Ferit Kula*
Alper Aslan*
Mete Feridun*

UDK 336.748
ORIGINAL SCIENTIFIC PAPER
IZVORNI ZNANSTVENI RAD

PURCHASING POWER PARITY IN MENA REVISITED: EMPIRICAL EVIDENCE IN THE PRESENCE OF ENDOGENOUSLY DETERMINED BREAK POINTS

ABSTRACT

This paper re-examines the Purchasing Power Parity hypothesis in which the endogenously determined break points are incorporated in 13 major MENA countries by using official and black market exchange rates data over 1970-1998. We utilize Lagrange Multiplier unit root test that endogenously determines structural breaks in level. We find evidence of PPP for eight of the thirteen countries at the 10% level or better. We also construct the half lives to investigate the persistence of deviations from PPP. The point estimates of the half lives for both OREX and BMREX in the seven countries are lower than range of the consensus of 3-5 years in the literature.[1]

Keywords: *PPP, Black Market Exchange Rates.*
JEL Code: *E24*

I. INTRODUCTION

Purchasing power parity (PPP) has been one of the most enduring concepts in international economics. The theory, which is a generalization of the law of one price, supposes that all goods are identical and transportation costs and trade barriers are very low in both countries. The absolute version of the theory asserts that under these conditions, the same basket of goods and services should cost the same when expressed in terms of the same currency.

On the other hand relative PPP is said to hold when the rate of depreciation of one currency relative to another matches the difference in aggregate price inflation between the two countries concerned. If the nominal exchange rate is defined simply as the price of one currency in terms of another, then the real exchange rate is the nominal exchange rate adjusted for relative national price level differences (Sarno and Taylor, 2002).

In MENA countries covered in the present study, black market exchange rates have a long tradition. The purpose of this study is to test the validity of the PPP in thirteen MENA countries using both BMREX and OREX by time series unit root tests with breaks. We also construct the half lives to investigate the persistence of shocks to the OREX and BMREX. The study differs from earlier studies which take in to account MENA countries in this way.

* **Ferit KULA** Department of Economics**,** Faculty of Economics and Administrative Sciences Erciyes University Kayseri, Turkey. E-mail: kulaf@erciyes.edu.tr
* **Alper ASLAN** Department of Economics**,** Faculty of Economics and Administrative Sciences Nevsehir University Nevsehir, Turkey E-mail: alperleo@gmail.com
* **Mete FERIDUN** Department of Banking and Finance Faculty of Business and Economics Eastern Mediterranean University Gazi Magosa, Mersin 10 Turkey E-mail: mete.feridun@emu.edu.tr

The black market and official exchange rates data are taken from the study of Reinhart and Rogoff (2004). Price levels are defined as the logarithm of the price ratio generated by the each country's consumer price index (CPI) divided by the US CPI (IFS line 64) and taken from the International Monetary Fund's International Financial Statistics (IMF-IFS) database. Due to the lack of consistent data on the CPI index for some countries before 1970 and unavailability of data beyond 1998 for black market, the data spans from 1970-1998. The 13 MENA countries considered in this study are Algeria, Egypt, Iran, Iraq, Israel, Jordan, Lebanon, Libya, Morocco, Saudi Arabia, Syria, Tunisia and Turkey.

The rest of the paper is organized as follows: The next section is devoted to describe the literature. Section 3 presents the basic model and data. Section 4 describes the LM unit root methodology and section 5 presents the conclusion of the paper.

II. LITERATURE REVIEW

There exists a rich literature on the validity of the PPP hypothesis. Despite a vast empirical literature, many questions remain regarding the validity of PPP. The validity of the PPP has been extensively tested, especially for developed countries and focused on official exchange rates. In general, PPP is a valid long-run equilibrium condition at least in industrialized economies (see the survey of Froot and Rogoff, 1995; Sarno and Taylor, 2002; Sarno 2003). On the other hand, empirical evidence on the validity of long-run PPP for developing countries is rather mixed (see, for example, Telatar and Kazdaglı, 1998; Bahmani-Oskooee and Mirzai, 2000; Luintel, 2000; Basher and Mohsin, 2004). On the other hand, a number of studies have documented evidence showing persistent deviations from PPP. Studies by Roll (1979), Frankel (1981, 1986), Adler and Lenmann (1983), Hakkio (1986), and Taylor (1988) fail to reject the hypothesis that real exchange rate follows a random walk. Studies, by Frankel and Mussa (1985) Edwards (1989), Roll (1979), and Pippenger (1982) reveal that deviations from PPP follow a random walk process which implies that the deviations from PPP are cumulative and permanent such that PPP does not hold. Studies by Abouf and Jorian (1990) find evidence that verifies long-run PPP based on multivariate unit root tests performed on first differences rather than levels. Cheung and Lai (1993) and Chen (1995) find some fragmented support for PPP based on cointegration analysis. Lothian and Taylor (1997), based on panel data, verified long-run PPP through use of multivariate unit root tests. Cheung and Lai (1998) find evidence in favor of mean reversion using fractional cointegration. In short, empirical results from the past studies have been mixed and conflicting. Most studies concluded that PPP does not hold. Mark (1990) did not reject the null of a unit root and the null of no-cointegration. On the contrary, Chen (1995) who used monthly data from five European countries over the period 1973:4-1990:12 concluded that the PPP hypothesis is upheld. Feridun (2005) finds evidence that does not favor mean reversion in the log real exchange rates for the exchange rates US Dollar-French Franc, US Dollar- German Mark, and US Dollar-Great Britain Pound for both monthly and quarterly observations. Hence, the study fails to verify PPP based on these three exchange rates. Hung and Jan (2002) show that the PPP does not hold for most Asian markets. Montiel (1997); Baharaumshah and Ariff (1997); and Weliwita (1998) show non- stationary real exchange rate. Froot and Rogoff (1995); and Rogoff (1996) show a slow parity reversion. Kuo and Mikkola (1999); Glen (1992); and Lothian and Taylor (1996) reject the random walk hypothesis in the real exchange rate. Meese and Rogoff (1983) show a contrary result to the theory of PPP; they conclude that the real exchange rate follows a random walk, implying that time series can fluctuate without bound. Some studies focus on the development of econometric models based on economic

fundamentals. Mark (1995), MacDonald (1996), and Taylor and Peel (2000) attribute the predominant source of real exchange rate fluctuations to the effect of real disturbances.

Although black market exchange rates (BMREX) play such a key role in emerging market economies, there is very few papers in the PPP literature use this major source of information to investigate the long run PPP hypothesis. Pioneering study of Age´nor and Taylor (1993), Baghestani (1997), Phylaktis and Girardin (2001) and Aslan et al. (2009) examined for 19 developing countries, India, China and Turkey, respectively. Phylaktis and Kassimatis (1994) and Luintel (2000) focused on the experience of seven countries in the Pacific Basin region, while Diamandis (2003) analyzed four Latin-American countries and Cerrato and Sarantis (2007) examined 34 emerging countries. Studies that have used the black market rates have generally supported PPP more than those that have used official rates (Bahmani-Oskooee and Goswami, 2005).

There are few studies (Bahmani-Oskooee, 1998; Narayan and Prasad, 2005) on the exchange rates of MENA countries as a group. One of them is Narayan and Prasad (2005) who considered PPP for 11 Middle Eastern countries using a number of tests: the one break test unit root, the two breaks unit root test, and the panel lagrange multiplier (LM) unit root test with structural breaks. The main finding from univariate tests is that there is evidence for PPP in only seven countries (Lebanon, Saudi Arabia, Egypt, Iran, Syria, Tunisia and Sudan). However, when the panel LM test is applied with two structural breaks, strong evidence is found in favor of PPP for the Middle Eastern countries.

III. BASIC MODEL AND DATA

$$RER=NER\frac{P^*}{P} \tag{1}$$

where RER is the real exchange rate, NER is the nominal exchange rate and P* and P are the foreign and domestic prices, respectively. In logarithmic form, the real exchange rate can be represented by

$$\log(RER)=\log(NER)+\log(P^*)-\log(P) \tag{2}$$

Following equation shows the model of mean reverting real exchange rate

$$\log(RER)_t=\alpha+\beta\log(RER)_{t-1}+\varepsilon_t \tag{3}$$

where α and ε are constant and error term respectively. PPP suggest that real exchange rate series should be stationary. If real exchange rate is stationary this exhibit that any percentage changes in the price level between two countries would be offset by an equal depreciation/appreciation of the nominal exchange rate. If there is a unit-root in the real exchange rate this implies that shocks to the real exchange rate are permanent and PPP does not exist between two countries

IV. LM UNIT ROOT METHODOLOGY

The majority of studies on the validity of PPP theory in developing countries have used Augmented Dickey-Fuller (ADF) tests. The ADF statistics have been found to have low power with a short time span. Another limitation of the conventional ADF test is that they do

not take into account potential structural breaks in the series. Perron (1989) showed that failure to allow for an existing structural break leads to a bias that reduces the ability to reject a false unit root null hypothesis.

This paper applies univariate Lagrange Multiplier (LM) unit root tests with structural breaks proposed by Lee and Strazicich (2003, 2004). We utilize the general model (crash model) that allows for up to two breaks in the level of the series. The two break minimum LM unit root can be described as follows. According to the LM (score) principle, a unit root test statistic can be obtained from the following regression:

$$\Delta Y_t = \delta' \Delta Z_t + \phi \tilde{S}_{t-1} + \sum_{1}^{k} \gamma_i \Delta \tilde{S}_{t-i} + \varepsilon_t \qquad (4)$$

Where $\tilde{S}_t$ de-trended series that $\tilde{S}_t = Yt - \tilde{\psi}_x - Z_t \tilde{\delta}$, for $t=2,....,T$. $\tilde{\delta}$ is a vector of coefficients estimated from the regression of ΔYt on ΔZt and $\tilde{\psi}_x = Y_1 - Z_1 \tilde{\delta}$, where Y_1 and Z_1 firs observations Y_t and Z_t, respectively. Z_t is a vector of exogenous variables defined by the data generation process of the series. Crash model includes two breaks in level and is described by $Z_t = [1, t, D_{1t}, D_{2t}]'$, where $D_{jt} = 1$ for $t \geq T_{bj} + 1$, $j=1,2$ and zero otherwise.
The unit root null hypothesis is described by $\phi = 0$ (implying a unit root with two breaks), and the LM test statistics are given by:

$$\tilde{\tau} = \text{t statistics for the null hypothesis } \phi = 0. \qquad (5)$$

The minimum LM unit root t-statistic determines the endogenous location of two breaks $(\lambda_j = T_{bj}/T, j=1,2)$. The LM unit root test can endogenously determine the two breaks by utilizing a grid search as follows:

$$LMt = \inf_{\lambda} \tilde{\tau}(\lambda) \qquad (6)$$

This methodology presents the following advantages. First, the minimum LM t-statistics allow for breaks under the null and alternative, which avoids the possibility of spurious rejections caused by size distortion. Second, the optimal number of break points and their location together with the degree of augmentation are endogenously and jointly determined.

V. EMPIRICAL STRATEGY AND RESULTS

Following Lee and Strazicich (2003), in the beginning, we determine the number of lagged augmentation terms and we start from a maximum of k=8 lagged terms. As such, the procedure looks for the significance of the last augmented term. We then use the 10% asymptotic normal value of 1.645 on the t-statistic of the last first differenced lagged term. After determining the optimal k at each combination of two break points, we can determine the breaks where the endogenous two break LM t-test statistic is at a minimum. We examine each possible combination of two break points over the time interval [0.1T, 0.9T] while eliminating the endpoints. Here, T is the sample size.

We begin with the LM unit root t-statistic with two breaks and examine the significance of the dummy coefficients on the basis of the conventional t-statistics.

If less than two breaks are significant at 10% we apply the minimum LM unit root t-statistic with one break proposed by Lee and Strazicich (2004), and if the break is insignificant we employ the LM unit root t-statistic without breaks proposed by Schmidt and Phillips (1992)[2]. We summarize the results in Table 1[3].

Table 1

LM Unit Roots Test Results (break in levels)

Country	OREX		BMREX	
	LM Statistics	Number of break(s) and location(s)	LM Statistics	Number of break(s) and location(s)
Algeria	-3.170 (1)	1990-1993	-1.663 (0)	--------
Egypt	-2.946 (1)*	---------	-8.850 (6)***	1983-1990
Iran	-0.893 (0)	1992	-7.477 (8)***	1981-1990
Iraq	-5.890 (7)***	1990-1996	-2.687 (3)	1992-1994
Israel	-2.995 (6)	1984	-2.206 (0)	---------
Jordon	-2.937 (5)	1985 1988	-2.419 (7)	1985-1988
Lebanon	-2.222 (2)	---------	-2.085 (2)	--------
Libya	-2.300 (0)	---------	-2.933 (0)*	---------
Morocco	-2.021 (1)	---------	-3.567 (7)*	1985-1987
Saudi Arabia	-3.891 (7)***	--------	-2.498 (1)	----------
Syria	-4.220 (7)**	1986-1994	-2.432 (7)	----------
Tunisia	-3.059 (7)	1992-1996	-2.839 (8)	1989
Turkey	-2.925 (8)	1983-1986	-4.719 (6)***	1981 1993

Notes: The 1, 5 and 10% critical values for the LM unit root t-statistic without breaks are: -3.63, -3.06 and -2.77. The 1, 5 and 10% critical values for the minimum LM unit root t-statistic with one break are: -4.239, -3.566 and -3.211. The 1, 5 and 10% critical values for the minimum LM unit root t-statistic with two breaks are: -4.545, -3.842 and -3.504. *, **, *** denote statistical significance at the 10, 5 and 1% levels, respectively. The lag length is reported in parentheses.

Four of the thirteen OREX series (Egypt, Iraq, Saudi Arabia and Syria) reject the unit root null at the 10% level or better. Rejection of the null hypothesis would imply that this OREX series exhibit mean reverting tendencies. In other words, PPP holds. The examination reveals that two structural breaks in level are significant (t-values significant at 10%) six OREX series (for Algeria, Iraq, Jordon, Syria, Tunisia and Turkey), while only one structural break is significant in the two countries (Iran and Israel). However, the structural break is not significant for other countries (Egypt, Lebanon, Libya, Morocco and Saudi Arabia).

The results of the unit root tests as shown in Table 1 appear to support that the BMREX series are stationary for the sample of five countries (Egypt, Iran, Libya, Morocco and Turkey). However, the null hypothesis is not rejected for other countries. Table 1 also shows that two structural breaks in level are significant six BMREX series (for Egypt, Iran, Iraq, Jordon, Morocco, and Turkey). A structural break is found to exist in only Tunisia out of 13 countries. It is observed that any structural break is significant for other remaining countries (Algeria,

[2] We want to determine if including two breaks instead of one can adversely affect power to reject the null. To check for this possibility, we perform additional tests.

[3] See appendix for more detail.

Israel, Lebanon, Libya, Saudi Arabia and Syria). Overall, we find evidence of PPP for eight of the thirteen countries or 60% of the sample at the 10% level or better. The unit root null is rejected for OREX in Iraq, Saudi Arabia and Syria, but not for BMREX, while the unit root null is rejected for BMREX in Iran, Libya, Morocco and Turkey but not for OREX. The PPP holds for both OREX and BMREX in Egypt as only one out of eight cases.

A structural break is found to exist in eight out of thirteen countries for OREX and seven out of thirteen countries for BMREX series, all occurring during the period from 1981 to 1996. This preponderance of break points may reflect policy transformation during this period that lead to large shifts in the exchange rates markets. In addition to exchange rates, the business cycle and political instability might significantly impact price levels in most MENA countries.
Our other one interest in this paper concerns the persistence of shocks to the OREX and BMREX. A measure of persistence typically applied in the literature is the half life, which indicates how long it takes for the impact of a unit shock to dissipate by half.

Table 2 report calculations of the half lives of random shocks to the OREX and BMREX series that are able to reject the null of unit root for the countries based on the Table 1. Looking at the half life point estimates, we can observe that the half life for the OREX series range minimum from 0.326 years (Saudi Arabia) to maximum 7.436 (Iraq). And it is found that the estimated half lives of adjustments to PPP are 0.374 and 0.689 for Syria and Egypt respectively.

Table 2

Half Lives of OREX and BMREX

Country	**OREX**		**BMREX**	
	ϕ	**Half lives (years)**	ϕ	**Half lives (years)**
Egypt	-0.366	0.689	-0.562	1.202
Iran	-----	-----	-0.730	2.202
Iraq	-0.911	7.436	-----	-----
Libya	-----	-----	-0.525	1.075
Morocco	----	-----	-0.380	0.716
Saudi Arabia	-0.120	0.326	-----	-----
Syria	-0.157	0.374	----	-----
Turkey	-----	-----	-0.571	1.236

Notes: The reported value for ϕ is estimated from Eq. (4) and used to calculate the reported "approximate" half lives, $\ln(0.5)/\ln|\phi|$.

As reported in Table 2, the estimated half lives indicate the existence of considerable variation in the persistence of BMREX series among countries. But contrary to OREX series (if we neglect Iraq), all are over one year except Morocco (0.716). The point estimates of the half lives for both OREX and BMREX in the seven countries are lower than range of the consensus of 3-5 years in the literature (e.g. Rogoff, 1996). It is important to note that half live for OREX in Egypt is faster than BMREX based estimate.

Table 3

LM Unit Roots Test with two breaks

Country	OREX				BMREX			
	LM	TB	B_{t1}	B_{t2}	LM	TB	B_{t1}	B_{t2}
Algeria	-3.170 (1)	1990 1993	0.589***	0.255***	-3.554 (8)*	1985 1993	-0.050	0.496*
Egypt	-5.592 (8)***	1985 1990	0.008	0.609***	-8.850 (6)***	1983 1990	-0.105***	0.159***
Iran	-2.015 (8)	1982 1985	-0.802**	-0.016	-7.477 (8)***	1981 1990	0.530***	0.973***
Iraq	-5.890 (7)***	1990 1996	0.439***	3.020***	-2.687 (3)	1992 1994	2.311***	0.890**
Israel	-4.383 (7)**	1985 1992	0.058	0.187**	-3.121 (0)	1980 1984	0.119	0.129
Jordon	-2.937 (5)	1985 1988	-0.219***	0.180***	-2.419 (7)	1985 1988	-0.158**	0.224**
Lebanon	-2.925 (6)	1992 1996	-2.113**	1.06	-2.796 (2)	1991 1994	0.818*	0.547
Libya	-2.849 (0)	1983 1989	-0.067	-0.081	-4.698 (1)***	1982 1986	-0.011	0.334**
Morocco	-2.975 (8)	1981 1985	-0.091	-0.108	-3.567 (7)*	1985 1987	-0.338***	-0.189*
Saudi Arabia	-5.864 (7)***	1983 1987	0.014	-0.034	-5.619 (7)***	1985 1994	0.018	-0.045**
Syria	-4.220 (7)**	1986 1994	-0.955***	2.181***	-3.239 (7)	1981 1983	-0.259	0.007
Tunisia	-3.059 (7)	1992 1996	0.271**	0.212**	-3.298 (7)	1980 1989	-0.019	-0.370***
Turkey	-2.925 (8)	1983 1986	0.390**	-0.382**	-4.719 (6)***	1981 1993	0.175*	0.573***

Notes: TB is the date of the structural break. B_{t1} and B_{t2} are the dummy variables for the structural breaks in the intercept. Critical values for the LM test at 10, 5 and 1% significance levels are -3.504, -3.842, -4.545. *, **, *** denote statistical significance at the 10, 5 and 1% levels, respectively. The lag length is reported in parentheses

Table 4

LM Unit Roots Test with one break

Country	OREX			BMREX		
	LM	TB	B_t	LM	TB	B_t
Algeria	-----	-----	-----	-1.906 (0)	1994	-0.162
Egypt	-3.157 (1)	1988	-0.150	------	-----	------
Iran	-0.893 (0)	1992	2.894***	------	------	------
Israel	-2.995 (6)	1984	0.180*	-2.572 (0)	1984	0.099
Lebanon	-2.542 (2)	1994	0.420	-2.365 (2)	1994	0.486
Libya	-2.610 (0)	1983	-0.056	-4.247 (1)***	1983	0.052
Morocco	-2.400 (8)	1980	0.145	------	------	------
Saudi Arabia	-4.927 (7)***	1987	-0.026	-4.661 (7)***	1987	-0.018
Syria	------	------	------	-2.897 (7)	1996	0.306
Tunisia	------	------	------	-2.839 (8)	1989	-0.342***

Notes: TB is the date of the structural break. B_t is the dummy variable for the structural break in the intercept. Critical values for the LM test statistic at the 10, 5 and 1% significance levels are -3.211, -3.566, -4.239. The lag length is reported in parentheses. *, **, *** denote statistical significance at the 10, 5 and 1% levels, respectively.

Table 5

LM Unit Root tests (Without Break)

Country	OREX	BMREX
Algeria	-------	-1.663 (0)
Egypt	-2.946 (1)*	-------
Israel	-------	-2.206 (0)
Lebanon	-2.222 (2)	-2.085 (2)
Libya	-2.300 (0)	-2.933 (0)*
Morocco	-2.021 (1)	---------
Saudi Arabia	-3.891 (7)***	-2.498 (1)
Syria	----------	-2.432 (7)

Notes: The 1, 5 and 10% critical values for the LM test without a break are −3.63, −3.06, −2.77, respectively *,**and *** denote statistical significance at the 10%, 5% and 1% levels respectively. The lag length is reported in parentheses.

V. CONCLUSION

Using official and black market real exchange rates data from thirteen MENA countries are examined over the period 1970–1998 to test for evidence of PPP. We utilize a LM unit root test that endogenously determines breaks in level. The mean reversion hypothesis is accepted for the four of thirteen countries using the official exchange rate and five of thirteen countries using black market exchange rate.

In this study we provide an analysis of PPP persistence by comparing a data set of BMREX and OREX for 13 MENA economies. We calculate the half life point estimates by using traditional methodology. The point estimates of the half lives for both OREX and BMREX in the seven countries are lower than range of the consensus of 3-5 years in the literature.

REFERENCES

Abuaf, N. and Jorion, P. (1990). Purchasing Power Parity in the Long Run. *The Journal of Finance,* 45(1), 157- 174.

Adler, M. and Lehmann B. **(**1983). Deviations from Purchasing Power Parity in the Long Run, *Journal of Finance*. 38(5), 1471– 487.

Age´nor P.R and Taylor M.P. (1993). The causality between official and parallel exchange rates in developing countries, *Applied Financial Economics*, 3, 255–266.

