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Content

From the Editor

The South East European Journal of Economics and Business is publishing a new volume (Volume 10, Issue 1) that brings us five empirical papers mainly focused on the South East European Region (in particular Croatia and Slovenia). The papers are heterogeneous in their coverage and include focuses on the foreign exchange rate system, gray economy, insurance services, the use of statistical methods and corporate citizenship activities in the business sector. The main findings and implications of these articles are briefly presented below.

Mance, Živković and Mance in their article "Econometric analysis of Croatia›s proclaimed foreign exchange" provide a time-series econometric analysis focused on Croatia›s proclaimed foreign exchange over the period 1997-2014. The authors use time-series data to assess the efficiency of the Croatian National Bank›s (CNB) policy, which is a managed floating regime, in maintaining price stability. The article empirically tests the validity of three monetary policy hypotheses: the stability of the nominal exchange rate, the stability of exchange rate changes, and the exchange rate to inflation pass-through effect. The obtained results suggest that for the Croatian Kuna/Euro foreign exchange rate stability is not a direct mechanism of price stability and that the CNB cannot directly target inflation via foreign exchange. The results imply, at the same time, a strong link between foreign exchange rate changes and changes in monetary aggregate M4, as well as between M4 changes and inflation. Nevertheless, the authors conclude that a firm foreign exchange policy commitment toward the Euro may be the only policy choice for the future of this small open economy.

Williams and Franic focus their research attention on the gray economy in Croatia in their interesting article, "Tackling the propensity towards undeclared work: some policy lessons from Croatia". The authors rely on survey data from 1,000 interviews conducted in Croatia during 2013 and logistic regression analysis. Their primary research task was to evaluate policy approaches towards undeclared work. Interestingly enough, their results provide no evidence of an association between participation in undeclared work and the perceived level of penalties and risk detection. However, they do find a strong relationship between participation in undeclared work and levels of tax morality. The policy implication the authors draw from their research is that an indirect controls approach that seeks to improve tax morality might be a more efficient policy to tackle undeclared work in Croatia than a direct engagement through increasing penalties and risk detection.

Sebjan and Tominc's "Conceptual model of relationships among customer perceptions of components of insurance service" uses structural equation modelling applied on a sample of 200 Slovenian users of insurance services and investigates the relationships between customer perceptions of the benefits of sales promotion, quality, adequacy of premium, and the adequacy of information about the coverage of insurance services. The authors show that higher perceived benefits of sales promotion in their sample are associated with higher perceived quality of insurance services. In addition, higher perceived quality is associated with higher perceived adequacy of information about the coverage and the premium for insurance services. Finally, they report that higher perceived adequacy of premium is associated with higher perceived adequacy of information about the coverage of insurance services. The paper ends with some recommendations for insurance companies in the Slovenian market.

Shaker Al Ani and Ahsan Jamil's "The effect of corporate citizenship activities on financial performance and market performance: the Omani experience" investigates the effects of corporate citizenship activities on the financial performance and market performance of manufacturing companies (sectors included: Food, Construction and Chemicals) in Oman. They provide an empirical investigation based on data covering the period 2009-2013. The main results from this analysis show that there is a positive impact from corporate citizenship activities on the financial and market performance of the sampled Omani companies, which leads to profit maximization. While this research operates with a limited sample and time-period, the results are indicative for the Omani market as a whole, and in particular the sectors under investigation.

Finally, the last paper in this issue is "Adoption and benefits of statistical methods in enterprises: differences between Croatian regions" by Žmuk, which addresses differences in the use of statistical methods by enterprises as one of the factors leading to the uneven level of economic development between different regions in Croatia. The author uses logistic regression analysis based on web survey data collected in 2013 on a sample of 667 Croatian enterprises. The obtained results generally confirm that the enterprises that use statistical methods have a greater probability of achieving a positive net income in comparison to enterprises that do not use it. The main implication of this research is that there is a need for the adoption of statistical methods as a tool for achieving higher net income and for reducing economic dissimilarities between regions in Croatia.

On behalf of Editorial Board
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ECONOMETRIC ANALYSIS OF CROATIA'S PROCLAIMED FOREIGN EXCHANGE RATE

Davor Mance, Saša Žiković, Diana Mance *

Abstract

The officially proclaimed foreign exchange policy of the Croatian National Bank (CNB) is a managed float with a discretionary right of intervention on the Croatian kuna/euro foreign exchange (FX) market in order to maintain price stability. This paper examines the validity of three monetary policy hypotheses: the stability of the nominal exchange rate, the stability of exchange rate changes, and the exchange rate to inflation pass-through effect. The CNB claims a direct FX to inflation rate pass-through channel for which we find no evidence, but we find a strong link between FX rate changes and changes in M4, as well as between M4 changes and inflation. Changes in foreign investment Granger cause changes in monetary aggregates that further Granger cause inflation. Changes in FX rate Granger cause a reaction in M4 that indirectly Granger causes a further rise in inflation. Vector Autoregression Impulse Response Functions of changes in FX rate, M1, M4, and CPI confirm the Granger causalities in the established order.

Keywords: *central bank policies, monetary transmission effects, inflation targeting*

JEL classification: *C22, E52, E58, F42*

INTRODUCTION

The Croatian National Bank (CNB) has recently changed its official policy from a free floating to a managed floating exchange regime (CNB 2013, CNB 2014). The CNB reserves the right to intervene on the currency markets and it did so more than 200 times in an 18 years period (1997-2014). The CNB has not officially determined an a priori upper or lower boundary or intervention point but it claims to maintain the stability of the kuna/euro foreign exchange (FX) rate in order to meet its primary objective of price stability. A similar approach was recently also taken by the Czech National Bank (CZNB 2014).

The aim of the paper is to analyze the Croatian kuna/euro foreign exchange policy (FX policy) using

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an econometric approach. The three hypotheses tested in this paper and based upon CNB statements on their web pages are: (1) 'the CNB does not predetermine the lower and upper level of the kuna exchange rate it is committed to defend (the upper and lower intervention point)'; (2) 'the CNB participates in foreign exchange market transactions in order to prevent excessive exchange rate fluctuations in both directions', and (3) 'the CNB maintains the stability of the kuna/euro exchange rate in order to meet its primary objective of maintaining price stability' (CNB 2014). The stated reason for the proclaimed CNB policy is a presumed fast transmission channel between inflationary expectations and exchange rate changes (CNB 2014). This inflation pass-through effect is important as it prevents the exchange-rate policy from being an effective policy tool for employment and GDP growth. This is the reason why we analyze the statistical relationships and Granger causalities between Foreign Investments (FI), the foreign exchange (FX) rate and the consumer price index (CPI) via transmission monetary aggregates M1 and M4.

The paper continues with a literature review with comments, followed by an explanation of our comprehensive data set and methodology. In the results and discussion section, statistical tests are consequently applied and commented on.

LITERATURE REVIEW

During the last 15 years several empirical studies on monetary transmission channels in Croatia have come to different conclusions. The presumed inability to model the primary FX rate time series because of its non-stationarity, non-normality, heteroscedasticity, and the presence of frequent structural breaks in the time series has motivated several other authors to model the FX returns instead, and to pursue various ARCH (Autoregressive Conditional Heteroscedasticity), TAR (Threshold Autoregression) and VAR (Vector Autoregression) approaches (Posedel 2006, Tica and Posedel 2009, Erjavec et al. 2012). Earlier exchange rate – inflation pass-through research did not come to converging results regarding the endogeneity of the exchange and inflation rate (Choudhri and Hakura 2001, Cukierman, Miller, and Neyapti 2002, Devereux and Engel 2003, Gagnon and Ihrig 2004, Mihaljek and Klau 2008). In regard to Croatia, Stučka (2004) found statistically significant J-curve effects with subsequent implications on investment, production, and international trade, with the latter having an influence on inflation. These are indirect effects that, according to the envelopment theory, should be disregarded in the direct assessment of FX - inflation pass-through effects. Subsequent research shows that the pass-through effect declines with increasing monetary stability and decreasing inflation (Mihaljek and Klau 2008). Monetary stability has, in this regard, a psychological memory effect and a non-linear relationship.

For a small open economy such as Croatia, credit and liability euroization reduces the efficiency of the FX rate as a shock absorber, such that the positive effects of free floating are easily mitigated against (Devereux and Lane 2003). The question of the "fear of floating" (Calvo and Reinhart 2000) may be countered by the question of the "fear of commitment" in an environment involving the future obligation of every EU country (except UK and Sweden) to eventually join the EMU. The question of "either fix or float" and suboptimal intermediary policies has been discussed at great length (Mundell 1961, Friedman and Mundell 2001, Buiter and Grafe 2002). As Friedman and Mundell (2001) concluded, intermediary solutions are suboptimal. With credit and liability euroization constraints present in Croatia, it might have been optimal in the past to have a formal currency board as in Bosnia and Herzegovina and Montenegro, or, fast-forwarding to the present day, beneficial in the short run to make an earlier firm commitment to the Economic and Monetary Union. This may be the principal reason for the change of the FX policy description on the official CNB web site from free float to managed float. The authors' aim was to put this label to comprehensive econometric testing.

DATA AND METHODOLOGY

The time series of kuna/euro FX rate consists of monthly observations covering the period from January 1997 to April 2014 (CNB 2014). Consumer price index (CPI), foreign investment (FI), and M1 and M4 monetary aggregates data were comprehensively available only on a quarterly basis from Q4 of 2000 to Q4 of 2013 (CNB 2014).

To model the FX time series, a Box-Jenkins methodology with a truncated Fourier series approach was used. Let y_t be time series with $t = 1, \ldots, N$, where N is length of time series. In order to determine the seasonal variations and trend, the time series is divided into two components:

$$y_t = \chi_t + Y_t \tag{1}$$

where Y_t is a stochastic irregular component and χ_t is a deterministic periodic function of the truncated Fourier series form:

$$\chi_t = c_1 + c_2 \cdot t + c_3 \cdot \cos\left(\frac{2\pi}{T} \cdot t - c_4\right) \quad (2)$$

c_1 is the mean, c_2 is the linear trend, c_3 is the seasonality amplitude, c_4 is the phase correction, T is the period and t is time in months.

To model the stochastic component Y_t in the equation (1), ARIMA modelling of time series is used (Box, Jenkins, and Reinsel 2008). If Y_t is stationary one can construct a p-order autoregressive (AR) model (3) and/or q-order moving average (MA) model (4):

$$Y_t = \sum_{i=1}^{p} \Phi_i \, Y_{t-i} + \varepsilon_t \quad (3)$$

$$Y_t = \varepsilon_t - \sum_{i=1}^{q} \theta_i \, \varepsilon_{t-i} \quad (4)$$

In AR models, the current value of the process is expressed as a finite, linear aggregate of previous values of the process Y_{t-i} and white noise ε_t. In MA models, Y_t linearly depends on finite number q of previous random shocks ε_{t-i}. When (3) and (4) are both included in one model, one gets a mixed autoregressive-moving average (ARMA) model. If Y_t is nonstationary, one can construct an autoregressive-integrated moving average (ARIMA) model of order (p, d, q), where d is the d^{th} difference of the process after which stationarity is achieved. ARIMA model fitting was performed with a three-stage Box-Jenkins technique: identification, estimation and verification (Maddala 2001). During the identification phase, the main tool was a visual analysis of the autocorrelation function (ACF) and partial autocorrelation function (PACF) (Enders 2010).

To test the assumption that one series may have a delayed response to the other series the cross-correlation function (CCF) was analyzed. Autocorrelation and cross-correlation coefficients are considered significant within $\pm 1.96/\sqrt{N}$ the bounds.

The time series stationarity may be influenced by structural breaks since structural breaks in the data can change the value of its mean, or the vector of its movement. To identify structural breaks the Zivot-Andrews test was used (Zivot and Andrews 1992). To test for stationarity in the time series we use the Augmented Dickey-Fuller test (ADF).

To identify other transmission channels, the lags and leads between the variables, and to simultaneously avoid spurious correlations, the CPI, FI, M1 and M4 1st differences (differences assured stationarity) are Granger tested and the speed of the pass-through effects is tested with impulse response functions. The Granger test is a standard bivariate regression:

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \cdots + \alpha_l y_{t-l}$$
$$+\beta_1 x_{t-1} + \cdots + \beta_l x_{t-l} + \varepsilon_t$$
$$x_t = \alpha_0 + \alpha_1 x_{t-1} + \cdots + \alpha_l y_{t-l}$$
$$+\beta_1 y_{t-1} + \cdots + \beta_l x_{t-l} + \omega_t \quad (5)$$

for all pairs of x_t, y_t series in the group (Granger 1969). The strength of causation is reported according to the F-statistics based on the Wald statistics for the joint hypothesis: $\beta_1 = \beta_2 = \cdots = \beta_l = 0$.

Nonstationary variables are tested for cointegrations. If two nonstationary time series are cointegrated with some stationary time series, a causal relationship may be assumed and further tested with a Vector Error Correction (VEC) model (Engle and Granger 1987). If the time series are not cointegrated, a Vector Autoregression (VAR) approach is considered (Johansen 1991).

Statistical tests and estimation of the model coefficients was performed by the E-Views 7.2 statistical package.

RESULTS AND DISCUSSION

The assessment of the correct label on the FX regime of a country requires a careful analysis of its time series, and testing whether the stochastic process of the exchange rate values follows a mean reverting process in response to central bank interventions. For this purpose, we use Box-Jenkins time-series analysis, Granger causality and Johansen cointegration tests (Box, Jenkins, and Reinsel 2008, Granger 1969, Johansen 1991). To the authors' knowledge the autoregressive (AR) kuna/euro FX time series has for the first time been augmented by a truncated Fourier series.

Stability testing and Box-Jenkins ARIMA modelling

For the monthly FX series for the period January 1997–April 2014 the Zivot-Andrews test found an endogenous structural break in level and trend in September 1998 (Fig. 1). Therefore, the observations can be grouped around two separate targets in level and time: the period before and after Sep 1998. The structural break in level and trend shown in Figure 1 can be attributed mainly to the change in statistical methodology and the introduction of the Value

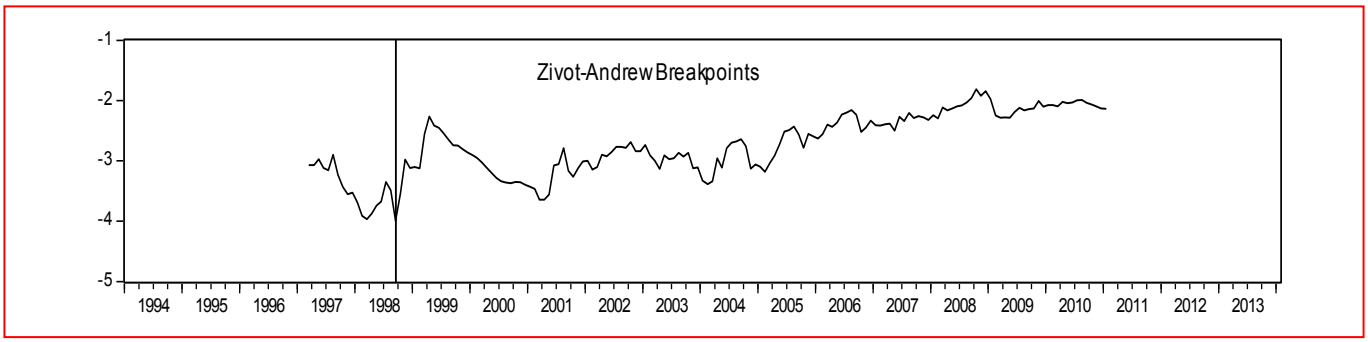

Figure 1: Zivot-Andrews structural break test. Data source: CNB 2014, calculation: E-Views 7.2.

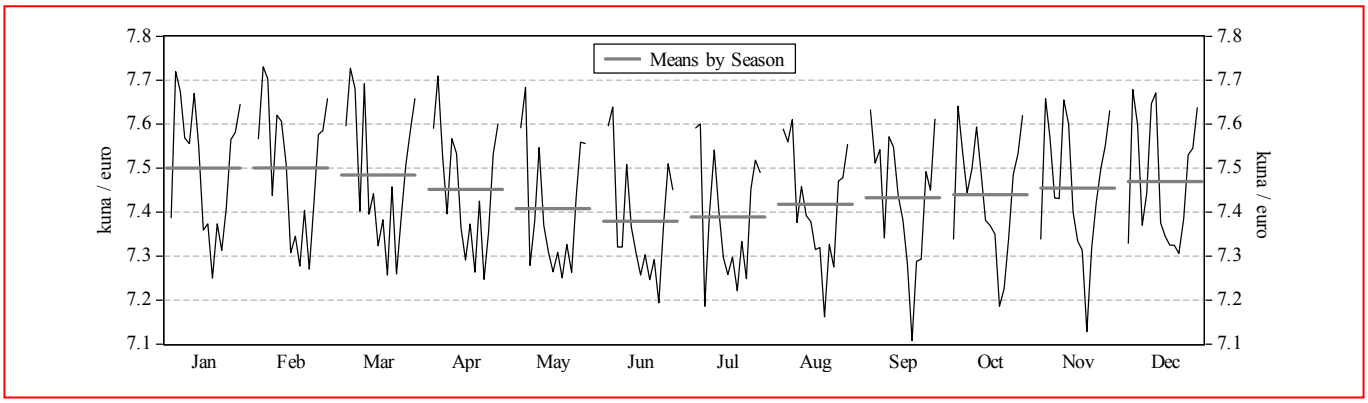

Figure 2: Kuna/euro FX rate means by season. Data source: CNB 2014, calculation: E-Views 7.2.

Added Tax in 1998. After Sep 1998 the FX rate is fairly constant with a mean of 7.44 and a coefficient of variation of 1.9%. Further calculations and analysis are restricted to the period between October 1998 and April 2014.

When analysing seasonal averages of the kuna/euro FX rate it can be seen that they exhibit a regular behaviour with maximum values in winter months, and minimum values in summer months (Fig. 2). Such seasonal behaviour can be explained by large tourism receipts, an important driver for the Croatian economy, peaking in summer months and euro denominated loan repayments peaking in winter months. Due to this seasonal behaviour the dynamics of the monthly kuna/euro FX rate can be described by (1).

Residuals remaining after the removal of the periodic component were tested for stationarity. The ADF test showed that the series is stationary in level and trend. The ACF of the residuals has dropped below the statistically significant level after approximately two years. The series is characterized by a drop in the PACF after only one month, without any significant reverse effect. This behaviour implies an ARIMA(1,0,0) i.e. AR(1) process. The final model of the dynamics of the monthly kuna/euro FX rate is represented by the following equation:

$$y_t = 7.468 + 0.052 \cdot \cos\left(\frac{2\pi}{12} \cdot t + 1.385\right) + 0.937 \cdot y_{t-1} + \varepsilon_t$$

$$R^2 = 0.885 \qquad (6)$$

Parameter coefficients, standard errors as well as standard statistical tests and diagnostic measures are given in Table 1. The linear trend is statistically not significant ($p > 0.1$).

Table 1: Parameter values of the HRK/EUR FX rate time-series model.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	7.468	0.057	130.201	0.000
C(3)	0.052	0.009	5.271	0.000
C(4)	-1.385	0.188	-7.365	0.000
AR(1)	0.937	0.026	35.685	0.000
R-squared	0.885	Mean dependent var		7.444
Adjusted R-squared	0.884	S.D. dependent var		0.14
S.E. of regression	0.048	Akaike info criterion		-3.221
Sum squared resid	0.412	Schwarz criterion		-3.151
Log likelihood	300.283	Hannan-Quinn criter.		-3.192
F-statistic	463.475	Durbin-Watson stat		1.552

Data source: CNB 2014, calculation: E-Views 7.2.

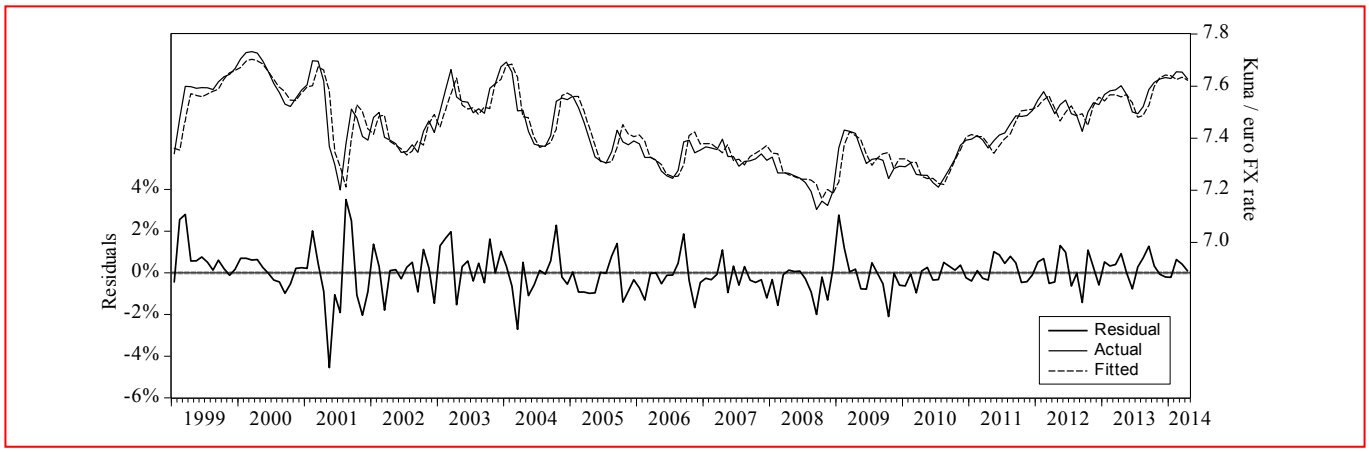

Figure 3: HRK/EUR FX rate series, model (periodic and AR(1) fit) and residuals. Data source: CNB 2014, calculation: E-Views 7.2.

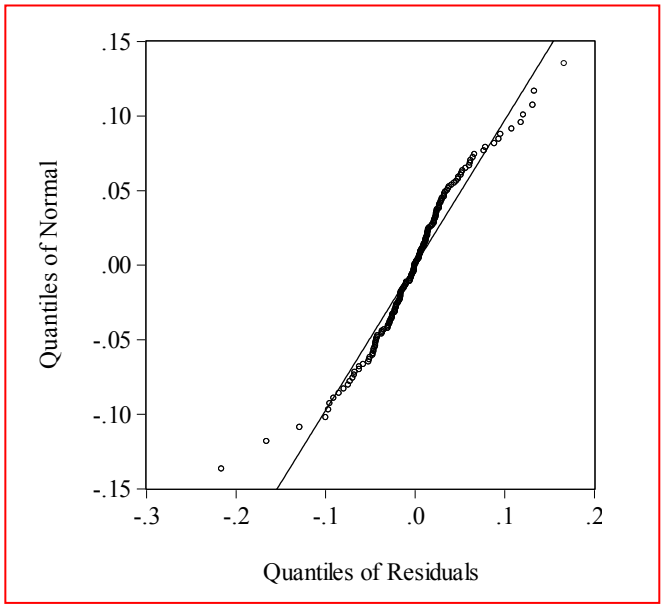

Figure 4a: Quantiles of residuals. Calculation: E-Views 7.2.

