostic tests on the residuals from the estimated model. The results are presented in Appendix 5 and show that the model is correctly specified.

CONCLUSION

The main purpose of this paper was to reassess and analyze the dynamic interactions between money, prices and output in the case of Macedonia. In the first study, we derived and simulated Sidrauski's MIUF model, calibrated to match the data for the Republic of Macedonia. The simulated impulse responses reveal the main property of this model - the *superneutrality* of money. The real variables were mostly driven by productivity shocks, whereas the monetary shocks didn't have any real effects. Sidrauski's (1967) model is mostly used to analyze the determinants of the money demand function. In the second study, we estimated the money demand function in the case of the Republic of Macedonia using VECM on quarterly data from 2002 to 2012. Following *Cziráky and* Gillman (2006) we tested the validity of the Fisher effect to decide whether to include the inflation rate in the money demand equation. The Fisher effect does not hold in the case of Macedonia, so we included the inflation rate in the money demand equation. We found one cointegrating vector between the real money balances, deposit interest rates, rate of inflation and the scale variable using Johansen's multivariate approach. The money demand equation was estimated using a vector error-correction framework. The results of the cointegration equation (normalized to real money balances) are in line with economic theory. The estimated income elasticity is less than unity (0,81) and consistent with previous studies in the case of Macedonia. However, we must note that previous studies were focused on the monetary aggregate M1 rather than M2. Also, previous studies covered different periods. The estimated semi-elasticity of money demand with respect to the interest rate is small and negative (-0,17), suggesting that economic agents are willing to decrease their real money holdings when opportunity costs rise. The estimated interest rate of semi-elasticity reported here is smaller compared to the coefficient reported by Petrevski and Jovanovski (2013) and Kjosevski (2013). However, as Nell (1999) argued, interest rate elasticities for broader monetary aggregates are likely to be much smaller than those for narrow money. Finally, the results indicate negative elasticity with respect to the inflation rate (-0,38) implying that economic agents decrease their money holdings less than proportionally as inflation rises. The short-run dynamics reveal that only 2,70% of the disequilibrium is corrected in a single quarter. The properties of stability imply that the M2 aggregate may serve as a proper policy indicator. The estimated money demand function should help monetary authorities to optimize liquidity in the banking sector, in accordance with economic expectations.

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APPENDIX

1. Steady state

In this section, we define the steady state values of the variables in the model. The steady state values are the values of consumption, inflation, interest rate, money balances and capital stock to which the economy converges in the absence of shocks (Walsh 2010; Brzoza-Brzezina 2011). There are two important assumptions in the MIUF model:

- 0% population growth (n=0), and
- 0% productivity growth.

The nominal money supply can be expressed as a simple stochastic process:

$$M_t = e^{\theta_t} M_{t-1} \tag{26}$$

And the real money supply in per-capita terms can be written as:

$$m_t = \frac{m_{t-1}}{\pi_t} e^{\theta_t} \tag{27}$$
$$\theta_t = \rho_\theta \theta_{t-1} + \varepsilon_{\theta,t}$$

- where $\varepsilon_{\theta,t}$ represents the money supply shock.

Also, the MUIF model assumes zero net supply of government bonds $b_t = 0$, and the government budget is balanced every year (Brzoza-Brzezina 2011). This relation implies that monetary policy is not independent of fiscal policy.

$$r_t P_t + N = M_t - M_{t-1} \tag{28}$$

or in per-capita terms:

$$r_t = m_t - \frac{m_{t-1}}{\pi_t} \tag{29}$$

If we use equation (29), we can rewrite the budget constraints as:

$$y_t + (1-\delta)k_{t-1} = c_t + k_t \tag{30}$$

The assumption of no productivity and polulation growth leads to the following steady state equations:

$$\alpha (k^{ss})^{1-\alpha} = \frac{1}{\beta} - 1 + \delta \tag{31}$$

$$(k^{ss})^{1-\alpha} = \left(\frac{\alpha\beta}{1 + \beta(\delta - 1))}\right)^{\frac{1}{(1-\alpha)}} \tag{32}$$

Equation (32) implies that steady state capital depends only on the discount rate, the rate of depreciation and on the production function (Walsh 2010). Putting equation (30) into production function (24) yields:

$$c^{ss} = f(k^{ss})^{\alpha} - \delta k^{ss}$$

Now, we can use equation (32) to rewrite the previous equation as:

$$c^{ss} = \left(\frac{\alpha\beta}{1+\beta(\delta-1))}\right)^{\frac{1}{(1-\alpha)}} - \delta\left(\frac{\alpha\beta}{1+\beta(\delta-1))}\right)^{\frac{1}{(1-\alpha)}} \tag{33}$$

- where $f(k) = k^{\alpha}$. Again, steady state consumption is independent of the rate of inflation and the rate of growth of the nominal money supply. Since the steady states of output, consumption and catital per-capita are all independent of the growth rate of the nominal money supply and thus in the rate of inflation, this condition is commonly known as the superneutrality of money (Walsh 2010).

2. Log-linearization around the steady state and the money demand function

The model we derived in the previous section is non-linear, and non-linear models are difficult to solve. In order to be able to solve the model, we will use first-order Taylor approximations around the steady state (Uhlig 1995). The variables are described as percentage deviations around the steady state, and the model can be solved and simulated using the DYNARE platform developed by Michael Julliard.
Log-linearizing around the steady state leads to the following system of equations (Walsh, 2010)1:

$$\hat{y}_t = \alpha \hat{k}_{t-1} + (1-\alpha)\hat{n}_t + z_t$$

$$\frac{y^{ss}}{k^{ss}}\hat{y}_t = \frac{yc^{ss}}{k^{ss}}\hat{c}_t + \hat{k}_t + (1-\delta)\hat{k}_{t-1}$$

$$E_t[\Omega_1(\hat{c}_{t-1} - \hat{c}_t) - \Omega_2(\hat{m}_{t-1} - \hat{m}_t)] - \hat{r}_t = 0$$

$$[\hat{y}_t - \Omega_1\hat{c}_t + \Omega_2\hat{m}_t] = \left(1 + \eta\frac{n^{ss}}{1-n^{ss}}\right)\hat{n}_t$$

[1] Full derivation of the log-linearized equations can be found in Walsh (2010). In this paper, we simplify the model and the dynamics of employment are excluded from the model.

$$\hat{r}_t = \alpha \frac{y^{ss}}{k^{ss}} (E_t \hat{y}_{t+1} - \hat{k}_t)$$

$$\hat{\imath}_t = \hat{r}_t + E_t \hat{\pi}_{t+1}$$

$$\hat{m}_t = \hat{M}_t - \hat{p}_t = \hat{c}_t - \left(\frac{1}{b}\right) \hat{\imath}_t$$

$$\hat{m}_t = \hat{m}_{t-1} - \hat{\pi}_t + u_t$$

$$\hat{y}_t = \alpha \hat{k}_{t-1} + z_t$$

$$\hat{m}_t = \hat{m}_{t-1} + \Omega - \hat{\pi}_t + u_t$$

$$\hat{c}_t = E_t(\hat{c}_{t+1} + \hat{r}_t)$$

$$\hat{\imath}_t = \hat{r}_t + E_t \hat{\pi}_{t+1}$$

$$\hat{m}_t = \hat{c}_t - \left(\frac{1}{i^{ss} - 1}\right) \hat{\imath}_t$$

$$r^{ss} \hat{r}_t = \alpha \frac{y^{ss}}{k^{ss}} E_t(\hat{y}_{t+1} - \hat{k})$$

$$\hat{k}_t = (1 - \delta)\hat{k}_{t-1} + \frac{y^{ss}}{k^{ss}} \hat{y}_t - \frac{yc^{ss}}{k^{ss}} \hat{c}_t$$

$$z_t = \rho_z z_{t-1} + \varepsilon_t$$

$$\Omega = \rho_\Omega \Omega_{t-1} + \mu_t$$

The parameters $r^{ss}; i^{ss}$ and π^{ss} are defined in the following way:

$$r^{ss} = \frac{1}{\beta}$$

$$\pi^{ss} = 1$$

$$i^{ss} = \pi^{ss} r^{ss} = r^{ss}$$

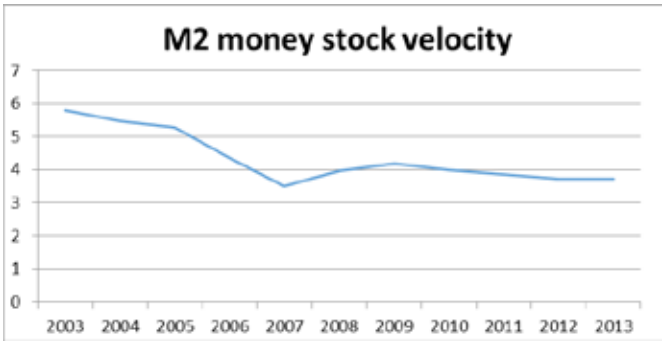
3. VECM: Short Run Dynamics

Table 7: VECM: Short-run dynamics

Short-run dynamics (VECM)		
regressor	coefficient	p-value
ECM(-1)	-0,0269	0,0018
Δrealm2(-1)	0,1578	0,3599
Δrealm2(-2)	0,3487	0,055
Δincome(-1)	-0,3756	0,1708
Δincome(-2)	-0,2917	0,2915
Δdeposit(-1)	0,0012	0,9523
Δdeposit(-2)	0,0391	0,0419
ΔDinflation(-1)	0,0014	0,8014
ΔDinflation(-2)	0,0113	0,0514

4. M2 money stock velocity in the Republic of Macedonia:

Graph 1: M2 money stock velocity



Source: Author's calculations based on IFS data.

5. VECM Diagnostic tests:

Table 8: VEC Residual Portmanteau Tests for Autocorrelations

Lags	Q-Stat	Prob
3	18,34313	0,9172
4	42,06867	0,5547
5	55,18934	0,6518
6	64,18571	0,8310
7	78,18226	0,8473
8	104,4223	0,5795
9	113,4382	0.7415
10	124,7172	0,8182
11	136,4046	0,8689
12	142,8652	0,9488

Table 9: VEC Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares):

Joint test:		
Chi-sq	df	Prob.
211,91	180	0,519

Table 10: VEC Residual Normality Tests

Compo-nent	Jarque-Bera	df	Prob.
1	1,791174	2	0,4084
2	0,528712	2	0,7677
3	1,913792	2	0,3841
4	0,688563	2	0,7087
Joint	4,922242	8	0,7659

DE GRUYTER OPEN

South East European Journal of Economics and Business
Volume 9 (2) 2014, 21-32
DOI: 10.2478/jeb-2014-0001

A RISK METRIC ASSESSMENT OF SCENARIO-BASED MARKET RISK MEASURES FOR VOLATILITY AND RISK ESTIMATION: EVIDENCE FROM EMERGING MARKETS

Innocent Sitima, Clifford K. Hlatywayo *

Abstract

The study evaluated the sensitivity of the Value- at- Risk (VaR) and Expected Shortfalls (ES) with respect to portfolio allocation in emerging markets with an index portfolio of a developed market. This study utilised different models for VaR and ES techniques using various scenario-based models such as Covariance Methods, Historical Simulation and the GARCH (1, 1) for the predictive ability of these models in both relatively stable market conditions and extreme market conditions. The results showed that Expected Shortfall has less risk tolerance than VaR based on the same scenario-based market risk measures.

Keywords: *risk metric assessment: market risk measures: risk estimation: risk volatility: emerging market*

JEL: *G11, G15*

1. INTRODUCTION

Globalisation has swayed capital markets and necessitated the need for collaboration of economic trade, which has instigated international markets to be more networked. Global capital markets have frequently affected each other as there is a higher dispersion of international information causing more powerful co-integration in the movement of capital markets in the world, whether developed or otherwise. Extraordinary events in the market often give rise to high losses in the market, and events such as those of October 1987, February 1994 and the more recent subprime mortgage crisis often are the major causes for market distortions in developed markets. The literature (Longin, 2000; Barry & Rodriguez, 2004; Lee, Shie, & Chang, 2012), shows that emerging markets suffer many crises stemming from political disturbances or misguided economic policies, among other sources.

Some market crises do not necessarily affect the whole market but rather a small region or a specific country. A regional crisis can be a crash like that of the Asian tigers in 1999, or an epidemic such as the Asian flu as suggested by Girard *et al*, (2003). In South Africa these extraordinary situations can be seen in events such as the 2002-2003 rand crisis, erratic labour disturbances and high electricity hikes, which often result in misguided economic policies that tend to affect stock market performance. Some of the factors do not have globally catastrophic effects on markets, although they have regional or even continental effects, considering that South African financial markets are the best performing financial system in Africa. Under such

*** Innocent Sitima, PhD candidate**
Department of Agricultural Economics,
University of Fort Hare, South Africa,
E-mail: innositima@gmail.com

Clifford K. Hlatywayo, PhD candidate
Department of Agricultural Economics,
University of Fort Hare, South Africa

a heavy wave of uncertainty on global and domestic frontiers there is a dire need for risk to be mitigated (Prem*et al*., 2010).

Emerging markets, particularly those in Africa, have been neglected by the literature in terms of risk metric assessment. Most emerging markets are basically characterised by heavy tails in their distribution, particularly those of Extreme Value, making emerging markets more volatile and riskier compared to developed markets (Longin, 2000). Gourieroux *et al*., (2000); Fan *et al*., (2004); Yamai & Yoshiba (2005); Cheng *et al*., (2007), have shown that since the subprime mortgage crisis of 2007- 2008, the risk properties of emerging markets have become equally important on global markets. Investors always try to mitigate both capital and credit risk to ensure that portfolios incur a minimum number of losses. Various theories have been put forward to make sure that losses are kept at a reasonable level. In this light numerous theories were brought forward, such as the Value-at-Risk (VaR), Expected Shortfall and Extreme Value (EVs) theories, to mention but a few. Most of these methods seek to measure risk and reduce uncertainty in the market.

On the regulatory side, regulators also have roles in the financial health of the financial system because most regulators are concerned with the condition of the financial system amid extreme events and catastrophic events occurring in the market. Various statutes and pieces of legislation such the Basel I, II and III have been put in place to ensure that banks and financial institutions remain functional and the risk appetites of investment companies is kept at a controlled level (Haas, 2009). Over and above the main problem in risk management has been the issue of risk measurement and how best to quantify the amount of exposure.

This paper seeks to look at the interdependency and concentration of the market risks of financial markets in terms of how the emerging markets relate to some of the best and most advanced markets. To achieve this, the paper will construct a portfolio that comprises investments in emerging market and developed market structures.

2. THEORETICAL BACKGROUND, CONCEPTS AND LITERATURE

Value-at-Risk

Value-at-Risk (VaR) is the statistical analysis of the maximum number of losses that can occur in a given portfolio due to unexpected market movements as a result of an unforeseeable catastrophic event for the market. The main advantages of the VaR as an estimation technique are its conceptual simplicity, ease of computation and its readiness for applicability (Yamai&Yoshiba, 2005). The VaR technique allows for both long and/or short-term risk factors and the correlation between the risk factors to be measured during extreme conditions (Longin, 2000). However, most investors and risk managers have been sceptical about the use of VaR as a risk metric procedure after the 2007-2008 subprime crisis. The VaR is given as *α*, the confidence interval that a portfolio is not expected to exceed given such an event. Formally, VaR is given as:

$$VaR_\alpha = \inf\{l \in \Re : P(L > l) \leq 1-\alpha\}$$
$$= \inf\{l \in \Re : F_L(l) \geq \alpha\}$$

where the given confidence interval is $\alpha \in (0,1)$ and the VaR for the portfolio loss is given by l such that the probability loss of the portfolio L exceeds l and is not bigger than $1-\alpha$ (McNeil *et al*, 2005), and F_L denotes the loss distribution function (Rossignolo, Fethi&Shaban, 2012). By applying the quartile function the normal VaR function[1] is given as:

$$VaR_\alpha = \mu + \sigma\Phi^{-1}(\alpha)$$

hence $F_L(VaR_\alpha) = \alpha$, giving the linearised loss and risk factor changes.[2] The main disadvantages of VaR as a risk metric assessment technique has been that VaR is generally unreliable in assessing a market under stress where the market is generally characterised by a volatile and extreme dependence structure (Yamai&Yoshiba, 2005). The VaR technique tends to underestimate the risk. Artzner *et al*., (1997) developed another approach to be used to estimate risk beyond VaR, which is the expected shortfall.

Expected shortfall

This complementary approach to modelling and measuring loss distribution based on the exposure of a portfolio is now preferred to the VaR technique, as this technique allows risk managers to avoid the problem of non-additives associated with the VaR

[1] If the Loss follows a student t distribution then $L \sim t(v,\mu,\sigma^2)$ then $VaR_\alpha = \mu + \sigma t_v^{-1}(\alpha)$

[2] Assuming the data follows a Gaussian distribution

approach. The Expected Shortfall (ES) is a statistical technique that allows risks to be measured by simply looking at the tail of the distribution of the loss incurred that have exceeded VaR (McNeil *et al*., 2005). The definition of ES is given as:

$$ES_\alpha = \frac{1}{1-\alpha}\int_\alpha^1 q_u(F_L)du$$

where $q_u(F_L) = F_L^{\leftarrow}(u)$ is the quartile function of F_L (McNeil *et al,* 2005), therefore:

$$VaR_\alpha = \frac{1}{1-\alpha}\int_\alpha^1 VaR_\alpha(L)du$$

The main drawback of ES as a risk metric is that it depends on the accuracy of the estimation of the portfolio.