Aslan, A., Kula, F. and Kalyoncu, H. (2010). Additional evidence of long-run purchasing power parity with black and official exchange rates, *Applied Economics Letters*, First published on 28 September 2009 (iFirst) URL:http://dx.doi.org/10.1080/13504850902967522

Baghestani H. (1997). Purchasing power parity in the presence of foreign exchange black markets: the case of India, *Applied Economics*, 29, 1147–1154.

Baharaumshah, A. and Ariff, M. (1997). Purchasing power parity in South East Asian countries economies: A cointegration approach, *Asian Economic Journal*, 11(2), 141-153

Bahmani-Oskooee, M. and Goswami, G. G. (2005). Black Market Exchange Rates and Purchasing Power Parity in Emerging Economies, *Emerging Markets Finance and Trade*, 41, 37-52.

Bahmani-Oskooee, M. (1998) Do exchange rates follow a random walk process in Middle Eastern countries? *Economics Letters*, 58, 339–344.

Bahmani-Oskooee, M., and Mirzai, A. (2000). Real and Nominal Effective Exchange Rates for Developing Countries: 1973:1–1997:3, *Applied Economics*, 32, 411–428.

Basher, S. A. and M. Mohsin, (2004). PPP tests in cointegrated panels: evidence from Asian developing countries, *Applied Economic Letters*, 11, 163-166.

Cerrato M, Sarantis N. (2007). Does Purchasing Power Parity Hold in Emerging Markets? Evidence From a Panel of Black Market Exchange Rates, *International Journal of Finance and Economics*, 12, 427–444.

Chen, B. (1995). Long-run purchasing power parity: evidence from some European monetary system countries, *Applied Economics*, **27**, 377–83.

Cheung, Y.W, and Lai, K. (1993). Long-run purchasing power parity during the recent float, *Journal of International Economics*, 43, 181-192

Cheung, Y.W., and Lai K. (1998). Parity Reversion in Real Exchange Rates During the Post-Bretton Woods Period, *Journal of International Money and Finance*, 17, 597-614.

Diamandis P. F. (2003). Market efficiency, purchasing power parity, and the official and parallel markets for foreign currency in Latin America, *International Review of Economics and Finance*, 12, 89–110.

Edwards, S. (1989). Real Exchange Rates, Devaluation, and Adjustment: Exchange Rate Policy in Developing Countries. The MIT Press: Cambridge, 87-127.

Feridun, Mete (2005). Can We Explain the Long-Term Real Equilibrium Exchange Rates through Purchasing Power Parity (PPP): An Empirical Investigation (1965-1995), *Ekonomický Casopis*, 53(3), 273-283.

Frankel, Jeffrey A**. (**1986). International Capital Mobility and Crowding-out in the U.S. Economy: Imperfect Integration of Financial Markets or of Goods Markets? in *How Open is the U.S. Economy?* R. W. Hafer, ed. Lexington, Mass.: Lexington Books, 33–67.

Frenkel, Jacob A**. (**1981). The Collapse of Purchasing Power Parity During the 1970s, *European Economic Review.* 16(1), 145–65.

Frenkel, J and M Mussa (1985). Asset Markets, Exchange Rates and the Balance of Payments, *Handbook of International Economics*, Volume II (eds.), Ronald Jones and Peter Kenen, North Holland, Amsterdam, 679- 747.

Froot, Kenneth A. and Kenneth Rogoff (1995). Perspectives on PPP and Long-Run Real Exchange Rates*, In Handbook of International Economics*, Volume 3, ed. G. Grossman and K. Rogoff. Amsterdam: Elsevier Science, 1647–1688.

Glen, J. (1992). Real exchange rates in the short, medium, and long run, *Journal of International Economics*, 33, 147-166

Hakkio, Craig S., 1986, Does the exchange rate follow a random walk? A Monte Carlo study of four tests for a random walk, *Journal of International Money and Finance,* 5, 221-229.

Hung, M. and Jan, Y. (2002). Use of deviations of purchasing power parity and interest rate parity to clarify the 1997 Asian financial crisis, *Review of Pacific Basin Financial Markets and Policies*, 5, 195–218.

Kuo, B. and A. Mikkola (1999). Re-Examining Long-Run Purchasing Power Parity, *Journal of International Money and Finance*, 18, 251-66.

Lee, J., Strazicich, M. C. (2003). Minimum LM unit root test with two structural breaks, *The Review of Economics and Statistics*, 85, 1082–1089.

Lee, J., Strazicich, M. C. (2004). Minimum LM Unit Root Test with One Structural Break. Department of Economics, Appalachian State University Working Paper Series.

Lothian, J. R. and Taylor M. (1996). Real Exchange Rate Behavior: The Recent Floar From the Perspective of the Past Two Centuries, *Journal of Politzcal Economnj.* 1043, 488-509.

Lothian, J. R. and Taylor, M. P. (1997). Real exchange rate behavior, *Journal of International Money and Finance*, 16, 945–54.

Luintel K. B. (2000). Real Exchange Rate Behaviour: Evidence from Black Markets, *Journal of Applied Econometrics*, 15, 161-185.

MacDonald, R (1996). Panel unit root tests and real Exchange rates, *Economic Letters,* 50, 7 – 11.

Mark, N. **(**1990). Real and Nominal Exchange Rates in the Long Run: An Empirical Investigation, *Journal of International Economics* 28 1- 2, 115-36

Mark, N. (1995). Exchange Rates and Fundamentals: Evidence on Long-Horizon Predictability*, American Economic Review*, 85, 201–218.

Meese, R and K. Rogoff. (1983). Empirical Exchange Rate Model of the Seventies: Do They Fit out of Sample?, *Journal of International Economies*, 14, 2-24

Montiel, P. (1997), "Exchange rate policy and macroeconomic management in ASEAN countries: in J. Hicklin et al.: Macroeconomic issues facing ASEAN countries, Washington, DC, IMF.

Narayan K. and B.C. Prasad (2005). The validity of purchasing power parity hypothesis for eleven middle eastern countries, *Review of Middle East Economics and Finance* **3**, 135–149.

Perron, P. (1989). The great crash, the oil price shock, and the unit root hypothesis. *Econometrica*, 57, 1361–401.

Phylaktis K, Girardin E. (2001). Foreign exchange markets in transition economies: China, *Journal of Development Economics*, 64, 215–235.

Phylaktis K, and Kassimatis Y. (1994). Does the real exchange rate follow a random walk?, *Journal of International Money and Finance*, 13, 476–495.

Pippenger, J. (1982). Purchasing Power Parity: An Analysis of Predictive Error, *Canadian Journal of Economics*, 15, May, 335-346.

Reinhart C.M, and Rogoff K. (2004). The modern history of exchange rate arrangements: a reinterpretation, *Quarterly Journal of Economics*, CXIX, 1–48

Rogoff, K. (1996). The purchasing power parity puzzle, *Journal of Economic Literature*, 34, 647-68.

Roll, R., 1979. "Violations of Purchasing Power Parity and their Implications for Efficient International Commodity Markets," in *International Finance and Trade, Volume 1*. M. Sarnat and G.P. Szego, eds. Cambridge. Mass.: Ballinger, pp. 133–76.

Sarno, L. (2003). Nonlinear exchange rate models: a selective overview, *Rivasta di Politica Economica*, 93, 33–46.

Sarno, L. and Taylor, M.P. (2002). Purchasing power parity and the real exchange rate, *IMF Staff Papers*, 49, 65–105.

Schmidt, P. and Phillips, P. C. B. (1992). LM tests for a unit root in the presence of deterministic trends, *Oxford Bulletin of Economics and Statistics*, 54, 257–87.

Taylor, M. P., (1988). An empirical examination of long run purchasing power parity using cointegration techniques, *Applied Economics,* 20, 1369-1381.

Taylor, M.P. and D.A. Peel (2000). Non-linear Adjustment, Long-run Equilibrium and Exchange Rate Fundamentals', *Journal of International Money and Finance*, 19, 33-53.

Telatar, E. and Kazdaglı, H. (1998). Re-examine the long-run purchasing power parity hypothesis for a high inflation country: the case of Turkey 1980–93, *Applied Economics Letters*, 5, 51–53.

Weliwita, A. (1998). Cointegration tests and the long-run purchasing power parity: Examination of six currencies in Asia, *Journal of Economic Development*, 23(1), 103-115.

REEVALUACIJA PARITETA KUPOVNE MOĆI U MENI: EMPIRIJSKI DOKAZI U PRISUSTVU ENDOGENO ODREĐENIH PRIJELOMNIH TOČAKA

Sažetak

Ovaj rad ponovno proučava hipotezu pariteta kupovne moći u kojoj su endogeno određene prijelomne točke ugrađene u 13 najvećih zemalja MENA-e koristeći službene tečajeve i tečajeve na crnom tržištu za period od 1970 do 1998. Koristili smo Lagrange Multiplier test jediničnog korijena koji endogeno određuje strukturalne prekide u razini. Nalazimo dokaze pariteta kupovne moći za osam od trinaest zemalja na razini od 10% ili bolje. Također smo konstruirali poluživote kako bismo istražili postojanost devijacija od pariteta kupovne moći. Procjene parametara poluživota za OREX i BMREX u sedam su zemalja niže od u literaturi općeprihvaćenih 3-5 godina.

***Ključne riječi**: PPP (paritet kupovne moći), tečaj na crnom tržištu.*
***JEL:** E24*

Osama D. Sweiden[1]

UDK 336.781.5(569.5)
ORIGINAL SCIENTIFIC PAPER
IZVORNI ZNANSTVENI RAD

INTEREST RATE PASS-THROUGH: THE CASE OF JORDAN

ABSTRACT

The paper seeks to explore empirically the long-run relationship between short-term policy interest rate and deposit and lending rates in Jordan. Technically, we examine the speed of adjustment and pass-through from policy rate to deposit and lending rates. The empirical evidence of the Jordanian economy shows deposit and lending rates adjust primarily in response to the previous period's departure from the long-run equilibrium. Further, retail interest rates follow a symmetric movement for their deviations from the long-run equilibrium. Accordingly, the CBJ has the power to control the spread between deposit and lending rates. Furthermore, deposit rate adjusts larger and faster than lending rate for a deviation from the long-run equilibrium. As a result, Jordan's monetary policy action needs approximately 11 quarters to be effective.

Keywords: *Monetary policy, Central bank, Symmetric adjustment, Interest rate pass-through, Error correction model.*

I. INTRODUCTON

The behavior of macroeconomic variables has long been an object of interest to economists and scholars. They spend significant efforts to predict the future path of these variables based on information from the history. Nowadays, it is widely recognized that monetary policy has a real influence on the economy over the short horizon. Besides, economists aware that the long-run effects of monetary policy fall entirely on prices. That's why, central banks play a crucial role to steer the economy toward more economic growth and more inflation rate in the short run. Central bankers determine the economy destination and they know the considerable responsibility they have. As a result, they work within critical restrictions such as effective, accurate, transparent and accountable monetary policy while performing their missions. Monetary policy effectiveness relies mainly on the degree and speed of retail interest rate adjustment to a change in policy interest rate. For this reason, understanding channels of monetary transmission had received enormous attention on both theoretical and empirical levels. However, it has a shortcoming because central banks use short-term interest rates as a policy instrument i.e. overnight interest rate and certificate of deposit. Consequently, the relationship between policy short-term interest rate and banks' retail interest rates i.e. deposit and lending rates have received modest attention in monetary theory. Economists widely agree that the control on firms' and households' behaviors is more related to retail interest rates rather than policy rate. Despite that, significant theoretical economic models[2] assume lending interest rate is equivalent to policy interest rate[3]. They assume implicitly that central bank has a full control over the interest rate. Hence, it is untrue that central banks have a full

[1] Assistant Professor of Economics, Department of Accounting, Finance and Economics, University of Sharjah, Sharjah, UAE, E-mail: osweidan@sharjah.ac.ae.
[2] Bernanke and Gertler (1989), Ravenna and Walsh (2006).
[3] On the contrary, Tillmann (2009) made a clear distinction between deposit rate and lending rate in his model.

direct control over the aggregate demand and inflation rate, because economists should understand the effect of policy short-term interest rate on retail interest rates. Additionally, early researches on the monetary transmission mechanism assumed immediate and complete pass-through of changes in policy rates to retail bank rates[4]. Recently, large numbers of empirical studies report stickiness in retail banks' interest rate, particularly lending rate. Put it in another way, retail banks' interest rate has asymmetric adjustment to an increase or a decrease in policy interest rate.

The current paper seeks to investigate empirically the long-run relationship between short-term policy interest rate and deposit and lending rates in Jordan. Specifically, we investigate the speed of adjustment and pass-through from policy rate to deposit and lending rates. Further, we test whether banks' retail interest rate respond in symmetric manner to policy interest rate or not. The current paper findings help to understand monetary policy effectiveness in Jordan. Moreover, it highlights on the commercial banks' behavior to set the deposit and lending rate in Jordan. The paper contributes by exploring the long-run relationship between short-term policy interest rate and retail interest rates in a developing economy. Further, Jordan lacks such important studies, thus, we believe this paper helps the economic policymakers and scholars to have more knowledge about the Jordanian monetary policy. The rest of the paper is organized as follows: Section II presents the literature review of interest rate pass-through. Section III introduces monetary policy in Jordan. Section IV introduces the method of the current study. Section V presents the empirical results. Conclusions are presented in the last section.

II. LITERATURE REVIEW

Since the last two decades, the concept of interest rate pass-through receives more attention in monetary economics. Central banks can influence short-term money market interest rate which, in turn, affects retail bank interest rates. On the aggregate demand side, retail interest rates play a crucial role to determine the decision of both lenders and borrowers, which creates inflation rate and economic growth. What is more, lending rate has a significant influence on the production cost, aggregate supply side. Tillmann (2008) states that monetary transmission cost channel describes the supply side effect of interest rates on firm's cost structure. If firms decide to borrow from financial intermediaries to finance factors of production in advance, then interest rates have an influence on their costs of production and, hence, on inflation rate. Additionally, he argues two significant points regarding the relationship between interest rate and inflation rate. First, the financial intermediaries play a decisive role in propagating interest rate shocks to the cost side of the economy and, finally, to inflation rate. Second, interest rate effect might reflect other factors leading to cost pressure more than labor share as a measure of marginal cost, which leads ultimately to a higher inflation rate. Tillmann (2009) demonstrates that uncertainty about the cost channel reflects uncertainty regarding the role of financial markets in transmitting policy shocks to the supply side of the economy. He proves that uncertainty about the cost channel affects the strength of interest rate adjustment.

Interest rate pass-through means how a change in policy interest rate influences retail interest rates; deposit rate and lending rate. Consequently, the nature of this relationship has a direct impact on monetary policy effectiveness. For the purpose of introducing the idea of interest rate pass-through, we adopt de Bondt (2005) method which uses the relationship between policy interest rate and retail interest rate as follows:

$$RR_t = C_0 + C_1 MR_t \quad (1)$$

4 For more details see Bernanke and Gertler (1995) and Kashyap and Stein (2000).

where RR_t is the retail interest rates (price) set by banks. C_0 is a constant markup. MR_t denotes the market interest rate (the marginal cost price for banks). The coefficient C_1 is the response of retail interest rates to market interest rate. If we live in a perfectly competitive economy with complete information, then we should not worry about the response of retail interest rates for a change in market rate, because we expect one-to-one relationship. But, we live in imperfect competition economies. As a result, the relationship should be less than one in the short run, which is known as interest rate stickiness. Technically, the value of C_1 depends on all types of imperfections in the economy and the level of uncertainties. For example, market power, switching costs and asymmetric information costs (adverse selection and moral hazard). The empirical studies focus on the value of C_1. Hence, we expect to find the value of C_1 is less than one in Jordan.

Most the empirical studies focus on answer the following question do banks' interest rates respond in asymmetric manner to policy interest rate? Sorensen and Werner (2006) show the previous practical studies[5] differ widely in terms of scope and methods. As for the scope, some studies focus on aggregate interest rate series for individual countries. Other studies use micro banks information to investigate the price setting behavior of these banks. In terms of method, the macro studies utilize single-equation error-correction model (ECM) to measure the dynamics of the pass-through. On the contrary, the micro studies employ panel data techniques. The previous applied studies conclude the degree and speed of pass-through differ significantly across countries as well as across banking products, especially in the short-run.

Large numbers of economists submit different justifications for the stickiness in retail banks' interest rates. These explanations rely either on theoretical or empirical work. In the theoretical part, Lowe and Rohling (1992) state there are four theories to explain loan rate stickiness, which they are; adverse selection, switching costs, risking sharing and consumer irrationality. In an earlier theoretical work, Stiglitz and Weiss (1981) show in an equilibrium characterized by *credit rationing* lending rate may not move-up even when other interest rates in the economy increase, because the interest rate charged by a bank may influence the hazardousness of the loans through imperfect information; *adverse selection and moral hazard*. In this case, higher interest rate may attract riskier borrowers, thus, the probability of not repaying back the loan is higher. Also, higher interest rate may incentive borrowers to engage in riskier investments. Accordingly, banks cannot increase lending rates even if they face higher marginal costs. In sum, the existence of asymmetric information between borrowers and lenders in the loan market may create an upward stickiness in lending rates.

In the bank loan market, running the business is completely different from other markets. The bank needs to find out some information about the features of each customer. This is a costly activity for the bank and usually it passes onto the customer as fees. This fee makes it costly for a buyer to switch from one bank to another. This is known in the literature as switching cost. Klemperer (1987) shows in a theoretical model that switching cost in a mature market reduces the elasticity of demand facing banks or creates a monopoly power in the banks' hands. Thus, for any bank to attract any customer from any other banks, the interest rate cut should be at least greater than the switching cost. With a large switching cost, there is no incentive to cut the interest rate. As a result, incomplete adjustment of retail interest rate for a change in market interest rate.

In the empirical part, Thompson (2006) proves that the prime lending-deposit rate spread displays asymmetric adjustment. He argues asymmetric adjustment in the spread is due to the *information asymmetries* between banks and their customers and the existence of switching costs. As a result, banks may be slow to adjust their rates for a change in market interest rate.

[5] For more details about the sample of the studies see Sorensen and Werner (2006) footnote 3 in page 8.

Banks may utilize this practice of asymmetric price setting behavior even though it may not be optimal in the long run. If banks have market power, they can widen of the spread by slowly adjusting their lending rates to the falling deposit rates. However, other competing banks would simply adjust their lending rates first to capture more customers and gain greater market share. Dueker (2000) examines the existence of an asymmetric relation between the prime rate and market interest rates. He finds two types of asymmetry in the prime rate. First, the latent prime rate moves more quickly in relation to the market interest rate, if the two rates are rising than if they are falling. This implies prime rate responds faster to positive shocks of market rate than negative shocks. Second, prime rate fluctuation is biased upward. Consequently, he argues banks are unlikely to lower their prime rates during a recession due to the *higher risk of default*. This risk-averse behavior of banks and their managers may result in prime rates adjusting asymmetrically to movements in market rates.

Recently, Leuvensteijn et al. (2008) investigate the effects of *bank competition* on bank loan and deposit rate levels as well as on their responses to changes in market rates by using data from the euro area during the period (1994-2004). They find stronger competition significantly lower spreads between banks and market interest rates. In addition, they conclude in more competitive markets, bank interest rates react more strongly to changes in market interest rates. Besides, they confirm when competitive pressure is heavier in the loan market than in the deposit markets, banks compensate for their reduction in loan market income by lowering their deposit rates. Neumark and Sharpe (1992) investigate the impact of *market concentration* on the adjustment prices in the market for consumer bank deposits. They use panel data of consumer bank deposits interest rate from the U.S. economy. They find banks in concentrated markets are slower to raise interest rates on deposits in response to rising policy interest rate. On the contrary, they find[6] the same banks are faster in reducing deposits' interest rates for decreasing policy interest rate. This result suggests that downward price rigidity, the analogy to upward interest rate rigidity, exists and related to the *market power*.

The methodologies employed in estimating the interest rate pass-through are developed during the last two decades. Some economists develop new techniques with noteworthy features to explore the economic variables fluctuations in-depth. Technically, they focus on the asymmetries of the macroeconomic and monetary variables. Scholars look to asymmetry from two different dimensions; persistence and influence. The former indicates, for example, the positive phases persist more than the negative phases of a series. The latter means, for example, to specify that positive shocks of money supply has a stronger effect on the real output than the negative shocks. Sichel (1993) states that the importance of asymmetries arises from a desire to understand facts about business cycles and other economic variables. Further, standard linear time series models are not capable to illustrate asymmetric behavior under certain assumptions.

Some economists noticed that some macroeconomic variables in many countries follow an asymmetry behavior, despite the fact that asymmetries have only recently been examined empirically, for example, Cover (1992) proves that an expansionary monetary policy in the U.S. economy does not affect the output, while a contractionary monetary policy affects the output. Sichel (1993) provides evidence from the U.S. shows real GNP displays weak asymmetric adjustment[7]. Additionally, recent studies concerning monetary variables reported asymmetric behavior. Enders and Granger (1998) present evidence shows the movement toward the long-run equilibrium of the interest rate has asymmetric process. Peersman and Smets (2001) use data from 7 countries of the euro area and find asymmetric effect of monetary policy in Germany, France, Italy, Spain, and Belgium. Florio (2004) reviews five

[6] Their result is similar to Hannan and Berger (1991).

[7] For more studies Holly and Stannett (1995), Terasvirta and Anderson (1992), Falk (1986) and Neftci (1984).

proposed explanations of why monetary policy has an asymmetric effect, of which credit market imperfection. This means the effect on a boom is not the same as in a recession.
Furthermore, the recent studies illustrate the pass-through may be incomplete and the adjustment speed may be slow. The pass-through and adjustment speed also differ across financial institutions and across financial products, implying the speed of monetary transmission may vary across different segments of the banking sector. For example, see Cottarelli and Kourelis (1994), Mojon (2000), de Bondt (2005), Hofmann and Mizen (2004) and Liu et al. (2008). Besides, some studies find the speed of adjustment may be asymmetric. For example, see Chong et al. (2006), Kleimeier and Sander (2006) and Payne and Waters (2008). In a recent study, Ozdemir (2009) finds retail interest rate adjusts symmetrically for an increase or a decrease in money market rate in Turkey.

III. MONETARY POLICY IN JORDAN[8]

Jordan is a small open economy classified as lower middle-income country with about 5.98 million inhabitants and annual per capita income at current market prices equal to $4202 in 2009. The Jordanian economy is living in an unstable region. As a result, the economy is vulnerable to external developments either political events or economic shocks i.e. higher international oil prices and lower external grants. That's why, the Central Bank of Jordan (CBJ) is seeking to accumulate foreign reserves to help cushion external shocks and maintain the peg. In 1989, the Jordanian economy experienced bad economic shock leads to high inflation rate reached at 25.7% and negative economic growth got in touch with -16.7%. Thus, Jordan adopted an economic adjustment program in the consultation with the IMF aimed to achieve economic stability and to move toward the market-oriented economy. Lately, Jordan relies on its own economic adjustment programs.
Jordan has a stable banking sector; it is privately owned, growing, well capitalized, opened to external investors, liquid and profitable. There are 23 banks are currently operating (13 local commercial banks, 8 foreign banks and 2 Islamic banks). The banking environment is highly competitive. The latest data shows a noticeable decline in the market concentration. Despite that, the largest three banks account for a market share of slightly over 40%.