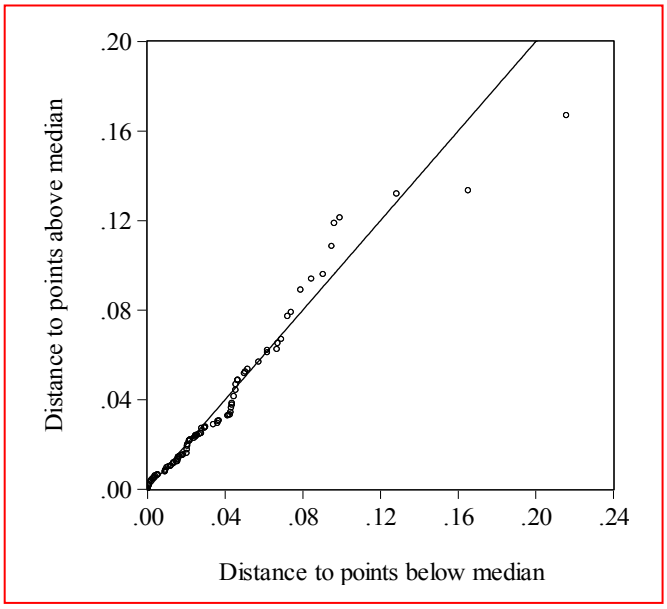

Figure 4b: Residuals distances from median. Calculation: E-Views 7.2.

The relationship between the original time series and the model is shown in Fig. 3. The residuals are homoscedastic (White test: F-statistic=1.166, p=0.322; Harvey test: F-statistic=1.732, p=0.145).

The theoretical and symmetry quantile-quantile plots in Fig. 4a and 4b show a close to normal distribution of the residuals.

Testing For Transfer Mechanisms

Testing for the FX rate/rate of inflation relationships (correlation, cross-correlation, and Granger causality) provides insight on the transfer mechanisms between the two. The correlation between FX rate and inflation is R=-0.11 (p>0.01), leading to the conclusion that the absolute values of FX rate and inflation rate are not correlated. The CCF of FX rate and inflation chain indices is also not statistically significant (all CCF coefficients were smaller than 0.15).

The period of 2001-2008 saw a stable kuna/euro FX rate (Fig. 3), and as can be seen in Fig. 5, a fine upward slope of continuously compounded quarterly exponential growth of 8% in FI (R^2=0.97), cumulatively 800% between Q4/2000 and Q4/2007, and a 30% increase in CPI (CBD 2014), coming to a halt after the outbreak of the financial crisis in 2008. Looked at from this perspective, the crisis deprived Croatia of significant growth in FI and GDP. Since Croatia was and still is in an implicit currency peg regime, a stop in FI growth rates also Granger caused a stop in growth rates of monetary aggregates (Fig. 5).

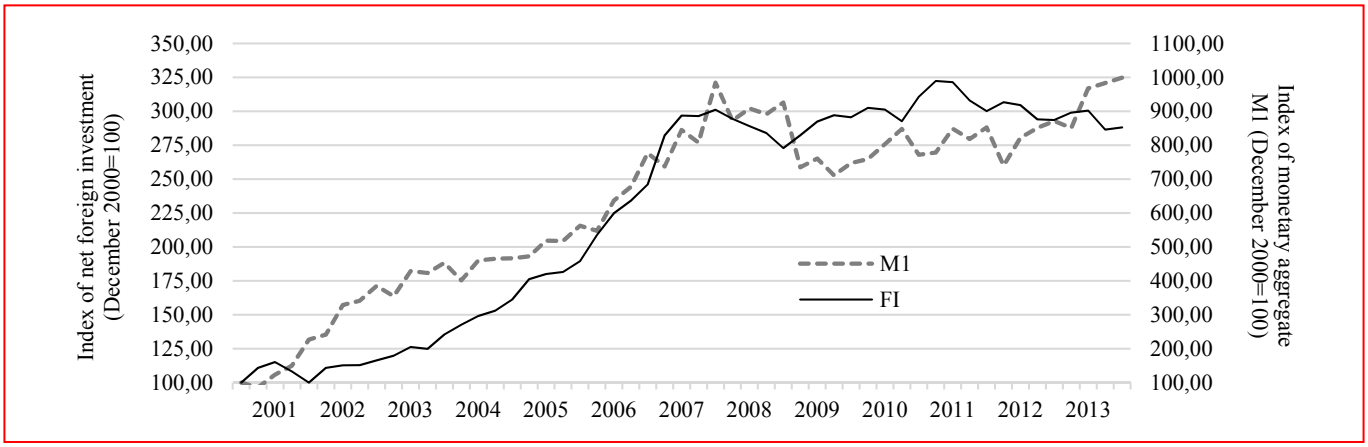

Figure 5: Levels of net foreign investments (FI) and monetary aggregate M1. Data source: CBD 2014, CNB 2014, own calculation.

Table 2 shows the pairwise Granger causality tests on quarterly data (data was 1st differentiated to achieve stationarity) of several factors conjecturing causal relationships in an inflation pass-through effect. The reason for using quarterly data is the availability of foreign investment time series in quarterly data, as well as because quarterly data assured a stronger expression of seasonality in the data, thus creating a better wave signal and improving the measurement of impulses in impulse response functions.

The analysis of quarterly time series data confirmed no statistically significant direct transmission channel between the change in the FX rate and inflation (Table 2). Economic theory provides us with different

Table 2: Granger Causality Tests.

Null Hypothesis:	Obs.	F-Statistic	Prob.
D(FX) does not Granger Cause D(CPI)	50	1.025	0.367
D(CPI) does not Granger Cause D(FX)		0.094	0.911
D(FX) does not Granger Cause D(FX)	50	2.646	0.082
D(CPI) does not Granger Cause D(FI)		2.342	0.108
D(M1) does not Granger Cause D(CPI)	50	20.098	0.000
D(CPI) does not Granger Cause D(M1)		0.357	0.702
D(M4) does not Granger Cause D(CPI)	50	7.709	0.001
D(CPI) does not Granger Cause D(M4)		1.570	0.219
D(FI) does not Granger Cause D(FX)	50	2.603	0.085
D(FX) does not Granger Cause D(FI)		2.869	0.067
D(M1) does not Granger Cause D(FX)	50	1.557	0.222
D(FX) does not Granger Cause D(M1)		3.111	0.054
D(M4) does not Granger Cause D(FX)	50	0.685	0.509
D(FX) does not Granger Cause D(M4)		8.248	0.001
D(M1) does not Granger Cause D(FI)	50	1.486	0.237
D(FI) does not Granger Cause D(M1)		6.279	0.004
D(M4) does not Granger Cause D(FI)	50	6.080	0.005
D(FI) does not Granger Cause D(M4)		6.712	0.003
D(M4) does not Granger Cause D(M1)	50	1.636	0.206
D(M1) does not Granger Cause D(M4)		1.749	0.186
INTERVENTION does not Granger Cause D(FX)	231	5.438	0.000
D(FX) does not Granger Cause INTERVENTION		2.380	0.030

FI=Foreign Investment; CPI=Consumer Price Index; FX=FX rate; M1&M4=Monetary Aggregates; Prefix D denotes first difference of data. Data source: CNB 2014, calculation: E-Views 7.2

determinants of inflation sources. Nevertheless *"…inflation is always and everywhere a monetary phenomenon"* (Friedman 1963). This statement was confirmed for the example of CNB monetary policy by testing the growth of the monetary aggregates M1 and M4 in regard to the change in the CPI (Table 2).

There is Granger causation between the highly correlated variables of M4 changes and FI changes, between the changes in M4 and inflation (changes in CPI), as well as between FX rate changes and changes in M4. The strongest Granger causation of inflation comes from changes in the monetary aggregate M1 (F-statistic=20.1, p<0001). Strong Granger causation of changes in monetary aggregates from FI, with the FX rate staying relatively fixed, is a confirmation of an effective currency peg.

Is it fixed, or does it float?

The Mundell's Impossible trinity theory states that with free capital flows and stable exchange rates, a country cannot keep its monetary policy sovereign (Mundell 1961). The dilemma is between fixing and floating. The question of "fear of floating" (Calvo and Reinhart 2000) is countered by the question of "fear of commitment". Intermediary policies are unstable and for a small open economy lead to untrustworthy monetary policies (Buiter and Grafe 2002) the productive sector cannot commit to with long-term plans. In the case of corner solutions (fix or float) the markets are given unambiguous information about the government's reactions to shocks and about the risks from non-hedged foreign exchange positions (Schadler et al. 2004). A floating rate gives no particular advantage over the hard peg. It gives no real monetary policy independence in an environment of high exchange rate/inflation rate pass-through velocity. It is not an automatic shock absorber in a high liability euroization environment and does not discourage unhedged currency exposures because the financial derivatives markets are undeveloped. The elimination of currency risks enhances policy credibility and stimulates Foreign Investments (FI).

The CNB has obviously discarded its own monetary policy sovereignty. The present low inflation rates are more a result of a stop in FI inflows than of FX policy (Fig. 5), and the presence of an intermediary monetary transmission channel between the two (Table 2).

Figures 6a and 6b show the correlation between ln(FI) and ln(M4), and between ln(M4) and ln(CPI) in Croatia. Furthermore, they depict a possible transmission mechanism of inflation in Croatia. The mechanism starts with a pegged FX rate. Foreign investments get absorbed by the monetary aggregates M1 and M4 (sterilized or not), which further increase the CPI.

There are actually no legal requirements for the CNB to use a double anchor for monetary stability. The CNB has the foremost constitutional obligation to preserve price stability. The CNB claims to "maintain the stability of the kuna/euro FX rate in order to meet its primary objective of maintaining price stability" (CNB 2014). As our econometric analysis shows, the best way to preserve price stability is by controlling monetary aggregates. Other intermediary goals may be pursued only if they are commensurate with the

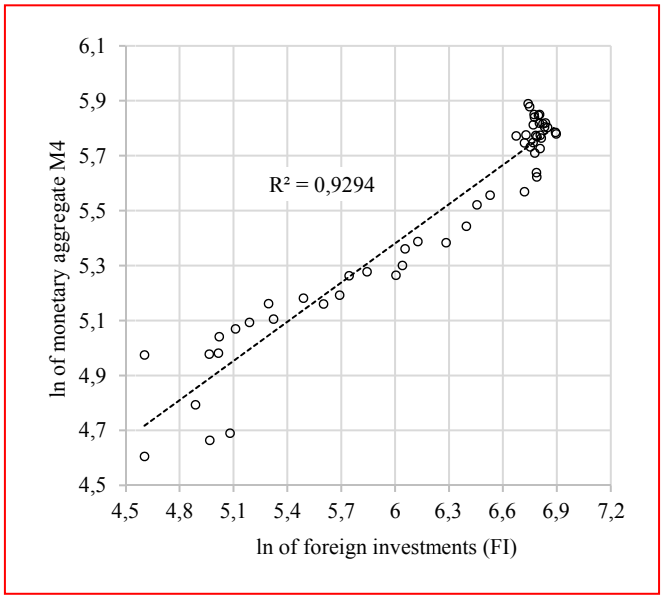

Figure 6a: Correlation between FI and M4. Data source: CBD 2014, CNB 2014, own calculation.

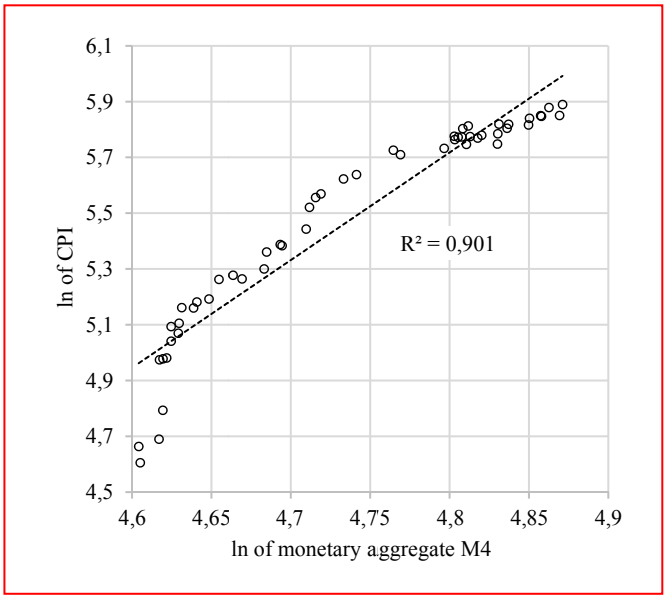

Figure 6b: Correlation between M4 and CPI. Data source: CBD 2014, CNB 2014, own calculation.

primary goal and this is the case under the absence of strong Balassa-Samuelson and Baumol-Bowen effects. FX rate stability guarantees CPI stability indirectly. There is Granger causality between the changes in FI, and inflation through the monetary M1 and M4 transmission channel. With the FX pegged to the euro, and Croatia's recession eventually coming to an end, the pressure on inflation might increase, so the timing of this change in the proclaimed CNB FX policy actually represents a positive signal towards EMU entry. This evolution comes as no surprise since Croatia has the highest level of euroization of all CEEC's and practically no ability to conduct a sovereign monetary policy. With nothing to lose, a firmer commitment may bring some reduction in risks and interest rates.

At the core of the question is the problem of heterodox goals and the effectiveness of the pass-through effect between FX returns and inflation. The pass-through effect measures the response of inflation to exchange rate changes. The smaller, more open and more internationally integrated an economy, the larger the pass-through effect should be. The efficiency of the exchange rate as an adjustment mechanism during the EMU convergence process depends highly on the pass-through effect (Devereux and Engel 2003). A high pass-through coefficient means also a high cross-correlation between the FX rate changes and inflation, and reduced adjustment policy effectiveness. Such high pass-through requires constant FX interventions.

Table 2 shows the results of testing the CNB FX interventions and FX moments for mutual Granger causation as one possible sign of CNB effectiveness in its implicit currency peg without an explicit currency board. It shall be reminded once again, that the CNB interventions amount to less than 3% of the total kuna/euro market volume (CNB 2014). The Granger causality test clearly shows that the CNB FX interventions are effective since they do Granger cause the FX rate to change (p<0.001). Even more interestingly, there is Granger causation going from FX rate change to intervention (p=0.03), which leads to the conjecture that CNB interventions are based on observed developments in FX markets and are not pre-emptive (Mohanty and Berger 2013). A cross-correlation test of FX rates and FX interventions has shown a disappearance of the effect after two quarters.

We test if the FX rate is changed in the right direction. In Fig. 7 a correct slope of the regression can be seen, but there are too many shots missing their mark. Nevertheless, the kuna/euro FX rate is stable in the long run and without a statistically significant trend, showing a successful FX intermediate policy goal.

Johansen co-integrations tests between FX rate (stationary), and combinations of M1, M4, and CPI (nonstationary) give no cointegrating vectors, requiring the use of a VAR instead of a VEC model. We tested the VAR Impulse Response Functions of relative changes in the FX rate, M1, M4, and CPI to test for the inflation pass-through. Figure 8 shows the impulse response functions of a dependent variable to a shock of a 1σ change in the independent variable. All variables are differenced for stationarity and normalized. The time lag is shown in months.

Fig. 8 shows the expected response result from inflation to a 1σ shock in the FX rate, and an expected response result from inflation to a 1σ shock in the change of M4. The response from the M4 to a 1σ shock in the change of the FX rate is also as expected. It overshoots at first, then backlashes, but then normalizes after four months. It may be concluded that the transmission channel goes from the FX rate, via the M4 monetary aggregate to inflation. The response of the change in the FX rate to a 1σ shock in the rate of inflation representing the central bank intervention is

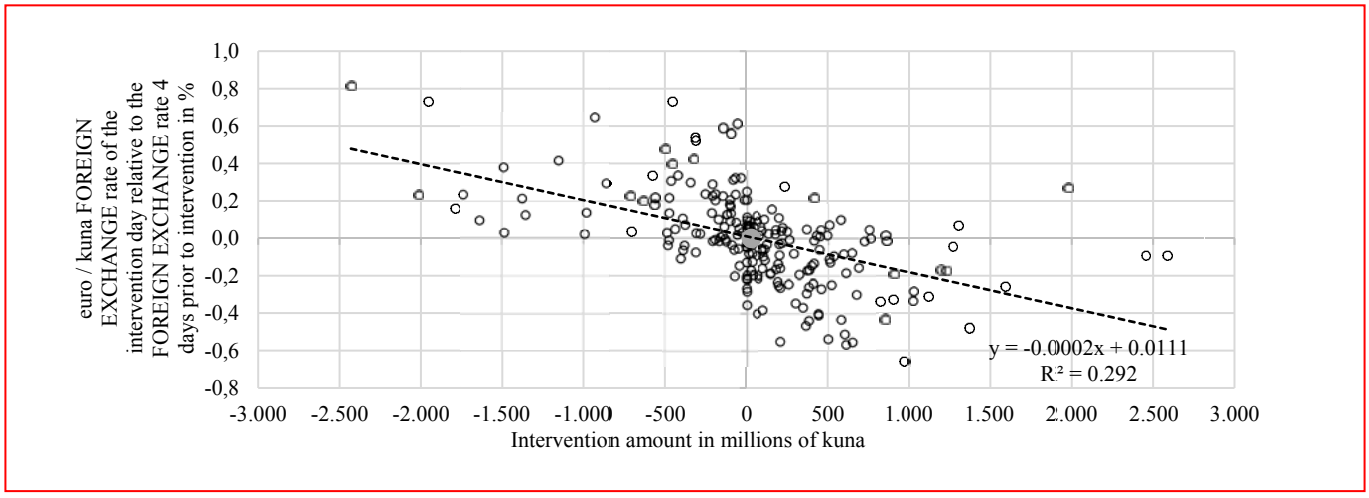

Figure 7: Euro/kuna FX rate changes as a consequence of FX interventions. Data source: CNB 2014, own representation.

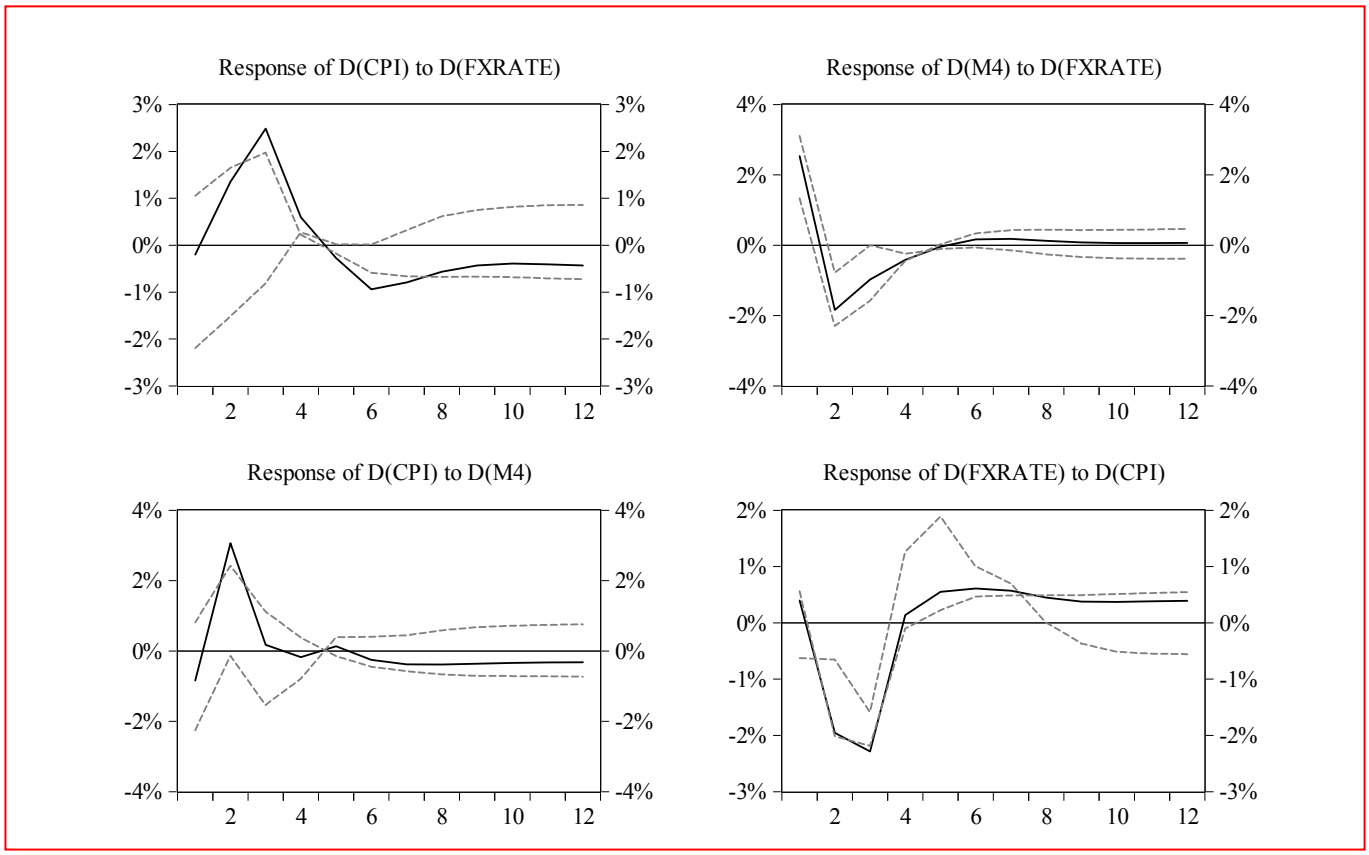

Figure 8: Impulse Response Functions of changes in FX, M1, M4, and CPI Data source: CNB 2014, calculation: E-Views 7.2.

lagged one month behind the inflation rate change, confirming our hypothesis that the CNB is targeting the monthly changes in the inflation rate, i.e. a moving target.

A currency peg gives a stable benchmark for the inflation rate. The surplus inflation over and above the eurozone inflation rate is then attributable to changes in relative prices. If the productivity growth is primarily in the internationally traded goods sector, the prices of tradables have to fall relative to the prices of non-tradables. According to the Balassa-Samuelson effect, with fixed exchange rates the prices of non-tradables will have to rise.

The CNB classifies its newly officially proclaimed FX policy as a managed float (CNB 2014). Nevertheless, the CNB acknowledges its commitment to pursue the multiple (heterodox) target policy (exchange rate and inflation targeting) as the best way to preserve low inflation rates. It is the CNB's constitutional obligation to pursue primarily the price stability target. Only once this goal has been fulfilled may the CNB pursue additional objectives. According to the CNB, its interventions on the exchange market accrue for no more than 3% of the total transactions volume. The largest amount has been used in the operations of selling kuna for euros in an attempt to prevent an appreciation of the kuna. Only recently has the CNB intervened several times to buy the kuna in an attempt to prevent depreciation of the kuna (CNB 2013, CNB 2014).

Depreciations feed inflation expectations and risk premiums. A higher risk premium reduces the real rate of return on capital. This is detrimental to investment and growth. Croatia would be better off if it could eliminate this negative and partially self-sustaining effect. But even without high exchange rate pass-through, a fixed exchange rate could be an optimal monetary policy in an environment of region-specific shocks (Devereux 2003).

Countries with difficulties in controlling their money supply benefit from a currency board/monetary union because the money supply is the primary Granger cause of inflation. This is also the Croatian case where Granger causality test results show best values between growth of M1 and inflation. Nevertheless, confidence in the domestic currency may depend on factors other than the exchange rate regime such as central bank independence (Cukierman, Miller, and Neyapti 2002), the degree of the openness of the economy and the level of debt and its sustainability because of its inherent incentive to monetize (Romer 1993, Romer 1998, Terra 1998). These are some of the issues worth future research.