3. METHODOLOGY

VaR and ES risk estimation models

In our analysis, the authors should emphasise that the paper shall use the main (marginal) distributions which are the normal and the student t-distributions for the returns data (see Berger (2013) for discussion). In this analysis the authors assess the risk metric measures using the following models:

Variance-Covariance Model

This is statistical analysis that allows for the modelling of multivariate normal analysis of both conditional and unconditional methods using risk factor changes:

$$L_{t+1}^{\Delta} = l_{[t]}^{\Delta}(X_{t+1}) \sim N(-c_t - b_t\mu, b_t^{'}\sum b_t)$$

where b and c represent random vector constants.[3]

Historical simulation

The authors apply arguably the simplest form of risk metric by using historical simulation (HS). To stimulate the data using empirical or historical data the HS model allows the multivariate model to be estimated using the loss operators, the assumption being that historical data is actually consistent with the estimator of the current loss operator (McNeil *et al*, 2005)[4] thus, $l_{[t]}(X)$ under F_X for larger samples. The more formal definition is given as:

$$F_n(l) = \frac{1}{n}\sum_{s=t-n+1}^{t} I_{\{L_s \le l\}} = \frac{1}{n}\sum_{s=t-n+1}^{t} I_{\{l_{[t]}(X_s)\le l\}} \to P(l_{[t]}(X) \le l = F_L(l)$$

GARCH processes

Financial time series display some stylized facts like the autocorrelation of squared returns and volatility clustering (Rossignoloet al., 2012). It is paramount that the authors use the Generalized Autoregressive Conditional Heteroscedastic (GARCH) process to capture the volatilities of the daily risk-factor return series in the data. The GARCH process has good predictive ability for estimating conditional volatility assuming the processes $(X_t)_{t\in Z}$ is a GARCH (*p,q*) process if the model is strictly stationary. The GARCH process is given as:

$$X_t = \alpha_0 + Z_t,\ \sigma_t^2 = \alpha_0 + \sum_{i=1}^{p}\alpha_i X_{t-1}^2 + \sum_{j=1}^{p}\beta_j\alpha_{t-j}^2,$$

where

$\alpha_0 > 0, \alpha_1 \ge 0, i = 1,\ldots\ldots, p, and \beta_j \ge 0, j = 1,\ldots\ldots, q$

. The authors use the low order GARCH (1, 1) model, which allows that periods of high volatility tend to be persistent. The authors stimulate realisation of a GARCH (1, 1) process with a Gaussian innovation (McNeil et al, 2005). The GARCH (1, 1) process is given as:

$$X_t = Z_t\sqrt{\alpha_0(1+\sum_{i=1}^{\infty}\prod_{j=1}^{i}(\alpha_1 Z_{t-j}^2 + \beta))}$$

The main advantage of the GARCH methodology is that it is very practical in terms of the risk measurement of risk factors. GARCH is relatively simple to use and to apply, and moreover it tends to prove itself very easy to fit.

Back testing and Stressed GARCH

To assess the validity of the historical simulation model it is imperative that the risk manager should at least conduct a back test to check if the historical simulation procedure is continually implemented over time to compare the performance and the relative performance of the model. At time $t+1$ by

[3] See McNeil et al, 2005, chapter 3

[4] Assuming the stationarity of the risk factor changes

definition of VaR (assuming a continuous loss distribution) we have $p(L_{t+h} > VaR_{\alpha}^{t,h}) = 1-\alpha$ so that the probability of the default of violations of the VaR and ES is given by $1-\alpha$, thus:

$$\hat{I}_{t+1} := I_{\{L_{t+1} > VaR_{\alpha}^{t}\}},$$

$$\hat{I}_{t+h}^{(h)} := I_{\{L_{t+h} > VaR_{\alpha}^{t,h}\}}$$

4. DATA AND EMPIRICAL RESULTS

Data sources

Historical daily returns data were calculated using the logarithm difference between daily closing prices from the Data Stream Website for the period from January 2000 to December 2010. To stimulate the level of risk associated with these markets, the paper assumes a hypothetical portfolio invested as follows: the raw data consisted of a portfolio of 10 million USD to invest and borrowed 10 million against the 1-year Treasury Bill interest rate. A third of the portfolio is invested in the South Africa stock index (FTSE JSE). Another third was invested into the Goldman Sachs Commodity Index, while the rest is invested into the Chinese stock market, specifically in the Shanghai Stock Exchange (SSE) Composite Index.

Table 1 shows data analysis of the simulated portfolio. The SSE Composite Index tends to have higher volatility while the FSTE/JSE is less volatile in all data points.

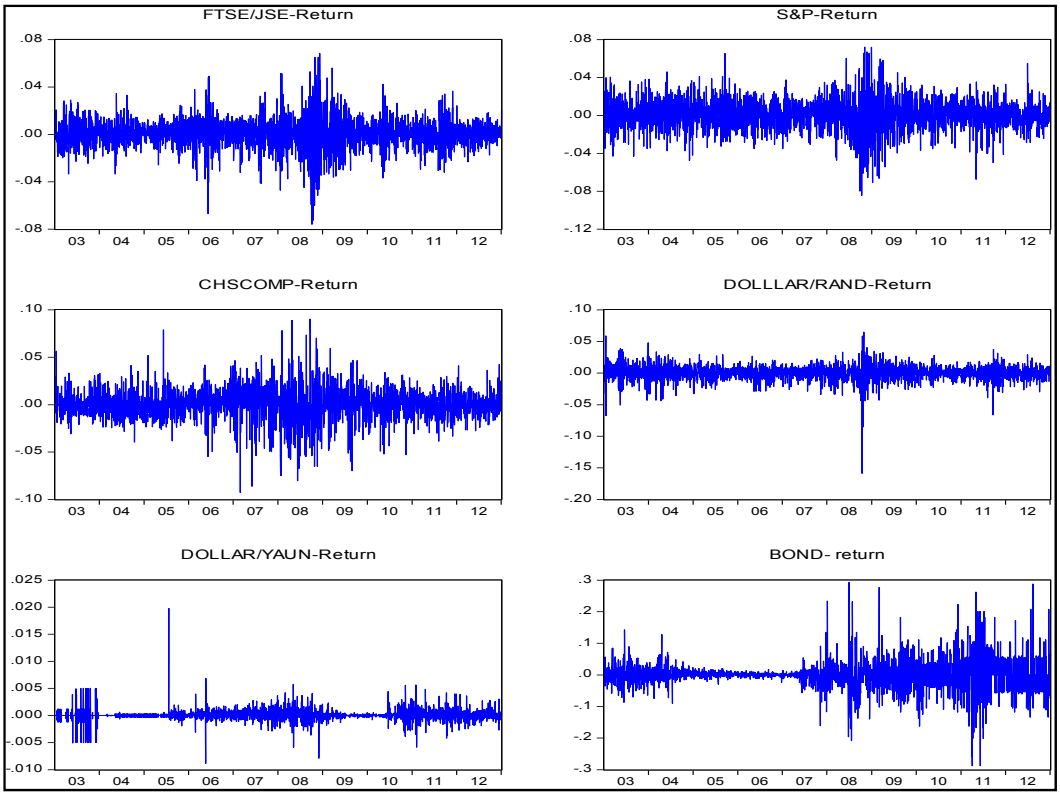
Figure 1 highlights the time series of risk factor changes in the daily log returns on the FTSE/JSE, S&P 500, and CHSC OMP indices, as well as their currency

Table 1: Descriptive Statistics, 2/1/03-2/1/13

	FTSE/JSE	S&P GSCI	SHANGHAI SE COMPOSITE - PRICE INDEX	US $ TO SOUTH AFR. RAND - EXCHANGE RATE	US $ TO CHINESE YUAN EXCHANGE RATE	US 1 year T-BILL
Mean	0,06%	0,04%	0,02%	0,00%	0,01%	-0,08%
STD DEV	1,27%	1,60%	1,63%	1,21%	0,11%	4,47%
Data Code	JSEOVER	CGSYSPT	CHSCOMP	SARCMUS	CHINYUS	H15/H15/ RIFSGFSY01_N.B
N	2609	2609	2609	2609	2609	2609

Source: DataStream, US Treasury

Figure 1: Risk factor changes of Portfolio Returns



exposure on Dollar/Rand, and Dollar/Yaun exchanges along with the 90-day T- Bill return for the period 2003-2013. Figure 1 shows that the period between 2007 and 2009 was extreme and shows large negative returns. The dates are from the period of the subprime mortgage crisis and clearly the markets showed correlations with periods of market stress. The standardised total portfolio value and the portfolio weight are given as:

Linearised loss function is the first order Taylor approximation of the loss function and is equal to:1

$$L^{\Delta}_{t+1} = -\left[\frac{\partial V(t)}{\partial t}*\Delta + \frac{\partial V(t)}{\partial Z_1}*X_1(t+1) + \frac{\partial V(t)}{\partial Z_4}*X_4(t+1) + \frac{\partial V(t)}{\partial Z_2}*X_2(t+1)\right.$$
$$\left. + \frac{\partial V(t)}{\partial Z_3}*X_3(t+1) + \frac{\partial V(t)}{\partial Z_5}*X_5(t+1) + \frac{\partial V(t)}{\partial Z_6}*X_6(t+1)\right]$$

Figure 2 shows the distribution of the portfolio losses during the period. The graph shows that there was high volatility during the subprime crisis and high portfolio losses. However, the FSTE/JSE market and the Rand-Dollar exchange seem less volatile as compared to the SSE Composite Index returns. The overall portfolio shows that the portfolio losses are likely to be during periods of high financial turmoil regardless of the portfolio positions. The greatest losses occurred during the financial crisis. Although the mean is -13123.60, is it not significantly different from zero at the 5% significance level.

Figure 2: Distribution of Portfolio Losses

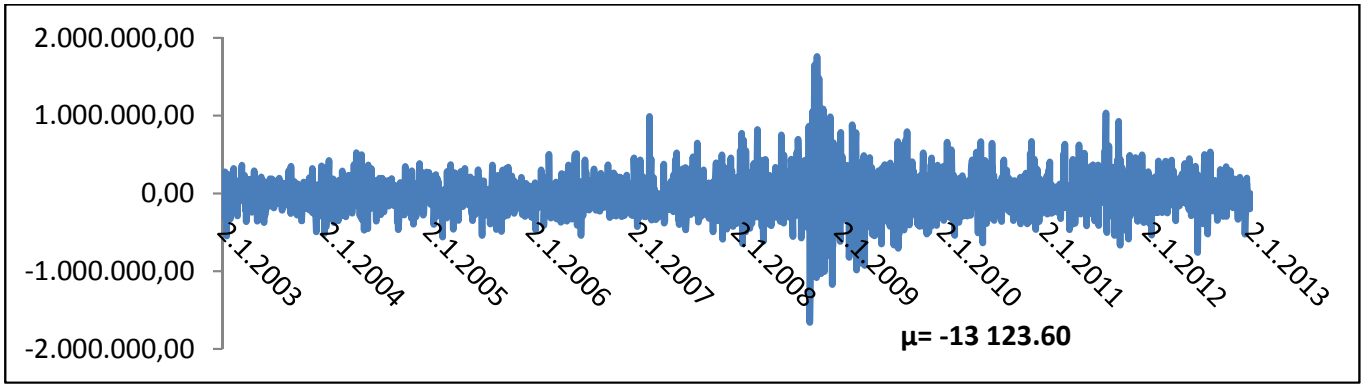


Table 2: Historical Simulation Method (1 Day Horizon)

A	*0.95*	*0.975*	*0.99*
VAR	*-395,229.97*	*-601,150.65*	*-748,623.47*
ES	*-643,471.26*	*-838,290.50*	*-1,069,442.71*

Variance Covariance Method (1 Day Horizon)

Table 3: Multivariate Normal

A	*95%*	*97,5%*	*99%*
VaR	*$(335.236,53)*	*$(399.552,01)*	*$(474.332,65)*
ES	*$(420.523,51)*	*$(476.670,64)*	*$(543.496,83)*

1 An interested reader may refer to the appendix for the portfolio mapping and risk factor changes.

Value-at-Risk and Expected Shortfall risk estimation models

Both the HS and the variance covariance methods have shown that the ES method has more losses than the Value-at-Risk (VaR) method. However, the multivariate normal variance covariance method has few number losses compared to the HS method. For investors with less risk tolerance, it would be more advisable to adopt the HS model than the covariance technique.

The covariance matrix shows that there is a low correlation between the FTSE/JSE index and the two more developed market indices, the S&P GSCI and SCI. However, the FSTE/JSE is less volatile than the S&P GSCI and SCI indices, as shown in Figure 1.

Validity of Normality Assumption

We applied the normality tests of the arbitrary group of indices and the exchange rate exposures. For each variable, the authors calculated sample skewness and kurtosis and applied the Jarque-Bera test to the multivariate time series. The null hypothesis of normality is not rejected at a p-value greater than 0.05. We applied Mardia's test to the multivariate data for all of the log daily returns. The results are shown in the distribution graphs and the QQ plots and distribution graphs below.

Figures 3 and 4 show the daily log returns data on the normality assumption. The figures show that the daily log returns data fail to reject the multivariate test of normality. The QQ plots look slightly linear, thus showing some evidence that the returns are close to being normally distributed. This shows that there is a need for both the standard normal and student t distribution. This might indicate the central limit theorem taking effect (Mc Neilet al., 2005). As expected, Figure 2 indicates that the currencies are the least volatile risk exposures in our log returns data, with the Yuan being the least volatile factor in our data. Figure 3 indicates that the returns show fatter tails than the normal distribution. However, as is the convention the authors will proceed under the assumption of univariate normality and therefore multivariate normality. In some cases the authors assume that the underlying

Table 4: Variance Covariance Matrix

	FTSE/JSE	S&P GSCI	SHANGHAI SE COMPOSITE - PRICE INDEX
FTSE/JSE	0,016%	0,007%	0,003%
S&P GSCI	0,007%	0,026%	0,003%
SHANGHAI SE COMPOSITE - PRICE INDEX	0,003%	0,003%	0,026%

Table 5: Student-t

VaR			
	95%	**97,5%**	**99%**
v=3	$(831.474,32)	$ (1.124.571,33)	$(1.604.741,59)
v=4	$(614.866,58)	$(800.928,29)	$(1.081.061,36)
v=5	$(530.475,37)	$(676.857,29)	$(886.166,38)
v=6	$(485.262,90)	$(611.183,74)	$(785.106,24)
ES			
V=3	$(790.300,23)	$(1.028.100,14)	$(1.428.900,08)
v=4	$(653.200,14)	$(814.600,48)	$(1.065.100,98)
v=5	$(589.400,55)	$(718.280,69)	$(908.280,13)
v=6	$(552.790,88)	$(664.110,73)	$(822.570,45)

Figure 3: Distribution of Returns

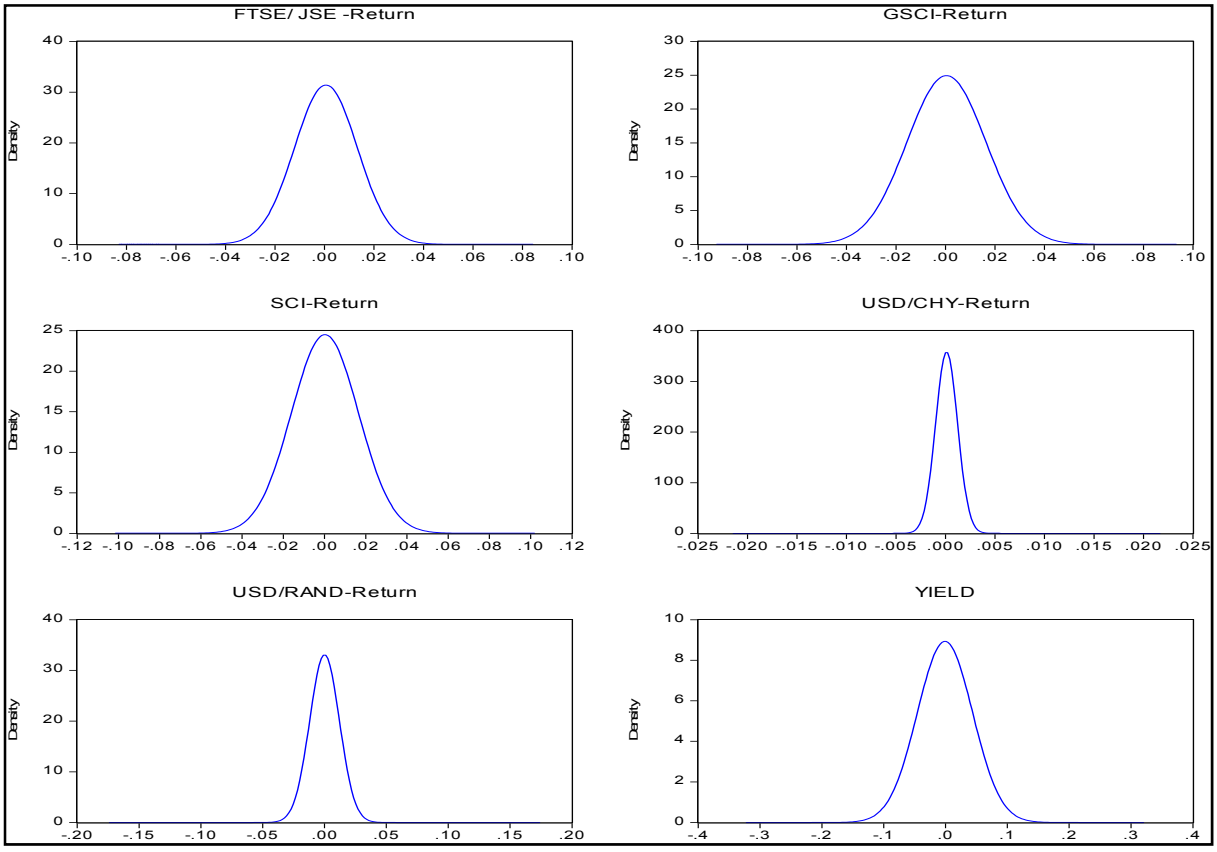
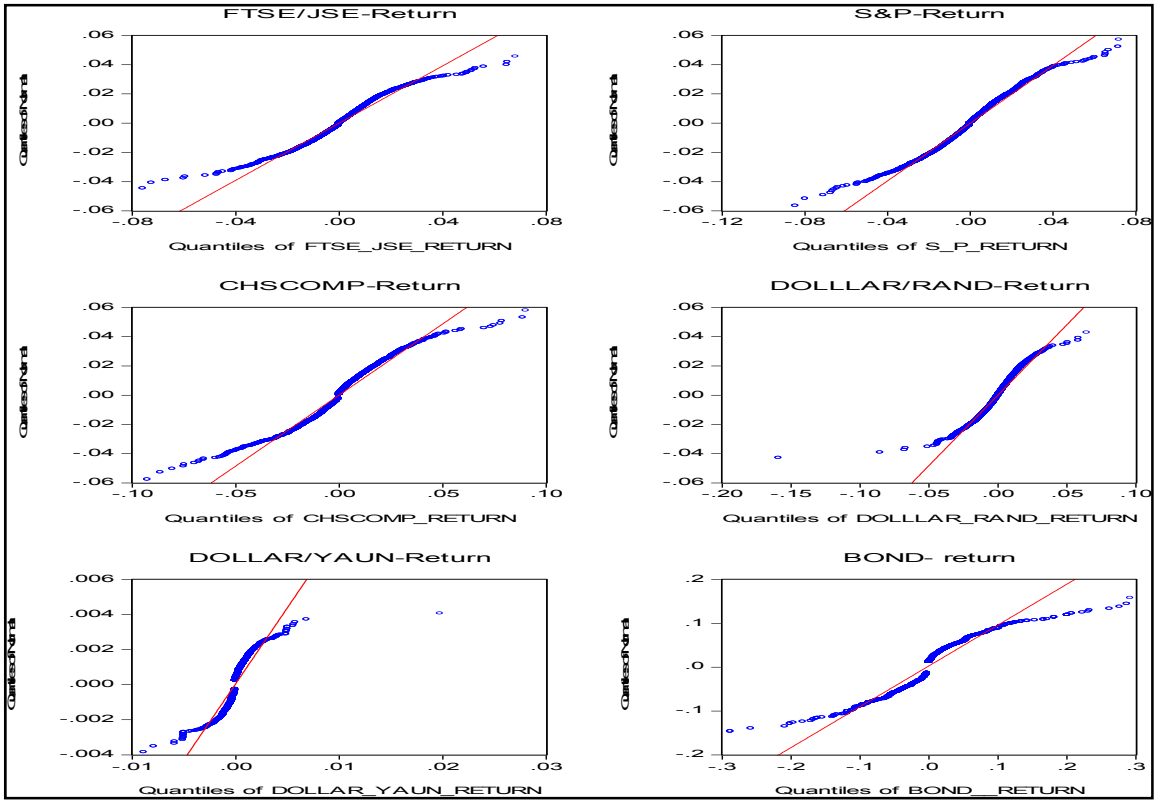