The CBJ primary announced objective is to enhance economic growth, maintain price stability and sustain a pegged exchange rate to the U.S. dollar. In September 1993, the CBJ moved toward the indirect method i.e. certificate of deposits issued by the CBJ to control money supply and absorb excess liquidity. The reasons behind this new policy are its convenience in the philosophy of free market economy, and its effect on both deposit and lending rates. Prior to mid of 1995, Jordan targeted the monetary aggregate to achieve its economic goals. After the mid of 1995, certificate of deposit auction rate started to be the main tool to conduct monetary policy in Jordan. The new operating procedure of the CBJ is to influence *banks' deposit and lending rates* to guarantee a high demand on the Jordanian dinar relative to the U.S. dollar. Hence, the success of monetary policy to achieve its goals depends on how the certificate of deposit rate affects the bank's retail interest rates. In March 1998, the CBJ added the overnight deposit facility (ODF) as a new tool to manage the liquidity on a daily basis. The ODF interest rate is the floor of the inter-bank rate.
Figure (1) shows the movement of the interest rate in the Jordanian economy and the federal fund rate from the U.S. economy during the period (1994:1-2008:3). It is obvious that since the first quarter of 1999, certificate of deposit rate declined. As a result, the deposit rate responds faster than lending rate and started to decline in the third quarter of 1999. However,

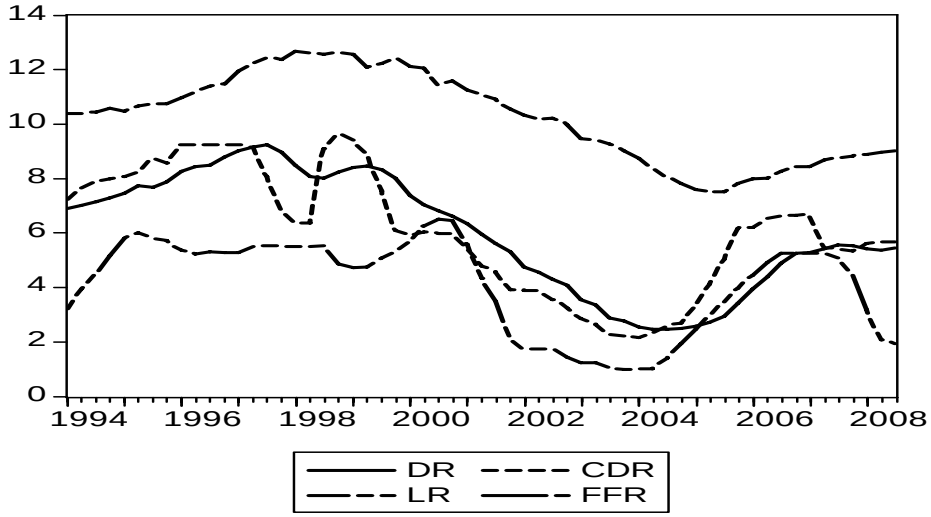
[8] Some details of this part depend on information from Sweidan (2008) and Sweidan (2009).

the lending rate began to decline since the first quarter of 2000. The same behavior happens again when the certificate of deposit rate started to hike in the second quarter of 2004. This behavior proves the reaction of deposit rate to a change in certificate of deposit rate is faster than the reaction of lending rate. Thus, we expect the empirical part of the current study to confirm this behavior. Also, we predict to find a noticeable slow pass-through adjustment because of two reasons; first, the highly competitive business-banking environment in Jordan. Second, large share of the local banks in Jordan are a family-business, as a result, they are careful in running their family investments. We believe this is a fundamental constraint on the effectiveness of monetary policy in Jordan.

What is more, the CBJ works between two edges; maintaining the attractiveness of the Jordanian dinar versus maintaining a pegged exchange rate to the U.S dollar. Therefore, it is crucial for the CBJ to be effective and have a symmetric control and effect on deposit and lending rates to keep their spread within a certain margin.

Figure (1):

Jordan Interest Rate Data and Federal Fund Rate



Recently, Poddar, Sab and Khachatryan (2006) seek to understand monetary transmission mechanism in Jordan. They find the CBJ operating targets affect foreign reserves and bank rates successfully. However, the evidence shows monetary policy is unable to influence output. Sweidan (2008) proves that policy interest rate in Jordan displays symmetric adjustment. This indicates that the CBJ is not prejudice of either easy or tight monetary policy. Recently, Sweidan (2009) studies the preferences of the CBJ. He proves the CBJ prefers higher level of inflation rate and higher level of output.

IV. THE METHODOLOGY

In order to explore a separate dynamic interest rate adjustment in the Jordanian economy between policy interest rate and deposit from one side and between policy interest rate and lending rate from the other side, we employ a symmetric error-correction model (ECM) as a first step in the estimation process. The specification of the ECM is as follows:

$$\Delta rr_t = \mu_0 + \sum_{j=1}^{J} \alpha_j \Delta cdr_{t-j} + \sum_{k=1}^{K} \gamma_k \Delta rr_{t-k} + \beta ect_{t-1} + \varepsilon_t \qquad (2)$$

Where Δ is the first difference, rr_t denotes lending rate (lr_t) or deposit rate (dr_t), cdr_t stands for policy interest rate, certificate of deposit, ect is the error correction term[9], ε_t stands for stochastic error and assumed to be normally distributed, $(0, \sigma^2)$ but not serially correlated. α_j and γ_k reflect the immediate or short run pass-through parameters, β is the speed of adjustment of deposit or lending rates for a divergence from the previous long-run equilibrium. The above-mentioned three parameters help us to understand the long-run relationship between the monetary variables in the model.

Following Scholnick (1996), Sander and Kleimeier (2000) and Ozdemir (2009), we utilize the asymmetric short-run dynamic model to investigate if deposit and lending rates adjust asymmetrically to the movement of the error correction term (ect). Technically, we investigate if retail interest rates adjust in an asymmetric manner to their divergence from the long-run equilibrium. The error correction term is divided into two components, as follows:

$ect_t^+ = ect$, if $ect > mean(0)$

$ect_t^+ = 0$, otherwise

$ect_t^- = ect$, if $ect < mean(0)$

$ect_t^- = 0$, otherwise

Then, we estimate the asymmetric short run dynamic model, which has the following form:

$$\Delta rr_t = \mu_0 + \sum_{j=1}^{J} \alpha_j \Delta cdr_{t-j} + \sum_{k=1}^{K} \gamma_k \Delta rr_{t-k} + \beta_1 ect_{t-1}^{+} + \beta_2 ect_{t-1}^{-} + u_t \quad (3)$$

The asymmetric mean adjustment lag of dr above the equilibrium = $(1 - \alpha_j / \beta_1)$.

The asymmetric mean adjustment lag of dr below the equilibrium = $(1 - \alpha_j / \beta_2)$.

The asymmetric mean adjustment lag is the time horizon through which policy interest rate is fully passed through to deposits and lending interest rates. Put it in another way, it measures the time span during which retail interest rates stick above and below the equilibrium.

In equation (3), the parameter β_1 of the ect_{t-1}^{+} measures the speed of adjustment of deposit or lending rate in response to the previous disequilibrium relation with the policy rate, when the two rates are above their long-run equilibrium level. Whereas, the estimated parameter β_2 of the ect_{t-1}^{-} computes the speed of adjustment of deposit or lending rate toward the new long-run equilibrium, when the two rates are below their previous long-run equilibrium level. The test of whether retail interest rates adjust asymmetrically relies on the values of β_1 and β_2 in equation (3). If β_1 and β_2 are statistically significant and $\beta_1 > \beta_2$, then banks adjust retail interest rate downward faster than upward. However, if $\beta_1 < \beta_2$, then banks adjust retail interest rate upward faster than downward.

V. EMPIRICAL RESULTS

The current study uses quarterly data from Jordan during the period (1994:1-2008:3). The data source is the International Financial Statistics (IFS) CD-ROM. Hence, the first step of the

[9] For the lending rate ECM model, $ect_{t-1} = (lr_{t-1} - \lambda_1 cdr_{t-1})$, Moreover, in the deposit rate ECM model, $ect_{t-1} = (dr_{t-1} - \lambda_2 cdr_{t-1})$. Where λ_1 and λ_2 reveal the long-run pass-through.

empirical part is to investigate whether the data on the level has a unit root or not. Since running a regression of a nonstationary time series on other nonstationary time series may produce a spurious regression. The three variables of the model; certificate of deposit, deposit rate and lending rate have a unit root on the level. This result is confirmed by performing the Augmented Dickey-Fuller (ADF) unit root test without trend and intercept[10]. Table (1) presents the results of the ADF unit root test. The lag length of ADF test is selected based on the Schwartz Criterion. The three variables of the model are stationary at the first difference. Besides, we perform Phillips-Perron and Kwiatkowski-Phillips-Schmidt-Shin tests to support ADF findings. Both tests confirm that all the series have a unit on the level and they are stationary on the first difference.

Table (1):

Augmented Dickey-Fuller Unit Root Test

Variable	Levels		First Difference	
	Lag Length	ADF test	Lag Length	ADF test
cdr	1	-0.89	0	-4.71
dr	1	-0.75	0	-2.62
lr	2	-0.50	1	-2.81

Note: The critical values are -2.60, -1.94 and -1.61 at 1%, 5% and 10%, respectively.

The second step is to test if there is a bivariate cointegration relationship between deposit rate and certificate of deposit from one side and between lending rate and certificate of deposit from the other side. The current study utilizes Johansen test and the results are reported in Table (2) and Table (3). The trace test statistics and maximum eigenvalue in Table (2) illustrate that there is one cointegration relation between deposit rate and certificate of deposit at 1 percent and 5 percent significance levels. Likewise, Table (3) reveals the existence of one cointegration relation between lending rate and certificate of deposit at 1 percent and 5 percent significance levels. These results assure bivariate long-run relationships exist between retail interest rates and policy interest rate in Jordan.

Table (2):

Deposit rate and certificate of deposits cointegration test

Trace Test Statistics				
Null	**Alternative**	**Statistic**	**5% Critical Value**	**1% Critical Value**
r = 0	r > 0	39.95	15.41	20.04
r≤ 1	r > 2	1.64	3.76	6.65
Maximum Eigenvalue				
Null	**Alternative**	**Statistic**	**5% Critical Value**	**1% Critical Value**
r = 0	r = 1	38.31	14.07	18.63
r = 1	r = 2	1.64	3.76	6.65

[10] We follow Enders (1995) methodology to choose the best regression equation that can be used to test for the presence of a unit root, for more details see Enders (1995) pages 221-224.

Table (3):

Lending rate and certificate of deposits cointegration test

Trace Test Statistics				
Null	**Alternative**	**Statistic**	**5% Critical Value**	**1% Critical Value**
r = 0	r > 0	31.72	15.41	20.04
r≤ 1	r > 2	1.86	3.76	6.65
Maximum Eigenvalue				
Null	**Alternative**	**Statistic**	**5% Critical Value**	**1% Critical Value**
r = 0	r = 1	29.86	14.07	18.63
r = 1	r = 2	1.86	3.76	6.65

Table (4) and Table (5) present the results of the ECMs[11] of deposit and lending rates, respectively. In both models, the coefficients of the error correction term and the long-run adjustment are statistically significant different from zero and have the right signs. On the contrary, in both models, the short-run coefficients are statistically insignificant different from zero[12]. This is a significant conclusion because it tells deposit and lending rates adjust principally in response to the previous period's deviation from the long-run equilibrium. Consequently, the mean lag adjustment of deposit rate illustrates it requires approximately 6 quarters to get to its long-run equilibrium. Conversely, it requires about 11 quarters of lending rate to arrive at its long-run equilibrium. The symmetric short-run adjustment of the deposit rate deviation from the long-run equilibrium is corrected by about 17 percent in the current period. The asymmetric adjustment speed of the deposit rate above and below the equilibrium is 22 percent and 15 percent, respectively. To inspect if deposit rate displays symmetric adjustment to the deviation from the long-run equilibrium, we test whether the two parameters β_1 and β_2 are equal or not. The Wald statistic is reported in Table (4), the symmetric adjustment hypothesis of deposit rate cannot be rejected. This implies deposit rate adjusts in a symmetric manner to the movement of the error correction term. In the long-run, the deposit rate adjustment coefficient is 1.09 percent which indicates a complete pass through from certificate of deposit to deposit rate.

[11] We run two residual tests of autocorrelation and both of them reject the hypothesis of autocorrelation.

[12] We have one exception which is in Table (5) where certificate of deposit second lag has a negative effect on lending rate at 10 percent significance level.

Table (4):

The Results of the Error Correction Model: The Deposit Rate

Variables	Δdr_t	
	Symmetric	**Asymmetric**
C	- 0.026 (-1.4)	0.01 (0.28)
cdr_{t-1}	-1.09 (-33.23)***	-
Δdr_{t-1}	0.07 (0.52)	0.04 (0.30)
Δdr_{t-2}	0.01 (0.09)	0.01 (0.07)
Δcdr_{t-1}	0.06 (1.25)	0.06 (1.16)
Δcdr_{t-2}	- 0.004 (-0.10)	-0.008 (-0.19)
ect_{t-1}	-0.17 (-3.3)***	-
ect_{t-1}^{+}	-	-0.22 (-3.40)***
ect_{t-1}^{-}	-	-0.15 (-2.73)***
$\overline{R}^2$	0.80	0.80
F-stat.	45.1	38.04
Wald stat. Prob.	-	1.36 (0.24)

Notes:
1) The ECM estimated using 2 lags based on lag length criterion; LR, FPE, AIC and HQ.
2) */**/***: denotes significance at the 10/5/1 percent level, respectively.
3) T-statistics are in parenthesis.

The symmetric short-run adjustment of lending rate departure from the long-run equilibrium is corrected by approximately 9 percent in the current period. The asymmetric adjustment speed of lending rate above and below the equilibrium is 10 percent and 7 percent, respectively. Similar to deposit rate behavior, the Wald statistic is reported in Table (5), the symmetric adjustment hypothesis of lending rate cannot be rejected. Lending rate adjusts in a symmetric manner to the movement of the error correction term. In the long-run, lending rate adjustment coefficient is 1.21 percent, which implies a complete pass through from certificate of deposits to lending rate.

Table (5):

The Results of the Error Correction Model: The Lending Rate

Variables	Δlr_t	
	Symmetric	**Asymmetric**
C	-0.007 (-1.28)	-0.002 (-0.03)
cdr_{t-1}	-1.21 (-8.62)***	-
Δlr_{t-1}	-0.12 (-0.91)	-0.12 (-0.89)
Δlr_{t-2}	0.03 (0.22)	0.04 (0.28)
Δcdr_{t-1}	-0.01 (-0.32)	-0.01 (-0.25)
Δcdr_{t-2}	-0.08 (-1.70)*	-0.08 (-1.63)
ect_{t-1}	-0.09 (-4.88)***	-
ect_{t-1}^{+}	-	-0.10 (-3.30)***
ect_{t-1}^{-}	-	-0.07 (-1.98)**
$\overline{R}^2$	0.46	0.45
F-stat.	10.3	8.50
Wald stat. Prob.	-	0.23 (0.63)

Note:

1) The ECM estimated using 2 lags based on lag length criterion; LR, FPE, AIC and HQ.
2) */**/***: denotes significance at the 10/5/1 percent level, respectively.
3) T-statistics are in parenthesis.

Overall, the findings of the current paper help the scholars to understand in depth the monetary policy of Jordan. In addition, the results are consistent, making sense and tell a story. Deposit and lending rates change mainly in response to the previous period's departure from the long-run equilibrium.

In the long run, there is a complete pass through from certificate of deposits to deposit and lending rates. Over the modification period, deposit and lending rates adjust in a symmetric process to the deviation from the long-run equilibrium. Further, deposits rate adjusts *larger and faster* than lending rate for a divergence from the long-run equilibrium. These facts mean Jordanian banking sector gives a priority to adjust deposit rate then it focuses on lending rate for a change in policy rate. One possible explanation of this behavior is that banks compete to affect their costs (deposit rate), because it seems their costs are connected to their revenues from certificate of deposit, their costs *backed by* their revenues. On the other hand, they are careful when adjusting their *not backed* lending rate in order to capture more customers and gain greater market share to maximize their profits. The policy implications of our findings are the ability of the CBJ to control the spread between deposit and lending rates since they have symmetric adjustments. In addition, the procedures of Jordan's monetary policy need about 11 quarters to be effective.

VI. CONCLUSIONS

Central banks play a crucial role to steer the economy toward either more economic growth or more inflation rate. The effectiveness of monetary policy relies mainly on the degree and speed of retail interest rates adjustment to a change in policy interest rate. Therefore, the channel between policy interest rate and retail interest rates polarized more attention of monetary economists over the last two decades. This is known in the literature as interest rate pass-through. Recently, some economists develop more techniques to explore the fluctuations in depth. Most empirical studies focus on the question whether bank interest rates respond in asymmetric manner to policy rate. The trend of research concentrates on either aggregate interest rate series or micro banks information. The results are mixed across countries and even across banks' products.

The current paper seeks to explore empirically the pass-through from short-term policy interest rate to deposit and lending rates in Jordan. In particular, we highlight on the behavior of deposit and lending rates. The current paper utilizes an error correction model. The empirical evidence is based on quarterly data over the period (1994:1-2008:3). We can summarize our findings as follows: *First*, deposit and lending rates change principally in response to the previous period's divergence from the long-run equilibrium. *Second*, deposit and lending interest rates follow a symmetric movement for their deviations from the long run equilibrium. *Third*, deposit rate adjusts faster and larger than lending rate to the deviations from the long-run equilibrium. *Fourth,* in the long-run, there is a complete pass-through from certificate of deposit to deposit and lending rates. We believe such a behavior is driven by two motives: the competition among the banks to gain larger market share and the enthusiasm to achieve the largest profits. Banks in Jordan connect their costs (deposit rate) with their revenues from certificate of deposits. They follow a rule: if I take I will give! Conversely, they adjust their lending rate carefully. The policy implications of our paper are the CBJ has the power to control the spread between deposit and lending rates. Besides, Jordan's monetary policy action needs around 11 quarters to be effective.

REFERENCES

Bernanke, B., and Gertler, M., (1995), "Inside the black box: the credit channel of monetary policy transmission", *Journal of Economics Perspective*, 9(4): 27–48.

Bernanke, B., and Gertler, M., (1989), "Agency costs, net worth and business fluctuations" *American Economic Review* 79(1):14–31.

Chong, B.S., Liu, M.H. and Shrestha, K., (2006), "Monetary transmission via the administered interest rate channel", *Journal of Banking and Finance* 30(5):1467–1484.

Cottarelli, C., and Kourelis, A., (1994), "Financial structure, bank lending rates, and the transmission mechanism of monetary policy", International Monetary Fund, IMF Staff Paper 41, 587–623.

Cover, J. (1992) "Asymmetric effects of positive and negative money-supply shocks", *Quarterly Journal of Economics,* 107(4): 1261-1282.

de Bondt, G. (2005) "Interest rate pass-through: empirical results for the Euro area",

German Economic Review, 6(1): 37-78.

Dueker, M., (2000), "Are prime rate changes asymmetric?", Federal Reserve Bank of St. Louis, *Review,* 82 (September/ October): 33-40.

Enders, W. (1995) Applied econometric time series, New York: John Wiley & Sons.

Enders, W., and Granger, C., (1998), "Unit-root tests and asymmetric adjustment with an example using the term structure of interest rate", *Journal of Business and Economic Statistics,* 16(3): 304-311.

Falk, B., (1986), "Further evidence on the asymmetry behavior of economic time series over the business cycle", *Journal of Political Economy,* 94(5):1096-1109.

Florio, A., (2004), "The asymmetric effects of monetary policy", *Journal of Economic Survey,* 18(3): 409-426.

Hannan, T., and Berger, A., (1991), "The rigidity of prices: evidence from the banking industry", *American Economic Review,* 81(4): 938-945.

Hofmann, B., and Mizen, P., (2004), "Interest rate pass-through and monetary transmission: evidence from individual financial institutions' retail rates", *Economica,* 71(2): 99–123.

Holly, S., and Stannett, M., (1995), "Are there asymmetries in UK consumption? a time series analysis", *Applied Economics,* 27(8): 767-772.

Kashyap, A.K., and Stein, J., (2000), "What do a million observations on banks say about the transmission of monetary policy", *American Economic Review,* 90(3): 407-428.

Kleimeier, S., and Sander, H., (2006), "Expected versus unexpected monetary policy impulses and interest rate pass through in eurozone's retail banking markets", *Journal of Banking & Finance,* 30(7) 1839–1870.

Klemperer, P., (1987), "Markets with consumer switching costs", *Quarterly Journal of Economics,* 102(2): 375–394.

Leuvensteijn, M., S˘rensen, C., Bikker, J., and Rixtel, A. (2008), "Impact of bank competition on the interest rate pass-through in the Euro area", European Central Bank, ECB Working Paper No. 885, March.

Lowe, P., and Rohling, T., (1992), "Loan rate stickiness: theory and evidence", Reserve Bank of Australia, Economic Research Department, Research Discussion Paper no. 9206.

Liu, M-H, Margaritis, D., and Tourani-Rad, A., (2008), "Monetary policy transparency and pass-through of retail interest rates", *Journal of Banking & Finance,* 32 (4): 501–511.

Mojon, B., (2000), "Financial structure and the interest rate channel of the ECB monetary policy", European Central Bank, Working Paper Series, Working Paper No. 40.

Neftci, S., (1984), "Are economic time series asymmetric over the business cycle?", *Journal of Political Economy,* 92(2): 307-328.

Neumark, D., and Sharpe, S., (1992), "Market structure and the nature of price rigidity: evidence from the market for consumer deposits", *The Quarterly Journal of Economics,* 107(2): 657-680.

Ozdemir, K., (2009), "Retail bank interest rate pass-through: the turkish experience", *International Research Journal of Finance and Economics*, Issue 28 (January): 7-15.

Payne J., and Waters, G., (2008), "Interest rate pass through and asymmetric adjustment: evidence from the federal funds rate operating target period", *Applied Economics*, 40(11) 1355–1362.

Peersman, G., and Smets, F., (2001), "Are the effects of monetary policy in the Euro area greater in recessions than in booms?", European Central Bank, Working Paper No. 52,.