CONCLUSION

The goal of the paper was to test three statements made by the Croatian National Bank regarding its long term FX policy commitments, which are also often used by a number of other European central banks. The results of our econometric analysis show that the monthly weighted average kuna/euro FX rate is trend stationary, i.e. without a statistically significant trend, normally distributed and with homoscedastic residuals after modelling. To test the three hypotheses proposed by the CNB, it was also necessary to use the quarterly differentiated data of FI, FX, M1, M4, and CPI. To test the effectiveness of interventions, nominal FX and intervention data were tested for Granger causality. Following the results of time series stability analysis, the statement of FX rate stability cannot be rejected. It seems that the CNB indirectly pursues the goal set in the statement about not determining a priori boundaries or intervention points by directly pursuing the goal set in the statement about maintaining the stability of kuna/euro FX rate changes. The upper and lower intervention points may be generalized as FX rates' first differences. Since the CNB defends no nominal FX rate, but maintains its rate of change at ± 1.9% per month, the second hypothesis of no upper and lower bounds of nominal FX rate returns can be rejected. A Granger causality test confirms the bidirectional causation effects between FX rate and interventions. The FX rate change is an important trigger of intervention. The results show that for Croatia kuna/euro FX rate stability is not a direct mechanism of price stability. The Granger causality test shows that the CNB cannot directly target inflation via FX rate. Johansen co-integration tests do not show any expected cointegrating vectors between the analyzed variables, and the cross-correlation tests do not show any significant direct pass-through effects between the FX rate and inflation as stated by the CNB.

We find that there is not enough statistical evidence for the confirmation of at least one out of three statements put forward by the CNB and which are usually considered absolutely correct and often serve as a starting point for fiscal/monetary policy decision-making. Nevertheless, we find a good political reason to change the official policy from free float to managed float: prospective EMU accession. Our FX rate model shows that the kuna/euro FX rate follows a very narrow currency peg of 7.44 kuna/euro with a coefficient of variation at 1.9%, so even this policy change may be assessed as too moderate, as it clearly is a functional currency peg or a quasi-currency board as it is sometimes also called. As already stated, a firmer FX policy commitment toward the euro may be the only policy choice for the future. Small open economies such as Croatia that joined the EU and enjoy full freedom of capital movement are confronted with a classic policy trilemma that becomes the dilemma of whether to fix or to float because of the inability of choosing capital controls. It seems the CNB has anchored, although without a strong commitment. The recent statement change is probably just one more step towards the EMU.

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TACKLING THE PROPENSITY TOWARDS UNDECLARED WORK: SOME POLICY LESSONS FROM CROATIA

Colin C. Williams, Josip Franic *

Abstract

The aim of this paper is to evaluate contrasting policy approaches towards undeclared work. To do so, evidence is reported from 1,000 face-to-face interviews conducted in Croatia during 2013. Logistic regression analysis reveals no association between participation in undeclared work and the perceived level of penalties and risk of detection, but a strong association between participation in undeclared work and the level of tax morality. It thus confirms recent calls for the conventional direct controls approach, which seeks to deter engagement in undeclared work by increasing the penalties and risk of detection, to be replaced by an indirect controls approach which seeks to improve tax morality so as to encourage greater self-regulation and a culture of commitment to compliance. The implications for theory and policy are then discussed.

Keywords: *informal sector; tax morale, institutional theory; tax evasion; Croatia; South-East Europe*

JEL: *E26, H26, J46, O17*

1. INTRODUCTION

The aim of this paper is to evaluate various policy approaches that can be used to tackle undeclared work. Although there is a growing understanding of the extent and character of undeclared work in South-Eastern Europe (Baric and Williams 2013, Gaspareniene, Kartasova and Remeikiene 2014; Hudson et al. 2012; Remeikiene, Gasparaeniene and Kartasova 2014; Schneider 2013; Williams, Franic and Dzhekova 2014; Williams et al. 2012, 2013), little attention has been so far paid to evaluating the various policy approaches available for tackling this phenomenon. However, unless effective strategies are developed to tackle the undeclared economy, not only will governments continue to lose public revenue due to its prevalence but the unfair competition faced by legitimate businesses and poorer quality working conditions faced by workers will remain (Andrews, Caldera Sanchez and Johansson 2011; ILO 2014). Tackling the undeclared economy which represents around a quarter of Gross Domestic Product (GDP) in South-East Europe is therefore an important task for South-East European governments (Schneider and Williams 2013).

To evaluate the various policy approaches available for tackling the undeclared economy, section 2

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provides a conceptual framework for understanding the range of policy approaches available and shows how until now in South-Eastern Europe, the focus has been upon using a direct controls approach which seeks to tackle the undeclared economy by increasing the penalties and risk of detection confronting those participating or thinking about participating in undeclared work. Despite recent calls in the scholarly literature for an indirect controls approach which engenders a commitment to compliance, South-East European governments have been slow to consider such an approach. This however is perhaps unsurprising since there have been few evaluations of these contrasting approaches. To begin to fill this gap therefore, section 3 introduces the data and methodology used here to do so, namely a logistic regression analysis of 1,000 face-to-face interviews conducted in 2013 in Croatia. Section 4 then reports the results. Finding no significant association between participation in undeclared work and the perceived level of penalties and risk of detection on the one hand, and a strong association between participation in undeclared work and a commitment to compliance on the other, section 5 discusses the policy implications before section 6 draws some conclusions.

Before commencing nevertheless, undeclared work must be defined. In this paper, and reflecting the consensus in the literature, undeclared work is defined as paid work which is legal in all respects other than it is not declared to the authorities for tax, social security or labour law purposes (Aliyev 2015; Boels 2014; European Commission 2007; OECD 2012; Polese and Rodgers 2011; Williams 2014a,b). If it is not legal in all other respects, it is not part of the undeclared economy. For example, if the goods and/or services exchanged are illegal (e.g., illegal drugs), then this is not part of the undeclared economy but part of the wider criminal economy.

2. BACKGROUND: POLICY APPROACHES TOWARDS UNDECLARED WORK

Undeclared work is an extensive and persistent feature across South-East European economies (Schneider 2013; Williams 2014a). This is particularly the case in Croatia where Schneider (2013) estimates that undeclared work in 2013 was equivalent to 28.4 per cent of GDP and Williams (2014a) estimates that the share of employment in the undeclared economy in 2013 was 22.7 per cent. Indeed, Croatia has one of the largest undeclared economies in South-Eastern Europe (Williams, Franic and Dzhekova 2014). Whether one examines the results of direct surveys (Rubić 2013; Williams 2014a) or the results of indirect measurement methods using proxy indicators (Galić Nagyszombaty 2012; Klarić 2011; Ott 2002; Schneider 2013), a similar finding is revealed. The undeclared economy is equivalent to around a quarter of total GDP and employment in Croatia. As a result, recent years has seen the issue of tackling the undeclared economy rapidly rise up the political agenda in Croatia, with the Ministry of Labour designating 2014 'the year of the fight against undeclared work' (Ministry of Labour and Pensions System 2014).

How, therefore, can the undeclared economy be tackled? To review the possible policy approaches, Table 1 provides a heuristic conceptual framework. This distinguishes between direct and indirect control approaches. Direct control approaches seek to tackle undeclared work by ensuring that benefits of operating in the declared economy outweigh the costs of working in the undeclared economy. This can be accomplished either by using deterrence measures to increase the costs of non-compliance ('sticks') and/or by making the conduct of declared work more beneficial ('carrots'). Indirect control approaches, meanwhile, shift away from using 'sticks' and 'carrots', and instead focus on developing the psychological contract (or what might also be called the social contract) between the state and its citizens so as to encourage a commitment to compliance among citizens and thus greater self-regulation.

Here, each approach is reviewed in turn so as to highlight the measures available for tackling the undeclared economy.

Direct Controls Approach

The conventional policy approach for tackling undeclared work is to use direct controls. During the early 1970s, Allingham and Sandmo (1972) argued that the non-compliant, such as undeclared workers, are rational economic actors who evade tax when the pay-off is greater than the expected cost of detection and punishment. To deter them therefore, the objective is to change the cost/benefit ratio facing those participating or considering participation in undeclared work (e.g., Hasseldine and Li 1999; Job, Stout and Smith 2007; Richardson and Sawyer 2001). As the OECD (2008: 82) summarize, 'Combating informal employment requires a comprehensive approach to reduce the costs and increase the benefits to business and workers of operating formally'. The most common approach is to increase the actual and perceived risks and costs associated with participation in undeclared work firstly, by raising the perceived

Table 1 Typology of policy approaches for tackling undeclared work

Approach	Method	Measures
Direct controls: deterrents ("sticks")	Improved detection	Data matching and sharing Joined up strategy Joint operations
	Increased penalties	Increased penalties for evasion
Direct controls: Incentives ("carrots")	Preventative	Simplification of compliance Direct and indirect tax incentives Supply chain responsibility Support and advice
	Curative	Supply-side incentives (e.g. society-wide amnesties; voluntary disclosure; smoothing transition to legitimization) Demand-side incentives (e.g. service vouchers; targeted direct taxes; targeted indirect taxes)
Indirect controls: reduce asymmetry between formal and informal institutions	Change informal institutions (values, norms and beliefs)	Tax education Normative appeals Education and awareness raising of benefits of declared work
	Change formal institutions (laws, regulations and codes)	Procedural fairness and justice Redistributive justice Wider economic and social developments (e.g., social protection, equality, growth strategies for quality employment, entrepreneurship support)

or actual likelihood of detection and/or secondly, increasing the penalties and sanctions for those caught. This is therefore a 'negative reinforcement' approach; it uses 'sticks' to punish non-compliant ('bad') behavior (Williams 2014b). Indeed, this is the dominant approach used in Croatia (see Baric and Williams 2013; Franic and Williams 2014; Official Gazette 2011; State Inspectorate 2013a,b).

Given that it is increasingly recognized that the goal is not to eradicate undeclared work but rather, to transform it into declared work, another way of using direct controls is to provide incentives ('bribes') to increase the benefits of declared work (Small Business Council 2004). Put another way, rather than punish 'bad' (non-compliant) behaviour, direct controls can also reward 'good' (compliant) behavior, rather than taking it as given. As Table 1 reveals, such measures can take two forms. On the one hand, they can prevent citizens from entering the undeclared economy in the first place such as by simplifying compliance and providing incentives to operate in the declared economy. On the other hand, they can seek to cure those already operating in the undeclared economy by providing either supply-side incentives for them to operate in the declared economy (e.g., amnesties) or demand-side incentives to stop people purchasing goods and services in the undeclared economy (e.g., target direct taxes, service voucher schemes). In Croatia, such direct controls to increase the benefits of declared work have been so far hardly used (see Baric and Williams 2013; Franic and Williams 2014).

Indirect Controls Approach

One problem with using direct controls to alter the cost/benefit ratio is that this is expensive (Alm 2011). An alternative approach is to engender a commitment in citizens to be compliant so that they self-regulate. To do this, indirect controls are used that seek to improve the psychological contract between the state and citizens (Alm and Torgler 2011; Weigel, Hessin, and Elffers 1987; Wenzel 2002). The goal is to engender voluntary commitment to compliant behavior rather than force citizens to comply using threats, harassment and/or bribes (Kirchler 2007; Torgler 2007, 2011).

To understand the tools used to achieve this, it is first necessary to recognize that there exists an institutional asymmetry between the laws, codes and regulations of formal institutions and the norms, beliefs and values of informal institutions (Efendic, Pugh and Adnett 2011a,b; Helmke and Levitsky 2004; North 1990; Webb et al 2009). Undeclared work occurs when the norms, values and beliefs (informal institutions) differ to the laws and regulations (formal institutions), resulting in what formal institutions deem to be illegal

activities being seen as socially legitimate in terms of the norms, values and beliefs of entrepreneurs (Williams and Shahid 2015). To tackle undeclared work therefore, there is a need to reduce this asymmetry between the formal and informal institutions. This can be achieved either by changing the informal institutions and/or the formal institutions.

To change informal institutions (i.e., the norms, values and beliefs of citizens regarding compliance) so that these are in symmetry with the formal institutions, governments can either seek to improve tax knowledge, use awareness raising campaigns about the costs of undeclared work and benefits of declared, or use normative appeals. However, in societies in which there is a lack of trust in government, such as due to public sector corruption (European Commission 2014), it is also the case that formal institutions need to change. This requires improvements in the perception amongst citizens that there is tax fairness, procedural justice and redistributive justice (Braithwaite and Reinhart 2000, Murphy 2005; Taylor 2005; Tyler 1997; Wenzel 2002).

Evaluating direct versus indirect control approaches

Although there is now a considerable literature which evaluates the validity of facets of one or other of these approaches for tackling undeclared work, there has been until now a lack of research which evaluates these approaches in a South-East European context. Beyond South-Eastern Europe however, a large and expanding body of scholarship reveals that increasing penalties or the probability of detection may not lead to greater compliance (Feld and Frey 2002; Murphy 2005; Varma and Doob 1998; Shaw, Slemrod and Whiting 2008; Webley and Halstead 1986). Instead, it raises non-compliance, not least due to a breakdown of trust between the state and its citizens (Ayres and Braithwaite 1992; Murphy and Harris 2007; Tyler et al. 2007). Indeed, the most telling critique of the use of deterrents is the suggestion that many voluntarily comply even when the level of penalties and risks of detection would suggest that they should not if they were truly rational economic actors (Murphy 2008).

Similarly, and in relation to indirect controls, there is now a large body of scholarship that evaluates the effectiveness of pursuing changes in informal and formal institutions (Braithwaite and Reinhart 2000, Gangl et al. 2013; Kirchgässner 2010, 2011; McGee 2005, 2008; Molero and Pujol 2012; Murphy 2005; Taylor 2005; Tyler 1997, Wenzel 2002). Studies have for example examined the effectiveness of awareness-raising campaigns to change attitudes towards compliance. As a UK study reveals, advertising campaigns run by the UK tax office have provided a return of 19:1 on the expenditure of £2 million, compared with an overall return of 4.5: 1 on the £41 million a year spent on all its detection and compliance work in 2006-07 (National Audit Office 2008). Similarly, and in the US, Chung and Trivedi (2003) examine the impact of normative appeals on a friendly persuasion group who were required to both generate and read a list of reasons why they should comply fully and compared with a control group not asked to do so. The participants in the friendly persuasion groups report higher earnings than the control group.

There have also been studies which reveal that improving procedural justice, which refers to whether citizens perceive the government to treat them in a respectful, impartial and responsible manner, significantly improves compliance (Braithwaite and Reinhart 2000, Gangl et al. 2013; Murphy 2005; Taylor 2005; Tyler 1997, Wenzel 2002). Similar findings have been revealed with respect to developing procedural fairness which refers to the extent to which citizens believe that they are paying their fair share compared with others (Kirchgässner 2010, 2011; McGee 2005, 2008; McGee, Alver and Alver 2008; Molero and Pujol 2012) and in relation to enhancing redistributive justice, which refers to whether citizens believe they receive the goods and services they deserve given the taxes that they pay (Kirchgässner 2010, McGee 2005).

Until now however, few if any studies have evaluated these approaches in a South-East European context. Does the deterrence approach of increasing the penalties and risks of detection reduce the likelihood of participation in undeclared in South-Eastern Europe? And does a commitment to compliant behavior on the part of citizen's result in a reduction in the likelihood of them participating in undeclared work in South-Eastern Europe? Given the lack of evaluation of these policy approaches in South-Eastern Europe, we here begin to fill this gap. To do so, two hypotheses are here evaluated:

Direct controls hypothesis (H1): there is an association between participation in undeclared work and the perceived penalties and risk of detection.

Indirect controls hypothesis (H2): there is an association between participation in undeclared work and the degree of symmetry between formal and informal institutions.

3. DATA AND VARIABLES

Data

We here evaluate these hypotheses regarding whether firstly increasing the penalties and risks of detection, and secondly, greater symmetry between formal and informal institutions, reduces the likelihood of participation in undeclared work in South-Eastern Europe. To do this, we here report data from 1,000 face-to-face interviews conducted in Croatia during 2013 as part of the Special Eurobarometer No. 402 survey ('Undeclared work in the European Union'). This survey is the first and so far only comprehensive source of data about not only who participates in undeclared work in Croatia but also citizens' views on the penalties and risk of detection, and acceptability of participating in undeclared work (and thus citizens level of commitment to compliance).

To collect this data, a multi-stage random (probability) sampling methodology was used to ensure that on the issues of gender, age, region and locality size, the Croatian national level sample as well as each level of the sample, was representative in proportion to its population size. In every household the 'closest birthday' rule was applied to select respondents, while every subsequent address was determined by the standard 'random route' procedure. The resultant dataset comprises a survey of 1,000 Croatian citizens above 18 years of age. In the face-to-face interviews, participants were firstly asked questions regarding their views on the acceptability of various types of undeclared work and their views on the level of penalties and risks of detection, 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.

Variables

To evaluate whether firstly increasing the penalties and risks of detection, and secondly, greater symmetry between formal and informal institutions, reduces the likelihood of participation in undeclared work in Croatia, two dependent variables are used. The first examines from the supply-side who participates in undeclared work and is a dummy variable with recorded value 1 for persons who answered 'yes' to the question, 'Have you yourself carried out undeclared work in the last 12 months?'. The second examines from the demand-side who purchases goods and services in the undeclared economy and is again a dummy variable with recorded value 1 for persons who answered 'yes' to the question, 'Have you in the last 12 months acquired any goods or services on an undeclared basis?'.

In order to evaluate whether there is an association between participation in undeclared work and the two types of policy measure, three explanatory variables are used. The first two variables examine the dominant deterrence side of the direct controls approach. On the one hand, and to evaluate whether the perceived risk of detection influences participation, respondents were asked to evaluate the perceived the risk of detection in Croatia. To do this, a categorical variable is used to measure the risk of being detected when engaging in undeclared work with four possible answers; very small, fairly small, fairly high or very high. On the other hand and to evaluate how penalties are associated with participation, they were asked about what they thought were the expected sanctions for those caught conducting undeclared work. For this categorical variable, the three possible answers were: normal tax or social security contributions are due; normal tax or social security contributions are due, plus a fine; and prison.

To evaluate the association between participation in undeclared work and the indirect controls approach meanwhile, the level of institutional symmetry was measured using an interval variable based on participants rating the acceptability of four types of undeclared work using a 10-point Likert scale (1 equals absolutely unacceptable and 10 equals absolutely acceptable). These four 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 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. Given the substantial pairwise correlations across these four indicators (ranging between 0.36 and 0.74) and the high Cronbach's alpha of 0.82, exploratory factor analysis was applied to reduce the dimensionality. The factor analysis indicated the existence of a single factor underlying the respondents' perceptions towards the given noncompliant behaviours, which can thus be labelled as a 'tax morale index'. Overall, each of the four individual indicators contributes significantly to the extracted index, with communalities ranging from 0.42 to 0.80. To reflect the scale of the four baseline variables, the obtained tax morale index has been transformed to follow the original 10-point Likert scale. Therefore, lower values of the index represent higher tax morale (and thus high institutional

Table 2 Summary of variables used in the logistic regression modelling

Variable name	Description	Values	Number of missing values
Participation in undeclared work	A dummy variable indicating whether a respondent carried out undeclared work during 12 months preceding the survey.	0 - no; 1 - yes	35
Purchase of undeclared goods and services	A dummy variable indicating whether a respondent acquired undeclared goods and/or services during 12 months preceding the survey.	0 - no; 1 - yes	65
Gender	A dummy variable for respondent's gender	0 - male; 1 - female	0
Age	An interval variable indicating the exact age of a respondent	Values representing exact age	0
Occupation	A categorical variable describing work status of a respondent	1 - unemployed; 2 - self-employed; 3 - dependent employee; 4 - inactive (house persons, students, etc.); 5 - retired	0
Financial situation	A categorical variable indicating how often a respondent finds herself/himself in difficulty to pay bills	1 - most of the time; 2 - from time to time; 3 - almost never/never	14
Type of community	A dummy variable denoting whether a respondent lives in rural or urban area	0 - rural area or village; 1 - urban area	0
Region	A categorical variable for a region of residence	1 - Zagreb and surrounding; 2 - North Croatia; 3 - Slavonia; 4 - Lika and Banovina; 5 - Istra, Rijeka and Gorski Kotar; 6 - Dalmatia	0
Detection risk	A categorical variable for perceived risk of being detected when engaged in unregistered activities	1 - very small; 2 - fairy small; 3 - fairy high; 4 - very high	80
Expected sanctions	A categorical variable measuring anticipated penalties when caught in carrying out unregistered activities	1 - normal tax or social security contributions due; 2 - normal tax or social security contributions due, plus a fine; 3 - prison	285
Tax morale	An interval variable measuring respondents tax morale	'1' denotes the highest level of tax morale and '10' the lowest level	14

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

symmetry and greater commitment to being compliant), and vice versa.

To control for the demographic and socio-economic characteristics of respondents, we also include a set of categorical and interval covariates, namely gender, age, occupation, financial situation, type of community (urban or rural) and region of residence, which previous studies reveal influence the level of undeclared work (Alm and Torgler 2011; Williams and Martinez 2014a). The full list and detailed description of all variables used in the logistic models is given in Table 2.

Given that there were a considerable number of missing values with respect to the variables of interest, a multiple imputation technique has been used to address this issue (Royston 2004; Rubin 1987; Schafer & Graham 2002). Fifty imputations were simulated through a system of chained equations for every missing value. In addition, population weights are applied to correct for over- and under-representation in the sample.

4. FINDINGS

To determine whether there is a significant association between participation in undeclared work and these direct and indirect controls, when other characteristics are taken into account and held constant, Table 3 reports the results of two logistic regression analyses of both supply-side participation in undeclared work and the demand-side purchase of goods and services in the undeclared economy.

Starting with whether there is an association between participation in undeclared work and the use of the direct controls, we found no significant impact of the perceived risk of detection on participation in undeclared work, when other variables are held constant. In other words, there is not enough evidence supporting hypothesis 1. It is not the case that when respondents view there to be a high risk of detection, this is related to lower levels of engagement in undeclared work. Similarly, we found no significant association between participation in undeclared work and the perceived level of sanctions. As such, when respondents perceive the level of sanctions to be high (e.g., prison), this does not imply lower levels of participation in undeclared work. The same is concluded when examining the demand-side. There is not only no significant link between the expected sanctions and the propensity to purchase undeclared goods and services, when other variables are held constant, but the only time that detection risk matters for the decision to purchase undeclared goods and services is when this risk is very high. On the whole therefore, the direct controls of increasing the level of punishments and risk of detection seem not to be significant factors influencing participation in undeclared work. The tentative intimation is that increasing the sanctions and risk of detection will have little impact on participation in undeclared work in Croatia.

Is there however, and as hypothesis 2 asserts, an association between participation in undeclared work and higher tax morale (and thus commitment to compliance)? If so, then this suggests that indirect controls that seek to improve tax morale may well be an effective means of tackling undeclared work. The finding of Table 3 is that this is the case. Tax morale is strongly associated with the propensity to participate in undeclared work not only on the supply-side but also the demand-side. More precisely, a unit decrease in tax morale increases the odds of working undeclared by 58.5% and the odds of buying undeclared goods and services by 16.9%, holding other variables constant. Put simply, where there is greater commitment to compliance, self-regulation occurs and the propensity to participate in undeclared work is lower. Individuals with a higher tax morale are significantly less likely to work on undeclared basis and also significantly less likely to purchase goods and services in the undeclared economy.

The outcome of these logistic regression analyses therefore, is that little or no association is found between the likelihood of participating in undeclared work either on the supply- or demand-side and the level of punishments and risk of detection, but a strong association is identified with the level of tax morality. The suggestion, therefore, is that policy interventions which seek to increase the level of punishments and risk of detection will have little influence on participation but policy interventions which seek to improve tax morality may well reduce participation.