Figure 4: QQ Plot of daily log-returns



distributions follow a student-t distribution so that we are better able to capture the fat tails observed in the data.

Table 6 shows an analysis of daily log- returns data for the period 2003- 2013, and ML estimates of parameters and standard errors for a GARCH (1, 1) model with a leverage term under the t innovation assumption. The GARCH (1, 1) process with Gaussian innovations and parameters are given above for both standard normal and the student t distributions.

The back testing results shown in Table 7 suggest that the number of violations for all models (excluding the Variance Covariance method: Student-t v=3) far exceeded the expected number of violations in the global financial crisis (2008, 2009). Furthermore, all models that assumed multivariate normality for the underlying risk factors had on average a higher number of violations than the student-t. This is because the student-t, with its heavier tails, is far more able to capture the observed nature of financial losses than the normal distribution. Thus, the lower the number of degrees of freedom, the lower the number of expected violations.

Table 6: GARCH (1, 1) results

Parameter	Normal	Student-t
μ	-17022,76	-19241,84
$\alpha 0$	581.452.475,81	508.053.397,86
$\alpha 1$	0,05	0,05
$\beta 1$	0,94	0,94
N		10,19

Critical Values	0,95	0,975	0,99
normal	1,644853627	1,95996398	2,32634787
student-t	1,812461123	2,22813885	2,76376946
VAR	0,95	0,975	0,99
normal	355.462,15	426.820,38	509.789,75
student-t	391.069,82	485.172,48	606.430,52

Table 7: Back Testing GARCH

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Trading Days	260	262	260	260	261	262	261	261	260	261	1
Expected Number of Violations											
(95% VaR)	13	13	13	13	13	13	13	13	13	13	0
(97.5% VaR)	7	7	7	7	7	7	7	7	7	7	0
(99% VaR)	3	3	3	3	3	3	3	3	3	3	0
Number of Violations											
Normal											
0.95	6	8	7	7	10	34	37	14	17	6	0
0.975	3	4	5	2	5	23	25	6	7	4	0
0.99	3	4	5	2	5	23	25	6	7	4	0
Student-t											
0.95	3	5	7	4	7	27	34	8	10	5	0
0.975	3	0	3	1	2	17	19	4	5	4	0
0.99	0	0	0	0	0	12	9	1	1	1	0

5. CONCLUSION AND RECOMMENDATIONS

The most appropriate VAR modeling approach is one that adopts a heavy tailed multivariate distribution (in this case the t-distribution) of the essential risk factors. The models in our portfolio that made use of the t-distribution performed relatively better in back testing, implying that they were better able to estimate the VAR and ES. This is because, in line with the stylised facts of the empirical findings, our results did indeed suggest that the distributions of the financial risk factors of our portfolio returns are heavier tailed than the normal distribution, thus prompting the use of a heavy tailed distribution like the student t. As a result of this, the authors saw that the assumption of Gaussian risk factors tended to underestimate the tail of the loss distribution. They experienced the highest number of violations, especially during the period of the global financial crisis.

The authors further recommend the use of both the conditional and unconditional Variance Covariance method. This is because this method is relatively easy to implement and provides fairly accurate estimates. One drawback of this method, however, is that it makes use of linearisation to approximate losses and this may not always offer a good approximation of the relationship between true loss distribution and the risk factor changes. In addition, the authors recommend the use of a GARCH structure with a heavy tailed multivariate distribution such as the t-distribution.

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1. Portfolio Mapping[6]

Risk Factors

1. FTSE JSE index (measured in log(index value))
2. Goldman Sachs Commodity Index (measured in log(index value))
3. Shanghai composite index (measured in log(index value))
4. USD/CNY exchange rate (the number of USD per CNY, measured in log(exchange rate))
5. USD/ZAR exchange rate (the number of USD per ZAR, measured in log(exchange rate))
6. 1-year UST interest rate

Logarithmic Prices

$Z_1(t) = \ln(S_1(t))$, "the log value of the FTSE/JSE index"

$Z_2(t) = \ln(S_2(t))$, "the log value of the GSCI commodity index"

$Z_3(t) = \ln(S_3(t))$, "the log value of the Shanghai composite index"

$Z_4(t) = \ln(S_4(t))$, "the log value of the USD/ZAR exchange rate, the number of USD per 1 ZAR"

$Z_5(t) = \ln(S_5(t))$, "the log value of the USD/CNY exchange rate, the number of USD per 1 CNY"

$Z_6(t) = y(t,T)$, "the 1-year UST interest rate"

$$Z(t) = \left(Z_1(t), Z_2(t), Z_3(t), Z_4(t), Z_5(t), Z_6(t)\right)$$

Risk Factor Changes

$$X(t+1) = \left(X_1(t+1), X_2(t+1), X_3(t+1), X_4(t+1), X_5(t+1), X_6(t+1) \right) := Z(t+1) - Z(t)$$

Loss Operator

$$L(t+1) = -\left(f\left(t+1, Z(t+1)\right) - f\left(t, Z(t)\right)\right)$$

Exposures

$w_1 = \dfrac{2V * (1/3)\lambda}{\exp(Z_1(0) + Z_4(0))}$, the position in the FTSE/JSE index

[6] For this estimation I am grateful to a reference for checking the accuracy

$w_2 = \frac{2V*(1/3)\lambda}{\exp(Z_2(0))}$, the position in the GSCI commodity index

$w_3 = \frac{2V*(1/3)\lambda}{\exp(Z_3(0)+Z_5(0))}$, position in the Shanghai composite index

$w_4 = \frac{V}{\exp(-(T-t)*Z_6(0))} = \frac{V}{\exp(-Z_6(0))}$ the number of UST bills shorted

Portfolio Value

$$V(t) = f\left(t, Z(t)\right)$$

$$V(t) = w_1 * \exp(Z_1(t) + Z_4(t)) + w_2 * \exp(Z_2(t)) + w_3 * \exp(Z_3(t) + Z_5(t)) - w_4 * \exp(-(T-t) * Z_6(t))$$

Portfolio Loss

$$L(t+1) = -\left(V(t+1) - V(t)\right) =$$

$$= w_1 * \exp(Z_1(t) + Z_4(t)) + w_2 * \exp(Z_2(t)) + w_3 * \exp(Z_3(t) + Z_5(t)) - w_4 * \exp(-(T-t) * Z_6(t)))$$

$$-\left[w_1 * \exp(Z_1(t+1) + Z_4(t+1)) + w_2 * \exp(Z_2(t+1)) + w_3 * \exp(Z_3(t+1) + Z_5(t+1)) - w_4 * \exp(-(T-t-1) * Z_6(t+1))\right] =$$

$$= w_1 * \exp(Z_1(t) + Z_4(t)) * (1 - \exp(X_1(t+1) + X_4(t+1))) + w_2 * \exp(Z_2(t)) * (1 - \exp(X_2(t+1))) + w_3 * \exp(Z_3(t) + Z_5(t)) * (1 - \exp(X_3(t+1) + X_5(t+1)))$$

$$-w_4 * \left[\exp(-(T-t) * Z_6(t)) - \exp(-(T-t-1) * Z_6(t+1))\right]$$

$$\approx w_1 * \exp(Z_1(t) + Z_4(t)) * (1 - \exp(X_1(t+1) + X_4(t+1))) + w_2 * \exp(Z_2(t)) * (1 - \exp(X_2(t+1))) + w_3 * \exp(Z_3(t) + Z_5(t)) * (1 - \exp(X_3(t+1) + X_5(t+1)))$$

$$-w_4 * \left[\exp(-(T-t) Z_6(t))\right]\left[1 - \exp(-X_6(t+1))\right]$$

$$= a * (1 - \exp(X_1(t+1) + X_4(t+1))) + b * (1 - \exp(X_2(t+1))) + c * [1 - \exp(X_3(t+1) + X_5(t+1)))] - d * [1 - \exp(X_6(t+1))]$$

where

$$a = w_1 * \exp(Z_1(t) + Z_4(t)),$$

$$b = w_2 * \exp(Z_2(t)),$$

$$c = w_3 * \exp(Z_3(t) + Z_5(t)),$$

$$d = w_4 * \exp(-(T-t) Z_6(t)).$$

Taking the derivatives of the value of the portfolio with respect to time and the risk factors:

$$\frac{\partial V(t)}{\partial t} = -w_4 * \exp(-(T-t) * Z_6(t)) * Z_6(t)$$

$$\frac{\partial V(t)}{\partial Z_1} = \frac{\partial V(t)}{\partial Z_4} = w_1 * \exp(Z_1(t) + Z_4(t))$$

$$\frac{\partial V(t)}{\partial Z_2} = w_2 * \exp(Z_2(t))$$

$$\frac{\partial V(t)}{\partial Z_3} = \frac{\partial V(t)}{\partial Z_5} = w_3 * \exp(Z_3(t) + Z_5(t))$$

$$\frac{\partial V(t)}{\partial Z_4} = -w_4 * \exp(-(T-t) * Z_6(t)) * -(T-t) = w_4 * \exp(-(T-t) * Z_6(t)) * (T-t)$$

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South East European Journal of Economics and Business
Volume 9 (2) 2014, 33-45
DOI: 10.2478/jeb-2014-0008

EXPLAINING THE UNDECLARED ECONOMY IN BULGARIA: AN INSTITUTIONAL ASYMMETRY PERSPECTIVE

Colin C Williams, Josip Franic and Rositsa Dzhekova *

Abstract

This paper proposes a way of explaining the undeclared economy that represents participation in undeclared work as a violation of the social contract between the state and its citizens, and as arising when the informal institutions comprising the norms, values and beliefs of citizens (civic morality) do not align with the codified laws and regulations of a society's formal institutions (state morality). Drawing upon evidence from 1,018 face-to-face interviews conducted in Bulgaria during 2013, the finding is that the greater is the asymmetry between formal and informal institutions (i.e., citizens' civic morality and state morality), the greater is the likelihood of participation in the undeclared economy, and vice versa. The outcome is that tackling the undeclared economy requires a focus upon reducing this lack of alignment of formal and informal institutions. How this can be achieved in Bulgaria in particular and South-East Europe and beyond more generally, is then discussed.

JEL codes: *H26, J46, O17*

Keywords: *informal sector; shadow economy; tax morale; institutional theory; Bulgaria, South-East Europe.*

Acknowledgements

This paper is an output of the European Commission's Framework 7 Industry-Academia Partnerships Programme (IAPP) grant no. 611259 entitled "Out of the shadows: developing capacities and capabilities for tackling undeclared work in Bulgaria, Croatia and FYR Macedonia" (GREY). The usual disclaimers apply.

1. INTRODUCTION

In recent years, a burgeoning literature has revealed the size of the undeclared economy in South-Eastern Europe and its crucial role in providing citizens with a means of getting-by (Baric and Williams 2013, Dzhekova and Williams 2014, Dzhekova et al. 2014, Franic and Williams 2014, Gaspareniene et al. 2014, Hudson et al., 2012, Remeikiene et al. 2014, Schneider 2013; Williams 2012). With around a quarter of national income in South-East Europe not declared to the authorities and a similar share of total employment in the undeclared economy (Schneider and Williams 2013), tackling participation in the

*** Colin C Williams**
Professor of Public Policy
Management School, University of Sheffield, UK
C.C.Williams@sheffield.ac.uk

Josip Franic
Marie Curie Research Fellow
Management School, University of Sheffield, UK
jfranic1@sheffield.ac.uk

Rositsa Dzhekova
Marie Curie Research Fellow
Management School, University of Sheffield, UK
rndzhekova1@sheffield.ac.uk

undeclared economy is not some relatively minor issue of limited importance. This sphere not only leads to governments losing considerable public revenue that could otherwise pay for wider social cohesion and social protection, but also results in poorer quality working conditions and unfair competition for legitimate businesses. Indeed, unless addressed, pressure occurs on legitimate businesses in South-East Europe to themselves flout the formal regulations, resulting in a vicious and ongoing levelling down of working conditions (Andrews et al. 2011, ILO 2014).

Participation in the undeclared economy in South-East Europe and beyond has been so far explained largely in terms of country-level structural conditions such as the level of economic development and the lack of modern state bureaucracies, public sector corruption and high taxes, or inadequate levels of social protection and intervention in work and welfare by the state (see Williams 2013). These country-level structural explanations of the undeclared economy however, are unable to explain why some citizens in a country participate in the undeclared economy and others do not. That is to say, they fail to take agency into account in their explanations.

The aim of this paper therefore, is to advance a way of explaining the undeclared economy in South-East Europe that takes agency into account. Drawing upon institutional theory (Baumol and Blinder 2008, Helmke and Levitsky 2004, North 1990), the undeclared economy is here explained as a violation of the social contract between the state and its citizens, and as arising when there is a lack of alignment of the codified laws and regulations of a society's formal institutions with the norms, beliefs and values of its citizens (i.e., informal institutions). The proposition is that the greater is this lack of alignment between the formal and informal institutions, the greater is the likelihood of participation in the undeclared economy, and vice versa. If valid, this has consequences for how the undeclared economy is tackled. Reducing this institutional asymmetry necessitates a very different policy approach to the approach currently adopted in South-East Europe and beyond.

To evaluate this way of explaining the undeclared economy, therefore, section 2 provides a brief review of the shortcomings of previous explanations of the undeclared economy and proposes an explanation grounded in institutional theory to overcome these shortcomings. To evaluate this institutional asymmetry thesis, section 3 then introduces the methodology and data used, namely a stepwise Tobit regression analysis of the association between participation in the undeclared economy and the degree of institutional asymmetry using data from 1,018 face-to-face interviews conducted in Bulgaria during 2013. Section 4 then presents the findings followed in section 5 by a discussion of the theoretical and policy implications, and in section 6 some conclusions along with the limitations of this study and future research required.

At the outset however, the undeclared economy needs to be defined. For Castells and Portes (1989: 15), such endeavour is 'a specific form of income generating production… unregulated by the institutions of society in a legal and social environment in which similar activities are regulated'. Although this defines the undeclared economy through the lens of both the formal ('legal') and informal ('social') institutions in a society, this definition fails to recognise firstly, that the undeclared economy, even if unregulated by formal institutions, is regulated by the rules of informal institutions and secondly, that such work can be considered 'legitimate' from the stance of informal institutions even if 'illegal' from the viewpoint of formal institutions (Siqueira et al. 2014, Webb et al. 2009). In consequence, and reflecting the consensus in the literature, we here define the undeclared economy as socially legitimate paid work that is legal in all respects other than it is not declared to the authorities for tax, social security or labour law purposes (European Commission 2007, OECD 2012, Williams 2014a,b). If it is illegal in other respects and also socially illegitimate, it is not part of the undeclared economy but rather part of the criminal economy (e.g., forced labour) which is both illegal from the viewpoint of formal institutions and illegitimate from the viewpoint of informal institutions.