Poddar, T., Sab, R., and Khachatryan, H., (2006), "The monetary transmission mechanism in Jordan", International Monetary Fund, Working Paper No. 48, Washington D.C., February.

Ravenna, F., and Walsh, C., (2006), "Optimal monetary policy with the cost channel", *Journal of Monetary Economics,* 53(2):199-216.

Sander, H., and Kleimeier, S., (2000), "Asymmetric adjustment of commercial bank interest rates in the Euro-11 countries: implication for monetary policy. 3rd Conference of the Swiss Society for Financial Market Research in Zurich, April 7, 2000.

Scholnick, B., (1996), "Asymmetric adjustment of commercial bank interest rates: evidence from Malaysia and Singapore", *Journal of International Money and Finance,* 15(3): 485-496.

Sichel, D., (1993), "Business cycle asymmetry: a deeper look", *Economic Inquiry,* 31(2): 224-236.

Sorensen, C., and Werner, T. (2006), "Bank interest rate pass-through in the Euro area: a cross country comparison", European Central Bank, Working Paper No. 580, January.

Stiglitz, J., and Weiss, A., (1981), "Credit rationing in markets with imperfect information", *American Economic Review,* 71(3): 917–926.

Sweidan, O., (2009), "Asymmetric central bank's preference and inflation rate in Jordan", *Studies in Economics and Finance* 26(4): 232- 245.

Sweidan, O., (2008), "Does policy interest rate have asymmetric adjustment: case of Jordan", *Applied Econometrics and International Development,* 8(2): 151-157.

Terasvirta, T., and Anderson, M., (1992), "Characterizing nonlinearities in business cycles using smooth transition autoregressive models", *Journal of Applied Econometrics,* 7 (S): S119-S139.

Tillmann, P., (2009), "Optimal monetary policy with an uncertain cost channel", *Journal of Money, Credit and Banking* 41(5): 885-906.

Tillmann, P., (2008), "Do interest rates drive inflation dynamics? an analysis of the cost channel of monetary transmission", Journal of Economic Dynamics & Control, 32(9): 2723–2744.

Thompson, M., (2006), "Asymmetric adjustment in the prime lending-deposit rate spread", *Review of Financial Economics*, 15(4): 323-329.

PASS-THROUGH (PRIJENOS) KAMATNIH STOPA: SLUČAJ JORDANA

SAŽETAK

Rad empirijski istražuje dugoročnu vezu između kratkoročnih ključnih kamatnih stopa i kamatnih stopa na depozite i kredite u Jordanu. Tehnički, ispitujemo brzinu pilagodbe i pass-through od ključne stope do kamatnih stopa na depozite i kredite. Empirijski dokazi jordanske ekonomije pokazuju da se kamatne stope na depozite i kredite prvenstveno usklađuju u odnosu na odmak od dugoročne stabilnosti u prethodnom periodu. Nadalje, kamatne stope na kredite i depozite slijede simetrična kretanja u svojim devijacijama od dugoročne stabilnosti. Shodno tome, Jordanska Centralna Banka ima moć kontrole razlike između kamatnih stopa na depozite i onih na kredite. Osim toga, kamatne stope na depozite se usklađuju šire i brže od kamatnih stopa na kredite radi devijacije od dugoročne stabilnosti. Zbog toga jordanska monetarna politika treba oko 11 kvartala da bi bila efikasna.

Ključne riječi: *monetarna politika, centralna banka, simetrično usklađivanje, prijenos (pass-through) kamatnih stopa, model korekcije greške*

Matjaz IRSIC [1]

UDK 339.138:338.46>(497.4)
ORIGINAL SCIENTIFIC PAPER
IZVORNI ZNANSTVENI RAD

HOW QUALITATIVE ELEMENTS OF RELATIONAL EXCHANGES INFLUENCE AN IMPLEMENTATION OF PURCHASING MARKETING STRATEGIES – A CASE OF SERVICE COMPANIES IN SLOVENIA

ABSTRACT

The author examines a relationship between the qualitative elements of relational exchanges and the implementation of relationship marketing strategies vs. transactional marketing strategies from the buyer's perspective in business-to-business exchanges. Therefore, four groups of qualitative relational exchange' factors have been determined: attractiveness of supplier, attractiveness of total purchasing market for the buyer, competitive position of the buyer on the purchasing market, and the bargaining orientation of the buyer toward its strategic supplier. Drawing on emerging perspectives on service companies with more than 200 employees in Slovenia and their relationship with strategic suppliers, the author proposes that a buyer's perception of qualitative elements of relational exchanges influences employment of particular marketing strategies towards its strategic supplier. Results of empirical study show some correlation between the groups of variables investigated. The influence of measured factors on the implementation of particular group of marketing strategies exists, although the strongest impact is prevailed especially by factors, which are characteristic for short-term relationships. Hence the surveyed companies are oriented much more toward achieving short-term efficiency instead of long-term effectiveness. This research makes a contribution to the strategy literature and to the practitioners, and has important implications for purchasing managers by offering guidelines for mixing the various aspects of partnering according to their objectives and strategies in order to improve the level of their relational approach to their strategic suppliers.

Key words: *qualitative elements of relational exchange, transactional marketing, relationship marketing, purchasing marketing strategies.*

JEL Classification: M310

1. INTRODUCTION AND THEORETICAL BACKGROUND

1.1 INTRODUCTION

Many researchers and managers support the thesis that one of the key goals of marketing is to build and sustain strong long-term relationships (Claycomb, Frankwick, 2010; Palmatier, Scheer, Evans, Arnold, 2008; De Wulf, Odekerken-Schroeder, and Iacobucci, 2001; Gummesson, 1995; Bagozzi, 1995; Groenroos, 1994; McKenna, 1991; Dwyer, Schurr, Oh, 1987). Therefore, the "new" paradigm of marketing in the 21st century is based on long-term interactive bonds among market players. Hence, a deep insight into the characteristics of B2B relational exchange from the buyer's perspective is an important starting point to investigate a development of relationship marketing concept. It has its proponents not only in the marketing academia but in industry as well and has had a major impact upon the

[1] Matjaz Irsic, Ph.D., Assistant Professor, Marketing Department. Faculty of Economics and Business, University of Maribor, Slovenia. E-mail: matjaz.irsic@uni-mb.si.

marketing discipline, triggering a paradigm shift away from transaction-based marketing toward a relationship focus.

While transactional exchange bases on the economic exchange among the participants (i.e. the participants try to maximize the benefit of discrete transaction), relational exchange is accompanied by the economic as well the social exchange, including the factors as: mutual dependence, friendship, closeness, trust, risk, cooperation, opportunism etc. (Bunduchi, 2008, 610-611).

There are a lot of advantages caused by long-term buyer-supplier relationships: provide a firm fast access to new technologies or markets; the ability to provide a wider range of goods and services; economies of scale in joint research and production; access to knowledge beyond a firm's boundaries; bridges to other firms; sharing of risks; and access to complementary skills (Johanson, Mattsson, 1987; Powell, 1987).

The relational exchange is very compounded construct and its elements influence the effectiveness of the relationship. Although there is a huge amount of authors who have analysed the topic mentioned above, there still exist a lot of open questions, especially about the role of specific relational elements in creating effective relationship between the partners.

At the same time, the relationships represent one of the greatest resources for developing sustainable competitive advantage (Claycomb, Frankwick, 2010, 252). On the other hand, the emergence process of coalitions and oppositions requests the adjustment of companies from the aspect of setting goals, strategies and tactical activities. The need for the external sources of purchasing diminishes the role of traditional concepts of the company on the purchasing market in order to determine the partners' negotiating strength. The efficient and effective creation of the purchasing marketing strategies toward important strategic suppliers in such circumstances requires a thorough knowledge of such relationships, necessary conditions for their creation, strengths and weaknesses of such the relationships, as well as their outputs (Shah, Swaminathan, 2008, 471-472).

On the base of the above mentioned problem, the purpose of this paper is to link the selected elements (qualitative elements) of relational exchanges with the implementation of particular purchasing marketing strategies in B2B context as well as to find out if there exist the correlation between selected elements of relational exchanges and the frequency of implementation of purchasing marketing strategies.

Further, we tried to find out do the selected elements of relational exchanges influence the "trade-off" decision of the companies to implement transactional or relational purchasing marketing strategies.

In addition to this fact, it is significant to emphasize the lack of research evidence about this problem in the service industry, although the size of the service sector is increasing in virtually all countries around the world (Lovelock, Wirtz, 2011, 27). Therefore, the service companies in Slovenia have offered the empirical context for the research in this paper.

1.2 THE ELEMENTS OF BUYER'S B2B RELATIONAL EXCHANGES

The review of the current literature about the characteristics of relational exchange uncovers the numerous of elements, which influence the effectiveness of the relationship. In our paper four qualitative elements of relational exchange have been chosen: attractiveness of a supplier, attractiveness of total purchasing market for a buyer, competitive position of a buyer on purchasing market, and bargaining orientation of a buyer.

First and second elements comprize the key strategic factors of purchasing environment of a buyer, while the third one comprizes the key strategic factors of competitive position of a buyer. Thus, we found the theoretical base for the selection of three of elements

in »General electric« (GE) multifactor portfolio matrix, which represents a widely used managerial and methodological tool for strategic decision-making process in the companies (Lancaster, Reynolds, 1998, 139-140). Therefore, it represents meaningfull construct in the estimation of the relational exchange.

The first well-known dimension of GE matrix – »attractiveness of the market« (i.e. market opportunities and threats) we split into two sub-groups: attractiveness of a supplier and attractivenss of other elements of purchasing market for a buyer, in order to expose the supplier as an important market subject in the process of investigating the relational exchange chracteristics.

The third element – competitive position of a buyer on the purchasing market – derived from the second dimension of GE matrix – »competitive position« (i.e. company's competences based on its strengths and weaknesses).

The fourth element of relational exchange investigated in the paper comprizes behavioural characteristics of the relational exchange. Therefore, Westbrook model of bargaining orientation of a buyer toward a supplier (Westbrook, 1996) has been chosen to clearly understand the process of disposing bargaining power among the participants in the relational exchange.

In the following text we have briefly described the main theoretical background of each above mentioned elements.

a) Attractiveness of supplier and other dimensions of purchasing market of a buyer

Evaluation of suppliers' attractiveness is usually compound from a number of different factors, through which the buyer's company judges supplier's capability to build and maintain long-term relational exchange, i.e. financial, economic, technological, cultural, and strategic factors of performance (Ellram, 1990; Lambe, Spekman and Hunt, 2002; Beckman, Haunschild and Phillips, 2004; Wuyts and Geyskens, 2005).

In addition to this general factors, mentioned above, it seems to be crucial to emphasize some specific or derivate factors: management' ability of supplier, strength and competences of employees in the company of supplier, supplier's cost structure, total quality system of implementation (for the products, systems, processes, technology, and philosophy), ability of supplier to adopt environmental changes, its financial stability, company of production and control mechanisms, development of electronic communication, supplier's strategies and activities, and supplier's potential for long-term cooperation (Monczka, Trent and Handfield, 2005, 215-222).

An extensive review of the literature on strategic alliances (relational exchange) in strategic management uncovered four key factors that have been shown to influence supplier's selection and subsequent relational exchange performance: trust, commitment, complementarity, and value or financial payoff (Shah and Swaminathan, 2008, 472; Hald, Cordon, Vollmann, 2009, 960-970).

Attractiveness of total purchasing market for the buyer corresponds with its opportunities and threats. The prevailing factors in this group of qualitative elements are as follows: the size of purchasing market (or availability of substitutes), its growth rate and structure, intensity of competition, technological, cultural, legal, political, economic and other relevant factors of macro-environment (Saunders, 1997, 55).

b) Buyer's competitive position on the purchasing market

Buyer's competitive position has derived from strategic analysis and prognosis of its internal (company) environment, i.e. analysis of its resources and competences. The result of

such analyses has brought to the buyer the information of its "core" competitive advantages and disadvantages.

An explanation of competitive advantage bases on two prevailing theoretical concepts: "resource-based" concept and "relational-view" concept of the company.

Advocators of "resource-based" concept interpret a competitive position of the company as a result of such available resources and abilities which couldn´t be imitated in a short time (i.e. company's image, market share, customer satisfaction, product quality, distribution efficiency, knowledge and specific competences of employees etc.). On the other side, the defenders of "relational-view" concept explain that company's competitive position has not derived from the internal (company's) environment, but it has based on "business-to-business" sources of competitive advantages, i.e. on transaction specific investments between a buyer and a supplier in the relational exchange (integrated knowledge of both partners, mutual and integrated effectiveness of performance, information systems among them, integrated marketing communication etc.) (Mesquita, Anand and Brush, 2008, 913).

c) Bargaining orientation of a buyer toward a supplier

Each relational exchange is closely associated with a specific "transaction climate" comprised from sentiments and behaviours, expectations, perceptions, feelings etc. of participants involved into such relationship. All these elements of transaction climate are linked with specific level of cooperation, opportunism, dependence, conflicts, risks, trust, orientation to reciprocity, satisfaction etc. (Westbrook, 1996; Palmer and Mayer, 1996; Bove and Johsnon, 2001; Walter, Muller, Helfert and Ritter, 2003; Duffy, 2008).

Relevant researchers of this topic state that the level of cooperative (and opportunistic) behaviour can be interpreted by four theoretical constructs: trust, commitment, relational norms, and methods of solving functional conflicts (Dwyer et al. 1987; Heide and John, 1992; Morgan and Hunt, 1994; Siguaw, Baker and Simpson, 1998; Duffy, 2008). Some level of cooperation among participants in relational exchange is a requisite for achieving them. But, the cooperation between a buyer and a supplier has been usually followed by their unilateral behaviour with risk coordination in which the participant estimates a willingness for cooperative behaviour of opposite participant (Westbrook, 1996; Batt and Purchase, 2004; Ritter, Wilkinson and Johnston, 2004; Johnson and Selnes, 2004; Palmatier, Scheer, Evans and Arnold, 2008).

Westbrook has defined four variables by which a participant's behaviour in relational exchange with risk coordination and bargaining orientation at the same time can be explained: risk orientation, orientation towards cooperation, power (dependence), and orientation towards reciprocity (Westbrook, 1996).

1.3 PURCHASING MARKETING STRATEGIES

Those companies which implement marketing orientation on the purchasing market will perform purchasing marketing strategies in order to attain comparative competitive advantages on the purchasing market. In the existing literature, authors deal with factors influencing the choice of purchasing marketing strategies in a similar way.

Baily, Farmer, Jessop and Jones mention the following factors influencing the choice of the purchasing strategy (Baily, Farmer, Jessop, Jones, 1994, 26-28): the position of purchasing in the purchasing chain, the number of favourable resources on the purchasing market, technological development on the purchasing and selling market, stability of purchasing and selling markets, the level of state intervention on the market and the ability of the organisation to manage a certain strategy on the purchasing market.

In addition to market factors, Qualls and Puto also mention the important role of organisational factors, which have an influence on decisions and strategies on the purchasing market. Here, we have to distinguish between taking decisions in conditions of certainty (without risk) and conditions of uncertainty (small, medium or large risk) (Qualls, Puto, 1989, 180-182).

Anders sets the basis for a slightly different definition of purchasing strategies. As important factors influencing basic strategic orientation of the company, Anders mentions purchasing volume and market potential on the purchasing market. Purchasing volume indicates the importance of the purchasing object for the organisation and the relation between the importance of the purchasing object and the necessary scope (ABC - analysis), whereas the market potential shows the quantity of potential supply for a group of purchasing objects. Thus the definition of the purchasing marketing strategy will depend on the intensity of demand, which necessitates a selection of a suitable demand strategy (Anders, 1992, 24).

Koppelmann comes to similar conclusions by defining purchasing potential as an important restricting factor and a starting point for the formation of strategies in the context of purchasing marketing. Purchasing potential is a potential of the company which depends on its advantages and disadvantages. Since purchasing potential represents a restricting factor in purchasing, it indirectly affects the definition of purchasing marketing strategies (Koppelmann, 1993, 111-113). His model of purchasing strategies represents the fundament for empirical part of our research in this paper.

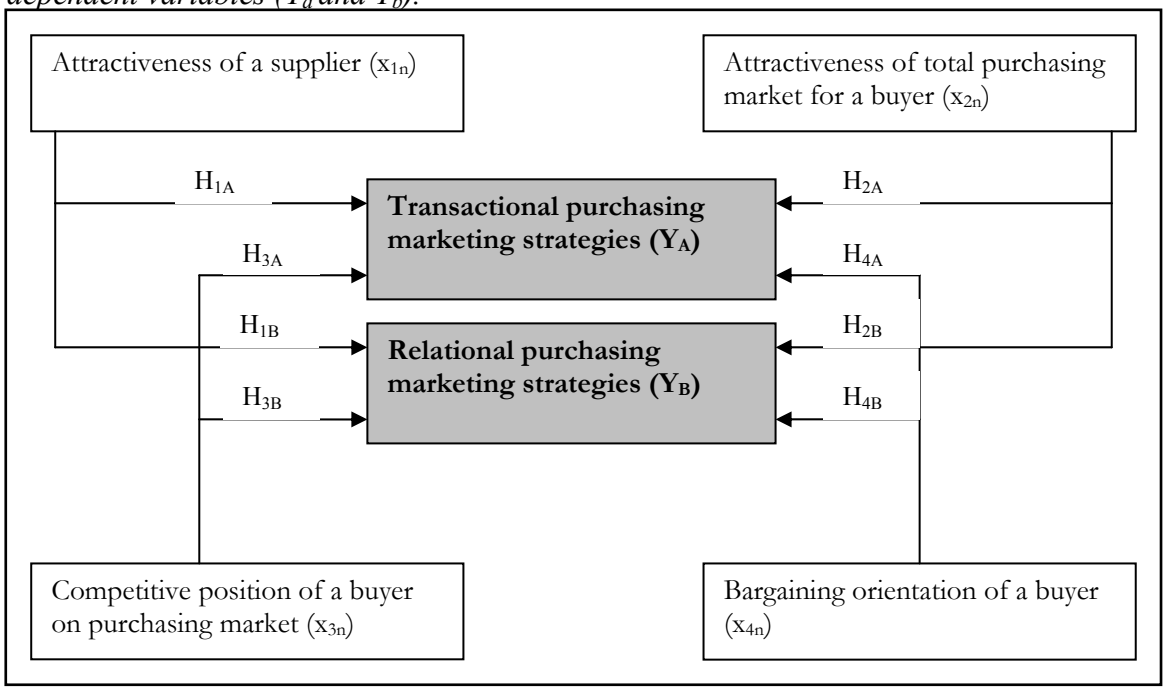
At the same time, it is significant to emphasize, that there is no vigorous research evidence in the literature about the characteristics of transactional and relational purchasing marketing strategies.

2. RESEARCH

2.1 THE DEVELOPMENT OF AN EMPIRICAL MODEL

Our research was based on an empirical model, in which the most significant relationships and interdependencies between variables revealed are seen in figure 1.

Figure 1: Empirical model of relations between qualitative elements of relational exchange (independent variables X_n) and purchasing marketing strategies with two aggregate groups of dependent variables (Y_a and Y_b).



As it has been seen from figure 1, qualitative elements of relational exchange in our empirical model have been defined by four groups of numerical independent variables (x): attractiveness of a supplier, attractiveness of total purchasing market for a buyer, competitive position of a buyer on purchasing market, and bargaining orientation of a buyer: $X = f(_1, x_2, x_3, x_4)$.

For each of four above mentioned groups of constructs we developed independent variables, which have been tested for convergent and discriminant validity and reliability of the measures.

Attractiveness of a supplier (x_1) has been evaluated by nine factors (independent numerical variables): supplier's capacity, location, supplier's financial status, technology, management, quality of products, delivery in due time, purchase price and supplier's ability to meet the market requirements.

Measurement of the attractiveness of total purchasing market for a buyer (x_2) based on the following seven factors that have been considered: the size of the purchasing market (or the availability of substitutes), the growth rate of the purchasing market, its structure (number of buyers and suppliers), stability of the demand, obstacles for entering the industry (entry barriers), obstacles for exiting the industry (exit barriers), and the possibility for a backward vertical integration.

With regard to the competitive position of a buyer on the purchasing market (x_3) eight factors were considered: purchasing potential, "switching" costs, the ratio between supply costs and total purchasing value, the growth rate of purchases, marketing communication

performance, buyer's image assessment, information knowledge of a buyer, and price elasticity of demand.

Bargaining orientation of a buyer toward a supplier (x_4) has been investigated by two main independent variables, i.e. buyer's orientation toward risk and buyer's orientation toward cooperation.

For each of independent variables (factors) the weighted estimation has been measured. It was compounded by respondent's evaluation of a factor and the estimated level of significance of the factor for the respondent as follows:

Weighted estimation of a factor = Respondent's evaluation of a factor * Estimated level of significance of the factor for the respondent.

Both of estimations were measured on the 5-pt. numerical interval scale.

The construct of dependent variables has been composed by 25 selected purchasing marketing strategies based on relevant instruments of purchasing marketing mix: product (service) strategies, price' and terms of exchange' strategies, delivery and inventory strategies, strategies of sources of supply, strategies of processes between a buyer and a supplier, and purchasing marketing communication strategies. Such selection of strategies reveals individual marketing activities of the buyers on their purchasing market. The above mentioned model based on Koppelmann classification of the purchasing marketing strategies (Koppelmann, 1993).

Since, we have looked on "trade-off" between transactional and relational content of purchasing marketing strategies, we split the selected group of 25 strategies onto two sub-groups: transactional purchasing marketing strategies (Y_A, type A) and relational purchasing marketing strategies (Y_B, type B). Transactional purchasing marketing strategies are prevailing in transactional exchanges, while relational purchasing marketing strategies are symptomatic for relational exchanges. For each of the selected strategy the frequency of its implementation has been measured in the buyers' companies on the 5-pt. numerical interval scale ranging from 1 –»never implemented« to 5 – »always implemented«.

2.2 RESEARCH METHODOLOGY

a) The validation of the constructs

In the first phase some of the relevant items for the questionnaire were taken from the relevant literature (see 2.1).

In order to assure convergent validity and reliability of the measures, the dimensionality of six constructs created (attractiveness of a supplier, attractiveness of total purchasing market for a buyer, competitive position of a buyer on purchasing market, bargaining orientation of a buyer, transactional purchasing marketing strategies, and relational purchasing marketing strategies) was assessed in the second phase. Therefore, exploratory factor analysis (EFA) as well as confirmatory factor analysis (CFA) were used. Factor loadings (FL), component reliability (CR) and average variance extracted (AVE) measures for groups of independent variables are shown in table 1 and for groups of dependent variables are shown in table 2.