To whom, therefore, should such indirect controls that seek to improve tax morality be targeted? Table 3 provides some clues since the analysis of the other variables displays which groups have a greater propensity to participate in undeclared work. This reveals that so far as the supply-side is concerned, the groups significantly more likely to participate in undeclared work are men, younger age groups, those who most of the time witness difficulties paying household bills, and those living in urban areas, especially in the capital and surrounding region. These signal the groups therefore, that might be targeted by indirect controls seeking to reduce participation in undeclared work by improving tax morality. On the demand-side however, no occupational, gender, economic and regional variations are found and only a weak significance with age, with younger age groups displaying a greater

Table 3 Determinants of undeclared work in Croatia, odds ratios

Variables	Participation in undeclared work	Purchase of undeclared goods and services
Detection risk (RC: Very small)		
- Fairly small	1.839 (0.872)	0.939 (0.211)
- Fairly high	0.773 (0.448)	0.724 (0.193)
- Very high	0.754 (0.844)	0.382* (0.159)
Expected sanctions (RC: Tax or social security contributions)		
- Tax or social security contributions plus a fine	2.428 (1.276)	1.494 (0.337)
- Prison	3.152 (2.641)	1.227 (0.680)
Tax morale	1.588*** (0.179)	1.169** (0.062)
Female	0.221*** (0.089)	1.112 (0.202)
Age	0.976* (0.013)	0.985* (0.007)
Occupation (RC: Unemployed)		
- Self-employed	0.842 (0.641)	2.215 (1.150)
- Employed	0.884 (0.434)	1.638 (0.467)
- Inactive (house persons, students, etc.)	0.373 (0.247)	0.963 (0.344)
- Retired	0.546 (0.381)	1.521 (0.559)
Financial problems (RC: Most of the time)		
- From time to time	0.233*** (0.106)	1.223 (0.307)
- Almost never/never	0.285** (0.127)	1.153 (0.286)
Urban area	0.184*** (0.075)	1.305 (0.268)
Region (RC: Northwest)		
- North Croatia	0.027*** (0.030)	0.921 (0.280)
- Slavonia	0.293* (0.159)	0.888 (0.263)
- Lika and Banovina	0.101* (0.107)	0.530 (0.244)
- Istra, Rijeka and Gorski Kotar	0.615 (0.365)	0.741 (0.226)
- Dalmatia	0.311* (0.169)	1.214 (0.332)
Cons	4.142 (4.989)	0.126**(0.083)
Number of observations	1,000	1,000
Number of imputations	50	50
Prob > F	0.000	0.003
Pseudo R2	0.327	0.051
Area under ROC	0.902	0.656

Significance: *p<0.05, **p<0.01, ***p<0.001, (standard errors in parentheses)
Notes: 1) Estimates based on multiple imputation technique with 50 imputations
2) Since tax morale is given on an inverse scale, positive coefficients indicate that lower tax morale entails higher likelihood to participate in the unregistered economy

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

propensity to purchase goods and services in the undeclared economy.

Given this significant association between tax morality and participation in undeclared work, Figure 1 explores the predicted probabilities of a 'representative' Croatian citizen of different ages participating in undeclared work according to their level of tax morality. Here, a 'representative' Croatian citizen is derived by taking the mean and modal values of the remaining independent variables. As such, the representative citizen is an unemployed woman who lives in an urban area of Slavonia, faces financial problems from time to time, perceives the risk of being detected as fairly small and expects to pay a financial fine

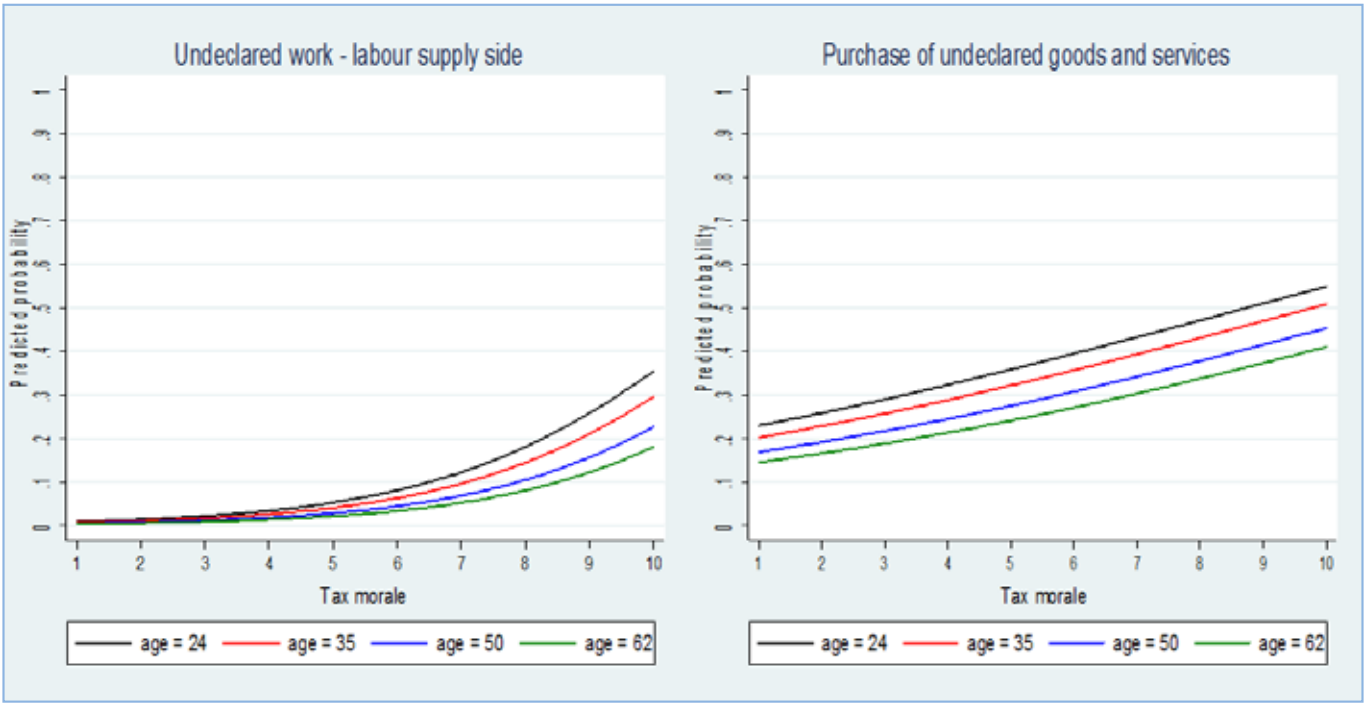
alongside the tax or social security contributions due when detected participating in the undeclared economy. For simplicity, we present the figures for four representative Croatian citizens aged 24, 25, 50 and 62.

As Figure 1 reveals, the finding is that the propensity of the representative Croatian citizen to supply undeclared work ranges from slightly above 0 per cent for those with the strongest tax morale to almost 40 per cent for those with the lowest tax morale. While there are no significant differences in the predicted probability of participation for those with high tax morale across age groups, significant discrepancies are noticeable across age groups as tax morale worsens. For instance, less than 20 per cent of representative citizens aged 62 who find participating in undeclared work absolutely acceptable are likely to work undeclared, but 30 per cent for those aged 35 and 37 per cent for those aged 24 years old. The important point nevertheless, and leaving aside the age differences, is that the predicted probability of participating in undeclared work for the representative Croatian citizen significantly rises as tax morality worsens.

This is also the case with purchasing undeclared goods and services. The predicted probability of a representative Croatian citizen purchasing goods and services in the undeclared economy ranges from around 20 per cent for those with the highest tax morale to around 50 per cent for those with the lowest tax morale. There is a relatively constant difference across age categories at all levels of tax morality. The predicted probability for the representative citizen aged 62 ranges from 15 per cent to 40 per cent depending on their level of tax morality, whilst it ranges from 23 per cent to 55 per cent for those aged 24, indicating the extent to which younger age groups display a greater propensity to purchase undeclared goods and services. The high share of citizens with even strong tax morale who purchase undeclared goods and services is not surprising however, given the prevalent culture of undeclared exchange in Croatian society (see Franic and Williams 2014; Rubić 2013).

Does the tax morale of a citizen have an influence on the propensity to participate in undeclared work however, even when a citizen feels heavily deterred by the level of punishments and risk of detection? To examine this, Figure 2 graphically represents the predicted probability of participation for an individual who perceives the risk of being detected as very high and expects imprisonment in the case of detection, and this individual has the characteristics of those most prone to engagement in undeclared work, namely they are a self-employed male living in the capital who regularly struggles to pay his bills.

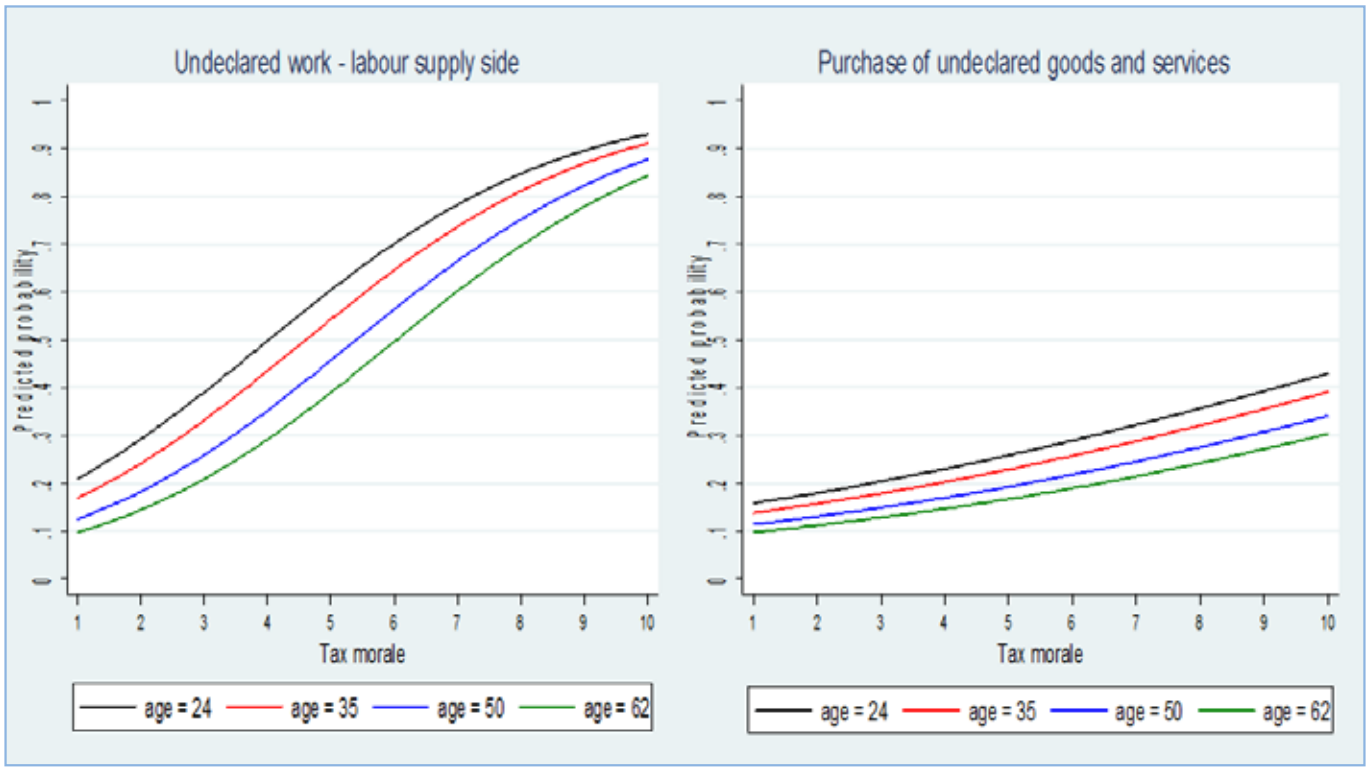
Figure 1 Predicted probability of participation in undeclared economy of a 'representative' Croatian citizen: by tax morality and age



Notes: 1) Tax morale is measured on the scale from 1 to 10, with value 1 indicating completely unacceptable and 10 absolutely acceptable. Therefore, higher levels mean lower tax morale.

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

Figure 2 Predicted probability of participation in undeclared work of a 'fearful' Croatian prone to undeclared work: by tax morality and age



Notes: 1) Tax morale is measured on the scale from 1 to 10, with value 1 indicating completely unacceptable and 10 absolutely acceptable. Therefore, higher levels mean lower tax morale.

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

As Figure 2 reveals, tax morale still plays a significant role in determining the probability of participation in undeclared work, even when examining the 'fearful' Croatian prone to undeclared work who believes that the risk of detection is very high and that prison will result if caught. Analysing the supply-side, this fearful citizen prone to undeclared work has around a 15 per cent probability of supplying undeclared work when they have the highest level of tax morality but around an 85 per cent probability when they hold the lowest level of tax morality. Tax morale therefore, still plays a significant role in determining the probability of participation. As before moreover, the predicted propensity for participation varies by age, with the probability of supplying undeclared work ranging from 84 per cent for those aged 62 years old to 92 per cent for those aged 24 years old with the lowest level of tax morality. On the demand-side, the predicted probabilities of this fearful citizen prone to undeclared work purchasing undeclared goods and services, although lower for the representative Croatian citizen, is again heavily influenced by their level of tax morality. Those with the highest level of tax morality have around a 12 per cent probability of purchasing undeclared goods and services compared with predicted probability of some 35 per cent for those with the lowest level of tax morality.

5. *DISCUSSION*

This paper has sought to evaluate the validity of both the dominant direct controls approach, which seeks to deter engagement in undeclared work by increasing the penalties and risk of detection, and the emergent indirect controls approach which seeks to encourage greater self-regulation and a culture of commitment to compliance. To do this, it has reported evidence from 1,000 face-to-face interviews conducted in Croatia during 2013. A logistic regression analysis reveals no significant association between participation in undeclared work and the perceived level of penalties and risk of detection, but a strong association between participation in undeclared work and the level of tax morality. The intimation is therefore that policy interventions which seek to increase the level of punishments and risk of detection will have little influence on participation but policy interventions which seek to improve tax morality may well reduce participation. In other words, indirect controls

that seek to engender commitment to compliance appear a potentially effective tool for reducing participation. Here, in consequence, we discuss the theoretical and policy implications of these findings.

Theoretically, this paper provides evidence to support the emergent explanation for undeclared work grounded in institutional theory which suggests that undeclared work can be explained as resulting from a violation of the social contract that exists between the state and its citizens (Webb et al. 2009; Williams, Franic and Dzhekova 2014; Williams and Horodnic 2015a,b). Undeclared work in other words, 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). The wider is the gap between state morality and civic morality (and thus the lower is the level of tax morality), the greater is the likelihood of participation in undeclared work. As such, this analysis provides a quantitative reinforcement for a burgeoning view that participation in undeclared work in Croatia is in large part due to the lack of alignment of civic morality with state morality (Čučković 2002; Rubić 2013; Šundalić 1999). Whether similar findings are identified in other South-East European countries now needs to be investigated, perhaps using the same Eurobarometer data-set.

Turning to the policy implications, the finding is that direct controls of higher penalties and the risk of detection have no significant influence on the decision to participate in undeclared work, but that the indirect control approach of engendering a commitment to compliance is strongly associated with participation. This suggests the need for a change in policy approach. The current focus upon increasing penalties and the risk of detection in order to tackle the undeclared economy needs to be replaced. Instead, what is required is a focus upon engendering a commitment to compliance by improving the tax morality of the population.

Firstly, this requires attention to be given to changing the norms, values and beliefs of the informal institutions in Croatia, so as to align them with the codified laws and regulations of the formal institutions. This necessitates the introduction of tax education so that citizens' understand what taxation is for and what government services are provided as a result of taxes collected. One way of doing this might be to provide a letter to all tax-payers which details where their taxes are spent and what services they receive in return. More directly, it could also include signs being put up in schools, doctor's surgeries and hospitals informing them that their taxes paid for these services. Table 3 reveals furthermore, that such tax education campaigns might well focus upon men, younger age groups, those who most of the time witness difficulties paying household bills, and those living in urban areas, especially in the capital and surrounding region, since these are the groups displaying a greater propensity to engage in undeclared work.

It is little use simply seeking to change informal institutions however, without also changing formal institutions. In South-East European countries such as Croatia, the norms and values of informal institutions will remain at odds with those of the formal institutions until the formal institutions change. Until now, the direct controls approach which uses penalties and detection has been a 'cops and robbers' approach which views citizens as criminals and is founded upon a low-trust, adversarial and low-commitment view of citizens. The shift towards an indirect controls approach however, necessitates the introduction of a 'customer service-orientated' approach founded upon a high trust high commitment view of citizens. To bring this to fruition, at least three changes are required in formal institutions so that citizens have greater trust and commitment in government.

Firstly, procedural justice must be improved, which means the authorities treating citizens in a respectful, impartial and responsible manner (Murphy, 2005). Secondly, procedural fairness must be improved which means citizens believing that they pay their fair share compared with others (Molero and Pujol, 2012) and third and finally, redistributive justice requires improvement which means citizens believing that they receive the goods and services they deserve based on the taxes they pay (Kirchgässner, 2010).

6. CONCLUSIONS

This paper displays the need for a new policy approach towards undeclared work in Croatia. It has revealed that there is no association between participation in undeclared work and the perceived level of penalties and risk of detection. However, there is a strong association between engagement in undeclared work and the level of tax morality, suggesting that efforts are required to engender a culture of commitment to compliance. Nevertheless, this paper has limitations. The major limitation is that although the quantitative analysis displays the importance of tax morality, it has not been able to identify the reasons for the low tax morality of the Croatian population. Future research is therefore required to identify these reasons. This will then enable an identification of the policy approaches required to engender commitment to compliance.

In sum, this paper has evaluated the use of direct

and indirect controls for tackling undeclared work. Whether similar findings are revealed in other South-East European countries now requires evaluation. If this paper inspires such evaluations, it will have achieved one of its intentions. However, if it also encourages South-East European governments to shift towards an indirect controls approach and to implement the policy measures required to do so, rather than persist with detection and punishment, then this paper will have achieved its broader intention.

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CONCEPTUAL MODEL OF RELATIONSHIPS AMONG CUSTOMER PERCEPTIONS OF COMPONENTS OF INSURANCE SERVICE

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Abstract

The objective of this study was to examine the conceptual model and to study the relationships between customer perceptions of the benefits of sales promotion, quality, adequacy of premium, and adequacy of information about the coverage of insurance services. The research model was tested with structural equation modeling (SEM) with a sample of 200 Slovenian users of insurance services. The results indicated that higher perceived benefits of sales promotion were associated with higher perceived quality of insurance services. In addition, higher perceived quality was associated with higher perceived adequacy of information about the coverage and the premium for insurance services. The study also found that higher perceived adequacy of premium was associated with higher perceived adequacy of information about the coverage of insurance services.

Keywords: *perceived sales promotion, perceived quality, perceived premium, perceived coverage, insurance company, insurance service*

JEL classification: *G22, M31*

1. INTRODUCTION

Insurance is of great importance to a modern society since it makes an important contribution to GDP and economy (Chen et al., 2011; Kramarić and Galetic, 2013), with the Slovenian insurance market having accounted for 5.6% of GDP in 2014 (SIA, 2014). The financial crisis did not have any significant negative impact on the insurance market, as compared with its impact on the banking market (Eling and Schmeiserb, 2010), but the decline in demand for insurance products was observed in international markets, which was also detected by Slovenian insurance companies. "Increasing illiquidity, numerous corporate bankruptcies and rising unemployment have led to lower demand for several years. Insurance is a service that consumers forgo relatively quickly" (SIA, 2014, 9), so it is necessary to continuously monitor the insurance market and to explore the behavior of the users of insurance services.

The high levels of the Slovenian market's openness for foreign insurance companies enable flexible insurance penetration. Many insurance companies strive for a competitive advantage, and this is particularly the case in the area of sales promotion, which is especially important to the users of insurance services due to the combination of financial turmoil and economic

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uncertainty at present. In this way, differentiated competitive relationships between insurers, whose objective is to promote sales and to maintain and increase their market share, are created in the market. With this aggressive and innovative approach, the insurance companies work to achieve the greatest benefit perceived by their customers in terms of sales promotion (price discounts, prize competitions, promotional materials, etc.).

Promotional activity has become increasingly common in the service industry (Tsao and Sheen, 2012) and has constituted an increasing proportion of promotional budgets (Laroche et al., 2001). Sales promotion has one of the strongest impacts on the short-term consumption behavior of customers (Laroche et al., 2003). Researchers of sales promotion put their main focus on individual tools (Kumar et al., 2004; Darke and Chung, 2005; Harmon and Hill, 2003) and tend to neglect the perception of sales promotion as a whole. This is because organizations do not consider and apply sales promotion tools in an integrated and comprehensive way. In studies of sales promotion, researchers often tend to restrict themselves to price discounts, which are perceived as negatively associated with the perception of the quality of brands and products (DelVecchio and Puligadda, 2012). Despite the widespread use of promotions in marketing practice and equivocal research findings, there has been no research on determining the nature of the relationship between sales promotion and quality of service. In the intense competition of insurance companies and related insurance service offers, many users expect benefits from insurance companies, which they connect to higher perceived quality of insurance services. In the field of health insurance it was established that the perceived quality of insurance service and coverage were important factors for users' decisions to change their health insurance company (Šebjan and Bastič, 2013).

Selecting an insurance company involves the provision of adequate insurance coverage and social/financial security by paying insurance premiums. Increasing numbers of demanding users expect a higher quality of insurance services when selecting insurance coverage and paying premiums. Because insurance coverage is complex, customers need adequate and detailed information (Eckardt and Rathke-Döppner, 2010). Walker and Baker (2000) came to the conclusion that one crucial element of insurance quality is insight into the customers' expectations because they are standards for the measurement of service performance. Therefore, high quality in the process of services delivery, including adequate and detailed information for customers in the process of purchasing insurance services, has become an indispensable factor for success and survival in today's competitive insurance environment (Kumar and Singh, 2010).

A fourth component included in this research (besides perceived quality of insurance service, benefits from sales promotion and adequacy of information regarding insurance coverage) was perceived adequacy of the premium (price) of the insurance service. Most researchers have focused on studying the impact of relative price and quality on customer value and willingness to buy (Beneke et al., 2013), and only a few have studied the impact of quality on price (Bezenić, 2006).

Incorporating all of these components, the objectives of the research were to analyze (1) the impact of perceived benefits of sales promotion on perceived quality of insurance services; (2) the impact of perceived quality of insurance services on perceived adequacy of insurance services premiums; (3) the impact of perceived quality of insurance services on perceived adequacy of information about the coverage of insurance services; and (4) the impact of perceived adequacy of insurance services premiums on perceived adequacy of information about the coverage of insurance services. Additionally, the measurement scales for multidimensional variables for perceived benefits of sales promotion and perceived adequacy of information about the coverage of insurance services were developed.

2. THEORETICAL BACKGROUND

The purpose of the conceptual model is to reveal relationships between the perceived benefits of sales promotion, perceived quality, perceived adequacy of premium and perceived adequacy of information about the coverage of insurance services (see Figure 1).