2. *Explaining the undeclared economy in South-East Europe*

Since the turn of the millennium, there has been growing recognition that the undeclared economy is a significant component of South-East European economies. As Schneider (2013) for example has estimated, the undeclared economy in 2013 was the equivalent of 31.2 per cent of GDP in Bulgaria, 28.4 per cent in Croatia, 28.4 per cent in Romania, 26.5 per cent in Turkey, 25.2 per cent in Cyprus, 23.6 per cent in Greece and 23.1 per cent in Slovenia. Meanwhile, Williams (2014a) estimates that the share of employment which is in the undeclared economy in 2013 as 22.7 per cent in Croatia, 19.6 per cent in Slovenia, 15.7 per cent in Bulgaria, 15.0 per cent in Greece, 14.6 per cent in Romania and 6.3 per cent in Cyprus.

Undeclared economies of this magnitude have significant implications for governments and societies. As Table 1 reveals, and based on 2009 figures, the average size of the undeclared economy in the five

Table 1 Tax revenue lost as a result of the undeclared economy, five South-East European countries

Country	GDP 2009	Size of undeclared economy 2009	Tax burden 2009	Tax revenue lost as a result of undeclared economy	Gov't spending as % of GDP	Tax lost as a % of gov't spending	Health care spending as % of GDP	Tax lost as % of healthcare spending
	Euro'm	%	%	Euro'm	%	%	%	%
Bulgaria	36,000	35.3	28.9	3,673	37.3	27.4	7.4	137.9
Cyprus	17,000	28.0	35.1	1,671	42.6	23.1	6.0	163.8
Greece	230,000	27.5	30.3	19,165	46.8	17.8	7.4	112.6
Romania	122,000	32.6	27.0	10,738	37.6	23.4	5.4	163.0
Slovenia	36,000	26.2	37.6	3,546	44.3	22.2	9.1	108.3
Total or unweighted average	441,000	29.9	31.8	38,793		22.8		137.1

Source: derived from Murphy (2012)

South-East European countries analysed was 29.9 per cent of GDP and on average, 22.8 per cent of the total tax revenue was lost in these countries. This equates to 137 per cent of current health care spending. Put another way, spending on health care in these countries could more than double if those operating in the undeclared economy paid their taxes.

Examining the variations in the size of the undeclared economy across South-East Europe, and as shown above, Bulgaria is often identified as having one of the largest undeclared economies. Indeed, indirect measurement methods using proxy indicators to measure its prevalence find the undeclared economy to be on average the equivalent of around one-third of total GDP (Bogdanov and Stanchev 2010, Elgin and Öztunali 2012, Ministry of Finance 2011, Nenovski and Hristov 2000, Schneider 2013). Direct surveys of the size of the undeclared economy in Bulgaria, meanwhile, find that on average some one-fifth of employment is in the undeclared economy (BICA 2012, CSD 2011, 2013, Loukanova and Bezlov 2007, Peracchi et al 2007, Perotti and Sanchez Puerta 2009, Stanchev 2005, Williams 2014a).

There have also been studies of the character of the Bulgarian undeclared economy. Firstly, these reveal firm-level variations in the prevalence of the undeclared economy with greater involvement amongst small and medium-sized businesses (BICA 2011a, CSD 2011, 2012, Dzhekova and Williams 2014, European Commission 2007). Secondly, they reveal sectorial variations with the undeclared economy more prevalent in construction, retail, tourism, hotels and restaurants, real estate, garments, food processing and the agricultural sectors as well as some services. Overall, it is labour-intensive, low technology sectors identified to be the sectors with the highest prevalence of the undeclared economy (BICA 2011a, CSD 2011, 2012, General Labour Inspectorate 2013). Thirdly, studies have been conducted of the nature of undeclared work, showing that most is wholly or partially undeclared waged employment (50 per cent of all undeclared work) and that under-reporting salaries is more common than working without a contract, with some one-fifth of the formally employed receiving an additional undeclared 'envelope' wage from their employer (Dzhekova and Williams 2014). Fourthly, the socio-demographic and socio-economic characteristics of those operating in the undeclared economy have been analysed. This reveals that men are more likely to work undeclared than women, as are those aged 45-54 years old, the unemployed and those from small/middle-sized towns and rural areas (Dzhekova and Williams 2014).

Despite these variations within Bulgaria across firm-types, sectors, population groups and places, explanations for the undeclared economy have largely focused upon country-level variables. As Williams (2014a) summarises, three major competing theoretical explanations exist. Firstly, 'modernisation' theory explains the undeclared economy in terms of the lack of economic development and modernisation of state bureaucracies (Geertz 1969, ILO 2013, Lewis 1959), secondly, 'neo-liberal' theory explains the undeclared economy as resulting from high taxes and too much state interference in the workings of the free market (De Soto 1989, 2001, Nwabuzor 2005) and third and finally, 'political economy' theory explains this sphere as resulting from inadequate state intervention and a lack of safeguards for workers (Castells and Portes 1989, Dau and Cuervo-Cazurra 2014, ILO 2014, Meagher 2010, Slavnic 2010). The problem with all these theories however, is that they do not explain

why some within a country participate in the undeclared economy and others do not. The reason this is important is because although earlier studies assumed that participation in undeclared work was necessity-driven (Castells and Portes 1989, Gallin 2001), more recent studies reveal that for the majority, participation in the undeclared economy is more a matter of choice, rather than due to a lack of choice (Maloney 2004, Round et al. 2008, Williams et al 2013).

Here therefore, a new way of explaining the undeclared economy which takes agency into account is proposed. To do this, we draw upon institutional theory which views institutions as setting the rules of the game by prescribing the norms regarding the acceptability of activities (Baumol and Blinder 2008, Denzau and North 1994, Dolenec 2013, Gërxhani 2004a,b, Mathias et al. 2014, North 1990, Podrug 2011). All societies have codified laws and regulations (i.e., formal institutions) that set the legal rules of the game (prescribing 'state morality'). They also have informal institutions which are norms, values and beliefs of the citizens; the 'socially shared rules, usually unwritten, that are created, communicated and enforced outside of officially sanctioned channels' (Helmke and Levitsky 2004: 727). These prescribe 'civic morality'.

When symmetry exists between the formal and informal institutions, the undeclared economy will be largely absent since citizens will seek to adhere to the legal rules of the game. The only reason informality will take place is because citizens unintentionally do so, such as due to the rules being not simple enough to understand or to complex too fulfil. However, if there is asymmetry between a society's formal institutions and its informal institutions, such as due to a lack of trust in government, the undeclared economy will be larger. Indeed, this is widely recognised in Bulgaria. Surveys have repeatedly pointed to a lack of trust in government due to for example public sector corruption and an inefficient judiciary as key reasons for the existence of undeclared work (European Commission 2012a, Goev 2009, CSD 2011). Indeed, the World Economic Forum's Global Competitiveness Report ranks Bulgaria 112 out of 148 countries in terms of the quality of its institutions in 2014, with particularly low scores given to public trust in politicians (1.9 out of 7), favouritism in decisions of government officials (2.1 out of 7) and judicial independence (2.3) (WEF 2014). The result is that national surveys show that undeclared work, although illegal from the viewpoint of formal institutions, enjoys high levels of social legitimacy in Bulgaria (BICA 2011a, 2011b, 2012a, CSD 2011, 2013, Chavdarova 2013). Here, therefore, and to test this new institutional theory that views the undeclared economy as arising from the asymmetry between state morality and civic morality, the following proposition can be evaluated:

> *Institutional asymmetry thesis*: the greater is the asymmetry between formal and informal institutions, the greater is the propensity to participate in the undeclared economy.

3. DATA AND METHODOLOGY

To evaluate this institutional asymmetry thesis, we here examine Bulgaria which as shown above has one of the largest undeclared economies in South-East Europe, and therefore should possess a high level of institutional asymmetry. This is here investigated by reporting data from special Eurobarometer survey no. 402, which involved 1,018 face-to-face interviews conducted in 2013. A multi-stage random (probability) sampling methodology was used to ensure that on the issues of gender, age, region and locality size, both the Bulgarian national level sample as well as each level of the sample, was representative in proportion to its population size.

In the face-to-face interviews, participants were firstly asked questions regarding their attitudes regarding the acceptability of various types of undeclared work, followed by questions on whether they had purchased from the undeclared economy and finally, whether they had participated in the undeclared economy in the prior 12 months. Here, we focus upon firstly, their attitudes regarding the acceptability of working in the undeclared economy, which measures the degree of institutional asymmetry, and secondly, whether they had participated in the undeclared economy.

To measure the level of institutional symmetry, participants were asked to rate the acceptability of five types of undeclared work using a 10-point Likert scale (1 equals absolutely unacceptable and 10 equals absolutely acceptable). These five types of undeclared work were: an individual is hired by a household for work and he/she does not declare the payment received to the tax or social security authorities even though it should be declared; a firm is hired by a household for work and it does not declare the payment received to the tax or social security authorities; a firm is hired by another firm for work and it does not declare its activities to the tax or social security authorities; a firm hires an individual and all or a part of the wages paid to him/her are not officially declared; and someone evades taxes by not declaring or only partially declaring their income.

Previous studies examining the acceptability of the undeclared economy have tended to use a single-item

measurement by constructing an aggregate index from such questions (Daude, Gutiérrez and Melguizo 2013, Frey and Torgler 2007, Ristovska, Mojsoska-Blazevski and Nikolov 2012, Torgler 2004, Williams and Martinez 2014a,b). However, and as Table 2 reveals, although an examination of the pairwise correlations indicates substantial cohesion among the five observed variables, with a high Cronbach's alpha value when all five variables are in the model (α=0.89), it also reveals that the first type of undeclared work (i.e., undeclared work by an individual for a private household) is not strongly correlated with the other four. There is an increase in both inter-item correlation and Cronbach's alpha when this first variable is excluded, which is not the case with the remaining four variables. Given the higher level of social legitimacy of undeclared work by individuals for households compared with other types of undeclared work in Bulgaria, this suggests that this type of undeclared work should be analysed separately from the other types of undeclared work.

Given that this first type of undeclared work needs to be considered separately in the stepwise Tobit regression analysis, Table 3 reports the results of an exploratory factor analysis on the remaining four types of undeclared work. This reveals high positive loads on all four variables, with loadings ranging between 0.76 and 0.87. Since these loadings represent coefficients of correlation between the latent construct and observed indicators, it is apparent that this single extracted factor has a substantially positive influence on attitudes towards undeclared work in general. If interpreted in terms of unique variances, which are given in the last column of Table 3, we can see that the underlying factor explains more than 75 per cent of the variability among respondents when it comes to their attitudes towards undeclared work by a firm for another firm and a firm for a private household, while in the case of two other noncompliant behaviours this effect is slightly weaker. The result is that Bulgarian citizens apply two different standards when making judgements about undeclared work. Bulgarians have a different more permissive attitude towards individuals carrying out undeclared work for households, while not differentiating between the other types of noncompliant undeclared behaviour (i.e. attitudes towards them are determined by one latent factor). Here, therefore, we differentiate between undeclared work by an individual for a private household and undeclared work in general.

To evaluate whether institutional asymmetry (as measured by the acceptability of non-compliance regarding these two types of undeclared work) is associated with participation in the undeclared economy, we include the two following variables to measure this:

– Participation in the undeclared economy - a dummy variable with recorded value 1 for persons who answered "yes" to the question, "Have you yourself carried out any undeclared paid activities in the last 12 months?" and with recorded value 0 otherwise.

Table 2 Inter-item correlations and Cronbach's alpha

	Item-rest correlation	Average inter-item correlation when the variable is excluded	Cronbach's alpha when variable is excluded
Undeclared work by individual for private household	0.57	0.70	0.90
Undeclared work by firm for private household	0.80	0.58	0.85
Undeclared work by firm for firm	0.77	0.60	0.85
Firm hires a worker on undeclared basis	0.75	0.61	0.86
Someone partially or completely conceals their income	0.76	0.60	0.86
Test scale		0.62	0.89

Source: Authors' calculations based on the Special Eurobarometer 402/Wave EB79.2

Table 3 Exploratory factor analysis - factor loadings and uniqueness

	Factor loadings	Uniqueness
Undeclared work by firm for private household	0.87	0.24
Undeclared work by firm for firm	0.88	0.23
Firm hires a worker on undeclared basis	0.79	0.37
Someone partially or completely conceals their income	0.76	0.43

Source: Authors' calculations based on the Special Eurobarometer 402/Wave EB79.2

– Purchasing goods and services in the undeclared economy – a dummy variable denoting whether a respondent had purchased goods and/or services from the undeclared market during 12 months preceding the survey: 0-no, 1-yes.

Drawing upon past studies that measure attitudes towards undeclared work conducted in other countries, which reveal how the acceptability of participation in undeclared work varies by gender, age, marital status, occupation, social class, income level and area (Alm and Torgler 2006, Cannari and D'Alessio 200,7 Daude and Melguizo 2010, Daude et al. 2013, Kastlunger et al, 2013, Lago-Peñas and Lago-Peñas 2010, Martinez-Vazquez and Torgler 2009, Williams and Martinez 2014a,b), the explanatory variables here selected for investigation are:

– Gender – dummy variable for gender: 0-men, 1-women.
– Age – respondent's age, six categories: 15-24, 25-34, 35-44, 45-54, 55-64 and 65 or more.
– Marital status – a categorical variable describing respondent's marital status: 1-married, 2-cohabiting, 3-single, 4-separated/divorced, 5-widowed.
– Occupation – a categorical variable denoting current job status of a respondent: 1-self-employed, 2-managers, 3-other white collars, 4-manual workers, 5-house persons, 6-unemployed, 7-pensioners, 8-students.
– Social class – a categorical variable for respondent's position in society (self-assessment): 1-working class, 2-middle class, 3-higher class.
– Financial problems – a categorical variable measuring how often a respondent have problems in paying their bills: 1-most of the time, 2-from time to time, 3-almost never/never.
– Community size – a categorical variable describing the size of the area where a respondent lives: 1-rural area or village, 2-small/middle town, 3-large town.
– Bulgarian region – a categorical variable indicating a region of residence: 1- Northwest, 2- North Central, 3- Northeast, 4- Southeast, 5- Southwest, 6- South Central

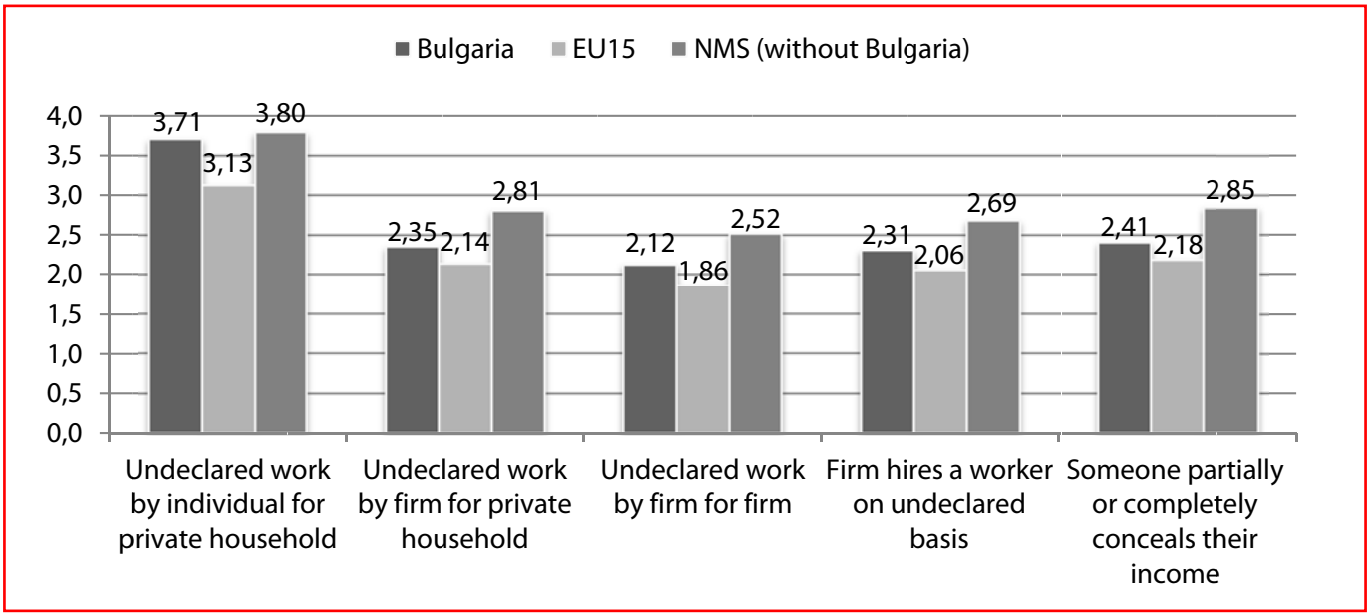
To analyse the results, the two outcome variables from the exploratory factor analysis (i.e., the acceptability of an individual working undeclared for a household and the acceptability of general undeclared work) are used as dependent variables in a regression model with a range of above described socio-demographic, socio-economic and spatial explanatory variables in order to test firstly, the institutional asymmetry hypothesis and secondly, to reveal the socio-demographic, socio-economic and spatial variables strongly associated with lower adherence to the formal institutions, in order to display potential population groups where there is high institutional asymmetry. To do this, we use Tobit modelling, which accounts for the fact that the distribution of attitudes is truncated normal (Tobin 1958). In addition, given the low ratio of non-corner observations (i.e. individuals who did not express a 'null-tolerance' attitude) to the independent variables, stepwise approach is used as the most convenient method for finding significant covariates.