Table 1:
Constructs (with independent variables), standardized loadings (FL), CR, and AVE

Constructs	Variables	FL	CR	AVE
Attractiveness of a supplier (x_1)	Supplier's capacity	0,822	0,74	0,56
	Location	0,745		
	Supplier's financial status	0,670		
	Technology	0,566		
	Management of a supplier	0,550		
	Quality of products	0,780		
	Delivery in due time	0,756		
	Purchase price	0,600		
	Supplier's ability to meet market requirements	0,645		
Attractiveness of total purchasing market for a buyer (x_2)	The size of a purchasing market	0,786	0,66	0,54
	The growth rate of the purchasing market	0,688		
	Structure of a market	0,661		
	Stability of demand	0,688		
	Entry barriers	0,890		
	Exit barriers	0,790		
	Possibility for a backward vertical integration	0,689		
Competitive position of a buyer on the purchasing market (x_3)	Purchasing potential	0,778	0,76	0,59
	"Switching" costs	0,668		
	Ratio between supply costs and total purchasing value	0,775		
	Growth rate of purchases	0,776		
	Marketing communication performance	0,624		
	Buyer's image assessment	0,689		
	Information' knowledge of a buyer	0,789		
	Price elasticity of demand	0,580		
Bargaining orientation (x_4)	Buyer's orientation toward risk	0,745	0,88	0,64
	Buyer's orientation toward cooperation	0,810		

Table 2:
Constructs (with dependent variables), standardized loadings (FL), CR, and AVE

Construct	Strategies	FL	CR	AVE
Transactional purchasing marketing strategies (y_A)	The strategy of instantaneous purchases based on classical buyer-supplier relationships	0,768	0,626	0,759
	The strategy of product standardization, with an alternative: purchased products are made according to your specifications or plan	0,567		
	The average market price strategy	0,560		
	The higher-than-average market price strategy	0,589		
	The occasional substantial order strategy	0,575		
	We have two or more alternative sources for occasionally purchasing the most important strategic products	0,640		
	The strategy of occasional communication ("when necessary")	0,674		
	The strategies aimed at the promotion of purchasing from the existing (chosen) suppliers in order to reach favourable purchasing terms	0,520		
Relational purchasing marketing strategies (y_B)	The strategy of cooperation with the supplier in the development of a new product of the company (the so-called "simultaneous engineering")	0,610	0,679	0,893
	Cooperation with the supplier in activities related to the product launch, modification of an existing product or removing products from the market	0,624		
	The strategy "Poka-Yoke" within the total quality management (TQM)	0,670		
	The lowest purchasing price strategy with regard to other potential supplier for a certain product	0,636		
	The "no stock" strategy (i.e. "just-in-time" strategy)	0,575		
	The multiple small quantity orders strategy	0,540		
	The most important strategic product is purchased from one supplier only	0,780		
	Together with the supplier we intensify competition among suppliers	0,891		
	The strategy of knowledge, information and technology transfer ("know-how")	0,630		
	The advertising strategy aimed at long-term cooperation between the buyer and supplier	0,714		
	Public relations strategy aimed at building a positive image in the local and wider environment	0,520		

	The strategies aimed at the promotion of the speed of interpersonal communication with the supplier in order to build long-term business relationships	0,672		
	Strategies of simultaneous harmonisation of processes between the supplier and the company in the field of R&D, production, logistics, purchasing, sales, etc.	0,646		
	Common development of strategies aimed at development of human resources	0,632		
	Strategies aimed at mutual decision-making processes	0,734		
	Strategies aimed at developing corporate culture and common values in both companies	0,870		
	Strategies aimed at the quality of business processes between the supplier and buyer	0,680		

The reliability of the constructs was assessed with Cronbach α measurement. The constructs with independent variables represented ranges from 0,66 to 0,88, while the constructs with dependent variables ranges from 0,626 to 0,679, which met the standard of 0,60 as suggested by Nunnally (1978).

Evidence of convergent validity was determined by inspection of the average variance extracted (AVE) for each construct has shown that the value exceeds the lower limit of 0,50 for each construct.

b) Sampling

All service companies on B2B market with more than 200 employees in Slovenia were included into our research. The justification for the selection of these companies based in the fact that in larger companies (with regard to number of employees) the purchasing function is more complex and sophisticated as well as of greater influence in creating the company's performance. In every company, a single respondent was identified in the position of CEO or member of the Board of Directors responsible for marketing or purchasing. Key respondents were used, as senior managers have been shown to be generally reliable in their evaluations of company's activities and performance (e.g. Venkatraman, Ramanujan, 1986). A highly structured questionnaire was mailed to all of 141 companies in service industry with more than 200 employees in Slovenia (Dec. 31st, 2008). In total, 90 usable questionnaires were received, representing a response rate of 63,8%.

c) Research objectives and hypotheses development

There is a lack of empirical evidence in the recent literature about how the attractiveness of a supplier and the total purchasing market of a buyer, as well as its competitive position and bargaining orientation influence the performance of strategic activities of the buyer in the B2B context. At the same time, some up-to-date empirical models verified the correlation between selected marketing tactics in increasing the loyal behaviours of buyers (Mitrega, Katrichis, 2010) or investigated various aspects of the effectiveness of relationship-based strategies (DeWulf, Odekerken-Schroeder, Iacobucci,

2001; Palmatier, Dant, Grewal, 2007). It is evidently that the implementation of purchasing marketing strategies of the buyers on their purchasing market in B2B relations contributes to the level of commitment of the buyer in the relationship between the buyer and the supplier as well as to the performance outcomes of the buyer. Empirical research also indicated that the performance of purchasing marketing strategies of the buyers on their B2B markets reveals buyer's overall relationship orientation (Palmatier, Scheer, Evans, Arnold, 2008, 185). Therefore, it is important to recognize, are the purchasing marketing strategies transactional oriented or relational oriented and to investigate, which elements of buyer's internal (competitive position) and external market environment (attractiveness of the supplier and other elements of purchasing market) contribute to the strategic decision of the buyers, i.e. which purchasing marketing strategy to formulate and implement.

Thus, the main research objective was to find out, which relevant factors in the selected four constructs of qualitative elements of the relational exchange influence a selection of particular purchasing marketing strategies and to establish, what are the characteristics of these strategies, i.e. do they belong to the transactional or relational group of strategies.

On the basis of the empirical model, which has been explained (see figure 1) and the main research objective, four pairs of research hypotheses have been proposed:

H_{1a}: There is a negative correlation between the weighted estimation of the majority of factors, with which the level of the attractiveness of a supplier has been measured, and the frequency of implementation of transactional purchasing marketing strategies.
H_{1b}: There is a positive correlation between the weighted estimation of the majority of factors, with which the level of the attractiveness of a supplier has been measured, and the frequency of implementation of relationship purchasing marketing strategies.

H_{2a}: There is a positive correlation between the weighted estimation of the majority of factors, with which the level of attractiveness of total purchasing market for a buyer has been measured, and the frequency of implementation of transactional purchasing marketing strategies.
H_{2b}: There is a negative correlation between the weighted estimation of the majority of factors, with which the level of attractiveness of total purchasing market for a buyer has been measured, and the frequency of implementation of relationship purchasing marketing strategies.

H_{3a}: There is a positive correlation between the weighted estimation of the majority of factors, with which the buyer's competitive position on the purchasing market has been measured, and the frequency of implementation of transactional purchasing marketing strategies.
H_{3b}: There is a negative correlation between the weighted estimation of the majority of factors, with which the buyer's competitive position on the purchasing market has been measured, and the frequency of implementation of relationship purchasing marketing strategies.

H_{4a}: There is a positive correlation between the weighted estimation of the majority of factors, with which the buyer's bargaining orientation toward a supplier has been measured, and the frequency of implementation of transactional purchasing marketing strategies.
H_{4b}: There is a negative correlation between the weighted estimation of the majority of factors, with which the buyer's bargaining orientation toward a supplier has been measured, and the frequency of implementation of relationship purchasing marketing strategies.

d) Methods of analysing data

In order to analyse data collected in our research, the method of multiple discriminant analysis has used to derive the linear combination of independent variables that will discriminate best between the a priori defined groups of constructs as well as to determine which independent variables count most in explaining differences between the constructs with dependent variables.

Further, with the method of canonical correlation we revealed the correlation between the above mentioned linear combinations in order to maximize this correlation. Since the canonical correlation analysis is an appropriate statistical technique when we have two criterion variables (dependent variables) and multiple predictor variables (independent variables), we aggregated the frequencies of implementation of individual dependent variables (purchasing marketing strategies) into two aggregated means: Y_A represents aggregate mean of the frequency of implementation of transactional purchasing marketing strategies and Y_B represents the aggregate mean of relational purchasing marketing strategies.

The significance of the discriminant function was measured with statistical testing through Wilks' λ.

2.3 RESEARCH RESULTS

In order to test the research hypotheses with the statistical methods mentioned above, we tried to find out:

(1) What is the correlation between series of independent variables x_n (i.e. individual qualitative factors of relational exchanges), and individual aggregate dependent variable Y?
We considered as statistically significant canonical correlation coefficients where $-0,5 \geq R \geq 0,5$.

(2) Are there some significant differences between the values of aggregate dependent variables (Y_A and Y_B), i.e. with regard to the frequency of implementation of purchasing marketing strategies of type A and type B from the point of view of individual set of independent variables (i.e. qualitative factors of relational exchange)?

(3) Which of the chosen independent variables add most towards the discrimination among both aggregate sets of dependent variables; standardized canonical coefficients of discriminant function have been taken as statistically significant, if they have been higher than 0,5 or lower than -0,5.

For each set of independent variables (x) we have considered the canonical discriminant function with the highest "eigenvalue" and the highest Chi-square test, which means that it makes it easier to discriminate between the sets of variables and, at the same time, the lowest Wilks' lambda.

a) Factors for evaluating the attractiveness of a supplier

Table 3: Discriminant analysis for a series of independent variables x_1

	Eigenvalue	**% of variance**	**R***	**Wilks λ**	**χ^2**	**Df**	**Sig.**
Y_A	1,439	68,6	0,552	0,330	23,456	18	0,017
Y_B	1,455	69,9	0,542	0,297	18,799	27	0,087

Standardized coefficients of the canonical discriminant function

X_1	**X_{11}**	**X_{12}**	**X_{13}**	**X_{14}**	**X_{15}**	**X_{16}**	**X_{17}**	**X_{18}**	**X_{19}**
r** (Y_A)	0,537	-0,206	-0,229	0,326	0,568	-0,868	0,785	-0,299	-0,556
r** (Y_B)	-0,021	-0,156	0,397	-0,220	0,667	0,123	0,651	-0,655	-0,220

Notes:
* R – canonical correlation coefficient, indicating the strength of correlation between discriminant values and the group of independent variables;
** r – standardized coefficients of the canonical discriminant function

Because canonical correlation coefficients (R) for both aggregate variables are higher than 0,5, there exists a correlation between the value of individual factors of attractiveness of a supplier, and the frequency of implementation of purchasing marketing strategies of type A and type B.

The companies which implement purchasing marketing strategies of type A more frequently, have evaluated their strategic supplier higher with regard to the following factors: »supplier's capacity«, »supplier's management« and »delivery in due time«, while the following two factors have been assessed the lowest: »product quality« and »supplier's ability to meet market requirements«.

Therefore, the research hypothesis H1a has been fully supported, because there is no significant negative correlation between weighted value of the majority of factors, with which the companies have measured the attractiveness of existing strategic suppliers, and the frequency of implementation of transactional purchasing marketing strategies.

The companies which implement purchasing marketing strategies of type B more frequently, have evaluated their strategic supplier higher with regard to the following factors: »supplier management« and »delivery in due time«, but the lowest with regard to the »purchasing price«.

The research hypothesis H1b has not been supported, because there is no significant positive correlation between the weighted value of the majority of factors, with which the companies have measured the attractiveness of existing strategic suppliers, and the frequency of implementation of relationship purchasing marketing strategies.

b) Factors of attractiveness of total purchasing market for a buyer

Table 4:

Discriminant analysis for a series of independent variables x_2

	Eigenvalue	**% of variance**	**R***	**Wilks λ**	**χ^2**	**Df**	**Sig.**
Y_A	1,255	71,5	0,451	0,233	11,982	14	0,046
Y_B	1,290	68,9	0,474	0,486	19,528	21	0,031

Standardized coefficients of the canonical discriminant function							
X_2	**X_{21}**	**X_{22}**	**X_{23}**	**X_{24}**	**X_{25}**	**X_{26}**	**X_{27}**
r** (Y_A)	0,151	0,102	-0,971	0,249	0,294	0,001	0,700
r** (Y_B)	0,676	-0,235	-0,673	0,421	-0,217	0,412	0,124

Notes:
* R – canonical correlation coefficient, indicating the strength of correlation between discriminant values and the group of independent variables;
** r – standardized coefficients of the canonical discriminant function

As the canonical correlation coefficients (R) are smaller than 0,5 for aggregate dependent variables Y_A and Y_B, we can conclude that there is no correlation between the degree of attractiveness of the purchasing market and the frequency of implementation of purchasing marketing strategies of companies. Standardized canonical discriminant function coefficients for the set of dependent variables Y_A and for the set of dependent variables Y_B are statistically insignificant for the majority of independent variables (i.e. factors of

attractiveness of the purchasing market for a buyer). Thus, research hypothesis 2a and 2b have not been supported.

Because canonical correlation coefficients (R) for both dependent variables are higher than 0,5, there exists a correlation between factors of buyer's competitive position on the purchasing market and the frequency of implementation of both types of purchasing marketing strategies.

The companies, which implement purchasing marketing strategies of the type A more frequently, have achieved strong competitive position on the purchasing market, if it has been measured by the following two factors: »the ratio between supply costs and supply value« and »demand price elasticity«. On the other hand, their competitive position is relatively weak if »switching costs« have been taken into consideration.

c) Factors of buyer's competitive position on the purchasing market

Table 5:

Discriminant analysis for a series of independent variables x_3

	Eigenvalue	**% of variance**	**R***	**Wilks λ**	**χ^2**	**Df**	**Sig.**
Y_A	1,313	79,6	0,589	0,205	12,774	16	0,048
Y_B	1,655	82,6	0,718	0,039	33,588	24	0,020

Standardized coefficients of the canonical discriminant function								
X_3	**X_{31}**	**X_{32}**	**X_{33}**	**X_{34}**	**X_{35}**	**X_{36}**	**X_{37}**	**X_{38}**
r** (Y_A)	-0,053	-0,584	0,771	0,287	-0,060	0,185	-0,154	0,563
r** (Y_B)	-0,010	0,011	-0,203	0,072	0,326	0,324	0,537	-0,622

Notes:
* R – canonical correlation coefficient, indicating the strength of correlation between discriminant values and the group of independent variables;
** r – standardized coefficients of the canonical discriminant function

The research hypothesis 3a has been supported because there is a significant positive correlation between the competitive position (i.e. the majority of factors for assessing a buyer's competitive position on the purchasing market), and the frequency of implementation of transactional purchasing marketing strategies.

The companies, which implement purchasing marketing strategies of the type B more frequently, have stronger relative competitive position related to »the level of available reliable marketing information" and weaker competitive position related to the factor »price elasticity of demand«.

The research hypothesis H3b has not been supported because there is no significant negative correlation between the competitive position (i.e. the majority of factors for measuring the level of buyer's competitive position on the purchasing market), and the frequency of implementation of relationship purchasing marketing strategies.

d) Factors for bargaining orientation of a buyer

Table 6:

Discriminant analysis for a series of independent variables x_4

	Eigenvalue	% of variance	R*	Wilks λ	χ^2	df	Sig.
Y_A	1,420	68,0	0,544	0,267	18,036	26	0,087
Y_B	1,911	72,8	0,737	0,037	39,603	39	0,044

Standardized coefficients of the canonical discriminant function

X_4	X_{41}	X_{42}
r** (Y_A)	-0,168	-0,574
r** (Y_B)	0,051	0,360

Notes:

* R – canonical correlation coefficient, indicating the strength of correlation between discriminant values and the group of independent variables;

** r – standardized coefficients of the canonical discriminant function

Because canonical correlation coefficients (R) for both dependent variables are higher than 0,5, there exists a correlation between factors related to the buyer's bargaining power, and the frequency of implementation of both types of purchasing marketing strategies.

Both standardized canonical discriminant function coefficients of the independent variable x_{41}, i.e. "a buyer's orientation toward risk", are statistically insignificant.

There is statistically significant negative correlation between the buyer's orientation toward cooperation, and the frequency of implementation of transactional purchasing marketing strategies. Therefore, the research hypothesis 4a has been supported partially, while the research hypothesis 4b has not been supported at all.

3. FINDINGS, CONTRIBUTIONS AND MANAGERIAL IMPLICATIONS

3.1 FINDINGS AND CONTRIBUTIONS

Globalization and technological innovation of the companies in service industry evidently impact the creation of dynamic and specific networks or chains of interconnected players to bring and deliver more value for the customer (Srivastava, Singh, 2010, 3).

However, results of our empirical research have indicated that the companies in service industry in Slovenia implement the most frequently the purchasing marketing strategies with fast, short-term (immediate), and direct effects on their business performance and purchasing savings (i.e. strategies oriented toward decreasing purchasing costs and costs of production), as well as to ensure safety of purchasing activities and diminish the level of business risks, consequently.

It was also found out that researched companies develop certain strategies with their strategic suppliers, which are characteristic for the concept of »relationship marketing«, nevertheless their prevailing purchasing activities are still oriented toward classical buyer-supplier relations, prevailed in »transactional« marketing.

The analysis of the impact of qualitative elements of buyers' B2B relational exchange with their strategic suppliers on the frequency of implementation of purchasing marketing strategies has shown to us some correlations between supplier's attractiveness, buyer's competitive position on the purchasing market, bargaining orientation of a buyer on the one hand, and the frequency of implementation of particular purchasing marketing strategies (transactional and relationship strategies) on the other hand. But, there are no statistically significant correlations between the attractiveness of total purchasing market and dependent variable.

A thorough insight into standardized canonical discriminant function coefficients with regard to individual groups of qualitative factors (groups of independent variables) has revealed the following conclusions:

- the weighted value of individual qualitative factors of relational exchange, as well as the content of these factors for supplier's evaluation, had very different impact on the

frequency of implementation of both types of purchasing marketing strategies (type *a* and type *b*);

- stronger competitive position of a buyer reduces its tendency to implement relationship purchasing marketing strategies (nevertheless the strategic supplier has tried to establish a long-term relationships);
- more intensive buyer's risk orientation toward a supplier does not have direct effects (perhaps there are some indirect effects) on the frequency of implementation of a certain type of purchasing marketing strategy;
- the buyers, which are more intensive oriented towards cooperation, more frequently implement such purchasing marketing strategies which are characteristic for the concept of »relationship marketing«.

The results of this research contribute to the literature in important ways. First, in previous research studies authors did not analyze the linkage between qualitative elements of buyer's relational exchange process with its strategic supplier and the implementation of its purchasing marketing strategies.

Second, this research also contributes to a greater understanding of the factors that influence partner selection and attractiveness of purchasing market as a whole.

Third, we extended the research of qualitative elements of relational exchange of the buyers in service industry in Slovenia on B2B market by demonstrating the behaviour of such companies in the relationship with their strategic suppliers, which indicate a great level of opportunistic behaviour and inconsistent decisions, because there is very significant difference between what does company do on one hand and what does company really want to achieve.

There are a huge number of authors, who have analyzed the buyers' perspectives of buyer-seller relationship development on B2B market (Claycomb, Frankwick, 2010; Mitrega, Katrichis, 2010; King, Burgess, 2008; Palmatier, Scheer, Evans, Arnold, 2008; Duffy, 2008; Grayson, 2007; Hawkins, Wittmann, Beyerlein, 2008 et. al.), but the above mentioned authors and others did not emphasize the role of relationship' characteristics in creating and performing purchasing marketing strategies. It is evidently true that the empirical investigations about the effects of marketing activities from the buyer's perspective on its purchasing B2B market toward their strategic suppliers are handled deficiently in the current literature. Therefore, the following paper represents the significant strategic link between the theory of the relationship on one hand and the strategic purchasing marketing decision-making on the other hand.

Last but not least, this research makes a contribution to the strategy literature and to the practitioners, and has important implications for purchasing managers by offering guidelines for mixing the various aspects of partnering according to their objectives and strategies in order to improve the level of their relational approach to their strategic suppliers.

3.2 Managerial implications

Our results caution on inconsistency between the level of relational exchange and the strategic purchasing marketing activities of larger companies in service industry in Slovenia. The selected suppliers can be attentive on the marketing behaviour of the buyers, who do not commit to develop the existing relationship with the appropriate marketing strategies. Such situation can decrease a level of trust between the companies and enhance opportunistic behaviour.

Therefore in addition to having realistic expectations for the relationship between a buyer and a supplier, an accurate assessment of the status of a relationship is important for managers looking to develop appropriate interaction strategies (Duffy, 2008, 238).

Buyers on B2B market in service industry in Slovenia looking to move along the relational continuum regarding the level of quality of the relationship should take note of the importance of trust and relational norms, as its key role in discriminating between all relationship types highlights the importance of ensuring the consistency between the relationship status of the buyer and derived purchasing marketing strategies. Therefore these results imply the managers on both the supply and buy side need to become considerably more discriminating when they decide to join in any supply relational exchange that is considerably more than a discrete purchase. Some suppliers may view such buyer's use of transactional purchasing marketing strategies as opportunistic behaviour when the reality is that they are simply a tool to help a buyer gain the best possible price.

Thus, results of our study have managerial implications for both buyers and suppliers who should recognize that while relationship quality regarding attractiveness of the market, competitive position of its players, and bargaining orientation of both of them on one side, and conflict resolution on the other side are important aspects of buyer-supplier relationships, their use may not always lead to the desired relationship characteristics. For this reason, the cooperative implementation of purchasing marketing strategies as strategic marketing assets contributes to gain competitive advantage as well as sustained profitability of the buyer.

4. RESEARCH LIMITATIONS AND DIRECTIONS FOR FURTHER RESEARCH

There are some important research limitations which have to be taken into account during evaluation of the research. *First*, the sampling error as the result of difference between the characteristics of service companies in the sample and total statistical population of service companies in Slovenia, has some impact on relevance of research results. *Second,* the effect of qualitative elements of relational exchanges on the frequency of implementation of individual purchasing marketing strategies was researched by empirical model of selected individual independent variables and the empirical model of 25 selected purchasing marketing strategies. Therefore, our model cannot be generalized on all qualitative elements of relational exchanges as well as on all possible purchasing marketing strategies, performed by the companies in B2B relations. Additional research should investigate other key performance drivers in the relation researched. *Third,* since we aggregated the values of dependent variables to two sub-groups, the results of this study should be viewed with caution. *Fourth,* the use of multiple discriminant analysis and canonical correlation analysis somehow narrows the possible empirical results. To improve this methodological area the application of structural equation models (SEM) can be appropriate in this context. *Fifth*, the answers on our questions in the questionnaire have resulted in personal (subjective) perceptions of respondents (CEO's and presidents of companies). Of course, it is not necessary that their perception fit with objective situation in analysed companies.