Sales promotions can offer many customer benefits, the most obvious being monetary savings, although customers may also be motivated by the desire for quality, convenience, value expression, exploration and entertainment (Babin et al., 1994; Hirschman and Holbrook, 1982). Sales promotions provide utilitarian benefits such as monetary savings, added value, convenience and increase of quality (Weng and de Run, 2013). This is because they help customers increase the acquisition utility of their purchase and enhance the efficiency of the shopping experience (Chandon et al., 2000). Quality benefits derived from customer value can be understood as promotions relaxing budgetary constraints so that customers can afford to upgrade to higher quality products, which are otherwise too expensive to buy (Jamal et al., 2012). Because researchers have different views about the relationship

between sales promotion tools and perceived quality, one can hypothesize that:

H1. The higher the perceived benefits of sales promotion of insurance services, the higher on average is the customer's perceived quality of insurance services.

Price is closely linked to the quality of service. If users receive the expected service compared to the money spent, they are content and feel loyal to the organization (Nusair et al., 2010; Ganguli and Roy, 2010). Price can significantly affect the perceived quality of the product/service (Zeithaml and Bitner, 2000; Chapman and Wahlers, 1999; Sanjeev and Kenneth, 2002). The perceived quality of the product/service can also have an effect on customer perceived price (Alhabeeb, 2002). Users often understand higher prices as higher quality and low prices as a result of low quality (Rao and Monroe, 1988). Since services are intangible, their price is a signal of their quality. Price becomes an important substitute for quality of service. Therefore, inexpensive services are perceived as poor in quality, while expensive services are considered as higher in quality (Verma, 2012). Benazić (2006) found that improvements in the service quality features that are subjectively evaluated as important should lead to the client's acceptance of a higher life insurance premium. Perception of the relationship between price and quality has a direct impact on perception of price and, consequently, satisfaction with price (Matzler et al., 2006). Insurance industry researchers often associate the insurance premium with the insurance coverage or insurance risk. An insurance premium is the total price of the coverage (Williams et al., 1998). Changes in insurance premium may also be reflected in changes of insurance coverage. For the customers to understand and perceive the insurance coverage appropriately, they expect quality performance from employees in terms of their physical appearance, professionalism and skill, clear explanation regarding the whole scope of insurance services, their ability to perform the promised insurance service correctly and accurately, their availability and promptness to help customers, transparent implementation and beneficial coverage from insurance services. Many of these characteristics are derived from the SERVQUAL service quality framework (Parasuraman et al., 1988), which has necessary components in the customer's perception of insurance coverage. Based on the theoretical principles, the following hypothesis is offered:

H2. The higher the perceived quality of insurance services, the higher on average is the customer's perceived adequacy of the premium of insurance service.

Perception of service quality is unders tood as a comparison between consumers' expectations and their perceptions of the services they actually receive (Grönroos, 1984; Parasuraman et al., 1985). Perceived service quality results from customers' comparison of the service they perceive that they have received against what they had expected to receive (Lovelock and Wright, 2002). The researchers focused on consumers' perceived quality of life insurance services (Siddiqui and Sharma, 2010), which was validated by a six-dimension instrument involving assurance, personalized financial planning, competence, corporate image, tangibles and technology. Sandhu and Bala (2011) developed a seven-factor construct of consumers' perceived quality of life insurance services representing proficiency: media and presentations, physical and ethical excellence, service delivery process and purpose, security and dynamic operations, credibility and functionality. Insurance service quality depends to a large extent on the information gathering and processing activities of the individual intermediaries, independent of the respective distribution channel (Eckardt and Räthke-Döppner, 2010). Gera (2011) discovered that agents selling insurance services must have in-depth knowledge and information about insurance services (besides other key attributes such as empathy, reliability and trust) that also have a significant effect on recommendation intentions. Therefore, it could be expected that customers' perception of insurance service quality are associated with a customer's satisfaction with the quality of information that he/she received in the purchasing process. Based on this discussion, we developed the followed hypotheses.

H3. The higher the perceived quality of insurance services, the higher on average is the customer's perceived adequacy of information about the coverage of insurance service.

The price of insurance coverage is denoted as the insurance premium. The premium is the money paid by the insured to the insurer for the insurance granted under a policy (Gulati, 2007). The premium is a payment made to the insurance company received from a customer in exchange for a promise to pay damages or the sum insured, the price at which the insurance company assumes the burden of risk (Flis, 1999). These premiums create a pool of money that the insurer invests to earn more money, which is used to compensate the insured for their losses (Crews, 2010). But the premium must not be equated with the price of insurance because the premium includes expected losses, which are distributed back to the insured

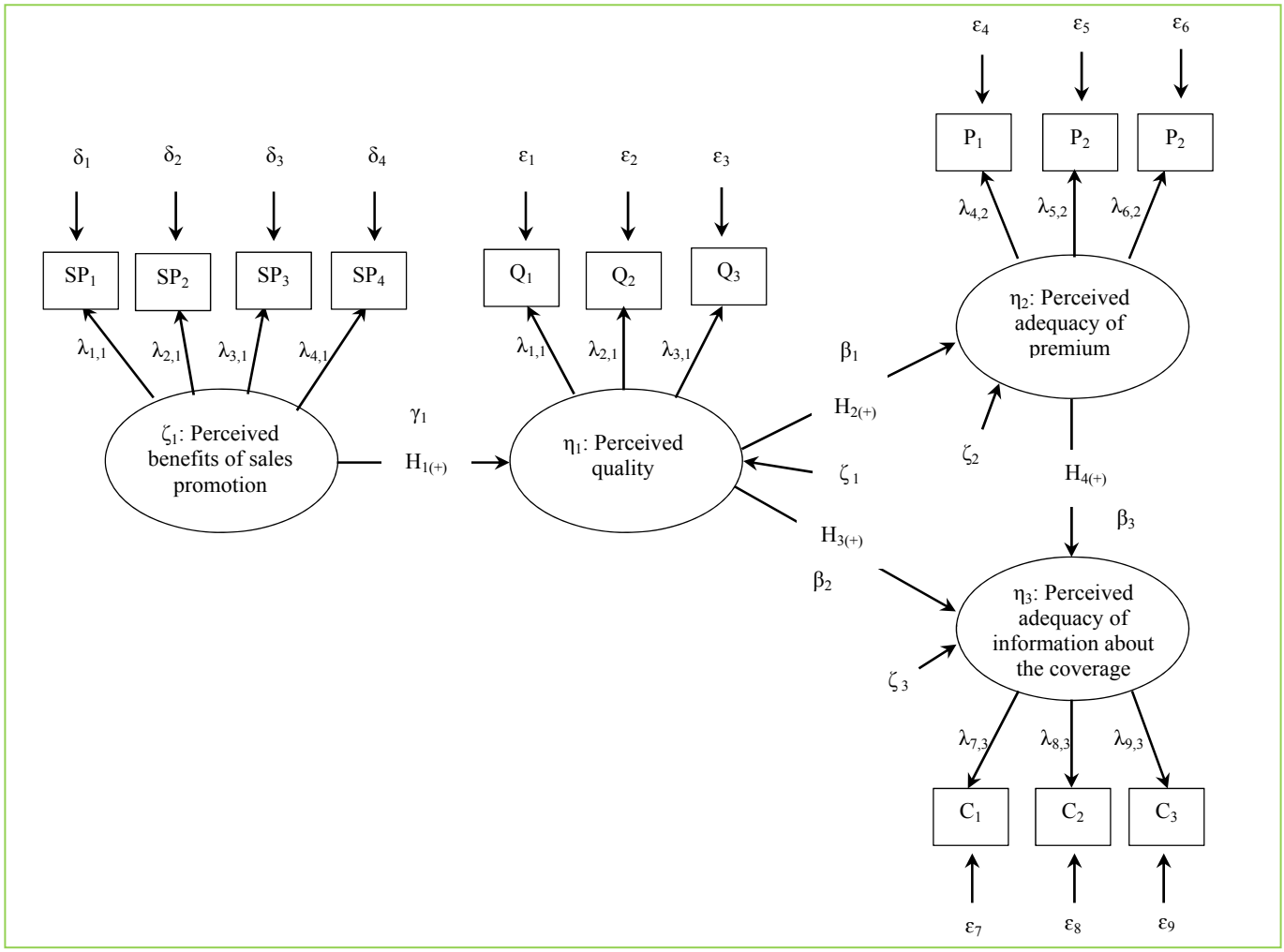
(Zweifel and Eisen, 2012). There are two differences between insurance pricing and the pricing function in other industries. First, the price for insurance is based on a prediction. Second, insurance rates are subject to government regulations (Vaughan and Vaughan, 2008). Researchers have found that insurance premium is important as the determinant of demand for private health insurance (Costa and Garcia, 2003; Šebjan and Bastič, 2013). The research on the evaluation of experts' opinions has indicated that when consumers are already inclined to purchase insurance services, the impact of the price and the quality of insurance services on the final decision making are unequal: consumers give a relatively higher importance to the insurance service price (Ulbinaite and Kucinskiene, 2013).

Insurance markets are characterized by incomplete and asymmetric information between insurance companies and consumers (Cummins and Doherty, 2006). Because insurance coverage is complex, consumers need information about their risks, insurance products and contract designs (Eckardt and Räthke-Döppner, 2010). Thus, we hypothesize:

H4. The higher the perceived adequacy of premium of insurance service, the higher on average is the customer's perceived adequacy of information about the coverage of insurance service.

The conceptual model which integrates the hypothesized relationships appears in Figure 1.

Figure 1: Conceptual model



Source: Author's illustrations

Notes: SP_1-SP_4: indicators of perceived benefits of sales promotion; Q_1-Q_3: indicators of perceived quality; P_1-P_3: indicators of perceived adequacy of premium; C_1-C_3: indicators of perceived adequacy of information about the coverage; ξ: exogenous variables; η: endogenous variables; δ: errors for indicators of exogenous variables; ε: errors for indicators of endogenous variables; ζ: errors in equations; λ: factor loading; γ: relationship between exogenous and endogenous latent variables; β: relationship between endogenous latent variables and corresponding subscripts; H_1-H_4: hypotheses.

3. METHODOLOGY

3.1 Survey instrument

The survey measurement instrument was developed in three steps. In the first step, the questionnaire used in this study was designed according to related literature, and users' and experts' opinions. In the second step, the questionnaire was pre-tested and revised to ensure content validity. The questionnaire was reviewed by ten employees in the management of one of the Slovenian insurance companies. In this way, the questionnaire was redefined and improved. In the third step, the questionnaire was tested on a sample of five users. The questionnaire was composed of two sections. The first section intended to gain insight on each respondent's basic personal data and usage of insurance services. The second section measured the respondent's perception of each construct in the research model. The questionnaire examined the perceived benefits of sales promotion of insurance services (4 items), perceived quality of insurance services (27 items), perceived adequacy of premium of insurance services (3 items) and perceived adequacy of information about the coverage of insurance services (3 items). Perceived quality of insurance services was measured using the modified questionnaire items of Chen et al. (2012), Yoo and Park (2007) and Harris and Goode (2004). To measure the perceived adequacy of premium of insurance services, the Walsh et al. (2013), Chi and Kilduff (2011) scales were used. Since there are no scales developed for measuring the perceived benefits of sales promotion and perceived adequacy of information about the coverage, the measurement scales were developed by the authors. The final questionnaire included 37 items. All items were assessed using a five-point Likert scale from 1 = "strongly disagree" to 5 = "strongly agree".

3.2 Data collection

The target population represented random users who were legally able to buy insurance services in Slovenia, aged 18 years and older. All returned online questionnaires were correctly completed. For hypothesis testing, data was collected based on a convenience non-random sample of 200 customers of insurance services from Slovenia. At the time of the implementation of this research, a total of 23 Slovenian and foreign insurance companies operated in Slovenia (SIA, 2009). In terms of demographics, 46 % were male (n = 92) and 54 % female (n = 108).

The largest group of respondents were from 36 to 45 years old (40%), followed by those who were from 26 to 35 years old (24%) and respondents who were from 46 to 55 years old (18%). The smallest group of respondents was 66 years and older (2%). The characteristics of the sample respondents are seen in Table 1.

Table 1. Sample characteristics

Characteristics	Frequency	Ratio (%)
Gender		
Male	92	45.9
Female	108	54.1
Education		
Grade school or below	15	7.6
Vocational school	48	24.2
Secondary school	80	40.1
College and over	57	28.0
Age		
18 to 25	18	8.9
26 to 35	48	24.2
36 to 45	80	40.1
46 to 55	37	18.5
56 to 65	13	6.4
66 and over	4	1.9
Monthly financial income		
Below 300 EUR	22	10.8
301 to 700 EUR	64	31.8
701 to 1.100 EUR	66	33.1
1.001 to 1400 EUR	41	20.4
1.401 EUR and over	7	3.8

Source: Authors' calculations

3.3 Methods of analysis

Statistical Package for the Social Sciences (SPSS) and Analysis of Moment Structures (AMOS) software were used to analyze the reliability and validity of the data and to conduct structural equation modeling (SEM). The analysis of the data set was based on exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Results within EFA were assessed based on the following rules: factor loadings of each item must exceed 0.5; and item-total correlation coefficients (CITC) for each item must exceed 0.5 to guarantee the reliability and validity of the questionnaire scale (Nunnally, 1978). EFA was also used to establish a scale dimensionality by checking the factorial structure of items (indicators). The Bartlett's Test of Sphericity (BTS) and the Kaiser-Meyer-Olkin statistics (KMO) were calculated. The independence of the factors and simpler factor

structure were obtained with the analysis of principal component analysis and the varimax method.

CFA was used to ascertain the efficiency of the measurement models, and SEM was used to test the conceptual framework and assumptions. To test the model, the following rules were applied. First, the goodness of fit index (GFI), normed fit index (NFI), comparative fit index (CFI) and Tucker-Lewis index (TLI) should exceed 0.9 (Jöreskog and Sörbom, 2002; Bentler, 1990; Schumacker and Lomax, 2004). Second, the root mean residual (RMR) and the root mean square error of approximation (RMSEA) should be less than 0.05 (Jöreskog and Sörbom, 2002; Bentler, 1990) or the limit value should be less than 0.08 (Byrne, 2001). Finally, the ratio of chi-square values to freedom degrees (2/df) should be less than 3.0 (Hoxmeier et al., 2000).

The scale reliability was assessed by item reliability measured by the individual reliability coefficient R^2. R^2 values above 0.5 provide evidence of acceptable reliability (Bollen, 1989). Measure reliabilities were assessed by calculating Cronbach's alpha (Cronbach, 1951) and item total correlation analysis. The majority of measures employed in this study exhibited reliability scores over 0.7, which is above the acceptable level (Nunnally, 1978; de Vaus, 1995). Scale validity was analyzed by focusing on convergent validity, discriminant validity and nomological validity. Convergent validity is the extent to which the individual items of a construct share variance between them and was assessed in two ways (Hair et al., 2010). It was tested by checking the values of composite reliability coefficients (CR) and average variance extracted (AVE). CR should be greater than 0.7, and AVE should be greater than 0.5 (Hair et al., 2010). Discriminant validity, which examines whether the constructs are uni-dimensional, was assessed by comparing the maximum shared variance (MSV) and average shared variance (ASV). Both should be less than the average variance extracted (AVE) to establish the discriminant validity (Hair et al., 2010). Nomological validity is established when the correlations between the construct in question and theoretically related constructs are significantly greater than zero (Campbell, 1960).

4. RESULTS

4.1 Validity and reliability analysis

In the first step, exploratory factor analysis (EFA) was employed. The CITC analyses were performed for the scale of 37 items. All cut-off values of 37 items were higher than 0.5. EFA showed that tree constructs were one-dimensional and one construct was three-dimensional (perceived quality of insurance service). The principle axing factoring extraction method was applied with varimax rotation (Anderson and Gerbing, 1988). Following the recommendation of Hair et al. (2010), all items had standardized factor loadings higher than 0.5. The Kaiser-Meyer-Olkin (KMO) value was 0.944, which was more than the recommended value of 0.5 for sample adequacy. Bartlett's test of sphericity (BTS = 5327.684) was also significant ($p < 0.001$). Factors with Eigenvalues greater than 1 and factor loading greater than 0.50 were retained for further analysis. A four-factor solution (perceived sales promotion, perceived premium, perceived quality and perceived coverage of insurance service) with 37 items was chosen.

In the next step, the scale's psychometric properties were evaluated using confirmatory factor analysis (CFA). Four factors were created and used as latent variables. Convergent validity was assessed by examining the loadings and their statistical significance through *t*-values (Dunn et al., 1994). Item factor loadings were very high, ranging from 0.719 to 0.922; all were significant at the 0.001 level. The R^2 values were used to estimate the reliability of particular observed items. An examination of their values reveals that all items did meet the 0.5 criterion. The items of the final scales with their loadings, item-total correlations, percentages of explained variance, item reliability, means and standard deviations are presented in Table 2. The "perceived benefits of sales promotion of insurance services" factor explained 59.7 % of total variance; "perceived adequacy of premium of insurance services" explained 10.2 %; "perceived adequacy of information about the coverage of insurance service" explained 6.1 %; and "perceived quality of insurance service" explained 5.3 %. These four factors accounted for 81.2 % of the total variance.

Construct reliability means that a set of construct items is consistent in its measurement. For the constructs, the composite reliability (CR) and the average variance extracted (AVE) were computed. Table 3 shows the construct reliability for all four constructs: perceived benefits from sales promotion of insurance services ($\rho_c^{CR} = 0.916$, $\rho_c^{AVE} = 0.732$); perceived quality of insurance company ($\rho_c^{CR} = 0.900$, $\rho_c^{AVE} = 0.750$); perceived adequacy of premium of insurance services ($\rho_c^{CR} = 0.874$, $\rho_c^{AVE} = 0.698$); and perceived adequacy of information about the coverage of insurance service ($\rho_c^{CR} = 0.840$, $\rho_c^{AVE} = 0.637$). The CR and AVE for all four constructs surpassed the threshold values of 0.7 and 0.5, respectively (Hair et al., 1998). The internal

Table 2. Factors and items, factors loading, variance explained, item reliabiliwwty, mean and standard deviation

Constructs	Items	Item-total correlation	Factors loading[a]	Variance explained	R^2 (item reliability)	Mean[b]	Standard deviation
Perceived benefits of sales promotion of insurance services	SP1 – The insurance company always delivers me promotional material when buying the insurance policy.	0.809	0.827	59.731	0.685	3.31	1.254
	SP2 – Additional promotion benefits are beneficial and useful.	0.776	0.802		0.643	3.54	0.957
	SP3 – The insurance company offers different educational events and presentations.	0.819	0.881		0.775	3.23	1.176
	SP4 – The insurance company offers participation in sweepstakes and other prize games.	0.829	0.890		0.792	3.11	1.207
Perceived adequacy of premium of insurance services	P1 – The insurance coverage is clearly evident from the premium paid.	0.796	0.865	10.169	0.749	3.64	0.817
	P2 – Insurance company offers different ways of payment.	0.742	0.818		0.669	3.73	0.812
	P3 – Premium of insurance service is justified by the service provided.	0.716	0.822		0.675	3.62	0.996
Perceived adequacy of information about coverage of insurance services	C1 – The insurance coverage is clearly and exactly evident from the insurance policy.	0.714	0.719	6.056	0.517	3.75	0.933
	C2 – The insurance company provides me with detailed information about the insurance coverage.	0.782	0.797		0.635	3.69	0.965
	C3 – The insurance company has made available a lot of adequate coverage that meet my needs.	0.713	0.871		0.759	3.64	0.914
Perceived quality of insurance services[c]	Q1 – Quality of offer	0.829	0.922	5.265	0.850	3.86	0.737
	Q2 – Quality of employees	0.836	0.896		0.802	3.76	0.760
	Q3 – Quality of implementation services	0.736	0.760		0.577	3.95	0.669

Source: Authors' calculations

Notes: [a] All factors loadings are significant at 0.001 level, [b] Measured on a five-point scale, ranging from 1 = strongly disagree to 5= strongly agree, [c] Composite indicator.

consistency of the items in relation to the single trait within the instrumental was tested using Cronbach's α, ranging from 0.861 to 0.913.

All values were above the generally agreed-upon lower limit of 0.7, indicating high internal consistency among the variables within each factor (Nunnally, 1978). The convergent validity of the measurement model was completely confirmed. Following Fornell and Locker's (1981) approach for evaluating discriminant validity, the average variance extracted (AVE) and squared correlation for every possible pair of factors were compared. The discriminant validity of the measurement model was partially confirmed. Two values of maximum shared variance (MSV) are less than AVE (perceived benefits of sales promotion and perceived quality of insurance services). All values of average shared variance (ASV) are less than AVE (see Table 3). The results indicate that the model partially

Table 3. Convergent and discriminant validity of measurement models

Construct	Cronbach's α	CR [a]	AVE [b]	MSV [c]	ASV [d]	Results of convergent validity CR > AVE AVE > 0.5	Results of discriminant validity MSV < AVE ASV < AVE
Perceived benefits of sales promotion of insurance company	0.913	0.916	0.732	0.531	0.474	yes	yes
Perceived quality of insurance company	0.897	0.900	0.750	0.686	0.611	yes	yes
Perceived adequacy of premium of insurance service	0.865	0.874	0.698	0.712	0.573	yes	partially
Perceived adequacy of information about the coverage of insurance service	0.861	0.840	0.637	0.712	0.632	yes	partially

Source: Authors' calculations

Notes: [a] CR refers to the composite reliability ($\rho_c=(\Sigma\lambda_i)^2var(\xi)/[(\Sigma\lambda_i)^2var(\xi)+\Sigma\theta_{ii}]$; (Bagozzi and Yi, 1998)), [b] AVE refers to the average variance extracted ($\rho_c=(\Sigma\lambda_i^2var(\xi))/[\Sigma\lambda_i^2var(\xi)+\Sigma\theta_{ii}]$; (Fornell and Larcker, 1981)), [c] MSV refers to the maximum shared variance, [d] ASV refers to the average shared variance.

supported discriminant validity (AVE > ASV and AVE > MSV). The inter-construct correlations are all positive and significant. The values are as expected relative to direction and size, and they make sense from a theoretical point of view. The results indicate that the model has complete nomological validity.

4.2 Competing model analysis

This study utilized three types of overall model fit measures: absolute, incremental and parsimonious. In the first step, the index of fit was evaluated for the one-factor model and the tree-factor model of perceived quality insurance services. The construct of perceived quality of insurance services was measured with a large number of variables. With the help of the CFA method, a three-factor model of perceived quality insurance services was developed. The one factor model and the free-factor model of perceived quality insurance services were compared to check which model was more consistent with the data. The $\chi^2(17) = 32.461$ of the measurement model was significant ($p < 0.05$). The Root Mean Square Error of Approximation (RMSEA) and the Root Mean Square Residual (RMR) values were 0.076 and 0.020, indicating a good model fit. The goodness-of-fit index (GFI) and the normed Fit Index (NFI), which were equal to 0.952 and 0.966, were above the threshold value of 0.9. The Relative Fit Index (RFI) reached a value of 0.943 and the Incremental Fit Index (IFI = 0.983). Both indices were above the threshold value of 0.9. The other fit indices achieved the recommended value of 0.9 (the Comparative Fit Index CFI = 0.983 and the Tucker-Lewis Index TLI = 0.972). A significant chi-square value (χ^2/df = 1.909) indicated that the model did not fit the data perfectly. The results indicated that the three-factor model of perceived quality insurance services was much more valid than the one-factor model (see Table 4).