4. FINDINGS

The acceptability of participating in the undeclared economy across all five forms of undeclared work in Bulgaria is 2.46 (where 1 is totally unacceptable and 10 totally acceptable). This display that the formal and informal institutions are therefore not wholly aligned (i.e., the institutional asymmetry index is not 1.00). Nevertheless, and as identified above, the social acceptability of participation in the undeclared economy varies according to the type of undeclared work being considered. As Figure 1 displays, the Bulgarian population deem it more acceptable for an individual to undertake undeclared work for a household than to undertake other types of undeclared work. Indeed, the mean score for the acceptability of an individual engaging in undeclared work for a household is 3.71, whilst the for a firm hiring an undeclared worker this is 2.31, 2.41 for someone partially or completely concealing their income, 2.35 for a firm doing undeclared work for a household, and even lower (2.12) for firms doing undeclared work for another firm (i.e., the lower the score, the more unacceptable is the activity). Indeed, this differentiation in the acceptability of an individual participating in the undeclared economy for a private household, compared with other forms of undeclared work, is replicated across not only the EU15 but also the new member states of the European Union, suggesting that the distinction of this type of undeclared work from other types of undeclared work can be more widely applied. It is also noticeable that the level of social legitimacy of undeclared work is higher in Bulgaria than in the older member states of the European Union, but lower than in other new member states.

To see further the importance of differentiating individuals conducing undeclared work from private households from other types of undeclared work, Figure 2 reports the share of respondents reporting that these practices are highly acceptable (on the scale 1-10, where 1 is highly unacceptable and 10 is highly acceptable, we take only those respondents who answered 8-10). This reveals that one in eight

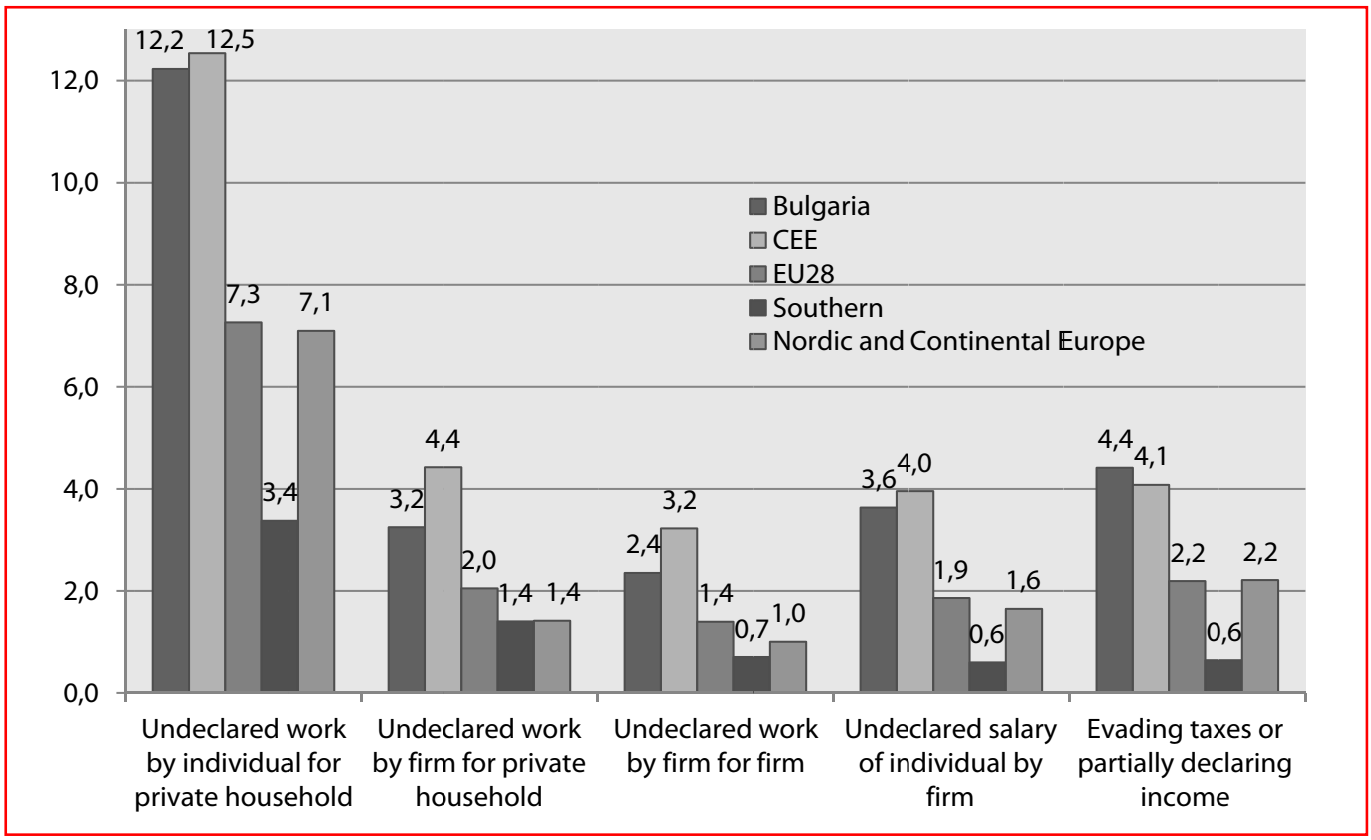
Figure 1 Acceptability of different types of undeclared work, a comparison of average scores for Bulgaria, EU15 and new member states



Note:
NMS – Croatia, the Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovenia, Slovakia
EU15 – Austria, Belgium, Denmark, Germany, Greece, Finland, France, Ireland, the Netherlands,
Norway, Luxembourg, Portugal, Spain, Sweden, the United Kingdom

Source: Authors' calculations based on the Special Eurobarometer 402/Wave EB79.2

Figure 2 Share of respondents deeming undeclared work highly acceptable (8-10 where 1= totally unacceptable and 10 = totally acceptable) in Bulgaria and other EU regions



Source: Special Eurobarometer 402 on Undeclared Work in the European Union, 2014

respondents think it is highly acceptable for an individual to undertake undeclared work for another private household but this is much lower for other types of undeclared work. This also reveals similar trends in other EU regions.

Is it the case therefore, that there is a relationship between the level of institutional asymmetry and participation in the undeclared economy? To evaluate this, Table 4 reports the results of a stepwise Tobit regression analysis for the two dependent variables,

Table 4 Tolerance of undeclared work conducted by individuals and companies, socio-economic and spatial determinants, Stepwise Tobit regression, marginal effects

Variables	Undeclared work by an individual for a private household	Undeclared work in general
Working undeclared	1.492*** (0.306)	0.971*** (0.281)
Purchasing undeclared goods and services	1.473*** (0.458)	0.756*** (0.184)
Female	-	-
Age (RC: over 65)		
15-24	0.291 (0.473)	0.474 (0.282)
25-34	1.076** (0.418)	0.651* (0.269)
35-44	0.929* (0.371)	0.650** (0.230)
45-54	0.396 (0.383)	0.485*(0.237)
55-64	0.420 (0.396)	0.130 (0.240)
Marital status (RC: married)		
Cohabiting	-	-
Single	-	-
Separated/divorced	-	-
Widowed	-	-
Occupation (RC: Retired)		
Self-employed	-	-
Managers	-	-
Other white collars	-	-
Manual workers	-	-
House persons	-	-
Unemployed	-	-
Students	-	-
Social class (RC: Working class)		
Middle class	-	-0.351* (0.142)
Higher class	-	0.635 (0.471)
Financial problems (RC: almost never/never)		
Most of the time	-	0.548** (0.208)
From time to time	-	0.206 (0.162)
Community size (RC: Rural area or village)		
Small/middle town	-	-
Large town	-	-
Region (RC: Southwest)		
Northwest	-	-0.499* (0.210)
North Central	-	0.053 (0.231)
Northeast	-	-0.340 (0.253)
Southeast	-	-0.396 (0.230)
South Central	-	-0.313 (0.213)
Sigma	3.829	2.390
Log likelihood	-1528.195	- 1245.535
LR	83.44	69.30
Prob > LR	0.000	0.000
Pseudo R2	0.020	0.033
Censored observations	266	320
Uncensored observations	496	462

Significance: *p<0.05, **p<0.01, ***p<0.001, (standard errors in parentheses)
Notes: 1) Both dependent variables are measured on the scale from 1 to 10 (with value 1 indicating completely unacceptable and 10 absolutely acceptable). Therefore, positive values of coefficients indicate greater tolerance
2) Models are based on forward stepwise selection method. Missing coefficients (-) indicate that no significant variation is found across a covariate

Source: Authors' calculation based on the Special Eurobarometer 402/Wave EB79.2

namely the acceptability of individuals participating in undeclared work for private households and the acceptability of undeclared work in general. The first row in Table 4 displays that adherence to the formal rules remains strongly associated with participation in undeclared work across both dependent variables, even when controlling for other socio-demographic, socio-economic and spatial characteristics. Since is it reasonable to assume reverse causality (i.e. that lower tax morale implies a higher propensity for participation in undeclared economy), this indicates a risk of a vicious circle in which widespread undeclared practices deteriorate tax morale, which in turn additionally increases noncompliance. The institutional asymmetry thesis is therefore positively confirmed. The greater is the non-alignment of informal institutions with formal institutions, the higher is participation in undeclared work.

This stepwise Tobit regression analysis also identifies the socio-demographic, socio-economic and spatial groups that are significantly more likely to not adhere to the formal rules when other characteristics are taken into account and held constant. The findings show that younger people in Bulgaria tend to tolerate undeclared work conducted by individuals for private households to a greater extent than older members of society. No significant variations are found across other dimensions such as gender, marital status, social class, occupation, financial problems being faced, community size and region. Turning to undeclared work more generally however, not only do middle-aged people tolerate such work to a greater extent than the retired, but so too do the working class more than the middle class, and those with financial problems in paying the household bills, whilst those in the Northwest are less accepting of undeclared work than those in the Southwest.

5. DISCUSSION

This article has evaluated the view that undeclared work is a violation of the social contract between the state and its citizens, and arises when the norms, values and beliefs of citizens (civic morality) do not align with the codified laws and regulations of a society's formal institutions (state morality). To evaluate this, data from a survey of Bulgaria in 2013 has been used. This positively confirms the thesis; the greater is the asymmetry between formal and informal institutions, the greater is the likelihood of participation in the undeclared economy, and vice versa. This is strongly significant when holding constant other socio-demographic, socio-economic and spatial variables. This Bulgarian survey thus confirms that the undeclared economy arises when there is a lack of adherence to the formal rules.

This has direct implications for how the undeclared economy is tackled. According to institutional theory, institutional asymmetry can be tackled using either disincentives (sticks) to dissuade citizens from engaging in socially legitimate but illegal activities, or incentives (carrots) to facilitate participation in legal activities (Matthias et al. 2014, North 1990). Conventionally, the Bulgarian government when tackling the undeclared economy, mirroring other South-East European governments, has used disincentives. They have sought to make the cost of being caught and punished greater than the pay-off from participating in the undeclared economy (Allingham and Sandmo 1972, Dekker et al. 2010). Firstly, penalties and sanctions have been increased and/or secondly, the likelihood of detection improved such as by increasing workplace inspections and by improving data sharing and matching to identify individuals engaged in undeclared employment (e.g., CSD 2009b, 2011, Dzhekova et al. 2014). In the period 2005 to 2009 for example, a review of measures to combat undeclared work in Bulgaria reveals that of the 222 measures, the majority were focused on deterrence, using stricter requirements, tougher sanctions and improved detection (CSD 2009b). Indeed, amendments to the Labour Code enacted in 2006 and 2008 merely extended the powers of control and introduced harsher penalties and fines (Loukanova and Bezlov 2007, Daskalova 2013a). The problem with using this disincentives approach, however, is that tougher sanctions and improving detection decreases voluntary compliance because it undermines respect for the fairness of the system and leads to greater rather than less undeclared work (Chang and Lai 2004, Murphy 2005, Murphy and Harris 2007).

If participation in the undeclared economy is to be tackled therefore, a rather different policy approach will be required. Two options exist. Firstly, incentives to behave legitimately can be used, such as direct and indirect tax incentives to either suppliers or consumers of undeclared work to encourage them to operate in the formal economy. An example is the food voucher system whereby employers can provide employees with food vouchers up to BGN 60 (€30) per month and this is nether included in the employees' taxable income and is treated as a social expense and exempt from all taxes for employers (KC2 and Industry Watch, 2010). In 2013, the scheme was used by 4,000-5,000 employers and covered 350,000 employees, or around 15-16 per cent of all employed (Dzhekova and Williams 2014). In a 2010 evaluation of the scheme by the consultancy companies Industry Watch and KC2

Ltd (2010), the finding was that employers use food vouchers to substitute for undeclared wage payments, thus leading to a reduction in the under-reporting of salaries.

The problem nevertheless, is that such incentives are in effect bribes offered precisely because they would not otherwise comply with the codified laws and regulations (i.e., state morality). Far more effective and cost-efficient than continuously offering bribes to conform, is to align informal institutions with formal institutions. Here, therefore, a second and rather different policy approach is proposed that seeks to reduce the gap between civic morality and state morality.

On the one hand, this requires policy measures to align civic morality with state morality, including education and awareness raising campaigns regarding the importance and benefits of paying taxes. An example is the 'Coming into the Light' awareness raising campaign of the Bulgarian Industrial Capital Association (Williams 2014a). Other possibilities are to use 'your taxes are paying for this' signs in hospitals, schools, on ambulances and other public construction projects. These education and awareness raising campaigns, moreover, and as Table 4 reveals, could be usefully targeted at middle-aged people who view themselves as working class.

On the other hand, alterations in formal institutions are also needed. Drawing upon a large body of management research at the organisational level where a shift has taken place from 'hard' to 'soft' HRM, and from bureaucratic to post-bureaucratic management (Legge 1995, Thompson and Alvesson 2005, Watson 2003), a similar shift could be applied at the societal level when tackling participation in undeclared work. This would result in a policy shift away from the conventional low commitment, low trust and adversarial 'hard' policy approach seeking compliance through tight rules, close supervision and monitoring, prescribed procedures and centralised structures. Instead, and mirroring how desirable behaviour change is elicited at the organisational level, a high trust, high commitment 'soft' policy approach would be pursued to nurture self-regulation through internalised commitment. This necessitates a shift away from the current 'cops and robbers' approach that views citizens as criminals and towards a customer service-oriented approach which views them as clients. To do this, improvements in the procedural and redistributive justice and fairness of formal institutions are necessary so that citizens believe that the authorities are treating them in a respectful, impartial and responsible manner, believe that they pay their fair share and believe that they receive the goods and services they deserve (Molero and Pujol 2012, Murphy 2005).

6. CONCLUSIONS

This article has propounded an explanation for the undeclared economy which asserts that the greater is the asymmetry between formal and informal institutions (i.e., citizens' civic morality and state morality), the greater is the likelihood of participation in the undeclared economy, and vice versa. The outcome is that tackling the undeclared economy requires a focus upon reducing this lack of alignment of formal and informal institutions. This is a different policy approach to that currently adopted.

However, this paper has limitations. The major one is that even if the quantitative analysis reveals the importance of aligning formal and informal institutions, it has not identified the reasons for the lack of adherence to the formal rules by the Bulgarian population. Future qualitative research is therefore necessary to pinpoint these reasons. This will then enable targeted policy measures to be developed to attack these causes of the lack of alignment of formal and informal institutions.

In this article, in conclusion, a way of explaining and tackling the undeclared economy has been outlined. Whether this is also valid in South-Eastern Europe more generally, as well as other global regions, now requires evaluation. If this article therefore stimulates such evaluations, one of its major intentions will have been achieved. If it also encourages governments in South-East Europe to recognise this institutional asymmetry explanation for the undeclared economy and to begin exploring policies to reduce this asymmetry, rather than persisting with the detection and punishment, then this article will have achieved its fuller intention.

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South East European Journal of Economics and Business
Volume 9 (2) 2014, 46-53
DOI: 10.2478/jeb-2014-0007

REGIONAL LIFESTYLE SEGMENTATION IN THE WESTERN BALKANS

Melika Husić-Mehmedović, Muris Čičić, Emir Agić *

Abstract

With this paper the authors aim not only to investigate the lifestyle specifics of the Western Balkan market, but also to define common lifestyle segments for the entire region. The question addressed in this research is whether current political issues and economic differences have led to dissimilar ways of living, or whether cultural similarities have prevailed and lifestyles can be defined accordingly.

Based on the research conducted using six underlying factors, three lifestyle clusters are identified. Analysis shows that there are three almost identical lifestyles for Bosnia and Herzegovina, Croatia, Serbia and Slovenia, and they are applicable to the entire region. These findings have significant managerial implications, as potential investors can apply identical marketing strategies to target the approximately 20 million consumers in the region.

Keywords: *Lifestyle, psychographic, regional segmentation*

JEL: *M39, Z13*

INTRODUCTION

Contemporary marketing and consumer behavior theory and practice use lifestyle studies for segmenting the market and understanding lifestyle similarities and differences. The efficiency of geographic and demographic segmentation has been challenged as it fails to capture the personality nuances (e.g. psychographics) that separate customers by meaningful brand experiences and relational behaviors (Barry and Weinstein 2009). Thus, lifestyle positioning has become an increasingly common approach among managers, especially in commodity categories in which functional differences are difficult to maintain (Chernev, Hamilton and Gal 2011). To many managers, lifestyle branding seems to offer a way of breaking free of the cutthroat competition within a category by

*** Melika Husić-Mehmedović, PhD**
School of Economics and Business,
University of Sarajevo
melika.husic@efsa.unsa.ba

Muris Čičić, PhD
School of Economics and Business,
University of Sarajevo
muris.cicic@efsa.unsa.ba

Emir Agić, PhD
School of Economics and Business,
University of Sarajevo
emir.agic@efsa.unsa.ba

connecting with consumers on a more personal level. Lifestyle researchers using the values paradigm draw from a short list of universal antecedents to human action to explain consumption patterns (Holt 1997).