Our present empirical research has also revealed some elements that marketing scholars should devote considerable attention in their further researches. It is evident that some additional factors during investigating B2B relational exchange from the buyer's point of view should be considered in order to evaluate a creativity of such relationship, i.e. trust, availability of sources of supply, motivational factors, the level of capability (competences) of governing relationship effectively (Wang, Bradford, Xu and Weitz, 2008, 110; Palmatier, Scheer, Evans and Arnold, 2008, 178), perceived effectiveness and efficiency of relationship (Palmatier, Scheer, Evans and Arnold, 2008, 178), uncertainty (Crosno and Dahlstrom, 2008, 192), time (duration), and the experience of the participants in the relational exchange (Fink, James and Hatten, 2008, 375; Laaksonen, Pajunen and Kulmala, 2008, 918).

Usually several members of a buying center in the company of buyer participate in long-term relationships with suppliers as well as in creating and implementing purchasing

marketing strategies. Therefore, future research could include several members (not only one of them) of the buying center who interact with the supplier in order to receive more relevant information about strategic decisions and plans of the buyer.

REFERENCES:

Anders, W. (1992). Strategische Einkaufsplannung. Peter Lang, Inc.

Bagozzi, R.P. (1995). Reflections on Relationship Marketing in Conusumer Markets; *Journal of the Academy of Marketing Science,* 23; pp. 272-277.

Baily P., Farmer, D., Jessop D., Jones D. (1994). Purchasing Principles and Management; Pitman Publishing London.

Batt, P.J., Purchase, S. (2004). Managing Collaboration within Networks and Relationships; *Industrial Marketing Management;* Vol. 33(3); pp. 169-174.

Beckman, C.M., Haunschild, P.R., Phillips, D.J. (2004). Friends or Strangers? Firm-specific Uncertainty, Market Uncertainty, and Network Partner Selection; *Company Science;* Vol. 15(3); pp. 259-275.

Bove, L.L., Johnson, L.W. (2001). Customer Relationships with Service Personel: Do we measure Closeness, Quality or Strength; *Journal of Business Research;* Vol. 54(3); pp. 189-197.

Bunduchi, R. (2008). Trust, Power and Transaction Costs in B2B Exchanges – A Socio-Economic Approach; *Industrial Marketing Management;* Vol. 37(5); pp. 610-622.

Claycomb, C., Frankwick, G.L. (2010). Buyers' perspectives of buyer-seller relationship development; *Industrial Marketing Management:* 39; pp. 252-263.

Crosno, J.L., Dahlstrom, R. (2008). A Meta-Analytic Review of Opportunism in Exchange Relationships; *Journal of the Academy of Marketing Science;* Vol. 36(3); pp. 191-201.

De Wulf, K., Odekerken-Schroeder, Iacobucci, D. (2001). Investments in Consumer Relationships: A Cross-Country and Cross-Industry Explorations; *Journal of Marketing,* 65; pp. 33-50.

Duffy, R.S. (2008). Towards a better understanding of Partnership Attributes: An Exploratory Analysis of Relationship Type Classification; *Industrial Marketing Management;* Vol. 37(2); pp. 228-244.

Dwyer, F. R., Schurr, P. H., Oh, S. (1987). Developing Buyer - Seller Relationships; *Journal of Marketing*; Vol. 51(2); pp. 11-27.

Ellram, L.M. (1990). The Supplier selection Decision in Strategic Partnership; *Journal of Purchasing and Material Management;* Vol. 26(1); pp. 8-14.

Fink, R.C., James, W.L., Hatten, K.J. (2008). Duration and Relational Choices: Time based Effects of Customer Performance and Environmental Uncertainty on Relational Choice; *Industrial Marketing Management;* Vol. 37(4); pp. 367-379.

Grayson, K. (2007). Friendship Versus Business in Marketing Relationships; *Journal of Marketing;* Vol. 71; pp. 121-139.

Groenroos, C. (1994). Quo Vadis, Marketing? Towards a Relationship Marketing Paradigm; *Journal of Marketing Management;* Vol. 10(1); pp. 12-15.

Gummesson, E. (1995). The New Marketing - Developing Long-Term Interactive Relationships; in McDonald, M., Marketing Strategies; New Approaches, New Techniques; Pergamon; pp. 83-101.

Hald, K.S., Cordon, C., Vollmann, T.E. (2009). Towards an understanding of atraction in buyer-supplier relationships; *Industrial Marketing Management* Vol. 38(4); pp. 960-970.

Hawkins, T.G., Wittmann, C.M., Beyerlein, M.M. (2008). Antecedents and consequences of opportunism in buyer-supplier relations: Research synthesis and new frontiers; *Industrial Marketing Management:* 37; pp. 895-909.

Heide, J.B., John, G. (1990). Alliances in Industrial Purchasing: The Determinants of Join Action in Buyer – Supplier Relationships; *Journal of Marketing Research*; Vol. 27(1); pp. 24-36.

Iacobucci, D. (1996). Networks in Marketing; Thousand Oaks, CA: Sage Publications.

Johanson, J., Mattsson, L. (1987). Interorganizational relations in industrial systems: A network approach compared with the transaction-cost approach. *International Studies of Management and Organization,* 17(1); pp. 34-48.

Johnson, M.D., Selnes, F. (2004). Customer Portfolio Management: Toward a Dynamic Theory of Exchange Relationships. *Journal of Marketing*; Vol. 68(2); pp. 1-17.

King, S.F., Burgess, T.F. (2008). Understanding success and failure in customer relationship management; *Industrial Marketing Management* 37; pp. 421-431.

Koppelmann, U. (1993). Beschaffungsmarketing, Springer-Verlag.

Laaksonen, T., Pajunen, K., Kulmala, H.I. (2008). Co-evolution of Trust and Dependence in Customer-Supplier Relationships; *Industrial Marketing Management*; Vol. 37(8); pp. 910-920.

Lambe, C.J., Speakman, R.E., Hunt, S.D. (2002). Alliance Competence, Resources, and Alliance Success: Conceptualization, Measurement, and Initial Test; *Journal of the Academy of Marketing Science;* Vol. 30(2); pp. 141-158.

Lancaster, G., Reynolds, P. (1998). Marketing. *MacMillan Business Masters.*

Lovelock, C., Wirtz, J. (2011). Services Marketing; People, Technology, Strategy; 7th ed. *Pearson Publ.*

McKenna, R. (1991). Marketing is Everything; *Harvard Business Review,* 69; pp. 65-79.

Mesquita, L.F., Anand, J., Brush, T.H. (2008). Comparing the Resource-Based and Relational Views: Knowledge Transfer and Spillover in Vertical Alliances; *Strategic Management Journal;* Vol. 29(9); pp. 913-941.

Mitrega, M., Katrichis, J.M. (2010). Benefiting from dedication and constraint in buyer-seller relationships; *Industrial Marketing Management:* 39; pp. 616-624.

Monczka, R., Trent, R., Handfield, R. (2005). Purchasing & Supply Chain Management; 3rd. ed. Thomson South –Western.

Morgan R.M., Hunt, S.D. (1994). The Commitment-Trust Theory of Relationship Marketing; *Journal of Marketing*, Vol. 58(1); pp. 20-25.

Nunnally, J.C. (1978). Psyhometric Theory. New York: *Mc.Graw-Hill.*

Palmatier, R.W., Scheer, L.K., Evans, K.R., Arnold, T.J. (2008). Achieving Relationship Marketing Effectiveness in Business-to-Business Exchanges; *Academy of Marketing Science*; Vol. 36(2); pp. 174-190.

Palmatier, R.W., Dant, R.P., Grewal, D. (2007). A comparative longitudinal analysis of theoretical perspectives of interorganizational relationship performance; *Journal of Marketing,* 71; pp. 172-194.

Palmer, A., Mayer, R. (1996). A Conceptual Evaluation of the Multiple Dimensions of Relationship Marketing; *Journal of Strategic Marketing;* Vol. 4(4); pp. 207-220.

Powell, W.W. (1987). Hybrid organizational arragements: new form or transitional development? *California Management Review,* 30(1), pp. 67-87.

Ritter, T., Wilkinson, I.F., Johnston, W.J. (2004). Managing in Complex Business Networks; *Industrial Marketing Management;* Vol. 33(3); pp. 175-183.

Saunders, M. (1997). Strategic Purchasing & Supply Chain Management; 2nd ed.; Financial Times Prentice Hall.

Shah, R.H., Swaminathan, V. (2008). Factors Influencing Partner Selection in Strategic Alliances: The Moderating Role of Alliance Context; *Strategic Management Journal;* Vol. 29(5); pp. 471-494.

Siguaw, J.A., Baker, T., Simpson, P. (2003). Preliminary Evidence on the Composition of Relational Exchange and its Outcomes: The Distributor Perspective; *Journal of Business Research;* Vol. 56(4); pp. 311-322.

Srivastava, V., Singh, T. (2010). Value creation through relationship closeness. *Journal of Strategic Marketing;* Vol. 18(1); pp. 3-17.

Qualls, W. J., Puto, C. P. (1989). Companyal Climate and Decision Framming: An Integrated Approach to Analyzing Industrial Buying Decisions; *Journal of Marketing Research*; Vol. 26(2); pp. 179-192.

Venkatraman, N., Ramanujan, V. (1986). Measurement of business performance in strategy research: A comparison of approaches. *Academy of Management Journal,* 11; pp. 801-814.

Walter, A., Muller, T.T., Helfert, G., Ritter, T. (2003). Functions of Industrial Supplier Relationships, and their Impact on Relationship Quality; *Industrial Marketing Management;* Vol. 32(2); pp. 159-169.

Wang, Q., Bradford, K., Xu, J., Weitz, B. (2008). Creativity in Buyer – Seller Relationships: The Role of Governance; *International Journal of Research in Marketing;* Vol. 25(2); pp. 109-118.

Westbrook, K., W. (1996). Risk Coordinative Maneuvers During Buyer - Seller Negotiations; *Industrial Marketing Management;* Vol. 25(4); pp. 283-292.

Wuyts, S., Geyskens, I. (2005). The Formation of Buyer – Supplier Relationships; detailed Contract Drafting and Close Partner Selection; *Journal of Marketing;* Vol. 69(3); pp. 103-117.

KAKO KVALITATIVNI ELEMENTI RAZMJENA ZBOG ODNOSA UTJEČU NA IMPLEMENTACIJU KUPOVNIH MARKETINŠKIH STRATEGIJA – SLUČAJ USLUŽNIH PODUZEĆA U SLOVENIJI

Sažetak

Autor istražuje vezu između kvalitativnih elemenata razmjene zbog odnosa i implementacije marketinških strategija baziranih na odnosu nasuprot transakcijskih marketinških strategija iz perspektive kupca u B2B razmjeni (između poslovnih subjekata). Stoga su određene četiri grupe faktora kvalitativne razmjene bazirane na odnosu: privlačnost dobavljača, privlačnost ukupnog nabavnog tržišta za kupca, konkurentnost kupca na nabavnom tržištu te pregovaračka orijentacija kupca prema njegovom strateškom dobavljaču. Baveći se uslužnim poduzećima u usponu s više od 200 zaposlenih u Sloveniji i njihovim odnosom sa strateškim dobavljačem, autor sugerira da kupčeva percepcija kvalitativnih elemenata odnosne razmjene utječe na korištenje određenih marketinških strategija prema strateškom dobavljaču. Rezultati empirijskog istraživanja pokazuju određenu korelaciju između istraženih grupa varijabli. Utjecaj istraženih faktora na implementaciju određene grupe marketinških strategija postoji, iako je najsnažniji utjecj onih faktora koji su karakteristični za kratkoročne odnose. Stoga su istražena poduzeća puno više orijentirana prema ostvarivanju kratkoročne nego dugoročne efikasnosti. Ovo istraživanje doprinosi strateškoj literaturi i profesionalcima u ovom polju te ima važne implikacije za menadžere nabave nudeći smjernice za miješanje raznih aspekata partnerstva u odnosu na ciljeve i strategije kako bi se poboljšala razina njihovog odnosnog pristupa strateškom dobavljaču.

***Ključne riječi**: kvalitativni elementi odnosne razmjene, transakcijski marketing, marketing baziran na odnosu, kupovne marketinške strategije.*

Ariana Nefat[1]
Dragan Benazić[2]

UDK 613.2:<659.13:654.1
ORIGINAL SCIENTIFIC PAPER
IZVORNI ZNANSTVENI RAD

PARENTS' PERCEPTIONS OF FOOD ADVERTISING AIMED AT CHILDREN ON TELEVISION: EXPOSURE, INFLUENCE AND REGULATIONS

SUMMARY

The purpose of this work is to investigate the perceptions of parents about advertising of food to children on television. The theoretical research includes a review of marketing to children, the analysis of influential factors, the influence of food advertising aimed at children, the perceptions of the parents and the issue of regulation of this area of advertising. The empirical research conducted via a questionnaire to the parents does not confirm the connection between the time spent in front of the television and the behaviour of children, but it does indicate at the negative attitudes of parents about advertising of food that influence their moderately restrictive attitude on the prohibition of such advertising.

Key Words: *advertising to children, television advertising, perceptions of parents, regulation, Croatia*

1. INTRODUCTION

Marketing activities wield a powerful influence on customers' behaviour and children are increasingly becoming a focus of their attention. A growing concern about the potentially damaging effects of food advertising to children, which is still mostly done via television advertising, regardless of the appearance of new media, has been present in the world for several years. Bearing in mind the multiple effects that the watching of television and food advertising have on children's knowledge about nutrition, their preferences and their behaviour, warnings about their negative influence on nutrition and health of children have recently become stronger. Since parents are responsible for the nutrition of their children and are an important factor in the children's choice of food the purpose of his work was to research the attitudes of the parents about food adverts to children on television in Croatia.

For this purpose, a theoretical framework providing the factors that influence the choice of food in children and their interaction, and a short review of the present marketing activities aimed at children in relation to food are given in the first part of the work. The key problem of advertising of food to children is the type of food that is advertised, which coupled with the creative force of persuasion and the frequency of advertising of specific food i.e. the percentage of advertising of unhealthy foods in the overall programme with respect to the frequency of viewing of the programme by the child, among other things, influences the final effect of the media. Findings of numerous researches about television advertising of food to children, most of which were carried out in the USA, are provided in the following chapter. Next is the consideration of parents' perceptions about advertising of food to children, which

[1] Ph.D., Juraj Dobrila University of Pula, Department of Economics and Tourism – Dr. M. Mirković, Pula, Preradovićeva 1/1, astok@efpu.hr
[2] M.Sc., Juraj Dobrila University of Pula, Department of Economics and Tourism – Dr. M. Mirković, Pula, Preradovićeva 1/1,

are very important in the definition of the legislative regulations whose options for the solution of the researched issue are examined in the last theoretical chapter. The aim of the empirical research is to shed light on this problem in Croatian settings.

2. THE ROLE OF MARKETING OF FOOD TO CHILDREN IN THE SELECTION OF FOODS AND ACQUIRING OF NUTRITIONAL HABITS IN CHILDREN

The purpose of food is to satisfy basic human needs. It gets constantly and repeatedly consumed and it is, at the same time, present on a very competitive market and therefore significant efforts and funds are invested into its marketing and into building of brands. According to the data, in 2007, food was the third most advertised category in Croatia with 10.8% (Lider, www-liderpress.hr). Children are an attractive market segment for marketers because the habits of consuming of a product acquired in childhood and preferences towards specific brands significantly influence consuming at an adult age.

A series of mutually interactive factors influence children's choice of foods: (Livingstone, Helsper, 2004)

1. Individual factors (psychosocial, biological and behavioural factors)
2. Social environment (family, friends)
3. Community (schools and facilities such as fast food restaurants, vending machines, shops and workplace restaurants)
4. Macrosystem (consumerism, production and distribution systems, pricing policies, mass media and advertising: media saturated environment, advertising foods to children, exposure to television, effects on demands for food, influence on perception of one's body).

Children are exposed to advertising from a very early age by visiting shops with parents, where the package is an important factor of impulsive shopping by children (Hill, 2002). They also often encounter advertising in schools through vending machines, direct advertising in schools, indirect advertising e.g. in school manuals or through various marketing researches (Kirstin, 2002). From all the daily encounters with the media, television is the most important source of messages from the media about food aimed at children. An average British child spends about 17 hours a week in front of a television and views an average of 28 advertisements per day, of which an average of 71% is beyond the children's programme time-slot (Ofcom, 2004). Along with a prolonged sedentary lifestyle, consuming of high-calorie foods with meagre nutritional values contributes significantly to an increased body weight in children (Caroli, Argentieri, Cardone, Masi, 2004) with the consequent risk of related illnesses and, sometimes, the stigmatising of the community (Schwartz, Puhl, 2003). Since a growing number of children have Internet access the marketers integrate advertising on the web in many different ways (f.eg. games, puzzles, quizzes, music, screensavers etc.), while some of the companies even use phone texting for their adverts (Corbett, Walker, 2009). A common marketing approach is also represented by many promotions such as cross-selling and tie-in. The marketers also use other available possibilities in order to reach children. In order to create an early positive relationship between the child and the brand the food producers increasingly use toys or picture books featuring the company trademark, while children's clubs, which are well accepted by children, enable mass marketing on a personalised level. It is becoming increasingly popular to feature a product in entertainment media, most frequently in films, but also in books, comics, songs etc., creating familiarity and brand preference in a sophisticated manner (Story, French, 2004).

3. CONTENT OF ADVERTISING TO CHILDREN

Food is amply represented in television adverts aimed at children. So, Lee and Tseng (2006) have determined that the frequency of advertising of food in the total number of television adverts for children on television in the USA is equal to 31.5% (Lee, Tseng, 2006), according to the research of Wilson, Quigley and Mansoor (1999) in New Zealand it equals 29%, in Australia Zuppa, Morton and Mehta (2003) have found that food advertising participates with 32% while Roberts and Pettigrew (2007) mention 22.3%.

What is particularly worrying is the type of food advertised to children. According to the research of Roberts and Pettigrew (2007) the participation of food with a high fat content and sugar is 72.2% and if advertising for fast food restaurants is included it rises to 79% according to the research by Zuppa, Morton and Mehta (2003). According to the last authors, when compared with recommendations for healthy nutrition of children under 11 years of age the advertised food is a complete opposite to the recommended food (Zuppa, Morton, Mehta, 2003). Similarly, according to a research of Wilson, Quigley and Mansoor (1999) the participation of such food in advertising is 63%. By a nutritional analysis it was further established that should one consume exclusively food advertised on television, this would lead to an excessive intake of energy from fats in the food, an excessive intake of saturated fats, proteins, sugars and salt, with a deficiency in fibres and many other important substances such as magnesium, selenium and vitamin E (Wilson, Quigley and Mansoor, 1999). Moreover, the research of Lee and Tseng (2006) has established that the food which was advertised to children contains and excessive amount of fat in 18.8% of the cases, 6.3% of salt, 1.6% of cholesterol and in as many as 82.2% of the cases an excessive quantity of sugar. It is indicative that such, generally, low quality food is advertised in an attractive and seductive way, and so Roberts and Pettigrew (2007) have found out that the appeals most used were the following: fantasy (17%), humour (13%) taste (12%) and action and adventure (11%), with a strong use of various rewards. Contrary to the food's actual nutritional value Lee and Tseng (2006) find that advertising of such food in 31.6% of the cases emphasises the taste and the aroma, in 28.1% it advertises its "cool" appeal and in 10.5% of the cases it emphasises its shape or colour.

Advertising of food to children in the printed media, according to the findings of Mendzigall and Morrison (2008), also abounds in food that has a high fat, oil and sugar content (58.3%) and there is no advertising for fruits and vegetables. Since children have increasingly been using the Internet the marketers have found new ways to attract them in advergames, i.e. on-line games that contain brand identifiers. In the US 63% of food and beverages manufacturers have included such games on their web sites (Lee, Choi, Quilliam, Cole, 2009). Contrary to the passive viewing of television learning about brands is amplified by active participation, a pleasant experience and fun during the game.

4. INFLUENCE OF TELEVISION FOOD ADVERTISING ON CHILDREN

Among the many mentioned factors that influence the nutritional habits of children food advertising contributes independently with 2% of explained variation, which is consistent with the findings on the effects of media in other areas. (Livingstone, Helsper, 2004) Advertising of food, primarily via television, has a multiple influence. On the child's cognitive and emotional level advertising becomes the source of knowledge about the product and the brand, it influences the knowledge, opinions and values about the product and the brand and, on a wider scale, it influences social interaction in consumption. The final goal of advertising is the achievement of specific behaviour i.e. the purchase of a specific brand, where children, especially the really young ones that have no personal financial means, often

pester their parents, possibly resulting in a family conflict (Gunter, Oates, Blades, 2005). On the basis of numerous researches in the last 40 years that have involved children of different age groups there is a general consensus that advertising aimed at children via television has a mild direct effect on knowledge about food, food preferences and the children's behaviour related to food (Livingstone, 2005). There is also modest evidence of the effect on knowledge about food, strong evidence of the effect on food preferences and behaviour that is related to shopping i.e. the effect on parents, and it has been found that promotion of food may, depending on the circumstances, induce single or short-term consumption and consumption patterns in children (Hastings, 2003). In addition to this direct effect of advertising on children, the indirect effects that may be important need to be taken into account such as lifestyle changes, changes in habits, cultural expectations and especially values and behaviour of peers in whose company it may be e.g. desirable to consume a certain product (Livingstone, 2004). Contrary to the general belief, the results of the researches on the influence of food advertising to children are clearer for older children while the opposite is true for the youngest age group (up to 6 years of age), which does not mean that this age group is less vulnerable but that other reasons, such as e.g. a lesser dedication to media, research methods and other reasons may have influenced the results of the research (Livingstone, Helsper, 2004).

The newest researches, mostly after the year 2000, more significantly target the effects of marketing and advertising on children's health and obesity. Among many other influences on child obesity (Ofcom, 2004), watching of television is continuously mentioned as a key factor. The reason for this is because watching TELEVISION is: (Ofcom, 2004) (1) a sedentary activity that slows the metabolism and replaces physical exercise (2) connected to snacks, fast food and fast food consumption during viewing (3) includes exposure to advertising of "unhealthy" products. Even though there is an important relation between watching of television and advertising of food on television and the children's nutrition routine, and even though it does not cause, but certainly contributes to obesity (Harker, Burns), there is no sufficient evidence of their single relative influence in relation to other factors (Hastings et al., 2003). While children demand foods which is mostly rich in sugar, salt and fat as a consequence of advertising of such foods on television, (Arnas, 2006), advertising of "healthy" food and positive messages from the public health care service may bring positive results with respect to health and obesity in children (Lobstein, Dibb, 2005).