Table 4. Summary statistics for one-factor and multi-factor models for perceived quality of insurance services

Construct	One-factor model	Multi-factor model
Perceived quality of insurance services	1 factor $\chi^2(20) = 53.446$ χ^2/df = 2.672 $p = 0.000$ RMSEA = 0.104 RMR = 0.029 GFI = 0.921 TLI = 0.949 CFI = 0.963 NFI = 0.943 RFI = 0.921 IFI = 0.964	3 factors* $\chi^2(17) = 32.461$ χ^2/df = 1.909 $p = 0.013$ RMSEA = 0.076 RMR = 0.020 GFI = 0.952 TLI = 0.972 CFI = 0.983 NFI = 0.966 RFI = 0.943 IFI = 0.983

Source: Authors' calculations

Notes: *Multifactorial model: quality of offer, quality of employees and quality of implementation services.

In the second step, the fit indices were evaluated for the one-factor and four-factor models of complete conceptual model. The one-factor model and four-factor models of the complete conceptual model were compared to evaluate the consistency of each of the models with the data. The four-factor model was developed with the CFA method. The results of the index of fit indicated that the four-factor model was much more valid than the one-factor model (see Table 5). The $\chi^2(58) = 101.579$ ($p = 0.000$) of the measurement models was significant ($p < 0.001$). The goodness-of-fit index (GFI) and the Normed Fit Index (NFI), which were equal to 0.912 and 0.939, were above the threshold value of 0.9. The Relative Fit Index (RFI) and the Incremental Fit Index (IFI) were assessed, with values of 0.918 and 0.973. Both indices were above the threshold value of 0.9. The Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI) were also assessed, with values of 0.972 and 0.963, respectively, both above the recommended level of 0.9, indicating support for the proposed model. The RMSEA, the RMR and the normed χ^2 were calculated to test parsimonious fit. The RMSEA and RMR values were 0.069 and 0.035, indicating a good model fit. Moreover, the normed χ^2 (χ^2/df = 1.751) fell between 1 and 2, further indicating a parsimonious fit. Hence, the suggested factorial structure fit properly.

Table 5. Summary statistics for one-factor and multi-factor of conceptual models

One-factor model	Multi-factor Model
1 factor	4 factors*
$\chi^2(64) = 373.363$	$\chi^2(58) = 101.579$
χ^2/df = 5.834	χ^2/df = 1.751
$p = 0.000$	$p = 0.000$
RMSEA = 0.176	RMSEA = 0.069
RMR = 0.088	RMR = 0.035
GFI = 0.804	GFI = 0.912
TLI = 0.762	TLI = 0.963
CFI = 0.804	CFI = 0.972
NFI = 0.775	NFI = 0.939
RFI = 0.726	RFI = 0.918
IFI = 0.806	IFI = 0.973

Source: Authors' calculations

Notes: *Multifactorial model: perceived quality, perceived benefits of sales promotion, perceived adequacy of premium and perceived adequacy of information about the coverage.

4.3 Hypothesis testing

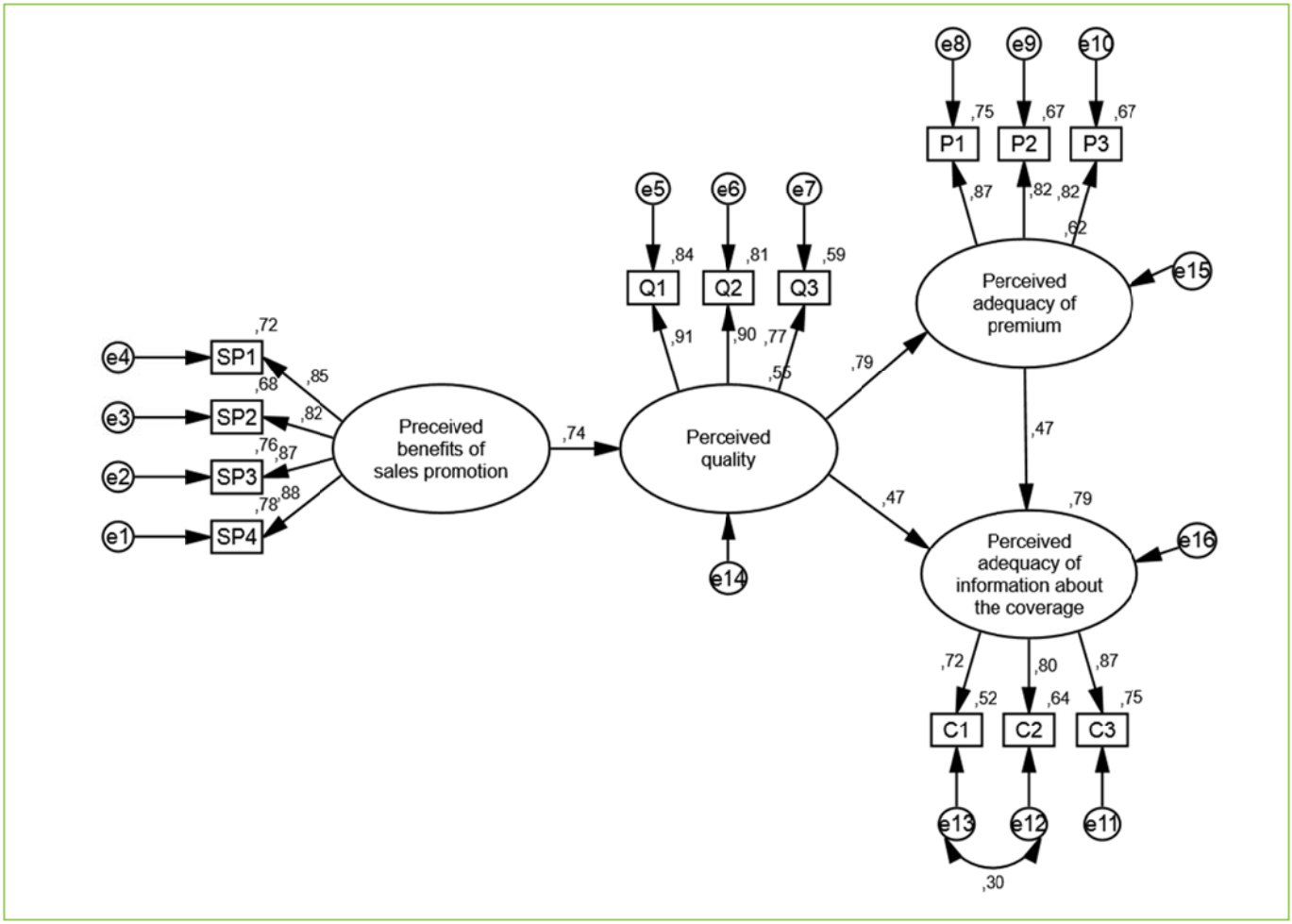
The conceptual model was examined with structural equation modeling. The overall fit measures of the full model in the SEM indicated that the fit of the model was acceptable. The indices of fit for the first development conceptual model were: $\chi^2(61) = 115.000$ ($p = 0.000$), GFI = 0.901, CFI = 0.966, TLI = 0.956, RFI = 0.911, IFI = 0.966, NFI = 0.931, RMR = 0.042, RMSEA = 0.075, χ^2/df = 1.885. Then an improved final conceptual model was developed that allowed statistically significant correlation between errors for indicators of one construct: perceived adequacy of information about the coverage of insurance services (between C1- the insurance coverage was clearly and exactly evident from the insurance policy; and C2- the insurance company provided detailed information about the insurance coverage.). The fit indices for the improved final conceptual model were: $\chi^2(60) = 106.392$ ($p = 0.000$), GFI = 0.909, CFI = 0.971, TLI = 0.962, RFI = 0.917, IFI = 0.971, NFI = 0.936, RMR = 0.042, RMSEA = 0.070, χ^2/df = 1.773. The improved final conceptual model is presented in Figure 2.

As predicted by H_1, the perceived benefits of sales promotion was a significant and positive predictor of perceived quality of insurance services ($\gamma_1 = 0.745$; t = 10.093; $p < 0.001$). Perceived benefits of sales promotion had a positive and strong influence on perceived quality of insurance services.

Hypothesis H_2 predicted that perceived quality of insurance services was positively related to perceived adequacy of premium of insurance services. The results show that the perceived quality of insurance services was indeed significantly positive and strongly related to perceived adequacy of the premium ($\beta_1 = 0.790$; t = 10.599; $p < 0.001$) of insurance services. The findings supported hypothesis H_2. As hypothesis H_3 predicted, perceived quality of insurance services is significantly related to perceived adequacy of information about the coverage of insurance services. Perceived quality of insurance services had a positive and significant influence on perceived adequacy of information about the coverage of insurance services ($\beta_2 = 0.469$; t = 4.217; $p < 0.001$).

The findings therefore supported hypothesis H_3. The findings of the model testing also supported H_4 ($\beta_3 = 0.473$; t = 3.943; $p < 0.001$) and therefore confirmed that perceived adequacy of premium of insurance services had a positive and significant influence on perceived adequacy of information about the coverage of insurance services. Therefore, H_1, H_2, H_3 and H_4 were all supported in this study. Table 6 shows the results of the structural model in this study.

Figure 2. Improved final conceptual model



Source: Author's illustrations

Notes: Q_1-Q_3: indicators of perceived quality; P_1-P_3: indicators of perceived adequacy of premium; C_1-C_3: indicators of perceived adequacy of information about the coverage. Fit indices: $\chi^2(60) = 106.392$ (p = 0.000), GFI = 0.909, CFI = 0.971, TLI = 0.962, RFI = 0.917, IFI = 0.971, NFI = 0.936, RMR = 0.042, RMSEA = 0.070, $\chi^2/df = 1.773$.

Table 6. Estimated effects within the causal model

Structural relationship	Standardized regression coefficient	Standard error	t-value	Significance	Results
H1: Perceived benefits of sales promotion → perceived quality of insurance services	$\gamma_1 = 0.745$	0.047	10.093	$p < 0.001$	H1 is supported
H2: Perceived quality of insurance services → perceived adequacy of premium of insurance service	$\beta_1 = 0.790$	0.078	10.599	$p < 0.001$	H2 is supported
H3: Perceived quality of insurance services → perceived adequacy of information about the coverage of insurance service	$\beta_2 = 0.469$	0.131	4.217	$p < 0.001$	H3 is supported
H4: Perceived adequacy of premium of insurance service → perceived adequacy of information about the coverage of insurance service	$\beta_3 = 0.473$	0.135	3.943	$p < 0.001$	H4 is supported

Source: Authors' calculations

5. CONCLUSION

To sum up, the results of this study show that there is a connection between components of insurance services (perceived benefits of sales promotion, perceived quality, perceived adequacy of premium and perceived adequacy of information about the insurance coverage) and that the perception of one component is reflected in the perception of other components. The results of this research also show that the perception of the components of sales promotion by Slovenian customers is relatively low. From this, one can conclude that there is an increase in customer expectations, and that insurance companies do not invest enough in creating innovative approaches to promote sales with perceived benefits. It is important to see insurance services as a whole. For that reason, these research results should provide incentives for managers of insurance companies to consider investing their efforts and resources into the development of specific components of insurance services.

Generalization from the study results requires caution, as this study was limited to customers of insurance services in Slovenia. The study was also limited in regard to the items measuring the perceived components of insurance service (i.e. perceived benefits of sales promotion, perceived quality, perceived adequacy of the premium and perceived adequacy of information about the insurance coverage). The final limitation relates to the development of the conceptual model with components of insurance service and the relationship between them. Future research could include: (1) other components of insurance services (e.g. perceived innovation, perceived social responsibility and perceived image); (2) the difference between the conceptual models according to customers from different countries (e.g. Slovenes, Croats Austrians); (3) development of fair components of insurance and design of the conceptual model; (4) the difference between the conceptual models according to customers' demographic characteristics (e.g. education, gender, income and status); (5) the difference between the conceptual models according to customers' domestic and foreign insurance companies; (6) the difference between the conceptual models according to the scope of insurance coverage; and (7) the difference between the conceptual models according to the type of insurance (e.g. life, non-life, health and accident insurance services).

In the Slovenian insurance industry, an increase in competition was identified, especially with the emergence of new foreign insurance companies. Time based competition, quality, product range and service created a more competitive environment, but the decisive test is how competitive advantages are used by the companies to differentiate themselves (Gayathri et al., 2006). Insurance companies are actively developing components of insurance services to satisfy customer expectations. Furthermore, the developing components are most likely to create a competitive advantage for a company in insurance markets. If insurance companies are acquainted with the role of the components of insurance services, they can more easily develop insurance services. Development of insurance services components tends to be perceived as very high if the insurance staff perceives the role of components of insurance services as customers. It is important that insurance staff understand how the components of insurance services are related. For that purpose, the management of insurance companies should provide enough information for their employees (through seminars, trainings, simulations, etc.) about the implementation of different tools that contribute to higher customer perceptions of the benefits of sales promotion and other components of insurance service. It is not enough just to know about the characteristics of components of insurance services; it is also important to use such knowledge about them. How the insurance company integrates and represents these components to (prospective) customers is also important. Not only do customers prefer a large number of discounts and advantages, but they also seek discounts and advantages that are tailored for them.

Insurance companies should invest more energy in raising awareness of customers' preventive insurance and spreading information about insurance services in the form of events, brochures, websites with useful advice, and via mobile applications. Insurance companies should invest more in activities, in sustaining development of the relationship with customers in the form of personal visits by salespeople and in organizing different events and maintaining contact with their customers by email. The expectations of Slovenian customers are rather high, so an insurance company focusing on components of insurance services will definitely help increase perceived value from its customers.

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THE EFFECT OF CORPORATE CITIZENSHIP ACTIVITIES (CCAS) ON FINANCIAL PERFORMANCE AND MARKET PERFORMANCE: THE OMANI EXPERIENCE

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Abstract

The main objective of this study is to investigate and analyze the effects of corporate citizenship activities on the financial performance and market performance of Omani manufacturing companies in the Sultanate of Oman for the period 2009-2013. The Financial performance of companies is measured by two independent variables: return on assets (ROA) and return on equity (ROE). Market performance is measured by the fair market value of shares (FMV). CCAs are determined by the voluntary disclosures of corporate citizenship activities by the companies. The study concludes that there is a positive impact by CCAs on the financial and market performance of the Omani companies that leads to profit maximization.

Keywords: *corporate citizenship activities, financial performance, fair market value of shares, return on assets and return on equity.*

JEL classification: *G32, L25, L1, M14*

1. INTRODUCTION

Corporations around the globe are expected to meet the ever-growing expectation of contributing to the welfare of society as 'citizens". This expectation has grown as the world has become globalized and multinational companies are increasingly called upon to play the role of "global citizens'. Each corporation must share its economic gains with society and should focus not only on its shareholders but all stakeholders (Thomas and Preston 1995). A firm therefore must focus on not only increasing its economic gains but also being a good corporate citizen.

The term corporate citizenship is defined as the gamut of activities that develop the business – society relationship in such a manner that "business sees itself as part of public culture" (Birch, 2001). This concept represents an extension of other similar concepts such as social responsibility, corporate social performance and stakeholder theory, all of which depict the relationship between companies and their communities. By 1990 a debate began over the relative importance of the normative responsibilities which

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corporations are expected to render to society versus the 'desired activities' (Matten et al., 2003) which firms are expected to perform.

Many previous studies have examined the impact of corporate social responsibility (CSR) and corporate social performance on the financial performance and market performance of firms. Most of these studies have yielded mixed results. Some studies indicated a positive impact, others a negative impact and several studies failed to find any correlation. Few studies had examined the effects of corporate social responsibility or corporate citizenship on financial performance and market performance in the Middle East, particularly in the sultanate of Oman.

In this study an attempt has been made to investigate and analyze the effects of corporate citizenship activities (CCAs) on the financial and market performance of Omani Companies in three distinguished industrial sectors in Oman for the period 2009-2013. The study aims to get at the answer to the question: What are the effects of CCAs on the financial and market performance of Omani industrial firms?

CCAs are measured through the voluntary disclosure of social activities inside and outside Oman by Omani companies, financial performance is measured by the two common variables of return on assets (ROA) and return on equity (ROE), while market performance is measured by the fair market value of shares (FMV). Accordingly, the study develops two key hypotheses: CCAs have effects on the financial performance and market performance of companies.

The study is divided into five sections. In the first section, the study presents an introduction. Theoretical issues related to the concepts of corporate citizenship are presented in the second section. A literature review is discussed in the third section. The forth section presents the model, data and methodology used in this study. Section five provides the results of the analysis, while section six presents a summary and conclusions**.**

2. THE CONCEPT OF CORPORATE CITIZENSHIP

The concept of social responsibility has a long history in business. This history reflects the development of the concepts and practices of social responsibility, and dates back to the 1950s, when Corporate Social Responsibility (CSR) was introduced with the publication of Bowen's book *The Social Responsibilities of Businessmen*. CSR is a subset of corporate responsibilities that deals with a company's voluntary/ discretionary relationships with its community.

In the 1970s, a second concept, Corporate Social Performance, was introduced in the literature. This concept focuses on the principles of social responsibility at the legitimacy, organizational and individual levels, and the processes of responsiveness (Valor 2005).

In the 1980s, a third concept, that of the Stakeholder, became dominant. Matten et al., (2003) explain that the stakeholder theory essentially argues that a company's relationships with stakeholders are at the core of understanding how it operates and adds value as a business.

In the late 1990s, practitioners introduced a new concept: corporate citizenship. This new concept is used to "connect business activity to broader social accountability and service for mutual benefit," enhancing the notion that a corporation is an entity with a status equivalent to that of a citizen (Valor 2005).

Wood (1991) defines the concept as the sum of socioeconomic activities that companies often undertake to fulfill their perceived duties as members of society.

Waddock and Graves (1997) define corporate citizenship as the strategies and practices that develop in to an operationalizing method. It has relationships with and impacts on stakeholders and the natural environment.

The World Economic Forum (2003) describes corporate citizenship as the group of policies and practices of a company in terms of their impacts on economic, environmental, and social parameters.

Corporate citizenship refers to businesses acting responsibly toward their stakeholders (Yasser 2011).

Matten et al. (2003) argue that a company enter the arena of citizenship at the point of government failure in the protection of citizenship.

According to the Center of International Private Enterprise, the concept looks beyond profits realized in the short term and takes into account the needs of various stakeholders, involves a high level of ethical standards, and creates a good environment for trade and investment. (Sullivan et al., 2004)

Pang (2010) pointed out that corporate citizenship is an advanced model of corporate social responsibility.

There are many other concepts related to social responsibility, such as strategic corporate social responsibility, strategic philanthropy, sustainability, corporate accountability, corporate moral agency and social entrepreneurship. The concept of social responsibility is regarded as a historical development of the social responsibility of corporations. This development reflects the relationship between corporations and community. Therefore, there are many differences between the abovementioned concepts and corporate

citizenship. The most important differences are that CCA is more operational and comprehensive than other concepts. In this study, we focused on corporate citizenship as a modern concept in the area of social responsibility. We used corporate citizenship activities (CCAs) because there are great debates about the concept itself and it is still at a primary stage.

It should be noted that CCAs are not just activities carried out by companies from time to time for the benefit of society, but they are a variety of planned and comprehensive programs which reinforce the view that the corporation is a also a societal person who must carry out day to day activities to strengthen its relationship with society, such as pro bono activities, corporate volunteerism, charitable contributions, support for community education and health care initiatives, as well as environmental programs (Gardberg and Fombrun 2006).

In order to understand the philosophy and nature of the citizenship of a company, the Panasonic Company's CCA philosophy statement is a good example: "Panasonic is promoting corporate citizenship activities (social contribution activities) and working to solve social issues around the world, based on the philosophy of education and coexistence while focusing on two key areas: the environment and the next generation. This philosophy shows the role of Panasonic in the community: "The Company believes that business activities and corporate citizenship activities should be balanced like the wheels of a car, and they are working to promote both types of activities simultaneously in a manner that suits the times."

Therefore, Panasonic translated these ideas into activities on the ground where the Company exercises such activities in different countries of the world, such as in Russia, Tanzania, Romania, and Austria in addition to Japan (http://panasonic.net/citizenship).

In the sultanate of Oman there are many manufacturing companies who undertake corporate citizenship activities, such as the Raysut Cement Company, one of the biggest industrial companies in Oman, and which also has a section dedicated to corporate citizenship, showing the details of the company's CCA practices.

The company states in its sustainable development section: "…we are committed to the proactive integration of HSE (Health Safety Environment) objectives into our management system at all levels, actively reinforced by reward programs that recognize outstanding HSE performance demonstrated by our employees and contractors."

This section on sustainable development contains many subsections that serve as voluntary disclosure of CCAs, such as information of environment, health and safety, accountability, and management commitments (http://www.raysutcement.com.om/susdevelopment.html).

Despite the ambiguity of the concept, some key features of the term are conclusive:

a) The concept of corporate citizenship overcomes the difficulties of operationalization and implementation as in other concepts such as corporate social responsibility.
b) The concept is a re-conceptualization of business–society relations.
c) The concept emphasizes the idea that corporations have the rights and duties of a person (Valor 2005).
d) The concept combines ethical, social, environmental and economic issues.
e) The concept meets the needs of stakeholders rather than stockholders.
f) The concept includes strategies, policies and practices to connect business and community.
g) The citizenship concept is not a distribution of profit to stakeholders, but investment in the society.
h) The concept embodies a communitarian approach.

3. *LITERATURE REVIEW*

Academic studies on the concept of Corporate Citizenship and its impact on financial and market performance are still at an early stage, and few studies have been carried out in this area.

Meijer and Schuyt (2005) analyzed the behavior of Dutch consumers towards corporate social performance. They found that the corporate social performance of producers does not encourage consumers to buy a product.

Gardberg and Fombrun (2006) examined the relationship between citizenship programs implemented by multinational companies and intangible assets. They supposed that these programs "can create intangible assets that help companies overcome nationalistic barriers, facilitate globalization, and outcompete local rivals". Their study concluded that corporate citizenship provides an appropriate application of strategic balance theory between legitimating and differentiation.

Fiori et al., (2007) examined the impact of voluntary disclosure about CSR on the stock prices of Italian listed companies over the period of 2002-2007. The results indicated that disclosure about some CSR activities leads to higher stock prices because of the prevalence of a good perception on the market.

Makni et al., (2009) examined the relationship between corporate social and financial performance in Canadian firms. They found no relationship between their corporate social responsibility and financial performance, though they did identify a negative relationship between environmental factors and financial performance.

Blazovich and Smith (2009) explored the relationship of ethical corporate citizenship to financial performance (greater profitability and efficiency, and lower cost of capital) and market-value premiums. They used firms listed by Business Ethics as "The 100 Best Corporate Citizens" as a sample of ethical firms. The results of the study show a significant relationship between ethical corporate behavior and financial performance, but no relationship between being recognized as ethical at least once and the market value of equity. They concluded that ethical corporate citizenship does indeed benefit a firm.

El Ghoula et al. (2011) tested the relationship between corporate social responsibility and cost of capital for a large sample of U.S. firms. They found that CSR companies have cheaper equity financing, and that this reduces the cost of capital.

Hamid et al., (2011) tested the relationship between corporate social responsibility and financial leverage measured by debt equity ratio and found that financial leverage (the debt to equity ratio) has a significant correlation of 0.10 at a 0.05 level of significance.

Setiawan and Janet (2011) argued that there is a relationship between corporate social responsibility, financial performance, and market performance. They used a sample of consumer goods companies in the Indonesian Stock Exchange during 2007-2010. They concluded that corporate social responsibility increased financial performance (ROA), but had no significant effect on market performance.

Uadiale and Fagbemi (2012) investigate the impact of CSR activities on Return on Equity (ROE) and Return on Assets (ROA) in Nigerian companies. The results indicate that CSR has a positive and significant relationship with financial performance measures.

Babalola (2012) examined the relationship between corporate social responsibility and firms' profitability in Nigeria. The result showed that the explanatory variable account for changes or variations in selected firms' performance is caused by changes in corporate social responsibility (CSR) in Nigeria.