This paper is focused on the Western Balkan countries of Slovenia, Croatia, Serbia and Bosnia and Herzegovina. The main research problem defined by the authors is that these countries are rather small markets *per se* for potential investors, yet together they comprise a market of approximately 20 million customers. Regional segmentation based on lifestyle might introduce common segments and thus result in a standardized market approach among potential investors. The focal research question is whether we can profile the same lifestyle clusters at the regional level and consequently treat the Western Balkans as a common market for investors.

The observed countries were once republics within the former Yugoslavia. Approximately 20 years ago, the dissolution of Yugoslavia resulted in different socio-economic development within each newly-established country. Even within a region with many similarities in terms of language, culture and history, many differences arose during this transitional period. Therefore, the authors wanted to research whether current trends led to dissimilar ways of living, or whether previous similarities had prevailed and lifestyles could be defined accordingly.

LIFESTYLE SEGMENTATION

From the start lifestyle has been a broadly defined social term, combining all of the general similarities one can observe among people, including drives, emotions, cultural experiences, or life plans (Adler 1929). In a psychological sense Levy (1963) finds that lifestyle is an expression of values, describing the roles people play in life and how they think those roles should be fulfilled. They reveal both real and ideal lifestyles. Similarly, Havighurst and deVries (1969) see lifestyle as a syndrome of role activities with a dominant central theme, which is behaviorally visible, a syndrome that represents a group. As such, it is crucial to point out the differences in attitudes between groups, while keeping in mind the similarities in behavioral patterns within the same group. Overall, researchers agree that in a social, psychological and economic sense lifestyle is a combination of psychological and social characteristics. As a result, lifestyle-based segmentation is also called psychographics (Demby 1974).

The first definition of lifestyle from a marketing perspective comes from Feldman and Thielbar (1972). They stated that lifestyle is a group phenomenon that combines many aspects of life. It implies a central life interest and differs according to sociologically relevant variables. Wind and Green (1974) explain the way in which products and services are consumed within a lifestyle, which brings this term into correlation with consumer behavior based on which scholars have developed definitions from the consumer point of view. Sobel (1983) defines lifestyle as a set of expansive, observable behaviors. Similarly, Featherstone (1987) states that lifestyle finds its meaning in reference to the distinctive style of life of specific status groups. Instead of inducting psychological traits from an amalgam of measures in the manner of the personality approach, values research pursues a more deductive project in which people are sorted into lifestyle groups on the basis of their rankings or weightings of a priori values.

From its origins in consumer behavior research, psychographics or lifestyle has become a well-accepted segmentation method, particularly in consumer markets (Barry and Weinstein 2009). Customer profiling has advanced to a point where entire product launch campaigns are designed around complex personality profiles.

Further, individuality in certain socio-demographic surroundings influences lifestyle. While some authors think that lifestyle is individual and specific for everyone (Adler 1929; Murphy 1974), the majority support the theory that it is a group phenomenon based on the same or similar ways that people behave (Feldman and Thielbar 1972; Havinghurst and De Vries 1969; Zablocki and Kantor 1976; Miedema 1989). The consensus of opinion was that lifestyle represents a combination of individual characteristics and the surroundings in which a person lives. Both the object signification and personality/values approaches assume that lifestyles are shared consumption patterns (Holt 1997). Therefore, Schutz, Baird and Hawke (1979) define lifestyle as the orientation to self, others and society that each individual develops and follows. Such an orientation derives from personal beliefs based on cultural context and the psychosocial milieu related to the stage of an individual's life. Finally, Ruiz (1990) thinks that not only personal peculiarities have to do with an individual's beliefs, values or norms of daily behavior, but also the way in which each person conforms to the group, class or global society to which he or she belongs. Those findings contribute to consumer behavior, because researchers used lifestyle to define groups/segments with the same or similar ways of living, since they will most likely have similar consumption patterns. Consumers make both

conscious and unconscious decisions based on their current lifestyle when it comes to their needs and attitudes, and their choice of product or brand. Lifestyle is changeable, which accordingly leads to changes in consumption patterns. Further, family lifestyle will determine individual lifestyle; however, individuality will be maintained (Bootsma, Camstra, de Feijter and Mol 1993). Hence lifestyles not only express collectivities; they also serve to reproduce these relationships. Lifestyles lead to associating with similarly socialized people and distancing from people from different backgrounds, and this process of interactional elective affinity reproduces the social conditions on which collectivities are based (Holt 1997).

Psychographic segmentation divides consumers into different groups depending on their lifestyle and personalities. Consumers in the same demographic group can express different individual profiles. Such approaches are backed by a broad literature showing that consumers prefer brands positioned around the identities they possess (e.g., Escalas and Bettman 2005). The foundations of the literature emphasize fit: consumers seek brands that fit their identity and respond favorably to messages that best communicate fit (Reed et al. 2012). Consumer identity research has focused on the vast potential of achieving a fit between brand and consumer identity (Stokburger-Sauer et al. 2012).

However, contemporary studies (Bhattacharjee, Berger, Menon 2014) argue that explicit identity-marketing messages may reduce purchase likelihood. Consumers perceive such explicit identity marketing as a threat to free identity expression and avoid brands they would otherwise prefer in order to restore their sense of agency. Consumers are thought to respond more favorably to messages that invoke their identity and show how it fits with a given brand (Reed et al. 2012). There are also some negative implications of lifestyle segmentation for companies as well. Chernev, Hamilton and Gal (2011) argue that managers may be trading fierce within-category functional competition for fierce across-category symbolic competition, whereby all self-expressive brands could end up competing with one another. Thus, by switching from functional branding to lifestyle branding, managers might be setting themselves up for even stronger competition for a share of a consumer's identity.

Reseachers were generally focused on identification of the trends which influence consumers such as their life, work or leisure, while analyzing lifesyle (Anderson and Golden 1984). Consumers use certain products to accomplish and/or maintain their relationships with others (Lin 2002). Therefore, whether in the leisure activities market (Green et al. 2006), banking (Peltier et al. 2002), apparel marketing (Richards-Sturman 1977), museum marketing (Todd, Lawson 2001) or B2B marketing (Barry and Weinstein 2009), it is important to know the lifestyle of our target market, so that we can offer them suitable recreational or cultural activities (Pronay, Hetesi, Veres 2009).

In the past decades, different scales were developed for measuring consumer values and attitudes. Some of the best known value based methods are VALS (Values and Lifestyle) (Reece 1989; Shih 1986; Hawkins, Best and Coney 1993), and Kahle's (1983) LOV (List of Values).

METHODOLOGY

This survey uses the VALS methodology, which was originally developed by consumer futurist Arnold Mitchell in 1969. The main dimensions of the segmentation framework are primary motivation and resources. An individual's primary motivation determines what in particular constitutes the meaningful core that governs an individual's activities. One of three primary motivations inspires consumers: ideals (guided by knowledge and principles), achievement (demonstrate success to their peers), and self-expression (desire for social or physical activity, variety, and risk). Resources that play a critical role in buying decisions are a person's energy, self-confidence, intellectualism, novelty seeking, innovativeness, impulsiveness, leadership, and vanity (SRI Consulting Business Intelligence 2006).

The survey for the purpose of this study was conducted in the following countries in the Western Balkans: Bosnia and Herzegovina, Croatia, Serbia and Slovenia. The survey aimed to define and compare individual lifestyles, as well as to define the shared lifestyle segments in this region. The questionnaire for Bosnia and Herzegovina, Croatia and Serbia were distributed in the same language, while a translation into Slovenian was provided for respondents from Slovenia.

The planned convenience based sample was two hundred respondents from each country and ended up with 762 respondents. Table 1 shows sample characteristics.

Table 1: Sample characteristics

Characteristics	Ratio (%)
Country	
Bosnia and Herzegovina	27,8
Croatia	26,4
Serbia	21,3
Slovenia	24,5
Gender	
Male	47,9
Female	52,1
Education	
Elementary school	0,4
High school	21,6
College degree	67,4
Post-graduate education	10,6
Annual financial income	
Below 5.000 €	16,3
5.000 - 9.999 €	18,9
10.000 - 14.999 €	15,1
15.000 - 19.999 €	15,0
20.000 - 24.999 €	9,0
25.000 - 29.999 €	8,1
30.000 - 49.999 €	14,6
50.000 € and above	3,0

The rationale for analyzing the markets of these four countries is that lifestyle segments were never defined within them, and moreover each market *per se* is not lucrative enough for potential investors. Due to the fact that these countries were all part of the former Yugoslavia, the question addressed in this research is whether recent political issues and economic differences have led to a dissimilar way of living, or whether cultural similarities prevailed such that lifestyles could be defined accordingly.

ANALYSIS AND DISCUSSION

In order to identify factors in the VALS scale, explorative factor analysis (EFA) was conducted. EFA defined a seven-factor solution. Based on the seven-factor solution, a confirmative factor analysis (CFA) was conducted for the entire sample followed by a multiple group analysis (MGA). The main objective of CFA and MGA was to eliminate factors that are not suitable for the whole sample and for each of the countries.

Table 2: Multiple Group Analysis

	Model 1	Model 2
$\chi 2$	970,8	528,5
Df	278	194
p<	0,00	0,00
GFI	0,91	0,94
AGFI	0,89	0,92
PNFI	0,86	0,74
TLI	0,86	0,91
CFI	0,87	0,92
RMSEA	0,06	0,05

Since Model 1 (containing 7 factors) did not have satisfactory values, six low loadings items were eliminated and after validity analysis and diagnostics, the final VALS Model 2 was formed based on the scale of six factors with matching items. The final model defined the following six factors, which are suitable for profiling the lifestyle clusters in the Region: activity, fashion, practice, tradition, theory and indolence.

Subsequently, we performed invariance tests across samples in line with the literature (e.g., Steenkamp & Baumgartner, 1998). The results of invariance testing confirmed that configural and metric invariance should not be a problem for this study. However, loose scalar invariance was partly confirmed, and this calls for further research. Therefore, we believe that measurement equivalence exists across samples, and that the items are equally reliable. As such the measures were used for further testing.

Since the goal of the analysis is to identify groups that describe a certain lifestyle, those factors were used to create lifestyle clusters. Hierarchical analysis used average linkage procedure, because of its small within-cluster variations, with Euclidian distance (Everitt 1993; Hair et al. 2006). Using an agglomeration schedule coefficient to show the level of heterogeneity, the solution of 3 clusters proved to be the most sufficient. Nonhierarchical clustering used a K-means procedure since it has an option of engaging initial cluster centers. Furthermore, validation was conducted in three steps: a different nonhierarchical method (with initial seed points), two-step clustering and cross-validation (for each country per se). Analysis revealed the high consistency of each lifestyle factor and clusters and implies that data can be used with statistical validity to explain behavior in the observed region regardless of the time dimension.

Profiling clusters are self explanatory. It is important to identify characteristics which vary substantially between clusters, and can predict that a subject

Table 3: CFA factor loadings

VALS items	Factors					
	Activity	Fashion	Practice	Tradition	Theory	Indolence
I like a lot of excitement in my life	0,77					
I am always looking for a thrill	0,73					
I often crave excitement	0,60					
I like to lead others	0,64					
I like trying new things	0,61					
I like to dress in the latest fashions		0,89				
I follow the latest trends and fashions		0,78				
I dress more fashionably than most people		0,63				
I want to be considered fashionable		0,57				
I like to make things with my hands			0,89			
I like making things of wood, metal, or other such material			0,73			
I would rather make something than buy it			0,61			
Just as religion says, the world literally was created in six days				0,75		
The government should encourage prayers in public schools				0,72		
There is too much sex on television today				0,39		
A woman's life is fulfilled only if she can provide a happy home for her family				0,41		
I am often interested in theories					0,52	
I like to learn about art, culture, and history					0,51	
I would like to understand more about how the universe works					0,57	
I like outrageous people and things					0,44	
I am really interested in only a few things						0,66
I must admit that my interests are somewhat narrow and limited						0,61

belongs in a certain cluster. Therefore, identification of the demographic, psychographic and other characteristics determines the segments with defined behavior. The six defined factors used to explain the three clusters are defined as follows:

- Activity – "Leaders always available for adventure"
- Fashion – "Trendy people who want to be perceived as fashionable"
- Practice – "Handyman or housewife enjoying do-it-yourself products"
- Tradition – "Individuals oriented to family and religion"
- Theory – "Intellectuals interested in everything around them"
- Indolence – "Individuals lacking interest in the world they live in"

Three clusters have been identified for the entire Region:

1. Urban Intellectuals
2. Trendy and Popular
3. Passive Observers

The cluster called Urban Intellectuals is the dominant lifestyle for persons interested in learning, both in a theoretical (value 0.7) and in a practical sense (0.4). They are active (0.4) and they act as participants

Table 4: Clusters' Profiling

	Indolence	Theory	Tradition	Practice	Fashion	Activity
Cluster "Urban Intellectuals"	-0,68	0,69	-0,56	0,42	-0,24	0,45
	Low	High	Low	High	Middle	High
Cluster "Trendy and Popular"	0,12	-0,25	0,63	-0,35	0,83	0,35
	Middle	Middle	High	Low	High	High
Cluster "Passive Observers"	0,85	-0,74	0,08	-0,22	-0,59	-1,05
	High	Low	Middle	Low	Low	Low

in all activities around them. On the other hand, those persons are not traditional (-0.6) and are not interested in fashion trends (-0.2). The analysis of the demographic data shows that they are highly educated, middle-aged and have higher incomes. Their goals are set high and they are determined to achieve them. Urban Intellectuals are not interested in trends and popular fashion, they do not join fancy mass culture and they are not followers. This cluster is the largest in the region, comprising 41.73% of respondents.

The cluster called Trendy and Popular gathers individuals who are highly traditional (0.6) and fashionable (0.8). To explain this finding it is necessary to understand the overall situation in the Region. Currently, it is trendy to be religious to an above-average degree, attend all mass gatherings and events, listen to folk music and, for the sake of fashion, purchase counterfeits in order to appear to own a designer label (Husić, Ostapenko 2010). This group is relatively high on indolence (0.1) and uninterested in hand-craft (-0.3), success or achievement. For them it seems easiest to blend into the majority and be popular by following the trend. This group consists mainly of moderately educated, mid-level income women. A total of 32.02% of respondents are placed in this cluster.

The cluster called Passive Observers is very high in terms of indolence (0.8) and absolutely not interested in life and the world around them (theory –0.7). It was expected that this group would be more traditional (0.1) and religious, but considering their overall lack of interest, they are passive in this area as well. They are mostly men, older than the average sample, with lower education and a lower level of income. Individuals belonging to this group are commonly disappointed and tired. The Passive Observers cluster is the smallest in the Region with 26.25% of respondents.

The specifics that determine some of the differences between the countries reveal that Bosnia and Herzegovina is overall more traditional than the average in the region, with strong religious beliefs. Croatia has an almost perfect equivalence with the region overall and many similarities with Bosnia and Herzegovina. In Serbia the cluster Trendy and Popular is more dedicated to a contemporary trend of urban living than the average for the region, while at the same time Serbia proves to be the most tradition-oriented country. Slovenia differs from the regional average the most in its socio-economic and political development. Therefore, it is not surprising that its population shares somewhat different values from the rest of the region. Generally, it can be concluded that Slovenia is less traditional and more fashionable. However, the same lifestyle patterns can be applied.

Detailed lifestyle analysis confirmed that political, economic and social differences between consumers in Bosnia and Herzegovina, Croatia, Serbia and Slovenia do not imply different lifestyles. This was confirmed by a cluster validity analysis using a different non-hierarchical procedure with initial seed points and a two-step clustering procedure. Finally, demographic analysis of the region showed that three demographic variables have statistically significant differences for all three clusters. Those variables are gender (Chi-square 6.081, significance 0.048), age (Chi-square 22.434, significance 0.004) and education (Chi-square19.929, significance 0.044).

CONCLUSION

The findings of the study can greatly increase managerial cooperation in the region. For some companies each of the presented countries per se may be an insignificant market, but the region as a whole represents a fairly large segment. This finding has the potential to bring the Region closer in terms of creating a mutual approach to foreign direct investment or even stimulating the growth of regional companies. With markets segmented on the same basis in the four countries, companies can create and promote the same products or services, overcoming the borders between the countries, and approaching the regional market. Modifications would be necessary only in terms of language, while product attributes could remain the same. Moreover, foreign trade offices could use lifestyle similarities in order to obtain foreign investment. Each country per se is not lucrative enough for large investors, but the twenty-million consumers of the entire market would be. Moreover, there is insufficient data on lifestyle analysis in the Western Balkan countries. Hence, marketing managers can have better profiles of their consumers and be in a better position to market their offerings to targeted lifestyle segments.

On the social side, this research shows that economic, political and social differences have less influence on lifestyle than historical and cultural similarities. Knowing that consumers use certain products to accmplish and/or maintain their relationships with others, it can be argued that people in the region still have a common attitude. Current lifestyle unconsciously influences not only the consumers' product or brand choice, but also their needs and attitudes. Those psychographic regional similarities can be used to strengthen common spirit and enhance cooperation, prosperity, and peace in the region. The observed markets were within the same country for 70 years, and the only during the last 20 years did they

experience different circumstances, development patterns and internal structural forces. Those results indicate that previous development has been stronger than the last twenty years of separation. However, it should be noted that even today Slovenia is the main investor in Serbia and Bosnia and Herzegovina, that Serbia and Croatia are the main trade partners of Bosnia and Herzegovina, and that major brands and companies still have the same business approach in all of the observed countries. It seems that linkages and healthy economic and trade patterns cannot be erased by several decades of separate development.