5. PARENTS' PERCEPTIONS ON ADVERTISING OF FOOD AIMED AT CHILDREN

Parents play an important role in the choice of food, the nutritional habits and the health of their children, depending on their financial situation and education, employment status, habits involving meals and mealtime, availability of food in their home and their convictions regarding nutrition. Their influence is, however, especially with older children, strongly interdependent with the influence of the children's peers and the media, having a "bounce back" effect on food consumption in the household, even in those families that tend to eat healthy food (Kelly, Turner, McKenna, 2006). Due to the limited ability of a child to understand advertising (Gunter, Oates, Blades, 2005) parents often express their concern with respect to advertising of food aimed at children on television and usually they can, depending on their communication patterns with their children and their attitude towards advertising (Grossbart, Crosby, 1984) intervene on the effect of advertising on children, e.g. by limiting viewing time or by watching television with their children and by discussing what is being broadcasted, thereby contributing to the children's media literacy and their adoption of other social norms (Livingstone, Helsper, 2004). According to Ofcom's research it appears,

however, that in Great Britain (2004) as many as 44% of the parents never discuss advertising on television with their children, 4% discuss it very often and 1% of the parents discuss it all the time, while the others do it sometimes, seldom or very rarely. Since the socialization of children is a two-way process, watching television stimulates children to ask for advertised foods, especially if they watch television while having their regular meals, which can lead to the annoyance of parents or even a family conflict either at home or at the shop (Livingstone, Helsper, 2004). The greater is the conviction of parents that their children are influenced by advertising, the greater will be the feeling that such a situation leads to conflict and the greater will be the parents' control over children's watching of television (Dens, De Pelsmacker, Eagle, 2007). It may become very difficult for the parents to prohibit the purchase of a product that is advertised by a favourite animated film character or a celebrity (Kelly, Turner, McKenna, 2006).

According to the research of Young, de Bruin and Eagle (2003) about the opinion of the parents about advertising aimed at children in Great Britain, Sweden and New Zealand, there is an agreement in all the three cultures that advertising to children is excessively disproportionate and that it leads children to pester parents to buy a specific product, and that, irrespectively of their material status, parents equally tend to give in to such pressure. (Ban, 2009) While advertising of foods to children on television is not considered to be an important factor/cause of unhealthy eating habits in New Zealand (average value of 3.5 in the range 1-5), nor it is considered to be the main influence on the nutrition of children in Great Britain (average value of 2.39 in the range 1-5) or Sweden (average value 1.52 in the range 1-5), there is a greater concern for the excessive content of sugars, fats and additives (average value of 4.0 in the range 1-5) in New Zealand parents. The research of Ip, Mehta and Coveney (2007) of a focus group has also found the existence of a negative and critical attitude towards advertising of foods has revealed concerns about the manipulation of children because of their naiveté. Some parents question the truthfulness of the advertising messages and protest to the employment of celebrities in the promotion of unhealthy foods. Research in the USA generally finds clearly negative attitudes of parents towards advertising of food to children, e.g. Spungin (2004) finds that even though the largest percentage of the believe that advertising is a commercial reality (45%), negative attitudes are prevalent, where 12% of the parents believe that advertising to children should be banned, 27% of the parents do not like it but do not think it should be banned and 15% of the parents have a positive attitude towards advertising to children. Conversely, according to the research of Dens, De Pelsmacker and Eagle (2007), parents in Belgium are not too concerned about the influence of advertising on children, especially about the advertising of food to children. This divergence in the findings may be explained e.g. by the media environment, characteristics of the parents or the group of children that was researched.

The perceived influence of advertising on children and the attitudes towards advertising of food are, according to the research of Dens, De Pelsmacker and Eagle (2007), the most important factor in the desire of the parents to regulate this area in legislation. According to a research of Ofcom (2004), 56% of the parents in Great Britain believe that changes are necessary in the laws regulating the advertising of food to children. While a smaller number of parents (24%) supports the prohibition of advertising, others want advertising that will be more informative, meaning that it should contain nutritional information about the foods (81%) and that it should exclude the claim that a product is healthy if, for some reason, it is not (65%), adverts should be less appealing to children (65%), animated characters (49%) as well as celebrities (48%) should be prohibited from appearing in advertising of unhealthy foods to children. Also, 57% of the parents are inclined to a prohibition of advertising of unhealthy foods during the broadcast of children's programmes and 48% have declared that such products should not be advertised before 21:00

hours. However, as Walsh, Laczniak and Carlson (1998) have found, one should consider the fact that preferences of mothers about the regulation of advertising on television may differ depending on the parenting style in the socialization of the child.

6. A REVIEW OF THE ISSUE OF LEGISLATIVE REGULATION OF FOOD ADVERTISING TO CHILDREN

The issue of protection of children from television advertising ensues from the following areas of concern by consumers' organizations: (Gunter, Oates, Blades, 2005) (1) quantity of advertising aimed at children, (2) types of advertising that prevail in children's programmes (3) marketing techniques that are used to attract children, (4) lack of sufficient application of regulations on advertising, (5) the influence exerted by transferring of the content of an advertisement from one country to another and circumventing of the regulations of the receptive country. Since 2004, when the World Health Organization invited the governments, the industry and the civilised society to decrease the number of unhealthy food adverts, Hawkes found out that the greatest progress around the world until 2006 was achieved in the area of self-regulation, while the actual legislative regulations that refer to advertising of food to children, including the restrictive approaches, developed very slowly (Hawkes, 2007).

The approaches that may be used to change the relation between the media and the choice of foods in children are: (Livingstone, Helsper, 2004) (1) prohibition of any kind of advertising for small children, (2) prohibition of unhealthy food advertising for small children, (3) prohibition of the introduction of products in children's programmes, (4) ensuring that even broadcast time is given to messages about nutrition or exercise in order to counteract food advertisements, (5) issuing of "warnings" to parents about the nutritional value of the advertised food, (6) revoking of tax alleviations for companies that are related to unhealthy food advertising, (7) prohibition of advertising or promoting of food in schools, (8) providing of explicit information about the contents related to food in popular programmes seen by children, (9) prohibition or limiting of cross-selling between characters popular with children in the media or celebrities and unhealthy food, 10) an increased use of popular media characters or celebrities in the promotion of healthy food, (11) better labelling and better information about healthy and unhealthy food. Even though some countries have adopted the prohibition of advertising to children such as Sweden and Quebec (Ofcom, 2004), and many others introduce various restrictions, like Great Britain that in 2007 prohibited advertising of unhealthy food during the broadcasting of programmes for children under the age of 16 (Darwin, 2009), a serious, wide intervention in this area is still uncertain because of the supremacy of commercial interests over the health of children.

7. RESEARCH OF THE PARENTS' PERCEPTION OF ADVERTISING OF FOOD TO CHILDREN

7.1. METHODOLOGY OF RESEARCH

First of all, the research wished to determine the number of food advertisements that the children are actually exposed to on Croatian television channels. When selecting the time of tracking of the advertising Ofcom data were used about the children's television ratings in the age between 10 and 15 in Great Britain (Ofcom, 2004) which were corrected for the children's programme timeslot on Croatian television channels. A total of 40 hours of programme was followed during September and October 2010, according to the programme of the following channels: HRT1, HRT2, RTL, NOVA TELEVISION from 7 to 8 am and in the afternoon on HRT1 from 20 to 22 pm, HRT2 from 18 to 20 pm, RTL from 16 to 18 pm,

NOVA TELEVISION from 20 to 22 pm, and Saturdays and Sundays all programmes in the morning from 8 to 10 am and in the afternoons at the same time as weekdays.

The research of the attitudes of the parents about advertising to children was carried out in two elementary schools in Rovinj, the ES Jurja Dobrile and the ES Vladimir Nazor, and in the ES Vladimir Gortan in Žminj. A total group of parents of 262 children attending the 5th and 6th grade of elementary school, i.e. parents of 221 pupils in Rovinj and parents of 41 pupils in Žminj were examined. The questionnaire was filled in on a parent information meeting by one of the children's parents. Out of 202 questionnaires (77% of the total number of questioned parents) which were filled in by an appropriate sample of parents on parent information meetings 25 were incorrectly filled in, while 10 questionnaires were excluded due to the presence of outliers (values greater of +/- 3 standard deviation, which can influence the calculation of the correlations and average values). The final interpretation of the results of the research is based on **167** questionnaires (63% of the total number of parents participating). The questionnaire, in addition to the question about the time that the children spend in front of the television, contains 14 statements with a Likert 5-degree scale.

The work starts from the supposition that opinions on advertising of food, knowledge, behaviour, conflict in the family and nutritional habits of children influence the attitudes of the parents about the legislative regulation of advertising to children. Consequently, the following hypotheses are made:

H1: Time spent in front of the television is related to the perceptions of the parent about the children's knowledge, behaviour and the conflicts related to food

H2: The perceptions of the parents about advertising of food to children influence the attitudes of the parents about the legislative regulation of advertising of food to children on television

H3: The perceptions of the parents about the knowledge, behaviour, conflict and nutritional habits of children in relation to the advertised food influence the attitudes of the parents about the legislative regulation of advertising of food to children on television

7.2. RESULTS OF THE RESEARCH

7.2.1. ANALYSIS OF THE INCIDENCE OF FOOD ADVERTISING AIMED AT CHILDREN

Tracking of the programme in the mentioned day periods produced the results provided in Table 1.

Table 1

Total number of adverts on television, adverts to children and children's food adverts

Channel	Day	Morning				Afternoon and Evening				Warning about oncoming advertising
		Total number of adverts	Adverts to children	Children's food adverts	Percentage of children's food in the total number of adverts	Total number of adverts	Adverts to children	Children's food adverts	Percentage of children's food in the total number of adverts	
HRT1	work day	3	-	-	-	20	1	-	-	Not always
	Saturday	6	-	-	-	22	1	1	5%	
	Sunday	5	4	1	20%	39	1	1	3%	
HRT2	work day	4	1	-	-	10	1	1	10%	Yes
	Saturday	7	7	1	14%	3	-	-	-	
	Sunday	3	-	-	-	9	1	1	11%	
RTL	work day	13	7	6	46%	28	3	2	7%	Not always
	Saturday	52	2	1	2%	56	14	4	29%	
	Sunday	24	12	12	50%	62	1	-	-	
NOVA TELEVISION	work day	17	13	8	47%	44	3	3	7%	Yes
	Saturday	48	36	7	15%	51	1	1	2%	
	Sunday	63	51	4	6%	44	3	3	7%	

Source: Authors

The tracking of adverts showed that children's food adverts are moderately present (they represent a share of 9% in the total number of adverts and 35% in adverts to children) and none of the channels broadcast warnings about the oncoming advertising which is unethical. Also, it has been noticed that children appear in adverts that are not intended for children and that do not refer to products for children, which suggests at the power of adverts that use the appeal of children.

7.2.2. PARENT QUESTIONNAIRE RESULTS

Table 2 presents mean values of the attitudes of parents, while table 3 presents the results of the correlation analysis. No statistically significant relation has been found between the hours spent in front of the television (an average of 2.5 hrs) and the attitudes of the parents. By examining of the mean values it can be noticed that parents believe their children are exposed to an ample amount of food adverts (mean value 3.87) which is, according to the values in table 2, still less than in countries that are economically better developed than Croatia. Also, they believe that the advertised products contain too much sugar and fat and that they contain too many additives (mean value 4.10).

Table 2

Descriptive analysis of the attitudes of the parents

Item	Statements	N	Mean	Std. Deviation
T1	Children are exposed to too many food adverts on television	167	3.87	.935
T2	The food that is advertised on television to children contains too much sugar and fat	167	4.10	.778
T3	The food that is advertised on television to children contains too many additives	167	4.10	.801
T4	The food that is advertised on television to children improves children's knowledge about a healthy nutrition	167	2.60	1.172
T5	Children ask the parents to purchase food that is advertised on television	167	3.75	1.067
T6	The food that is advertised on television is the reason for which children pester their parents to purchase such food	167	3.66	1.107
T7	The food that is advertised on television is the cause of family conflicts in relation to nutrition	167	3.00	1.141
T8	The food that is advertised on television is a significant cause of unhealthy nutritional habits in children	167	3.71	1.055
T9	Advertising of all unhealthy foods should be prohibited	167	3.96	.999
T10	Advertising of unhealthy foods to children under 12 years of age should be prohibited	167	3.99	.991
T11	Television should broadcast programmes about healthy nutrition and exercising for at least as much broadcast time it provides for unhealthy foods advertising	167	4.57	.663
T12	When advertising unhealthy food its nutritional value should be presented	167	4.16	.821
T13	When advertising foods with a high content of sugar and fat animated characters and celebrities should not be used	167	4.18	.845
T14	It is desirable to use animated characters and celebrities to promote healthy foods	167	4.12	.981
	HOURS_TELEVISION	167	2.527	.976

Source: Authors' calculation

Food adverts to children, according to the opinion of the parents, do not increase the children's knowledge about healthy nutrition (mean value 2.60), but are, on the contrary, the cause of their unhealthy eating habits (mean value 3.71). This is preceded by their request that advertised food be purchased (mean value 3.75), and pestering of parents (mean value 3.66) which however does not cause family conflicts (mean value 3.00). The results of the correlation analysis in table 3 do not confirm the relation between the time spent in front of the television and the attitudes of parents towards the advertised food, which does not confirm H1, but confirms a significant relation ($p<0.05$) between the attitudes of parents towards the advertised food, the behaviour related to the purchase i.e. the request to purchase such food, the conflicts with parents and the influence on the creation of unhealthy eating habits. As a result, parents believe that advertising of all unhealthy food should be prohibited (mean value 3.96), but only slightly more parents that it should also be prohibited to advertise unhealthy food to children under 12 years of age (mean value 3.99). It can be gathered from the above that the parents are not informed, nor aware of the effects that advertising may have on children in different age groups. Also, in their express opinion they believe that television should broadcast more programmes on physical exercise and a healthy nutrition (mean value 4.57), that are not featured at all in the observed time slots. The parents have clear opinions about the contents of the food adverts, and believe that they should include the nutritional value of the food (mean value 4.16), and that, in their express opinion, animated characters and celebrities should not advertise unhealthy foods (mean value 4.12), which would, however, be desirable in advertising of healthy foods (mean value 4.12).

Table 3 **Correlation analysis**

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
T1	1													
T2	**,556(**)**	1												
T3	**,411(**)**	**,662(**)**	1											
T4	-,059	-,196(*)	-,184(*)	1										
T5	,390(**)	,304(**)	,345(**)	,028	1									
T6	**,451(**)**	**,430(**)**	**,485(**)**	-,035	**,785(**)**	1								
T7	,294(**)	,265(**)	,204(**)	,203(**)	,312(**)	**,401(**)**	1							
T8	**,462(**)**	**,416(**)**	,383(**)	-,090	**,407(**)**	**,445(**)**	**,486(**)**	1						
T9	,291(**)	,345(**)	,381(**)	-,182(*)	,088	,217(**)	,222(**)	,373(**)	1					
T10	,259(**)	,290(**)	,266(**)	-,111	,204(**)	,256(**)	,256(**)	**,425(**)**	**,675(**)**	1				
T11	,277(**)	,361(**)	,373(**)	-,205(**)	,165(*)	,143	-,016	,188(*)	,304(**)	,363(**)	1			
T12	,317(**)	**,401(**)**	**,435(**)**	-,211(**)	,209(**)	,277(**)	,167(*)	,352(**)	,396(**)	,356(**)	,511(**)	1		
T13	,327(**)	**,413(**)**	,357(**)	-,262(**)	,163(*)	,240(**)	,187(*)	,357(**)	**,414(**)**	,361(**)	**,419(**)**	**,454(**)**	1	
T14	,208(**)	,206(**)	,169(*)	-,132	,109	,160(*)	,108	,209(**)	,263(**)	,261(**)	,237(**)	,224(**)		1
HOURS TELEVISION	-,006	-,023	-,007	,065	-,083	-,061	,041	-,001	-,042	,016	-,080	-,047	-,112	,012

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

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

Source: authors

7.2.3. RESEARCH OF THE CORRELATION BETWEEN THE ATTITUDES OF PARENTS TOWARDS ADVERTISED FOOD, THE INFLUENCE OF FOOD ADVERTISING ON CHILDREN AND THE ATTITUDES OF THE PARENTS TOWARDS THE FOOD ADVERTISING REGULATIONS

The research tried to establish the influence of the parent's attitudes towards advertised foods and the influence of food advertising on children based on the attitudes of the parents on the necessity of regulation of food advertising. For the purpose of establishing of the correlations between the mentioned constructs the structural equations modelling (SEM) was used. SEM enables a simultaneous testing of the relationships between the constructs described with several variables. So the first exogenous latent variable (construct) is the attitude of the parents measured with tree manifest variables i.e. statements (items) T1, T2 and T3. The second exogenous latent variable – the attitude of the parents towards the influence of food advertising on children was measured with five manifest variables (T4, T5, T6, T7, T8). Finally, the endogenous latent variable – the attitude of the parents towards the legislative regulations of food advertising aimed at children was measured with six manifest variables. All manifest variables were measured with the Likert 5-degree scale where 1 stands for "I do not agree at all" and 5 stands for "I entirely agree". Manifest variables were established on the basis of the secondary researches, mentioned in the previous chapters.

The structural model intended for testing presupposes that the attitude of the parents towards the advertised food significantly and positively influences the attitude of the parents towards the regulation of food advertising to children (**H2**). Also, the theoretical model presupposes a significantly positive influence of the parents' attitude on the influence of food advertising on children and the attitude of the parents towards the regulation of food advertising (**H3**).

Before the testing of the proposed model, we tested the suppositions, as well as the suitability of the collected data for the SEM. The testing of suppositions for the SEM included: identification and elimination of the univariate and multivariate outliers, the testing of the univariate and multivariate normality of the distribution of the variables, determination of reliability of the measurement scales and the determination of the convergent and discriminant validity by use of the confirmatory factor analysis.

10 univariate outliers were therefore first excluded from the analysis. Univariate outliers are cases (observances) above and under three standard deviations from the mean value (Hair et. al; 2006; 75). In order to determine the multivariate outliers the square of Mahalanobis distance was calculated according to which none of the observances displayed a great distance with respect to all the other observances. In order to test the univariate normality of distribution of single variables the symmetry and kurtosis indexes were measured. The values of symmetry and curtosis indexes for all the analysed variables in the final model were lower than 3. In this sense none of the variables showed an unacceptable level of univariate normality. In order to test the multivariate normality of the distribution of a group of variables the Mardia based Kappa curtosis index was calculated. The Mardia Based Kappa index for the final model equals 30,619 (C.R=12,771) and is higher than 5, which shows that there is no multivariate normality. Nevertheless, despite that, even though the disregard of the supposition of multivariate normality in SEM can lead to model parameter overestimation, a research of parallel methods of model parameter evaluation indicates that conclusions about the statistical significance of certain parameters may be accepted (Byrne, 2010).

The reliability of the scales has been established by the Cronbach alpha coefficient. Table 4 shows the Cronbach alpha coefficients for single scales (latent variables) and statements (manifest variables-indicators).

Table 4

Cronbach alpha coefficients and the influence of single statements on the Cronbach alpha coefficient of a single measuring scale

Scale – statement	**Cronbach alpha – if the statement is omitted**
Cronbach alpha for the whole scale – Attitude of the parents towards food advertising (SROH): **0.772**	
T1	0.796
T2	0.578
T3	0.707
Cronbach alpha coefficient for the scale - Attitude of the parents towards the influence that advertising has on children (SRUOD): **0.668**	
T4	0.781
T5	0.544
T6	0.529
T7	0.565
T8	0.662
Cronbach alpha coefficient for the scale – Attitude of the parents towards food advertising regulations (REGULACIJA): **0.780**	
T9	0.727
T10	0.731
T11	0.756
T12	0.746
T13	0.730
T14	0,784

Source: Authors' calculation

The calculated Cronbach alpha coefficients indicate at an acceptable level of reliability of the scales SROH and REGULACIJA (higher than 0.7) and an unacceptable level of reliability of the scale SRUOD (Cronbach alpha = 0.668), but which can be improved to 0.781 if statement 4 is excluded from further analyses.

After the testing of the reliability of scales we tested their unidimensionality and their convergent and discriminant validity. The unidimensionality presupposes a group of manifest variables that belong to only one latent variable. The convergent validity shows the degree up to which single manifest variables – statements of a specific construct – converge, that is to say, pool a large portion in a common variance. The discriminant validity shows the degree to which one latent variable differs from others.

On the basis of a confirmatory factor analysis of the initial structural model the statements 7, 10 and 14 were excluded, in the given order. After the exclusion of each statement a confirmatory factor analysis was carried out. The statements 7 and 14 were excluded because of low standardized loadings that amounted to 0.4 (less than 0.5) for both statements, while statement 10 was excluded on the basis of the modification index which showed that improvements of the model are possible by lowering of the chi square value. The lowering of the chi square value after the exclusion of statement 10 resulted in 58.339. By an analysis of the contents of the statements 7, 10 and 14 it was possible to notice their similarity

to the statements 6, 9 and 13 and it was for this reason that their exclusion with the purpose of improvement of the final model was considered justified. The results of the confirmatory factor analysis for the final model are given in Table 5. The evaluation of the model parameters was done by the use of the Maximum Likelihood (ML) method.

Table 5

Results of the confirmatory factor analysis

Construct – latent variable, statements	Structural coefficients (Regression weights) (C.R.)	Standardized loadings	CR	AVE
SROH			**0.79**	**0.56**
T1	0.933* (7.281)	0.619		
T2	1.023* (9.932)	0.817		
T3	1.000	0.785		
SRUOD			**0.81**	**0.60**
T5	1.000	0.817		
T6	1.214* (11.811)	0.954		
T8	0.583* (6.265)	0.481		
REGULACIJA			**0.76**	**0.45**
T9	0.978* (5.727)	0.528		
T11	0.803* (6.572)	0.664		
T12	1.220* (7.181)	0.796		
T13	1.000	0.645		

*Note: structural coefficients are statistically significant ($p<0,001$)
C.R. – Critical ratio, CR – Construct Reliability, AVE- Average Variance Extracted
Source: Authors' calculation

According to the data from Table 5 all structural coefficients are statistically significant, while standardised loadings are greater than 0.5, except for statement 8, but since the quality of the model does not significantly improve by elimination of this statement, it was preserved. The unidimensionality of the manifest variables was thus confirmed. The convergent validity was tested with the construct reliability indicator CR and the average variance extracted. For the entire construct the CR index is greater than 0.7 while the AVE indicator is greater or close to 0.5. The mentioned indicators confirm the acceptable level of convergent validity of the manifest variables. The discriminant validity was established by the comparison of AVE indicators and the squared correlations between single constructs. The AVE indicators and the squared correlations between single constructs are shown in Table 6.