Mulyadi and Anwar (2012) examined the relationship between corporate social responsibility and profitability and firm value. They used several variables to measure firm value and profitability, such as leverage. They concluded that there is no significant relationship between leverage and firm value.

Servaes and Tamayo (2013) argued that corporate social responsibility (CSR) and firm value are positively related to firms having high customer awareness using the proxy of advertising expenditures. For firms with poor customer awareness, the relation is either negative or insignificant. In addition, they found that the effect of awareness on the firm value-CSR relationship is reversed for firms with a poor prior reputation as corporate citizens.

Pauly et al., (2013) examined the relationships between the size of the company and corporate social responsibility in Swiss MNCs and SMEs. They suggested that smaller firms are not necessarily less advanced in organizing CSR than large firms. The main conclusion of the study is that unlike small firms the "large multinational corporations possess several traits that enhance communication and reporting about CSR."

Cheng et al., (2014) investigated whether superior performance on corporate social responsibility (CSR) strategies leads to better access to finance. They found a positive relationship between corporate social responsibility and a flexible financing structure, and that CSR performance is important in reducing capital constraints.

Gregory et al., (2014) examined the impact of corporate social responsibility on the risk and effects of risk on cost of capital, cash flows and the value of returns, finding "that the cost of capital thereby was reduced; the present value of the cash flows would rise, leading to an increase in the value of returns."

Most of these studies discussed the relationship between corporate citizenship, corporate social responsibility and variables such as financial performance indicators (profit, cost of capital and market value), the loyalty of customers, productivity, and so on. Table 1 depicts a summary of results CSR /CCAs studies.

According to these studies, there is an overlap between the two concepts of corporate citizenship and corporate social responsibility such that they can be used interchangeably. In addition, these studies do not agree in their results. Among other reasons, this is because they used different approaches or methodologies.

It may be noted that the literature review discusses the association between CCAs and financial performance and market performance around the world, but there are very few studies that discuss its impact in the Arab world generally, nor specifically in Oman. Unfortunately, the amount of literature concerning corporate citizenship or corporate social responsibility in Oman and the Gulf Cooperation Council Countries (GCC) is very limited. This is because CSR and CCA in the sultanate of Oman and other Middle Eastern

Table 1. Summary of the results of CSR and CCAs studies

Author (s)	Year	Dependent Variables	Independent Variable (CSR/ CC)	Results
Meijer and Schuyt	2005	Loyalty of Customers	CSR	No relationship
Gardberg and Fombrun	2006	Intangible Assets	CC	Positive relationship
Fiori et al.	2007	Stock Prices	CSR	Positive
Makni et al.	2009	Financial Performance	CSR	Negative relationship
Blazovich and Smith	2009	Profitability, Efficiency, Productivity and Lower Cost of Capital and Market-Value Premium	CC	Positive relationship with Financial Performance- No relationship with market performance
El Ghoula et al.	2011	Cost of Capital	CSR	Positive
Hamid et al.	2011	Financial Leverage (debt to equity Ratio	CSR	Positive
Setiawan and Janet	2011	ROA/ Market Value of Share	CSR	Positive with ROA- No relationship with Market Value
Uadiale and Fagbemi	2012	ROE/ROA	CSR	Positive
Babalola	2012	Profitability	CSR	Positive
Mulyadi and Anwar	2012	Profitability and Firm Value	CSR	No relationship
Pauly et al.	2013	Size of the Company	CSR	Positive
Servaes and Tamayo	2013	Firm Value	CSR/CC	Positive
Cheng et al.	2014	Financing Structure	CSR	Positive
Gregory et al.	2014	Risk/ Cost of Capital	CSR	Positive

countries remain at an early stage of development, and hence very few studies have been carried out in this region. In addition, these countries are still at the stage of trying to define CSR in their own context, map their stakeholders, and define their priority issues (Background Paper 2007).

4. MODEL, METHODOLOGY AND DATA HYPOTHESES AND DATA

4.1.1 CCAs and financial performance

Despite the fact that previous studies differ in their results, most of them agreed that CSR or CCA have some effect on the financial performance and market performance of firms. In this frame, the activities of corporate citizenship may have positive or negative relations based on each study. In terms of positive impact, CCAs may lead to competitive advantages and improve the financial performance and market performance of companies. This means that an increase in CCAs will increase both types of performance insofar as CCAs are correctly priced by the market. The study by Setiawan and Janet(2011) establishes that CSR activities may increase the demand for products and/or services by reducing consumer price sensitivity. CSR attracts socially conscious consumers to increase their purchases of a company's products and can actually lure them away from competitors. This results in protecting and enhancing the reputation of the company. The final impact of all of these actions is to actually improve the company's performance and profitability.

On the other hand, if CCAs are incorrectly priced by the market and fail to meet the needs of this market, a negative relationship between CCAs and financial performance may appear. Therefore the hypothesis is: CCAs will effect (positively or negatively) the financial performance of companies.

4.1.2 CCAs and market performance

The prices of shares are an indicator for the market performance of companies, and should reflect the invested value of CCAs. The market increasingly views CCAs as a tool to reduce risk management and improve corporate governance. Logically and practically,

higher financial performance will lead to a better market response and higher stock price.

But a negative relationship may appear if the market and investors discovered that the objective of CCAs is to maximize the profit not providing a service to the society. This relationship means that the CCAs are not efficiently priced by market. Babalola (2012, p.44) indicated that "if investors believed that companies implementing the corporate social responsibility principles are resource wasteful, they would determine a negative return premium on these companies' stocks". If the market and investor find out that the purpose of CCAs was seeking profit, the prices of shares do not efficiently reflect the CCAs where any increase in CCAs will not lead to an increase in the prices of shares or market performance. Therefore, the hypothesis is that CCAs will affect (positively or negatively) the market performance of companies.

4.3 Sources of data and methodology

This study depends mainly on secondary data obtained from the financial statements of (38) companies listed on Muscat Securities Market (MSM). The methodology of the study is content analysis of annual reports of a sample of 38 companies out of 48 (79%): 18 out of the 18 (100%) companies in the food sector, 10 out of the 10 (100%) in the construction sector and 10 out of the 10 (100%) companies in the chemical sector for the period 2009-2013. The study excluded 10 companies (4 from the mechanical sector, 2 from the textile sector and 4 from the mining sector) due to the insufficient availability of required data for these companies.

From the annual reports for the selected companies, the value of the three determinants ROA, ROE and FMV were taken for testing by using the statistical package for the social sciences (SPSS) software. The CCAs are measured by the voluntary disclosure of such activities. MSM itself started to make the annual reports available for its listed companies in 2007, thus making it difficult to get the required data for an extended period. In order to establish the impact of CCAs on the determinants, regression analysis, utilizing the ordinary least squares method, is used to test the hypothesis.

4.4 Sample selection

In order to test the relationships between the CCAs and financial and market performance of these companies, we have selected a total of 38 companies from three important sectors of the country which are also listed on (MSM) the only stock exchange of Oman. The sectors selected were: food, construction and chemicals. There are many reasons for selecting these three sectors. First, 18 companies out of 38 (47%) have corporate citizenship or corporate social responsibility activities, which is a higher rate than any other sectors in Oman. Second, the industrial sector in Oman is more interesting regarding CCAs because the Omani people still have a negative view toward industrial companies. Finally, of the total 48 of companies that are listed in the industrial sector, there are 38 companies that can be grouped into three sub-sectors as in the MSM and as shown in Table2 below.

Table 2. Population and Samples

Sector	Population	No. of sample	%	CCAs	No CCAs
Food	18	18	100%	8	10
Construction	10	10	100%	6	4
Chemicals	10	10	100%	4	6
Mining	4	-	-		
Textile	2	-	-		
Mechanical	4	-	-		
Total	48	38	79.1%	18	20

4.5 Models Specification

This study examines impact of Corporate Citizenship Activities on financial performance and market performance in Oman. The study employs an econometric method in formulating a regression model to be analyzed through ordinary least squares regression (OLS). The methodology employed in the study was to examine the annual report of the selected companies

$$\text{Equation 1} \qquad \text{ROE}it = \alpha 0 + \beta CCAsit + \varepsilon\text{it}$$

$$\text{Equation 2} \qquad \text{ROAit} = \alpha 0 + \beta\text{CCAsit} + \varepsilon\text{it}$$

$$\text{Equation 3} \qquad \text{FMV}it = \alpha 0 + \beta CCAsit + \varepsilon\text{it}$$

using the following three regressions:

Notes:
ROE: Return on Equity
ROA= Return on Assets
FMV= Market Fair Value of share

CCAs= Corporate Citizenship Activities
α= Constant
β= Beta
ε= Error term
i= ith firm
t= tth period

For the purpose of this study the OLS method is used and the parameter estimate obtained by the OLS is adopted because it is a fairly simple computational procedure and the data requirements are not too concessive.

5. RESEARCH FINDINGS

5.1 CCAs and Firm Performance in three sectors together

The study examines the relationship between CCAs and financial performance and market performance.

Table 3 shows the correlations and the regression results of a sample of 38 industrial companies.

As in the table 3, it seems that there is a statistically positive correlation between CCAs and ROE at 5%. On the other hand, there are no statistically significant correlations between CCAs and FMV and ROA at the 5% level. Regression analysis indicates that CCAs have impact only on ROE. The R-squared is 18.7% and the Sig- Value is 0.007, which is less than the P-value0.05. It can be deduced from the results that CCAs have a significant effect on financial performance in terms of ROE but have no significant effect on ROA and FMV. This means that Omani Manufacturing Companies with good CCAs will achieve a good ROE. In addition, this means that these Companies try to maximize profits when doing corporate citizenship activities. This indicates that there is a weak awareness for the real concept of corporate citizenship on the part of companies and investors.

5.2 CCAs and Firm Performance in the Food, Construction and Chemicals Sectors

Table 4 depicts the results of associations and regressions for all three sectors selected individually.

As shown in Table 4, in the Food sector there are no associations between CCAs and FMV, ROA and ROE. None of the correlations are significant at 5%. Also, the regression models are not significant at 5% since the Sig. values for all (0.701, 0.136, 0.711) are greater than 5% and the R-squares do not support the regression models any of the three dependent variables.

In the construction sector, the results show that there is a significant association between CCAs and ROE. On the other hand, there are no associations between CCAs and ROA and FMV at 5%. Regression analysis showed that the CCAs have an impact on ROE only at 5%. The R- Square results support the model, as the R- Square interprets 62.9% of the total variance in ROE. The associations and regressions between CCAs and FMV and between CCAs and ROA are not significant at 5% and the R-Squares do not support these associations and regressions.

In the Chemicals sector, the results show that there is a significant association between CCAs and ROE. On the other hand, there are no associations between CCAs and ROA and FMV at 5%. Regression analysis shows that the CCAs have an impact on ROE only at 5%. The R- Square results support the model, as the R-Square interprets 75.5% of the total variance in ROE. The associations and regressions between CCAs and FMV and between CCAs and ROA are not significant at the 5% level and the R-Squares do not support these associations and regressions.

Table 3. Summary of Correlations and Regression for Omani Industrial Sector (38 Companies)

Model	Independent Variable	Correlation	Dependent Variables	R-Squared	F-Value	Sig.	Coefficients		
							Variables	T-Value	Sig.
1	CCAs	0.069	FMV	0.005	0.171	0.682	Constant	0.754	0.456
							CCAs	0.413	0.682
		0.145	ROA	0.021	0.776	0.384	Constant	2.028	0.050
							CCAs	0.881	0.384
		0.433**	ROE	0.187	8.305	0.007	Constant	1.767	0.086
							CCAs	2.882	0.007

** Correlation is significant at the 0.05 level (2-tailed).

Table 4. Summary of the results of associations and regressions for the Food, Construction and Chemical sectors

Model	Independent variable	Correlation	Dependent Variables	R-Squared	F-Value	Sig.	Coefficients		
							Variables	T-Value	Sig.
Food sector	CCAs	0.097	FMV	0.009	0.153	0.701	Constant	-1.404	0.179
							CCAs	0.391	0.701
		0.366	ROA	0.134	2.468	0.136	Constant	0.601	0.556
							CCAs	1.571	0.136
		0.094	ROE	0.009	0.143	0.711	Constant	-0.897	0.383
							CCAs	0.387	0.711
Construction Sector	CCAs						Coefficients		
							Variables	T-Value	Sig.
		0.192	FMV	0.037	0.307	0.595	Constant	1.964	0.850
							CCAs	0.554	0.595
		-0.203	ROA	-0.079	0.344	0.574	Constant	1.321	0.223
							CCAs	-.587	0.574
		0.793**	ROE	0.629	13.589	0.006	Constant	1.938	0.089
							CCAs	3.686	0.006
Chemical sector	CCAs						Coefficients		
							Variables	T-Value	Sig.
		-0.528	FMV	0.278	3.087	0.117	Constant	5.635	0.000
							CCAs	-1.757	0.117
		0.132	ROA	0.017	0.142	0.716	Constant	1.987	0.082
							CCAs	0.377	0.716
		0.869**	ROE	0.755	24.671	0.001	Constant	5.236	0.001
							CCAs	4.967	0.001

** Correlation is significant at the 0.05 level (2-tailed).

5.3 F- test results

We use the F- test to examine the differences between the three sectors related to CCAs. Table 5 shows the results of this test. As shown in the table 5, the results indicate that there are no differences between the three sectors concerning the CCAs, where the Sig. 0.651 is greater than 0.05.

6. SUMMARY AND CONCLUSIONS

This study aims at identifying the effects of CCAs on the financial and market performance of Omani manufacturing for the period of 2009-2013. Financial performance is measured by two independent variables: return on assets (ROA) and return on equity (ROE), while market performance is measured by fair

Table 5. ANOVA analysis for Differences between three sectors

CCAs	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.229	2	0.115	0.434	0.651
Within Groups	9.244	35	0.264		
Total	9.474	37			

market value of shares (FMV). The CCAs are measured by voluntary disclosures of corporate citizenship activities undertaken by the companies. The study analyzed the annual reports for 38 (out of 48) manufacturing companies in three distinguished sectors; Food (18 companies), Construction (10 companies) and Chemicals (10 companies).

The study tested two hypotheses about the effect of CCAs on financial performance and market performance. The study built its hypotheses based on the results of literature reviews. The results of those studies were mixed, with some indicating positive effects and others negative effects. Few studies examined the effects of corporate social responsibility or corporate citizenship on financial performance and market performance in Oman. This is true not only of Oman but in Arab countries as a whole, where studies in this area are very limited.

For the 38 companies examined in this study, the results of statistical analysis indicate that there are positive correlations and regression at 5% levels of significance between CCAs and ROE. The R-square is 18.7% of total variance, which means that the CCAs interpret only 18.7% of any variance in ROE, or to a low degree. Also, the results indicate that there are no correlation and regression results at 5% levels of significance between CCAs and ROA and FMV.

For the food sector, the results indicate that there are no correlation and regression results at 5% levels of significance between CCAs and ROA and FMV.

For the Construction and Chemicals sectors, the results of statistical analysis indicate that there are positive correlations and regression results at 5% levels of significance between CCAs and ROE. The R-square results are 62.9% and 75.5% of total variance, respectively, supporting the results of the model. In addition, the results indicate that there are no correlation and regression results at 5% levels of significant between CCAs and ROA and FMV.

The overall results of the study are that manufacturing companies in Oman support profit maximization through corporate citizenship activities. This may be because the market and market participants increasingly view CCAs as a profit-seeking investment and not as a social investment.

The results of this study support the results of previous studies, such as Fiori et al., (2007) and Setiawan and Janet (2011) which suggest that there are no effects of CCAs (CSR) on market performance. Finally, the results of this study agree with the majority of previous studies, such as Blazovich and Smith (2009); Uadiale and Fagbemi (2012) and Babalola (2012), in suggesting that there is a positive relationship between CCAs (CSR) and financial performance.

As with other research, the present study has some limitations. Due to limited available information on the companies listed on the MSM, annual reports for only five years (2009-2013) were analyzed because only these reports were present on the websites of these companies and the MSM. At the same time, the disclosure of CCAs by companies is very limited. Therefore, further research is required. For example, testing financial and market performance in other sectors in Oman could be done, as this issue has not been researched in depth. Another research area of interest would be exploring the possible reasons explaining the differences between sectors concerning the relationship between corporate citizenship activities and financial and market performance.

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ADOPTION AND BENEFITS OF STATISTICAL METHODS IN ENTERPRISES: DIFFERENCES BETWEEN CROATIAN REGIONS

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ABSTRACT

This paper aims to address differences in the use of statistical methods by enterprises as one of the factors leading to the uneven level of economic development between different regions. For research purposes, a web survey was conducted on a sample of 667 Croatian enterprises in 2013. In order to better distinguish between Croatian regions, a complex sample survey design was used. The results show that the highest rates of statistical methods use among enterprises are in the Central and East region (36.96%). The conducted logistic regression analysis showed that the enterprises that use statistical methods have 63.5% greater odds of achieving positive net income than enterprises that do not. The research results point out the need for the adoption of statistical methods as a tool for achieving higher net income and for reducing economic dissimilarities between regions.

Keywords: *Complex sample survey design, Weighted stratified proportion estimator, Logistic regression, Nomenclature of Territorial Units for Statistics, Croatian enterprises, Use of statistical methods*

JEL: *C83, D63, G30, M21*

1. INTRODUCTION

There is no simple definition of the development concept (Nielsen 2011). Furthermore, there are different views on development levels. For instance, according to Sen (1999), development level increases when impediments to freedom such as hunger and tyranny are removed. This approach led to defining development level through acceptable minimum living conditions. The advanced version of this humanistic approach is an economic approach defining development level using purchasing power parities. The concept of purchasing power parities was originally used for exchange rate determination, but its use as a device in the comparison of living standards across countries prevailed (Lafrance and Schembri, 2002).

Consensus on what approach to the measurement of development should be used has also not been reached by global institutions. For instance, the United Nations Development Programme's country classification system is based on the Human Development Index (HDI), which was introduced in 1990 (UNDP 1990). The HDI emphasizes three dimensions as being basic for human development: a long and healthy

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life; knowledge; and access to resources for a decent standard of living (Sagar and Najam 1998). The World Bank uses its country classification system in order to ensure the return of funds which it has lent to countries (Radelet 2005). The World Bank classification system is based on gross national income (GNI) per capita, which is calculated using the World Bank Atlas method (World Bank 2014). At the same time, the International Monetary Fund in the World Economic Outlook divides countries into two groups: an advanced economies group and an emerging market and developing economies group. The classification is not based on any strict criteria but has evolved over time (International Monetary Fund 2014).

The countries' development levels are also observed via their competitiveness level. The Global Competitiveness Index is based on the following 12 pillars of competitiveness: institutions, infrastructure, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labour market efficiency, financial market development, technological readiness, market size, business sophistication, and innovation (World Economic Forum 2014). The World Competitiveness Index benchmarks the competitiveness performance of 60 countries based on 338 criteria that are grouped into 4 main factors: economic performance, government efficiency, business efficiency, and infrastructure (International Institute for Management Development 2014).

Past research concerning statistical methods in enterprises was mainly oriented on inspecting whether enterprises use them (West 1994, Ahmed and Hassan 2003, Tanco et al. 2008), or on defining the main barriers to their use (Deleryd 1998, Antony et al. 2004, Makrymichalos et al. 2005). The main reason for the scarce use of statistical methods is thought to be the insufficient familiarity of employees with statistical methods' abilities and benefits (Tanco et al., 2008). Some efforts in additional statistical methods training for employees have been done (Vere-Jones 1995, Dransfield, Fisher and Vogel 1999, Wild and Pfannkuch, 1999, Grigg and Walls, 2007). Unfortunately, the aversion of employees is too high to change their attitudes towards statistical methods and to achieve better results in the short run (Hahn and Hoerl, 1998, Deleryd, Garvare and Klefsjö, 1999, Rungasamy, Antony and Ghosh, 2002, Makrymichalos et al., 2005). Some research has been done on the impact of statistical methods on small enterprise performance (Dumičić, Bregar and Žmuk 2014, Žmuk 2015). Furthermore, the importance of the use of statistical methods is recognized and introduced in some quality management, accounting and auditing standards (Žmuk 2012).

Research on the impact that the adoption of statistical methods in enterprises has on a country's development level has been neglected and little work has been done in this field. For this reason, the main aim of this paper is to investigate whether there is impact from the use of statistical methods in enterprises on the different development levels of regions within a country. The research is based on enterprises in Croatia and its regions. The research questions that are expected to be answered are: "In which Croatian region do enterprises use statistical methods the most?" and "Which region benefits the most from the use of statistical methods measured through enterprises' net income?" According to these research questions two research hypotheses were set. The first research hypothesis is that the share of the enterprises that use statistical methods is the highest in the most developed region. The second research hypothesis is that there is no statistically significant difference in the impact of the use of statistical methods on the likelihood of achieving positive net income for enterprises in different Croatian regions.

After the introduction, in the second part of the paper, the regional stratification of Croatia is presented and the most developed region is identified. The third part describes the characteristics of the conducted survey. The main research results are provided and discussed in the fourth part. The fifth and final part contains conclusions and recommendations for further research.

2. REGIONS IN CROATIA

2.1 . Regional stratification of Croatia

In general, a distinction between administrative and non-administrative regional stratifications can be made. The main administrative stratification in Croatia is based on the so-called counties. Counties can be observed as political, administrative and self-managed institutions with a thousand-year-old tradition in Croatia (Vrbošić 1992). Because of its importance, the capital city Zagreb is also seen as a separate county. Thus, there are 21 counties in Croatia. The list of counties in Croatia is given in Table 1.

As opposed to administrative stratifications there are also non-administrative regional stratifications. The non-administrative regional stratifications are based mainly on the geographical position of a certain area, as well as different parameters such as population size, average income, and others that can be taken into account. Since Croatia is a European Union member state, the Nomenclature of Territorial Units for Statistics (NUTS) has recently become the main

Table 1: Stratification of Croatian regions according to the Nomenclature of Territorial Units for Statistics – Level 2 and 3 and their competitive position

NUTS-2 regions	Counties (NUTS-3 regions)	Gross domestic product per capita, 2011, in €	Regional competitiveness index rank, in 2013	Number of enterprises, October 2012
Adriatic region	County of Dubrovnik-Neretva	9,807	10	3,140
	County of Istria	12,991	3	8,393
	County of Lika-Senj	8,081	17	528
	County of Primorje-Gorski kotar	12,724	5	8,186
	County of Split-Dalmatia	8,072	9	10,311
	County of Šibenik-Knin	7,930	14	1,762
	County of Zadar	8,302	6	2,706
North-Western region	City of Zagreb	18,503	1	30,367
	County of Zagreb	7,786	7	5,538
	County of Koprivnica-Križevci	8,524	8	1,103
	County of Krapina-Zagorje	6,300	12	1,348
	County of Međimurje	8,459	4	2,138
	County of Varaždin	8,285	2	2,452
Central and Eastern region	County of Bjelovar-Bilogora	7,062	15	1,209
	County of Slavonski Brod-Posavina	5,882	16	1,263
	County of Karlovac	7,709	13	1,590
	County of Osijek-Baranja	8,271	11	3,494
	County of Požega-Slavonia	6,281	21	507
	County of Sisak-Moslavina	8,214	19	1,429
	County of Virovitica-Podravina	6,333	18	658
	County of Vukovar-Sirmium	6,217	20	1,291

Source: Croatian Chamber of Economy 2012, Croatian Bureau of Statistics 2014, National Competitiveness Council 2014.

non-administrative regional stratification in Croatia. NUTS uses population size as the base for stratification (Eurostat 2011). Also, NUTS recognizes three different levels of stratification. At the first level, NUTS strata (NUTS-1) include a population of between 3 and 7 million. At the second level, NUTS strata include a population of between 800 thousand and 3 million. The third level of NUTS strata is the most detailed. Each third level NUTS stratum has between 150 and 800 thousand people (Eurostat 2011).