To conclude, this lifestyle study indicates that a regional collection of countries previously comprising a common state, one that has very similar languages, and shares many cultural traits and traditional economic and political linkages, even while experiencing very different destinies over the last twenty years stills maintain a very similar structure and shared segmentation, while showing only insignificant differences.

As for the limitations of this research, the theory and practice still lacks a complete lifestyle scale that can be applied regardless of cultural context. VALS is the most frequently used methodology (Lin 2002; Todd, Lawson and Faris1996), but it is primarily created for the U.S. market. Considering the importance of the information that lifestyle segmentation provides, it is expected that new scales and methodologies will be developed accordingly.

Finally, this research used a convenience sampling method, which is its main limitation. For better insight into the population, rural areas have to be covered as well, and a larger-scale sample should be used for further explorations.

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DE GRUYTER OPEN

South East European Journal of Economics and Business
Volume 9 (2) 2014, 54-65
DOI: 10.2478/jeb-2014-0002

EFFECTS OF ADMINISTRATOR'S ROLE IN TRAINING PROGRAMMES AND TRAINEES' MOTIVATION ON TRAINING MAINTENANCE

Azman Ismail, Nurul Afiqah Foboy, Nur Atiqah Abdullah, Norazila Mat, Zafir Khan Mohamed Makhbul *

Abstract

The purpose of this study is to examine the relationship between the administrator's role (i.e., communication and delivery mode) in training programmes, trainees' motivation, and training maintenance. Data were collected from 123 employees of various military health centres in Malaysia. The results of SmartPLS path model analysis revealed two important findings: firstly, communication and trainees' motivation are positively and significantly related to training maintenance. Secondly, delivery mode and trainees' motivation are positively and significantly related to training maintenance. As a whole, these findings posit that trainees' motivation does act as an effective mediating variable in the relationship between the administrator's role in training programmes and training maintenance in the studied organizations. Further discussions, implications and conclusion are presented in the succeeding sections.

Keywords: *Administrator's role; trainees' motivation; training maintenance.*

JEL: *M1, M12*

1. INTRODUCTION

Training provides a positive return on investment, not only to the employees, but to the organization as a whole. Nowadays, organizations are moving rapidly, and businesses are required to be more competitive; thus, the need for employees to update their skills in order to tackle new challenges in their job has increased. The ultimate objective in any organization is to craft their employees towards enhanced motivation, job satisfaction, and performance. Hence, training is an important factor in shaping employee's attitudes and leads to organizational commitment. New skills are learned by employees as to enable them to work more efficiently and effectively. By motivating and engaging employees in organizational training programmes, their performance will improve; and this may ultimately improves the organizational outcome and profitability. If we look back to the history of industrial revolution in the European and North American countries, training has been seen as a core function of human resource management (Noe et al., 2014; Sung

*** Azman Ismail, PhD**
Faculty of Economics & Management
Universiti Kebangsaan Malaysia
azisma08@gmail.com

Nurul Afiqah Foboy
Faculty of Defence & Management Studies
Universiti Pertahanan Nasional Malaysia.
snafiqah@yahoo.com

Nur Atiqah Abdullah, PhD
Faculty of Economics & Management
Universiti Kebangsaan Malaysia
atiq@ukm.edu.my

Norazila Mat, PhD
Faculty of Economics & Management
Universiti Kebangsaan Malaysia
norazila@ukm.edu.my

Zafir Khan Mohamed Makhbul, PhD
Faculty of Economics & Management
Universiti Kebangsaan Malaysia
zafir@ukm.my

& Choi, 2014; Sawitri & Muis, 2014; Kennett, 2013). In managing training programmes, human resource administrators are given the authority by stakeholders to plan and implement various forms of training programmes in developing and enhancing employees' potentials (i.e., cognitive, affective, and psychomotor) in order to support their organizational strategies and goals (Noe, 2012; Chalofsky, Rocco & Morris, 2014). According to Latif, Jan & Shaheen (2013), training positively impacts productivity, whereby resulting in higher level of customer and employees' satisfaction. Furthermore, training can minimize the probability of failure as training affects performance, enlarges skill base, and improves competency (Noe, 2012).

In most organizations, human resource administrators (HR administrators) often take proactive actions to inspire and encourage line administrators towards working together in designing the types, procedures, and goals of training programmes for employees who work in different job levels and categories (Azman et al., 2013; Noe, 2012; Noe et al., 2014; Weiss, 2014). In the administration of training programmes, both traditional and non-traditional management approaches are often used by administrators to design suitable training programmes for their organizations. Under the traditional approach, both HR and line administrators often design various types of training programmes that focus on developing employees' basic skills, and motivate them to use what they have learned to overcome their daily job's deficiencies and improve current job's performances (Blanchard & Thacker, 2004; Noe, 2010; Reynolds, Rahman & Bradetich, 2014). This training approach is widely practised by organizations of highly stable market with less competition, in order to achieve their goals (Azman et al., 2013; Noe et al., 2014; Chalofsky, Rocco & Morris, 2014).

In responding to intense market competition and organizational uncertainty in this era of globalisation, most successful organizations have shifted their paradigms by focusing more on job-based training to achieve organizational strategies and goals (Azman et al., 2013; Arneson, Rothwell & Naughton, 2013; Noe et al., 2014). Under this new paradigm, administrators have often designed the types, procedures, and goals of training programmes that can impart employees' new competencies, change employees' negative attitudes, match employees' knowledge and skills in line with the organizational needs, prepare employees to face new challenges, and ease employees in adapting advanced technologies; as well as inculcate continuous improvement and promote organizational learning culture. The ability of administrators in managing these training programmes will enhance the quality and productivity of employees, and this may stimulate them to enhance organizational growth and competitiveness in this era of a borderless world (Arneson, Rothwell & Naughton, 2013; Azman & Nurul, 2010; Noe, 2010; Noe et al., 2014; Nijman et al., 2006).

Today, high performing organizations realise the need for effective training and development practices as to enhance their competitive advantage (Arneson, Rothwell & Naughton, 2013). Training and development are essential elements of every business if the value and potential of its people were to be harnessed and grown (Chalofsky, Rocco & Morris, 2014). For instance, without these training and development practices, Toyota will not be able to hold on to their achievement in productivity over the past 10 years. Toyota has taught manufacturing companies about the importance of employee training and company-wide cross training. The basis of Toyota's philosophy, which led them to their success, is to train and also cross-train everyone. Training that begins with preparing employees to serve customers at the counter, and extends to programmes that help individuals towards launching their own franchise, is a key to McDonald's 50-plus-year success story. Last year, the company had kicked it up a notch with improved restaurant leadership training, sharpened people selection and processes, and refined coaching and mentoring practices.

A review on the recent literature pertaining to high-performing organization highlights that both HR and line administrators often succeeded in designing and managing training programmes because they focused on two important practices: communication and delivery mode (Jaeggi et al., 2014; Weissbein et al., 2011; Teven, 2010; Inman, 2006). Communication is more likely to result in more effective training as it provides a clear vision on the objectives and purposes of the training (Latif, Jan & Shaheen, 2013). Communication depicts frankness between the trainers and trainees in exchanging information on matters pertaining to the advantages of attending training programmes, explaining course contents, delivering and exchanging knowledge, and overcoming interpersonal obstacles before, during and after training programmes (Weiss, 2014; Noe et al., 2014; Zilliox, 2013; Noe, 2010; Azman, Sofiah, Sheela Chitra, Rodney, & Rabaah, 2009b; Jonathan, Karen & Leslie, 2011; Klien, Noe, & Wang, 2006). Although delivery mode is seen as supportive component to communication, it is broadly viewed as hardware and software tool and method employed by instructors to deliver learning activities and track employee's progress during training programmes and upon returning to their organizations (Azman et al., 2009b; Hall, 2005; Klein, Noe & Wang, 2006; Noe, 2010; Teven, 2010).

Extant studies in the workplace of training

management highlighted that the ability of administrators (both HR and line administrators) to appropriately plan and implement the various types of training may have a significant impact to their personal outcomes, especially trainees' motivation (Azman et al., 2013; Kennett, 2013; DeSimone, Werner, & Harris, 2002; Inman, 2006). Training stimulates motivation for increased discretionary behavior and improved career development that ultimately lead to increased job satisfaction (Latif, Jan & Shaheen, 2013). Trainees' motivation is often seen in individuals who possessed strong inner desires that highly encourage them to learn necessary knowledge, up-to-date skills, new abilities, and positive attitudes in training programmes (Noe et al., 2014; Sung & Choi, 2014; Zilliox, 2013; Aziz & Ahmad, 2011; Azman & Nurul, 2010; Noe, 2010; Gegenfurtner et al., 2009). Unpredictably, the discovery of a recent training management research literature highlighted that administrator's role in training programmes and trainees' motivation has enhanced training maintenance in organizations (Latif, Jan & Shaheen, 2013; Kennett, 2013; Scaduto, Lindsay & Chiaburu,2008; Walker et al., 2001). Training maintenance is defined as the process of preserving learned behavior in carrying out duties and responsibilities (Noe, 2010; Gedeon, 2002). For example, employees are responsible to use newly learned behavior in a period of time (Gedeon, 2002). The ability of administrators to invoke the employee to continuously utilise the new learned behavior may increase employee and organizational performances (Balkisnah & Norhasni, 2009; Blume et al., 2010). Based on the discussion, training maintenance can be defined as continuous use, and application of necessary knowledge, up-to-date skills, new abilities and positive attitudes gained from training program in order to exhibit a consistent and improved performance (Walker et al., 2001; Scaduto et al., 2008). Within an organizational training model, many scholars view communication, delivery mode, trainees' motivation, and training maintenance as distinct, yet strongly interconnected variables. For example, the ability of administrators to adequately implement comfortable communication and accurately select the delivery mode will strongly motivate employees to attend and learn in training programmes. As a result, this situation may lead to greater training maintenance in an organization (Arneson, Rothwell & Naughton, 2013; Scaduto, Lindsay & Chiaburu, 2008; Walker et al., 2001).

Though the nature of this relationship is interesting, the influence of trainees' motivation as an important mediating variable is hardly being explored in the workplace of training management research literature (Latif, Jan & Shaheen, 2013; Teven, 2010; Elias & Rahman, 1994). Many scholars argued that the mediating effect of trainees' motivation has been ignored in the previous studies because they have focused much on describing the characteristics of administrator's role in training programmes, employing a simple correlation method to explain respondents' attitudes toward administrator's role in training programmes, and measuring the degree of association between the administrator's role in training programmes and trainees' motivation (Latif, Jan & Shaheen, 2013; Azman et al., 2013; Chaloner, 2006; Inman, 2006). Conversely, the role of human psychology (e.g. motivation) in influencing the effective size of administrator's role in training programmes on training maintenance has been inadequately discussed in the workplace of training management models (Weiss, 2014; Scaduto, Lindsay & Chiaburu, 2008; Walker et al., 2001). Consequently, these studies have provided insufficient empirical evidence to be used as key recommendations by practitioners in understanding the complexity of training management, and designing action plans to maintain and achieve organizational strategies and goals (Sheehan, 2014; Weiss, 2014; Scaduto, Lindsay & Chiaburu, 2008; Walker et al., 2001). Thus, this situation encourages the researchers to further discover the nature of this relationship.

2. PURPOSE OF THE STUDY

This study has two primary objectives: first, is to assess the relationship between the administrator's role in training programmes and trainees' motivation. Second, is to assess the relationship between the administrator's role in training programmes, trainees' motivation, and training maintenance.

3. LITERATURE REVIEW

The effect of administrator's role in training programmes on trainees' motivation is consistent with the notion of Eisenberger et al.'s (1986) organizational support theory. This theory explains that support is consisted of several important components, namely respect, encouragement, good relationship, and care. If an administrator is able to provide material and moral support, this may lead to an increased employee's motivation in the workplace. The principle of this theory has gained strong support from research literature on training management. For example, several studies had utilised the direct effect model to examine training management based on different samples, such as perceptions of 147 marriage and family therapy nursing trainees in United States (Inman, 2006), l00 respondents in the non-UK sites of the aircraft

manufacturer Airbus (Chaloner, 2006), 91 respondents from a state library in East Malaysia (Azman, Lucy, Mohd Na'eim, Noor Faizzah & Ali, 2009a), perceptions of 110 respondents at a state public work agency in East Malaysia (Azman et al., 2010), and perceptions of 113 respondents from a military-based health organization in Malaysia (Azman et al., 2013). The findings of these surveys revealed two important outcomes: first, the willingness of administrators to properly implement communication openness (e.g., good speaking and listening, comfortable language, and useful dialogue) had increased trainees' motivation (Azman et al., 2009a, 2010; Chaloner, 2006; Inman, 2006). Second, the willingness of the administrators to correctly select delivery mode (e.g., teaching aids and methods) had increased trainees' motivation (Azman et al., 2013; Chaloner, 2006; Inman, 2006). Thus, it can be hypothesized that:

H1: Communication is positively related to trainees' motivation.

H2: Delivery mode is positively related to trainees' motivation.

Further exploration of recent literature on the trainees' motivation showed that its role as an important mediating variable in the workplace of training management is consistent with the notion of adult motivation theory. For example, Vroom's (1964) expectancy theory clarifies that individuals will perform certain action if they perceive that their action will bring valued outcomes. Meanwhile, Baldwin and Ford's (1988) transfer theory postulates that the readiness of an individual to be trained will motivate him/her to transfer and preserve knowledge, skills, abilities, and positive attitudes in executing his/her job. In addition, Locke and Latham's (1990) goal-setting theory suggests that clarity of goals may guide individuals in performing their jobs. The spirit of these theories promotes perceived valued outcome, ready to be trained and clearly understand that goals are the results of the ability of administrators in properly implementing communication openness and correctly selecting the right delivery mode in training programmes. Furthermore, this situation will strongly motivate trainees to attend and learn new knowledge, up-to-date skills, latest abilities, and good moral values. As a result, it may lead to an enhanced training maintenance in organizations (Gurdjian, Halbeisen & Lane, 2014; Kennett, 2013; Scaduto, Lindsay & Chiaburu, 2008; Walker et al., 2001). Thus, it can be hypothesized that:

H3: Correlation between communication and trainees' motivation will positively impact training maintenance.

H4: Correlation between delivery mode and trainees' motivation will positively impact training maintenance.

4. METHODOLOGY

4.1. Research Design

This study employed a cross-sectional research design that allows the researchers to combine the training management literature, the pilot study, and the actual survey as its main procedure to gather data for the study. The utilization of this method may increase the ability to gather accurate data, decrease bias data, and increase quality of data collected (Cresswell, 1998; Sekaran & Bougie, 2014). This study was conducted in various military health centres throughout Peninsular Malaysia. At the initial stage of the data collection, the researchers had drafted the survey questionnaire based on related literature review. After that, a pilot study was conducted by discussing the questionnaire with four administrators, three medical officers, and four allied health officers. A purposive sampling technique was employed in order to choose respondents who had working experience from 4 to 19 years as well as being knowledgeable about the management of training programmes in their organizations. The information gathered from this pilot study assisted the researchers to improve the content and format of the survey questionnaire for an actual study. A back translation technique was utilized to translate the survey questionnaire into English and Malay in order to enhance the validity and reliability of research findings (Cresswell, 1998; Sekaran & Bougie, 2014).

4.2. Measures

The survey questionnaire consists of four major parts: firstly, four items of communication and three items of delivery modes (that were altered from the literature on training management) (Goldstein & Ford, 2002; Machin & Fogarty, 2004; Noe, 2012; Noe et al., 2014; Tsai & Tai, 2003). The items used to measure communication are the ability to clearly explain the benefit of attending courses in order to increase knowledge, enhance skills, strengthen attitudes, and develop critical thinking. While the items used to measure delivery mode are the ability of discussion to strengthen cooperation, the ability of lecture to enhance knowledge, and the ability of case studies to improve efficiency. Secondly, trainees' motivation was measured using four items that were modified from literature on trainees' motivation (Goldstein & Ford, 2002; Machin & Fogarty, 2004; Noe, 2010; Noe et al., 2014; Rodrigues

& Gregory, 2005; Tsai & Tai, 2003; Tai, 2006). The items used to measure trainees' motivation are concentration, willingness to learn, readiness to participate, and responsibility to do assignments.

Finally, training maintenance was measured using five items that were altered from the literature on training maintenance (Noe, 2012; Noe et al., 2014; Scaduto, Lindsay & Chiaburu, 2008; Walker et al., 2001). The items used to measure training maintenance are able to maintain thinking abilities in revising study, executing job, sharing working experiences, and discussing with senior staff, as well as maintaining good moral values in performing daily works. All items used in the questionnaires were rated using a 7-item scale ranging from "strongly disagree" (1) to "strongly agree" (7). Respondents' characteristics were only considered as controlling variables as this research only focused on employees' attitudes.

4.3. Sample

A convenient sampling technique was employed in distributing 200 survey questionnaires to employees in the studied organization. This sampling technique was chosen because the list of registered employees was not released by the HR department to the researchers in order to avoid intrusiveness. This condition did not allow the researchers to use any random sampling techniques in choosing respondents for this study. Of the total number of questionnaires given out, 123 questionnaires were returned to the researchers, yielding a 61.5 percent of response rate. The survey questionnaires were answered by participants with their consent and on a voluntary basis. The number of this sample met the requirement of probability sampling technique, signifying that it may be analyzed using inferential statistics (Cresswell, 1998; Sekaran & Bougie, 2014).

4.4. Data Analysis

Hence, the SmartPLS 2.0 as recommended by prominent scholars like Henseler, Ringle & Sinkovics, (2009), and Ringle, Wende & Will, (2005) was employed to analyze the survey questionnaires' data. This statistical package is very beneficial because it has the capabilities to deliver latent variable scores, avoid small sample size problems, estimate every complex model with many latent and manifest variables, hassle stringent assumptions about the distribution of variables and error terms, and handle both reflective and formative measurement models (Henseler, Ringle & Sinkovics, 2009; Ringle, Wende & Will, 2005).