According to NUTS-1, Croatia is stratified into just one stratum because there are around 4.2 million inhabitants in Croatia. NUTS-2 stratified Croatia into three strata: an Adriatic region; a North-Western region; and a Central and Eastern region (Letinić and Štavlić 2011). It has to be emphasized that the NUTS-2 stratification was valid until 1 January 2013. After that date, the new NUTS-2 stratification of Croatia was presented. In the new NUTS-2 stratification the North-Western region and the Central and Eastern region were merged into the new Continental region. As a result, the number of strata was reduced from 3 to 2 (Official Gazette 2012). Despite this fact, in this paper, the NUTS-2 stratification that resulted in 3 strata is observed primarily because all of the research data come from the period before this change was announced. The most detailed, the NUTS-3 stratification, resulted in stratification into counties.

2.2 Economic development levels of regions in Croatia

This paper analyzes the development levels of Croatia and its regions defined by NUTS levels using the following three development variables: gross domestic product per capita (GDPpc), competitive rank and number of enterprises.

The variable GDPpc presents development level as the level of the citizens' welfare. It is assumed that the higher the value of GDPpc, the higher the citizens' welfare level is, i.e. the higher their development level. The variable GDPpc is observed for the year 2011 for two reasons. The first reason for using data from that year is that more recent data for GDPpc were not available for counties or NUTS-3 strata. The second reason for using GDPpc data from 2011 is that a population census was conducted that year and the most precise number of citizens was obtained (Croatian Bureau of Statistics 2011). According to the data, GDPpc

in Croatia in 2011 was €10,325 (Croatian Bureau of Statistics 2014). The most developed NUTS-2 region based on this variable was the North-Western region, with a GDPpc of €12,966 in 2011. The Adriatic region had a GDPpc of €9,941 in 2011, whereas the least developed region was the Central and Eastern region, with a GDPpc of only €7,216 in 2011 (Croatian Bureau of Statistics 2014). Table 1 provides data for GDPpc by NUTS-3 strata or by county. The City of Zagreb definitely had the highest GDPpc with €18,503 in 2011. Because the City of Zagreb includes almost one fifth of the population of Croatia (Croatian Bureau of Statistics 2013), this county accounts for the fact that the North-Western region is the most developed NUTS-2 region in Croatia. In the Adriatic region, the highest value of GDPpc was in the County of Istria, with a GDPpc of €12,991, and the County of Primorje-Gorski kotar, with a GDPpc of €12,724 in 2011. The differences in GDPpc values between counties in a NUTS-2 region are the least present in the Central and Eastern region. This region includes the County of Slavonski Brod-Posavina, which had the lowest GDPpc among all counties. In 2011, the County of Slavonski Brod-Posavina had GDPpc of only €5,882 (Croatian Bureau of Statistics 2014). According to Mikulić, Lovrinčević and Galić Nagyszombatycan (2013) a regional convergence process is absent in Croatia. In order to reduce differences in economic development levels between Croatian regions, they suggest using structural funds for improvement in overall regional investment attractiveness.

The National Competitiveness Council has been publishing the Regional Competitiveness Index since 2007. Because of three-year cycles, three publications have been published so far. The most recent Regional Competitiveness Index is from 2013. The Regional Competitiveness Index is based on a survey which is conducted based on the methodology of the World Economic Forum and the Institute for Development Management (National Competitiveness Council 2014). The survey was conducted primarily at the NUTS-3 level, which enabled horizontal analysis of differences between counties. Based on the survey, a very wide range of different indicators was used. Overall, 116 statistical indicators and 68 perceptual indicators were formed. Those indicators were grouped into so-called competitiveness pillars, forming 17 at the ground level. The ranks of counties according to the Regional Competitiveness Index in 2013 are given in Table 1.

According to the Regional Competitiveness Index, the most competitive county in 2013 was the City of Zagreb. In second place was the County of Varaždin, also from the North-Western region, whereas the County of Istria from the Adriatic region was in third place. All top ten counties are either from the Adriatic or the North-Western regions. The best ranked county from the Central and Eastern region was the County of Osijek-Baranja, which was in 11th place. The last four counties, which are the lowest in the rankings, are from the Central and Eastern region. In general this indicates that the Central and Eastern region is the least competitive region in Croatia. This is also confirmed by regions' average ranks. The average rank of the Adriatic region is 9th, of the North-Western region 6th, and of the Central and Eastern region 17th. According to these results it can be concluded that the North-Western region is the most competitive and, consequently, the most developed region in Croatia.

The number of enterprises in a region reveals its business activity and indicates the level of prosperity the region has attained. Therefore, the present number of enterprises in the region can be viewed as an indicator of a region's development in the future. It has to be emphasized that, in the context of this paper, enterprises include only limited liability enterprises that are registered in the Court Register of the Republic of Croatia in accordance with the Companies Act (Official Gazette 2011). In October 2012, most enterprises, i.e. 30,367 (33.96%), were located in the City of Zagreb. On the other hand, the county with the fewest number of enterprises is the County of Požega-Slavonia. In October 2012 there were only 507 (0.57%) enterprises in the county. The number of enterprises in other counties is shown in Table 1. If NUTS-2 regions are observed it can be seen that the North-Western region had the largest number, or 42,946 (48.03%) enterprises in October 2012. The Adriatic region had 35,026 (39.17%) and the Central and Eastern region had 11,441 (12.80%) enterprises in October 2012. These numbers lead to the conclusion that, in the future, the North-Western region will further increase its lead in economic development relative to the other two regions.

3. RESEARCH METHODOLOGY

In order to inspect the impact that the use of statistical methods in enterprises has on regions' development levels, original primary research was conducted. The target population in the research included Croatian enterprises that are registered in the Court Register of the Republic of Croatia as limited liability enterprises (Official Gazette 2011) and that are subject to the submission of annual financial statements in accordance with the Accounting Act (Official Gazette 2007). According to the Croatian Company Directory

of the Croatian Chamber of Economy, which is an integrated database containing all registered business entities in Croatia (Croatian Chamber of Economy 2012) and which has been used as the sampling frame, there were 89,413 such enterprises at the beginning of the research. An in-depth analysis showed that overall 38,069 enterprises had no employees. It is assumed that those enterprises are shell enterprises that do not perform any business activity. For this reason, the target population was reduced to 51,314 enterprises.

The data about the use of statistical methods in enterprises were collected by a web survey. Therefore, in order to be able to participate in the survey, enterprises had to have a valid e-mail address. According to the data in Table 2, there were 59,190 enterprises overall that did not have a valid e-mail address. Because of the data collection method used, such enterprises could not participate in the survey. For this reason, there is a discrepancy between the target and the surveyed population. The size of the surveyed population was calculated by deducting the number of enterprises that did not have employees and/or did not have a valid e-mail address from the overall number of enterprises in the sampling frame. In this way, the size of the surveyed population was set at 26,186 enterprises. It has to be emphasized that it is assumed that there is no statistically significant difference in characteristics between enterprises that have and do not have a valid e-mail address. Consequently, all conclusions in this study are brought not only for the surveyed but also for the target population.

For the purpose of the study, enterprises were stratified according to their headquarters location. Three strata were recognized within this research. Those strata are the NUTS-2 regions in Croatia. A detailed overview of the number of enterprises in NUTS-2 regions in Croatia in October 2012 is given in Table 2.

An invitation to participate in the survey was sent to all enterprises from the population surveyed in October 2012. This was possible because a web survey was conducted. The survey data collection finished in February 2013. Meanwhile, two reminders for participation in the survey were sent to the enterprises. Finally, 667 enterprises participated and filled out the survey questionnaire completely. The majority, i.e. 378 (56.67%), of the enterprises that participated in the survey have their headquarters in the North-Western region. Participation in the survey included 197 (29.54%) enterprises from the Adriatic region, and 92 (13.79%) enterprises from the Central and Eastern region.

If Response rate 1 or the minimum response rate is used (American Association for Public Opinion Research 2011), the overall survey response rate is 2.55%. The strata response rates are given in Table 3. While the strata response rates are very similar, the nonresponse adjustment factors were introduced as a part of the survey weights. The sample selection weights were not used because all of the enterprises from the surveyed population were invited to take part in the survey and so every enterprise had the same probability of being included in the sample. It was estimated that there was no need for introducing post-stratification weights. Consequently, the final weights include only nonresponse adjustment factors, which are given in Table 3 and which were calculated as a reciprocal value of strata response rates.

Table 2: Number of enterprises in Croatia, October 2012

NUTS-2 region	Overall	Without employees	Without an e-mail address	Target population	Surveyed population
Adriatic region	35,026	21,318	24,291	13,708	9,254
North-Western region	42,946	13,668	28,428	29,278	12,608
Central and Eastern region	11,411	3,083	6,471	8,328	4,324
Total	89,413	38,069	59,190	51,314	26,186

Source: Croatian Chamber of Economy 2012, Author's calculation.

Table 3: Sample sizes, response rates and weight analysis

NUTS-2 region	Surveyed population	Sample size	Response rate (%)	Nonresponse adjustment factor
Adriatic region	9,254	197	2.13	46.9746
North-Western region	12,608	378	3.00	33.3545
Central and Eastern region	4,324	92	2.13	47.0000
Total	26,186	667	2.55	-

Source: Author's calculation.

Complex survey sample design characteristics were taken into account in the analysis. In order to properly introduce the stratification and the sampling weights, the Jackknife Repeated Replication method was used as a variance estimation method (Rust and Rao 1996, Heeringa, West and Berglund, 2010). The stratification effects on the variance are additionally observed by design effects (Deff). In the analysis, strata proportions, totals and averages were estimated and logistic regression modelling was performed.

4. EMPIRICAL RESULTS AND DISCUSSION

4.1. Use of statistical methods by enterprises in Croatian regions

The first aim of the research is to estimate the rate of enterprises that use statistical methods in their business and to identify which regions have the highest percentage of enterprises that use them. According to the results given in Table 4, 35.70% of enterprises (95% CI = 0.3200, 0.3941) in Croatia use statistical methods in their business, whereas 64.30% (95% CI = 0.6059, 0.6800) do not. The results show that approximately two-thirds of enterprises in Croatia do not use statistical methods, which could be seen as a serious problem and considered one of the reasons for the low levels of competitiveness of Croatian enterprises in the world.

Table 4 provides detailed results of the proportion of enterprises that use statistical methods in the three NUTS-2 regions (strata). Despite the different numbers of enterprises that participated in the survey from the NUTS-2 regions, the results show that there is approximately the same number of enterprises that use statistical methods among the strata. More precisely, it is estimated that 36.55% (95% CI = 0.2979, 0.4330) of enterprises in the Adriatic region, 34.66% (95% CI = 0.2984, 0.3947) of enterprises in the North-Western region and 36.96% (95% CI = 0.2702, 0.4689) of enterprises in the Central and Eastern region use statistical methods.

The value of the Rao-Scott second-order F-statistic for the overall test of the null hypothesis that the region where an enterprise has its headquarters is not associated with the use of statistical methods is 0.1346 (num df = 1.98, den df = 1317.40, p = 0.8725). Consequently, at the significance level $\alpha = 0.05$, the null hypothesis that the enterprises' affiliation to a region and the use of statistical methods are not associated may not be rejected. In other words, the levels of the response are not different within each region (Burke, Isik, 2009, SAS, 2014). In this way the first research hypothesis that the share of enterprises that use statistical methods is highest in the North-Western region can be rejected.

At the total level, i.e. at the country level, Deff is higher than 1 and is equal to 1.0352. This means that the variance for the proportion estimate is 1.0352 times or 3.52% higher than it would be for the variance of simple random sampling for the same sample size (667 enterprises). According to the value of Deff, the effective sample size, or the sample size of simple random sampling that would result in the same level of precision, is 644 enterprises. On the other hand, it must be emphasized that all Deffs at stratum levels are lower than 1. This indicates that the stratification and the weights, which were accounted for in the analysis, resulted in an improved level of precision for the proportion estimate. Consequently, the variances are lower than they would be if simple random sampling for the same strata sizes had been performed.

Table 4: Use of statistical methods in Croatian regions, n=667

NUTS-2 region	Stat. met. use	N	Sum of weights	Prop.	Std. Err. of Prop.	95% CL for Prop.		95% CL for Sum		Deff
Adriatic region	Yes	72	9254	0.3655	0.0343	0.2979	0.4330	2757	4007	0.8750
	No	125	9254	0.6345	0.0343	0.5670	0.7021	5247	6497	0.5657
North-Western region	Yes	131	12608	0.3466	0.0245	0.2984	0.3947	3763	4976	0.6671
	No	247	12608	0.6534	0.0245	0.6053	0.7016	7632	8845	0.4301
Central and Eastern region	Yes	34	4324	0.3696	0.0506	0.2702	0.4689	1168	2028	0.8114
	No	58	4324	0.6304	0.0506	0.5311	0.7298	2296	3156	0.4985
Total	Yes	237	26186	0.3570	0.0189	0.3200	0.3941	8378	10321	1.0352
	No	430	26186	0.6430	0.0189	0.6059	0.6800	15865	17808	1.0352

Source: Author's calculation.

4.2. Net income of enterprises by regions

One of the main goals of enterprises is to achieve positive net income. Positive net income is a reward for the owners and can be used for further development of the enterprise. On the other hand, it is emphasized that positive net income should not be the top priority of enterprises because an enterprise has to also have a social role in society (Doherty, Haugh and Lyon 2014). On the other hand, if an enterprise does not achieve positive net income in the long run or even in the short run, there is a possibility that the enterprise will not be able to pay out salaries to its employees. Furthermore, negative net income could lead to a situation where further enterprise's survival comes into question and the initiation of bankruptcy proceedings closing the enterprise seems to be the only and the best solution in that situation. In that case the social role of enterprises is lost as well. Therefore, positive net income has to be observed as a necessity for further continuation of business activities and the survival of the enterprise and its ability to fulfil its social role as well. Table 5 shows estimated mean net incomes in enterprises in NUTS-2 regions and throughout Croatia in 2011. Net incomes are given in Croatian currency – Hrvatska kuna (Croatian kuna - HRK).

The data from 663 Croatian enterprises were used for the purpose of estimating mean net income. The sample size was reduced because four enterprises from the sample, for unknown reasons, have not published their financial reports for 2011. In addition to observing the enterprises according to their affiliation to a NUTS-2 region, the enterprises were inspected based on whether they use statistical methods. It has to be emphasized that in estimating mean net incomes, a complex survey design was taken into account.

According to Table 5, the mean net income of the enterprises in Croatia that use statistical methods is HRK 168,146, whereas the mean net income of Croatian enterprises that do not use statistical methods is HRK -21,874. On the other hand, at the significance level of 5%, it cannot be concluded that the mean net income of Croatian enterprises that use statistical methods (95% CI = -926,001, 1,262,294) is greater than the mean net income of the enterprises that do not (95% CI = -315,352, 271,603). The same conclusion can be made at the NUTS-2 regions level. Furthermore, only in the North-Western region is the mean net income of enterprises that use statistical methods higher than the mean net income of the enterprises that do not. What is more interesting is that only the enterprises from the Adriatic region that do not use statistical methods and the enterprises from the North-Western region that do use statistical methods have achieved positive mean net income. Those poor financial results can be explained by the global economic and financial crisis, which hit Croatia in 2008 and was still present in 2011 (Gardo and Martin 2010, European Commission 2013).

4.3. Impact of the use of statistical methods on enterprises' net income

Because there is an evident impact from the crisis on Croatian enterprises, instead of a quantitative

Table 5: Estimated mean net income in enterprises according to NUTS-2 regions and use of statistical methods, 2011, in HRK, n=663

NUTS-2 region	Statistical methods use	N*	Mean	Std. Err. of Mean	95% CL for Mean		Deff
Adriatic region	Yes	72	-300,318	670,060	-1,616,008	1,015,374	1.2010
	No	125	70,995	72,897	-72,141	214,132	
	Total	197	-64,713	247,398	-550,490	421,064	
North-Western region	Yes	131	1,262,250	816,718	-341,411	2,865,911	0.8507
	No	245	-60,259	281,425	-612,849	492,331	
	Total	376	400,509	338,750	-264,641	1,065,659	
Central and Eastern region	Yes	33	-1,892,585	1,943,171	-5,708,084	1,922,914	1.2090
	No	57	-108,340	331,996	-760,228	543,548	
	Total	90	-762,563	734,904	-2,205,578	680,452	
Total	Yes	236	168,146	557,231	-926,001	1,262,294	0.9764
	No	427	-21,874	149,463	-315,352	271,603	
	Total	663	46,048	220,571	-387,054	479,149	

Source: Author's calculation.

* Note: Four enterprises did not publish financial reports for 2011.

estimation of the impact of the use of statistical methods on enterprises' net income, a kind of probabilistic approach is used. In other words, instead of estimating a possible change in enterprises' net income value, expressed in HRK, as a result of the use of statistical methods, the likelihood of achieving positive net income when statistical methods are used is inspected. In order to do this logistic regression modelling was used.

To estimate a high quality model, enterprises with unusual net income values in 2011 were omitted. Unusual net income values or outliers are those net incomes that were more than two standard deviations from the global estimated mean of HRK 46,048. There were 42 such enterprises, which had net incomes lower than HRK -973,132 or higher than HRK 1,302,941 in 2011. Consequently, data from 591 enterprises were used in the analysis. Out of these 591 enterprises, 194 (32.83%) use and 397 (67.17%) do not use statistical methods. In the analysis, the enterprises are also observed after their affiliation to a stratum, i.e. a region. There were 176 (29.78%) enterprises in the Adriatic region, 334 (56.51%) enterprises in the North-Western region and 81 (13.71%) enterprises in the Central and Eastern region.

In the logistic regression model, the variable *Net income* is the dependent variable. This variable is set as a binary variable. It is equal to 0 if the enterprise has achieved a negative net income and it is equal to 1 if the enterprise has achieved a positive net income in 2011. The variable *Use of statistical methods*, which is an independent variable in the logistic regression model, is also a binary variable. It is equal to 0 if the enterprise does not use statistical methods and it is equal to 1 if the enterprise uses them. In the regression model, the reference category for this variable is that an enterprise does not use statistical methods. Additionally, the analysis by stratum is made by introducing the variable *Strata*. The North-Western region is used as a reference category because the previous results have shown that this region is the most developed. The results of the logistic regression analysis are given in Table 6.

In the logistic regression model, net income is observed taking into consideration the use of statistical methods and an enterprise's affiliation in terms of NUTS-2 region. According to the Wald Chi-Square test, the variable *Use of statistical methods* ($\chi2(1)=3.9056$, $p = 0.0481$) is statistically significant in the model at the significance level $\alpha = 0.05$. Thus, the enterprise that uses statistical methods has 1.635 times or 63.5% (85% CI = 1.143, 2.339) greater odds of achieving positive net income than the enterprise that does not use statistical methods (holding all other factors constant).

The variable *Strata* ($\chi2(2)=6.2955$, $p = 0.0429$), which introduced the strata into the analysis, is significant overall in the model at the significance level $\alpha = 0.05$. The individual categories of the variable *Strata,* which are introduced into the model, are individually significant at the significance level $\alpha = 0.05$ (Adriatic region, $p = 0.0169$) and $\alpha = 0.15$ (Central and Eastern region, $p = 0.1365$). The model has pointed out that enterprises in the Adriatic region and the Central and Eastern region have lower odds of achieving positive net income than those in the North-Western region. The estimated odds ratio of achieving positive net income of enterprises in the Adriatic region relative to enterprises in the North-Western region is 0.569. The estimated odds of achieving positive net income for enterprises in the Central and Eastern region are 0.626 times the odds of achieving a positive net income for enterprises in the North-Western region.

The first-order interaction of the variables *Use of statistical methods* and *Strata* was tested in a separate model and was not significant. Therefore, the interaction terms were not included into the final model, which is given in Table 6. Consequently, it can be concluded that the decision to use or not use statistical methods and affiliation to a NUTS-2 region together do not have a statistically significant impact on achieving positive net income. This lack of impact led to the conclusion that there is no statistically significant

Table 6: Logistic regression analysis of net income in Croatian enterprises, positive vs. negative net income, n=591

Parameter	Analysis of Maximum Likelihood Estimates				Odds Ratio Estimates		
	Estimate	Stand. Error	Wald Chi-Square	Pr > ChiSq	Point Estimate	85% Wald Confidence Limits	
Intercept	1.5726	0.1632	92.8328	<.0001	-	-	-
Use of statistical methods	0.4917	0.2488	3.9056	0.0481	1.635	1.143	2.339
Strata – Adriatic region	-0.5631	0.2356	5.7105	0.0169	0.569	0.406	0.799
Strata – Central and Eastern region	-0.4688	0.3149	2.2169	0.1365	0.626	0.398	0.985

Source: Author's calculation.

Note: Reference categories for categorical predictors are: Enterprise does not use statistical methods (*Use of statistical methods*), North-Western region (*Strata*).

difference in the successfulness of the use of statistical methods in the NUTS-2 regions in Croatia. As a result, the second research hypothesis of the paper can be accepted.

5. CONCLUSION

The more developed a country is, the better a standard of living it is supposed to have. Unfortunately, there are very significant differences between countries in the level of development they have achieved. These differences are not only present at the level of countries, but at the regional level as well. Of course, Croatia is no exception.

In Croatia there are different regional stratifications. In the paper, the emphasis was on the stratification according to the NUTS system. The NUTS system recognizes different levels of stratification and the NUTS level 2 stratification was selected as the most appropriate to observe. According to the NUTS-2, there are three regions in Croatia: the Adriatic region, the North-Western region and the Central and Eastern region. If GDPpc, the regional competitiveness index rank and the number of enterprises criteria are observed, it can be concluded that the most developed region in Croatia is the North-Western region.

In order to obtain insight into statistical methods adoption in NUTS-2 regions in Croatia, a web survey was conducted. In the data analysis, a complex survey methodology was used. The results have shown that there is no statistically significant difference in statistical methods adoption between NUTS-2 regions. Hence, development level does not have any impact on an enterprise's decision to use statistical methods. On the contrary, logistic regression modelling showed that the enterprises that use statistical methods have higher odds of achieving positive net income than enterprises that do not use them. The interaction effect of the use of statistical methods and affiliation to a stratum did not have a statistically significant effect on the odds of achieving or not achieving positive net income. Based on this finding it has been concluded that there is no difference in the benefits of the use of statistical methods in enterprises in different regions. According to the results, more emphasis should be given to intensive statistical methods use in less developed regions. In this way, enterprises in less developed regions could achieve better business results and so reduce gaps in economic development. The crucial thing here is to conduct additional employee training. Only when employees become aware of the potential benefits of statistical methods will they warm to their use.

The main limitation of the research stems from the point in time at which the research was conducted, which was inappropriate. Namely, the research was conducted during the financial and economic crisis in Croatia. Because the negative crisis effects prevailed over the positive effects of the use of statistical methods, the given results have to be taken with great caution. Furthermore, instead of conducting a web survey, due to its limitations, different approaches are recommended for use in future research. A preliminary face-to-face interview survey with managers is highly recommended. In case of a very limited budget, a preliminary telephone survey could also be very useful in further improving the survey questionnaire.

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