5. FINDINGS

5.1. Sample Profile

Table 1 shows that most respondents were male (54.5%), age ranging from 26 to 30 years old (43.9%),

Table 1: Respondent characteristics (n=123)

Respondent	Sub Profile	Percentage
Gender	Male	54.5
	Female	45.5
Age (years)	<18	15.4
	26 – 30	43.9
	31 – 35	18.7
	>36	22.0
Marital status	Single	16.2
	Married	83.7
Education	Degree and above	21.1
	Diploma	1.6
	STPM/HSC	5.7
	SPM/MCE	65.9
	PMR/SRP/LCE	5.7
Position	Medical Officers	3.3
	Administration staff	10.6
	Allied health science	7.3
	Others	78.9
Work Group	Medical Officers	19.5
	Administration Staff	34.1
	Allied Health Science Staff	33.3
	Others	13.0
Division	Formation Center	1.6
	Allied Health Science Institute	34.1
	Hospital	33.3
	Non-hospital	13.0
Tenure of Service (years)	< 5	21.1
	6 – 10	35.0
	11 – 15	13.8
	16 – 21	13.0
	> 22	17.1

Note:

SPM/MCE :Sijil Pelajaran Malaysia/ Malaysia Certificate of Education

STPM/HSC :Sijil Tinggi Pelajaran Malaysia/ Higher School Certificate

PMR/SRP/LCE :Penilaian Menengah Rendah/Sijil Rendah Pelajaran/ Lower School Certificate

married (83.7%), passed SPM/MCE certificates (65.9%), hospital employees (60.2%), and had 6 to 10 years tenure of services (35.0%).

5.2. Validity and Reliability of the Instrument

The outcomes of confirmatory factor analysis are shown in Tables 2 and 3. Table 2 displays the validity of all constructs. All constructs had the values of AVE larger than 0.5, indicating that they had met the acceptable standard of convergent validity (Barclays, Higgins & Thompson, 1995; Fornell & Larcker, 1981; Henseler, Ringle & Sinkovics, 2009). Besides that, all constructs had the values of $\sqrt{}$ AVE in diagonal were greater than the squared correlation with other constructs in off diagonal, showing that all constructs had met the acceptable standard of discriminant validity (Henseler, Ringle & Sinkovics, 2009; Yang, 2009).

Table 3 displays the validity and reliability of all constructs. The correlation between items and factors had higher loadings than other items in the different constructs; and the loadings of variables were greater than 0.70 in their own constructs in the model, which are considered adequate (Henseler, Ringle & Sinkovics, 2009). These show that the validity of measurement model had met the criteria. Besides that, the values of composite reliability and Cronbach's Alpha were greater than 0.8, indicating that the instrument used in this study had high internal consistency (Henseler, Ringle & Sinkovics, 2009; Nunally & Bernstein, 1994).

Table 2: The results of convergent and discriminant validity analyses

Variable	AVE	Communication	Delivery	Trainees motivation	Training Maintenance
Communication	0.8768	0.9364			
Delivery	0.8371	0.5983	0.9149		
Trainees motivation	0.7982	0.4752	0.6043	0.8934	
Training Maintenance	0.8282	0.4522	0.6827	0.6386	0.9101

Table 3: The results of factor loadings and cross loadings for different constructs

Construct/ Item	Communication	Delivery	Trainees motivation	Training Maintenance	Composite Reliability	Cronbach Alpha
Communication					0.9660	0.9529
COM1	0.9343	0.5643	0.4082	0.4749		
COM2	0.9818	0.5927	0.4602	0.4347		
COM3	0.9132	0.6132	0.4451	0.4260		
COM4	0.9146	0.4728	0.4618	0.3638		
Delivery					0.9390	0.9023
DEL1	0.5818	0.9446	0.5297	0.6191		
DEL2	0.4832	0.9145	0.5836	0.6781		
DEL3	0.5819	0.8846	0.5413	0.5712		
Trainees motivation					0.9405	0.9155
TM1	0.4312	0.5060	0.9066	0.5148		
TM2	0.4337	0.5613	0.8672	0.5729		
TM3	0.4409	0.5870	0.8735	0.5742		
TM4	0.3903	0.4983	0.9251	0.6138		
Training Maintenance					0.9601	0.9479
TME1	0.4500	0.6702	0.6014	0.9357		
TME2	0.3653	0.5585	0.5470	0.9338		
TME3	0.3152	0.5363	0.5499	0.8693		
TME4	0.4853	0.6274	0.6147	0.9003		
TME5	0.4278	0.7026	0.5861	0.9094		

Table 4: Pearson correlation analysis and descriptive statistics

Variable	Mean	Standard Deviation	Pearson Correlation analysis (r)			
			1	2	3	4
Communication	5.8	.99	1			
Delivery	6.0	.71	.61**	1		
Trainees motivation	6.1	.69	.47**	.59**	1	
Training Maintenance	6.0	.64	.46**	.68**	.63**	1

Note: Significant at **<0.01; reliability estimation is shown in diagonal

5.3. Construct Analysis

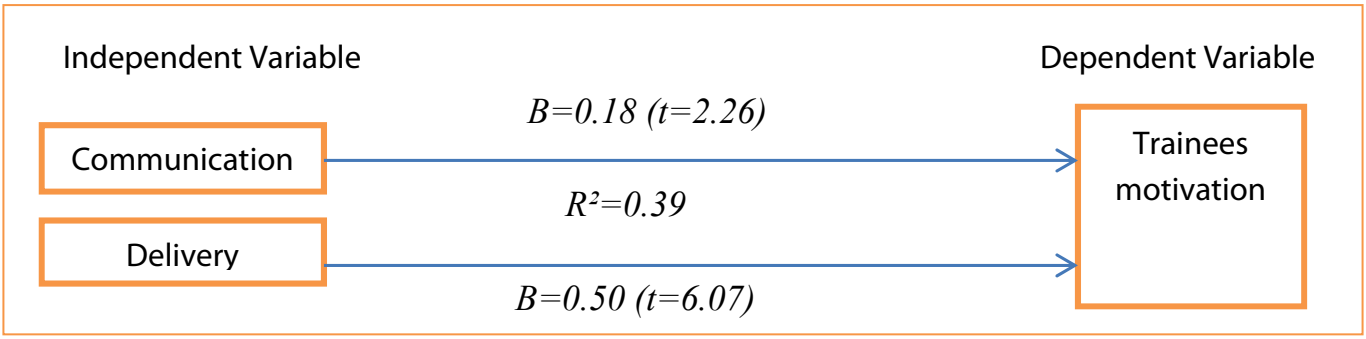
Table 4 displays the outcomes of Pearson Correlation analysis and descriptive statistic. The mean values for the variables were between 5.8 and 6.1, with the levels of communication, delivery mode, trainees' motivation, and training maintenance range from high (4) to the highest level (7). The correlation coefficients for the relationship between the independent variable (i.e., communication and delivery mode) and the dependent variable (i.e., training maintenance), and the relationship between the mediating variable (i.e., trainees' motivation) and the dependent variable (i.e., training maintenance) were less than 0.90, showing that the data were not affected by serious collinearity problem (Hair et al., 2006). These outcomes further confirmed that the instruments used in this study had met the acceptable standards of the analyses of validity and reliability.

5.4. Outcomes of Testing Hypotheses 1 and 2

Figure 1 presents the outcomes of testing a direct effect model using SmartPLS path model. The value of R^2 was used as an indicator to the overall predictive strength of the model. The value of R^2 was considered as follows; 0.19 (weak), 0.33 (moderate), and 0.67 (substantial) (Chin, 1998; Henseler, Ringle & Sinkovics, 2009). This model showed that the inclusion of communication and delivery mode in the analysis explained 39 percent of the variance in the dependent variable. Specifically, the result of testing research hypotheses displayed two important findings: first, communication is significantly correlated with trainees' motivation (β=0.18; t=2.36), therefore H1 is supported. Second, delivery mode is significantly correlated with trainees' motivation (β=0.50; t=6.07), therefore H2 is supported. Therefore, the result demonstrated that the administrator's role in training programmes is an important predictor to trainees' motivation in the hypothesized model.

In addition to the testing of direct correlation between the administrator's role in training programmes and trainees' motivation, we have also carried out a global fit measure to validate the adequacy of the model globally (Figure 1) based on Wetzels, Odekerken-Schroder, & Van Oppen's (2009) global fit measure guideline. The guideline is as follows: GoF = SQRT {MEAN (Communality of Endogenous) x MEAN (R^2)}. The results of this test will be used to explain the power of SmartPLS path model analysis in comparison to the baseline values (GoF small=0.1, GoF

Figure 1: The Outcomes of SmartPLS Path Model Showing the Relationship between the Administrator's Role in Training Programmes and Trainees motivation



Note: Significant at *t *t.96

medium=0.25, GoF large=0.36). In this study, the value of GoF was 0.57, indicating that it exceeded the cut-off value of 0.36 for large effect sizes of R^2. Thus, it provides adequate support to validate the PLS model globally (Wetzel et al., 2009).

5.5. Outcomes of Testing Hypotheses 3 and 4

Figure 2 presents the outcomes of testing a mediating model using SmartPLS path model. The value of R^2 was used as an indicator of the overall predictive strength of the model. The R^2 value was interpreted as follows; 0.19 (weak), 0.33 (moderate) and 0.67 (substantial) (Chin, 1998; Henseler, Ringle & Sinkovics, 2009). This model shows that the inclusion of communication, delivery mode, and trainees' motivation in the analysis explained 41 percent of the variance in the dependent variable. Specifically, the results of research hypothesis testing revealed that relationship between the administrator's role in training programmes (i.e., communication and delivery mode) and trainees' motivation are positively and significantly correlated with training maintenance (β=0.64; t=9.90). Therefore, H3 and H4 are supported. In sum, the result has proven that trainees' motivation does act as an important mediating variable in the relationship between the administrator's role in training programmes and training maintenance in the hypothesized model.

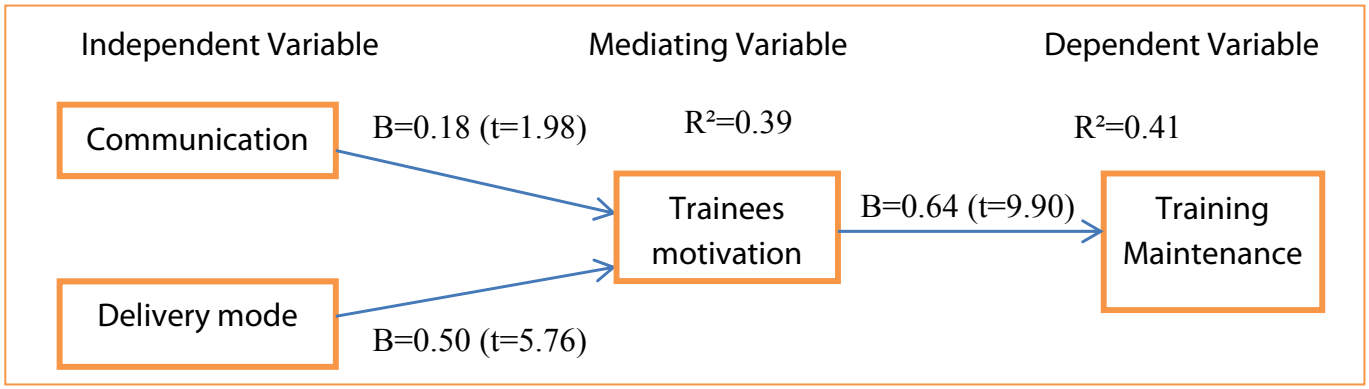
As an extension to the testing of mediating effect of trainees motivation in the hypothesized model, we had carried out a global fit measure to validate the adequacy of the model globally (Figure 2) based on Wetzels, Odekerken-Schroder, & Van Oppen's (2009) global fit measure guideline as follows: GoF=SQRT{MEAN (Communality of Endogenous) x MEAN (R^2)}. Results of this test will be used to explain the power of SmartPLS path model analysis in comparison with the baseline values (GoF small=0.1, GoF medium=0.25, GoF large=0.36). In this study, the value of GoF was 0.59, indicating that it exceeded the cut-off value of 0.36 for large effect sizes of R^2. Thus, it provides adequate support to validate the PLS model globally (Wetzel et al., 2009).

6. DISCUSSION AND IMPLICATIONS

This study proves that trainees' motivation acts as an important mediating variable in the relationship between administrator's role in training programmes and training maintenance. In the context of this study, HR administrators have properly planned and implemented training programmes based on the broad policies and procedures set up by the stakeholder. According to majority of the respondents, they perceived high levels of communication, delivery mode, trainees' motivation, and training maintenance. This condition explains that the willingness of administrators to appropriately implement comfortable communication and correctly select delivery mode will strongly motivate employees to attend and learn in training programmes. Consequently, it may lead to an enhanced training maintenance in the workplace.

This study has three major implications: theoretical contribution, the robustness of research methodology, and practical contribution. In terms of theoretical contribution, the outcomes of this study highlight two significant findings: first, trainees' motivation functions as an important mediating variable in the relationship between communication and training maintenance. Second, trainees' motivation serves as

Figure 2: The Outcomes of SmartPLS Path Model Showing the Relationship between the Administrator's Role in Training Programmes, Trainees motivation and Training Maintenance



Note: Significant at *t >1.96

an important mediating variable in the relationship between delivery mode and training maintenance. These findings are also consistent with, and supported the studies of Latif, Jan & Shaheen (2013), Walker et al. (2001), and Scaduto, Lindsay & Chiaburu (2008).

Regarding the robustness of research methodology, the survey questionnaire used in this study had satisfactorily met the criteria of analyses of validity and reliability. As such, this may lead towards producing accurate and reliable research findings. With respect to practical contribution, the findings of this study can be used as important recommendations by practitioners to improve the administration of training programmes in organizations. This objective can be achieved if the management considers the followings: firstly, the trainings' content and methods need to be tailored to the individuals' jobs and expectations in order to enhance the competency of employees in fulfilling their organization's key performance indicators. Secondly, recruitment and selection policies need to strongly emphasis on hiring administrators who appreciate continuous learning of their employees, as well as communicating and encouraging their employees to go through training programs designed for new skills and competencies. Thirdly, the administrator has to propose an appropriate and diverse training method according to individual's learning style. A wide range of methods are applicable internally (coaching, e-learning, pairing, job rotation, etc.) and externally (course, technical class, workshop, etc.) can be found in the market. Fourthly, the administrator has to ensure that training's needs be identified and that performance appraisals are met. These training objectives directly affect corporate performances through improved behaviours, increased capability (which produces greater productivity), and employee engagement. If these suggestions are strongly considered, this may motivate employees to appreciate the organizational training's strategies and goals.

7. CONCLUSION

This study suggests a theoretical framework based on the research literature of workplace training. The instrument use in this study satisfactorily meets the criteria of the analyses of validity and reliability. The outcomes of SmartPLS path model show that the correlation between the administrator's role in training programmes (i.e., communication and delivery mode) and trainees' motivation is significantly related to training maintenance. This finding confirms that trainees' motivation mediates the effect of the administrator's role in training programmes on training maintenance in the studied organizations. Thus, current researches and practices within the workplace of the training programme need to consider trainees' motivation as a critical key element to the training management's domain. This study further posits that the competency of administrators to appropriately implement comfortable communication and to correctly select the right delivery mode will induce positive outcomes to individuals (e.g., satisfaction, commitment, performance, and career advancement). Therefore, these positive outcomes may lead towards maintaining and achieving the stakeholder's needs and expectations in this era of a borderless world.

The results of this study are subjected to the methodological and conceptual limitations. First, by virtue of a cross-sectional research design, this study may not capture causal connection between the variables of interest. Second, the outcomes of SmartPLS path model analysis have not measured the relationship between specific indicators for the independent variable, mediating variable, and dependent variable. Finally, the sample for this study was only taken from military-based health organizations; thus, generalization of the results to other organizations is very limited.

The limitations of this study may be improved if future researches can consider the following suggestions: first, several organizational and personal characteristics should be further explored, where this may show meaningful perspectives in understanding how individual similarities and differences influence the administration of training programmes within an organization. Second, other research designs (e.g., longitudinal studies) should be employed to collect data and describe the patterns of change and the direction and magnitude of causal relationships amongst variables of interest. Third, to fully understand the effect of the administrator's role in training programmes on individual attitudes and behaviours via its impact upon trainees' motivation, more varied organizations need to be involved. Fourth, other specific theoretical constructs of trainees' motivation, such as competitiveness motive, self-efficacy, motivation to transfer, and perceived value need to be considered because they have widely been acknowledged as an important link between the administrator's role in training programmes and many aspects of personal outcomes (Sung & Choi, 2014; Kennett, 2013; Gegenfurtner et al., 2009; Hoi Yan & Alex, 2012; Khalil, 2012; Machin & Fogarty, 2004; Machin & Treloar, 2004; McCracken, Brown, & O'Kane, 2012). Fifth, response bias and common-method variance are common issues in all questionnaire-based research. In order to reduce the biasness, the employment of a larger sampling pool

may represent the studied population. Finally, other elements of the administrator's role in training programmes such as training's assignment and participation need to be given attention because their roles are often discussed in many research literature on training management (Sawitri & Muis, 2014; Zilliox, 2013; Arneson, Rothwell & Naughton, 2013; Brown & McCracken, 2009; Khalil, 2012; McCracken, Brown, & O'Kane, 2012; Vodde, 2012). The significance of these issues needs to be further elaborated in future researches.

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ISSN 2233-1999