Table 6

Comparison between AVE indicators and squared correlations between constructs

	SROH	SRUOD	REGULACIJA
SROH	**0,56**		
SRUOD	0,38	**0,60**	
REGULACIJA	0,48	0,12	**0,45**

Source: Authors' calculation

Since all the AVE indicators are almost equal or significantly greater than single squared coefficients of correlation between single constructs it is possible to conclude that an acceptable level of discriminant validity exists. Finally, in order to establish the suitability and quality of the final SEM, we provide the FIT indexes for the structured model for the empirical data in Table 7.

Table 7

Fit indexes for the structural model

Chi square/degrees of freedom	2.356
Goodness-of-Fit Index (GFI)	0.922
Adjusted Goodness – of - Fit Index (AGFI)	0.866
Normed Fit Index (NFI)	0.890
Comparative Fit Index (CFI)	0.932
Incremental Fit Index (IFI)	0.934
The Tucker Lewis Coefficient (TLI)	0.902

Source: Authors' calculation

The data from Table 7 indicate at the good quality of the model – the theoretical model fits appropriately to the empirical data. The relation between the chi square and the degrees of freedom is less than 2.5 while all the other indexes are greater than or close to 0.9.

After having established that the model fits the empirical data for the testing of the hypotheses it was necessary to carry out the structural model analysis (Path analysis). Table 8 shows the results of the structural model analysis.

Table 8

Structural model analysis results

HYPOTHESIS	Standardised structural coefficient
H2: SROH → REGULACIJA (+)I	0.771*
H3: SROUD → REGULACIJA (+)	-0.123

* Significant at level p<0,001

Source: Authors' calculation

The attitude of the parents towards advertising has a significantly positive influence on the attitude of the parents towards regulation, thereby confirming the H2 hypothesis. On the other hand, the attitude of the parents towards the influence of advertising does not have a statistically significant influence on the attitude of the parents towards the regulation of food advertising on television and therefore H3 has been discarded. On this basis, it can be

concluded that parents form their attitudes about regulations primarily on the basis of their personal perception of the advertising, and not as much on their perceptions of their children's behaviour. In other words, even though parents believe that advertising on television influences children's' behaviour and their tendencies to choose such foods, they form their opinion on the necessity of regulation of this issue on the basis of their own opinion about such food. The following question arises: Could it be that advertising to children on Croatian television channels and the influence of such advertising on unhealthy eating habits are still not conspicuous enough to cause a stronger reaction of the parents and to result in the awareness of the necessity for the proper legal regulation of this issue? The answer may be confirmative, but this does not justify the neglect of this issue by the legislation.

8. CONCLUSIONS

Advertising of food to children is one of the principal issues of the ethics in advertising. Even though a whole series of factors influences the choice of foods of a child, there is no doubt about the influence of food advertising, which eventually influences the development of nutritional habits in children. In addition to the time spent in front of the television, the influence of advertising also greatly depends on the content of the advertisement and its frequency, the type of food and the sophistication of the advertisement and its appeals, as well as the overall creative strategy and use of the possibilities of the promotional mix. The effect of food advertising on children is multiple and moderate, depending on knowledge about foods, food preferences and children's behaviour in connection with food, with recent emphasis on nutritional habits and the consequential obesity.

An important mediating role in children's consumption within socialization is played by the parents, who also have influence over food advertising to children. Their attitudes towards food advertising, in line with such researches carried out elsewhere in the world, are mostly negative, and they tend to a better regulation of this area, which involves many possibilities, ranging from the intervention into the content of the advertising to its total prohibition.

The research of parents' attitudes in Croatia does not confirm the relationship between the time spent in front of the television and the attitudes of the parents towards food advertising and their influence on the children, or the question of its legislation. Such a result may partly derive from a moderate occurrence of food advertising to children on the tracked television channels. However, the negative attitude towards the undesirable content of the advertised foods, as well as the negative influence on the nutritional habits of children has been confirmed. Therefore, the parents believe that the advertising of unhealthy food should be prohibited, but their position about the prohibition of advertising of food to children under the age of 12 is not overly restrictive. Parents have positive attitudes towards the contents of the advertising, including the emphasising of the nutritional values and the objectionability of exploitation of animated characters and celebrities, and they also believe that there should be more programmes and contents that deal with healthy nutrition. The research of the influence of the attitudes about advertising and attitudes about the knowledge and behaviour of children on the issue of adequate regulation has established that the perception of the advertising by the parents mostly influences their attitudes about the regulations, while the attitudes about knowledge and behaviour of the children do not possess a statistically significant influence. The research generally confirms the results of previous researches and indicates at the need for better legislative regulations of this issue in Croatia and a larger contribution of foods that have a positive effect on the health of children in the future.

REFERENCES

Arnas, Y.A., (2006), «The effects of television food advertisement on children's food purchasing request», *Pediatrics International*, 48 (2): 138-145.

Ban, Đ., (2009), "Utjecaj ekonomske propagande na učeničku populaciju u Dubrovniku", *Ekonomska misao i praksa*, 18 (1):153-174.

Byrne, M.B., (2010), *Structrual Equation Modeling with Amos*, Routledge, New York.

Caroli, M., Argentieri, L., Cardone, M., Masi, A., (2004), «Role of television in childhood obesity prevention», *International Journal of Obesity*, 28: 104-108.

Chan, K., McNeal, J.U., (2003), «Parent-child communications about consumption and advertising in China», *Journal of Consumer Marketing*, 20 (4): 317-334.

Corbett, C., Walker, C., (2009), «Catchy cartoons, wayward websites and mobile marketing – food marketing to children in a global world», *Education Review*, 21 (2): 84-92.

Darwin, D., (2009),"Advertising Obesity: Can the U.S. Follow the Lead of the UK in Limiting Television Marketing of Unhealthy Foods to Children", *Vanderbilt Journal of Transnational Law*", 42(1): 317-350.

Dens, N., De Pelsmacker, Eagle, L., (2007), "Parental attitudes towards advertising to children and restrictive mediation of children's television viewing in Belgium", *Young Consumers*, 8 (1): 7-18.

Grossbart, S.L., Crosby, L.A., (1984), "Understanding the Bases of Parental Concern and Reaction to Children's Food Advertising", *Journal of Marketing*, 48 (3): 79-92.

Gunter, B., Oates, C., Blades, M., (2005) *Advertising to Children on TV: Content, Impact, and Regulation*, Lawrence Erlbaum Associates, Inc.

Hair et. al., (2006), *Multivariate Data Analysis*, Prenitice Hall, Upper Saddle River, New Jersey.

Harker, D., Harker, M., Burns, R., (2007), «Tackling Obesity: Developing a Research Agenda for Advertising Researchers», *Journal of Current Issues and Research in Advertising*, 29 (2): 39-51..

Hastings, G., Angus, K., Caraher, M., Forsyth, A., Godfrey, C., MacKintosh, A.M., McDermott, L., Stead, M., «Review of Research on the Effects of Food promotion to Children», (2003), Final Report, University of Strathclyde, Glasgow, 22nd September: 1-218.

Hawkes, C., (2007), «Regulating Food Marketing to Young People Worlwide: Trends and Policy Drivers», *American Journal of Public Health*, 97 (11): 1962-1973.

Hill, H., (2002), «Packaging of children's breakfast cereal: manufactururers versus children», *British Food Journal*, 104 (8/9): 766-777.

Ip, J., Mehta, K.P., Coveney, J., (2007), «Exploring parent's perceptions of television food advertising directed at children: A South Australian study», *Nutrition&Dietetics*, 64 (1): (50-58)

Kelly, J., Turner, J.J., McKenna, K., (2006), "What parents think: children and healthy eating", *British Food Journal*, 108 (5): 413-423.

Kirstin, L., (2002), «Commercialism in Schools», *ERIC Digest* 158:1-4. (PROVJERITI)

Lee, M., Choi, Y., Taylor Quilliam, E., Cole, R.T., (2009), «Playing With Food: Content Analysis of Food Advergames», *The Journal of Consumer Affairs*, 43 (1): 129-154.

Lee, W.-N., Tseng, E.S., (2006), "Food Advertising to Children: A Content Analysis Study of Television Commercials in Top Rated Tweens' Programs", *American Academy of Advertising Conference Procedings*, 140-149.

Livingstone, S., (2004), «A Commentary on the Research Evidence Regarding the Effects of Food Promotion on Children», MEDIA@LSE, Department of Media and Communications, Febrary: 1-32.

Livingstone, S., (2005), «Assessing the research base for the policy debate over the effects of food advertising to children», *International Journal of Advertising*, 24 (3): 273-296.

Livingstone, S., Helsper, E., (2004), «Advertising Foods to Children: Understanding Promotion in The Context Of Children's Daily Lives», Report to Ofcom, London, 7th May: 29-31. http://www.ofcom.org.uk/research/tv/reportsfood_ads/appendix2.pdf. (5.9.2010)

Livingstone, S., Helsper, E., (2004), «Advertising Foods to Children: Understanding Promotion in The Context Of Children's Daily Lives», MEDIA©LSE, Department of Media and Communications, 7th May: 1-53.

Lobstein, T., Dibb, S., (2005), «Evidence of a possible link between obesogenic food advertising and child overweight», *Obesity Reviews*, 6, (3): 203-208.

Mendzigall, T., Morrison, M., (2008), "Oh Boy, Am I Hungry! An Analysis of food Advertising in Boys' Life Magazine Relative to CARU's Self-Regulatory Program for Children's Advertising", *American Academy of Advertising Conference Procedings*, 122-133.

Mukherji, J., (2005), «Maternal Communication Patterns, Advertising Attitudes and Mediation Behaviours in Urban India», *Journal of Marketing Communications*, 11 (4): 247-262.

Roberts, M., Pettigrew, S., (2007) "A thematic content analysis of children's food advertising", International *Journal of Advertising*, 26 (3): 357-367.

Rozenkranz, R.R., Dzewaltowski, D.A., (2008), «Model of the home environment pertaning to childhood obesity», *Nutrition Reviews*, 66 (3): 123-140.

Schwartz, M.B., Puhl, R., (2004), «Childhood obesity: a societal problem to solve», (2003), *Obesity reviews*, 4 (1): 57-71.

Spungin, P. «Parent power, not pester power», (2004), *Advertising & Marketing to Children*, 5 (3): 37-40.

Story, M., French, S., (2004), «Food Advertising and Marketing Directed at Children and Adolescents in the US», *International Journal of Behavioral Nutrition and Physical Activity*, 1: 3-17.

Walsh, A.D., Laczniak, R.N., Carlson, L., (1998), "Mothers' Preferences for Regulating Children's Television", *Journal of Advertising*, 27 (3): 23-36.

Wilson, N., Quigley, R., Mansoor, O., (1999), «Food ads on TV: a health hazard for children?», *Australian and New Zealand Journal of Public Health*, 23 (6): 647-650.

Young, B.M., de Bruin, A., Eagle, L., (2003), «Attitudes of Parents Toward Advertising to Children in the UK, Sweden and New Zealand», *Journal of Marketing Management*, 19 (3/4): 475-490.

Zuppa, J.A., Morton, H., Mehta, K.P., (2003), «Television food advertising: Counterproductive to children's health? A content analysis using the Australian Guide to Healthy Eating», *Nutrition & Dietetics*, 6 (2): 78-84.

... (2004), »Childhood Obesity – Food Advertising in Context», Ofcom, Office of Communication, 22 July: 1-180.

... Rang lista 2008, Najoglašavanije kategorije, Lider, www.liderpress.hr (24.9.2010.)

PERCEPCIJE RODITELJA O OGLAŠAVANJU HRANE PREMA DJECI NA TELEVIZIJI: IZLOŽENOST, UTJECAJ I REGULATIVA

SAŽETAK

Svrha rada je istražiti percepcije roditelja o oglašavanju hrane prema djeci na televiziji. Teorijsko istraživanje uključuje osvrt na marketing prema djeci, analizu utjecajnih čimbenika, utjecaj oglašavanja hrane prema djeci, percepcije roditelja te pitanja regulacije ovog područja oglašavanja. Empirijsko istraživanje anketnog ispitivanje percepcija roditelja ne potvrđuje vezu između vremena provedenog ispred televizora i ponašanja djece ali ukazuje na negativne stavove roditelja o oglašavanju hrane koje utječu na umjereno restriktivan stav o zabrani takvih oglasa.

***Ključne riječi**: oglašavanje prema djeci, televizijsko oglašavanje, percepcije roditelja, zakonska regulativa, Hrvatska*

Jože Kocjančič[1]
Štefan Bojnec[2]

UDK 674:<334.72:334.71>(497.4)
PRELIMINARY PAPER
PRETHODNO PRIOPĆENJE

DYNAMICS IN WOOD INDUSTRY IN SLOVENIA

ABSTRACT

This paper investigates the dynamics of large wood industry enterprises on the dynamics of micro and small wood industry enterprises using firm-level survey data and time-series data. In addition, entry and exit of micro and small wood industry enterprises is explained by factors of demand, value-added, and profitability of capital. The empirical results show relatively modest impact of the dynamics of large enterprises on the dynamics of micro and small enterprises in the wood industry. The rate of value-added per employee and the rate of capital profitability are significantly associated with investments, particularly investments into new technological equipment. Easier access to financial means for micro and small enterprises at acceptable guarantees and reduction in costs of financing of capital are among possible measures to improve wood industry enterprise performance and entry into foreign markets as well as to efficiently reduce imports of wood raw materials and low value-added wood semi-products and to increase exports of higher value-added products and services.

JEL Classification: *D22, L25, L69, C12, C81;*

Keywords: *Firm Dynamics, Competition, Wood Industry, Slovenia*

INTRODUCTION

The aim of this research is to investigate the association between the changes in the number and importance of the large wood industry enterprises on the dynamics of entry and exit of small enterprises in the wood industry in Slovenia. Literature on dynamics of entry and exit of small enterprises have largely been developed for developed western market economies, while literature on Slovenia often focuses on the manufacturing sector as a whole.

This present paper focuses on the wood industry as one of the sectors in the Slovenian manufacturing sector. It contributes to literature on enterprise dynamics. In the first part, we present theoretical background as a starting point for empirical analysis of the dynamics of the wood industry enterprises in Slovenia. The research is based on economic theory and empirical analysis on performances of enterprises and determinants, which are determining entry and exit of enterprises (Antončič et al., 2002; Antončič, 2007; Hudson, 1986; Dunne et al., 1988; Davelaar, 1991; Machin and Reenen, 1993; Storey, 1994; Geroski and Walters, 1997; Audretsch et al., 2006; Smith et al., 2007; Kraus and Schwarz, 2007; Bojnec and Xavier, 2004, 2005, 2007). In the second, empirical part of this paper, we present empirical results of the research of the sample of micro and small Slovenian enterprises, which operate in the wood industry in Slovenia. The results might show in which degree and in which way the changes in the number and importance of large wood industry enterprises determine on the dynamics of entry and exit of new micro and small enterprises in this activity. We also

[1] University of Primorska, Faculty of Management Koper, Slovenia. Cankarjeva 5, 6000 Koper, e-mail: joze.kocjancic@siol.net.
[2] University of Primorska, Faculty of Management Koper, Slovenia. Cankarjeva 5, 6000 Koper, e-mail: stefan.bojnec@fm-kp.si.

estimate regression analysis using time series statistical data on the associations between the dynamics of micro and small enterprises vis-à-vis the dynamics of large enterprises in the wood industry in Slovenia. Finally, we derive main conclusions and some proposals.

THEORETICAL BACKGROUND AND MAIN EMPIRICAL FACTS

Economic development is in a great extent determined by entrepreneurial orientation. Bierly and Muzyka (2000) on the sample of 500 dynamic western small enterprises show that even during economic recession dynamics of small enterprises experience positive job creation rates as well as growth in revenues. The empirical evidences for different countries show the importance of small and medium sized enterprises for creation of new jobs (Birch, 1979; Kirchhoff and Phillips, 1988; Davidsson et al., 1994; Storey, 1994; Picot and Dupuy, 1998).

ECONOMIC IMPORTANCE OF DYNAMICS OF ENTERPRISES

Economic efficiency of a country is determined by several factors. Dynamics of entry and exit of enterprises is a determinant without which the process of creative destruction would not be possible. New enterprises are inducing competitive pressures, fulfil market niches, and regenerate branch (Schumpeter, 1934). Entry of new enterprises, changes in size structures and exit of enterprises have a crucial impact on a country's economic growth. Several new emerging enterprises, which are entering in a market, provide opportunities for easier and faster adjustments in the economy on technological changes and utilisation of new business opportunities.

The positive rate of dynamics of entry of new enterprises creates greater competition, which encourages the existing enterprises to struggle for market shares, induces needs for restructuring and more efficient operation. On the other hand, the increased enterprise entry competition can cause exit of less efficient enterprises from the market, which improves resource allocative efficiency from less to more productive enterprises and activities (Foster et al., 1998, Scarpetta et al., 2002, Brown et al., 2004). The dynamics of entry and exit of enterprises have the crucial role for competitive market economy, particularly during the periods of structural reforms, when economic growth, which is based on existing industries and markets, is in a stagnating stage. In such periods the economic growth depends particularly on ability to gains new markets and activities. These are areas, which largely depend on more efficient new enterprises and entrepreneurs (Davelaar, 1991). The institutional environment, which represents an enabling environment for business performance of enterprises, dynamics of entry and growth of new enterprises and enterprise survival, often indicates a crucial association with general economic performance indicators by countries. Due to these reasons, the demography of enterprises is one of most important indicators, which indicates the rate of efficiency of countries (Brandt, 2004).

DETERMINANTS OF DYNAMICS OF ENTERPRISES

Dynamics of entry and exit of enterprises is determinant by several factors, which are associated to changes in macro-economic environment of an enterprise (Hudson 1986; Robson 1996). Market demand and supply, market growth, employment rate, and technological changes are only some factors, which are determining the rate of profitability and associated dynamics of entry and exit of enterprises (Geroski and Machin, 1993; Machin

and Reenen, 1993; Geroski and Walters, 1997). Enterprise size, enterprise ownership structure, competitive pressures, market orientation and branch characteristics are also important factors, which determine dynamics of enterprises. Dynamics of micro and small enterprises is in a great extent determined by factors of enabling enterprise environment and factors of the role of entrepreneur. From an economic point of view, dynamics of entry of new enterprises and dynamics of exit of inefficient enterprises crucially influence on economic growth of an economy. From broader social point of view, dynamics of enterprises has important role for capital allocation and job creation, which is important for economic growth and social cohesion.

Slovenia has experienced relatively a high percentage of exits among the new enterprises, which suggest low efficiency and survival rate among newly established enterprises. The high percentage of exits among newly established enterprises imply losses of invested means. The resources, which were invested in a certain activity, were not profitable and might be better to reallocate them in another more productive investment opportunity. In 2004, the exit rate among newly established enterprises in Slovenia was around 37% implying that ten enterprises out of 27 newly established enterprises survived. The highest exit rate among newly established enterprises in the EU was only in France (Minniti et al., 2006). In 2005 the exit rate among newly established enterprises declined and thus the survival rates increased.

In 2005 in Slovenia were set up 8,400 new enterprises, which represented almost 45% more than in 2000. During the same period the increase in the number of employees in the newly established enterprises was less substantial, as it increased by 16%. The newly established enterprises are mostly micro and small enterprises. In 2000, in the newly established enterprises on average were employed 1.66 persons per enterprise, while in 2005 it was 1.34 persons per enterprise, which shows the decline in the average employment size of the newly established enterprises (SORS, 2008).

WOOD INDUSTRY IN SLOVENIA

The wood industry is classified among manufacturing activities. It includes production of sawn wood, plywood and plates, impregnated wood, production of furniture, packaging, building furniture and other products from wood. The wood industry in Slovenia is ranked among the first thirds of the most important economic activities within the manufacturing activities. From point of view of contributions to employment, revenues and gross value added it is almost twice as important as it is in the other EU countries. On the other hand, productivity in the Slovenian wood industry is almost twice less than on the average of the branch in the EU countries (Kožar, 2006). The main problems, which the Slovenian wood industry is facing, are its relatively low international competitiveness, low labour productivity, and heavily indebtedness. For the Slovenian wood industry is typical high concentration of enterprises, which produce semi products and products with low value added, which is an additional factor, which due to relatively high production cots reduces competitive position of the wood industry enterprises.

The Slovenian wood industry is important in employment and in generation of value added in the economy. In 2006, in the Slovenian wood industry were operating 2,586 enterprises, which employed 23,757 persons, which represented 4.09% of employment in the Slovenian manufacturing activities. In the same year, wood industry contributed 4.86% of revenues and 1.77% of net pure profit of the Slovenian manufacturing activities. Net revenue from sales in the Slovenian wood industry amounted to 1.09 billion euro, and 50.1% of all revenues were realized at the foreign markets.

During the period 2000-2006, the dynamics of entry of new enterprises in the Slovenian wood industry shows relatively balanced dynamics of the share of newly established enterprises by the individual years, which on average is between 2.93% in 2006 and 4.4% in 2004.The average survival rate of the newly established enterprises, which survived the first year of operation, is almost 92% and is reduced on average to 62% of the newly established firms, which survived the first five years of operation (SORS, 2008).

METHODOLOGY AND DATA

The research aims to investigate the causalities between the dynamics of the number of the large enterprises and entry of new and exit of micro and small enterprises in the wood industry in Slovenia. We aim to investigate determinants of changes in the number and size structure of the large enterprises in the wood industry and the dynamics of entries and exits of micro and small enterprises. On the basis of comparisons of the obtained empirical results of the research with a similar research in literature we derive implications for entrepreneurial decisions at the enterprise level and for needs of economic policy.

The data collection for the selected sample of micro and small enterprises is conducted by using the written questionnaire, which was sent by post-mail to the randomly selected addresses of the population of the micro and small enterprises in the wood industry. The micro and small enterprises were selected on the basis of the registry of enterprises. The micro, small and large enterprises are defined according to the Slovenian legislation where at least two criteria should be fulfilled. A micro enterprise is defined as: average number of employees in a business year is equal or less than 9 employees, net revenues is equal or less than 2 million euro, and active value in balance sheet of an enterprise is equal or less than 2 million euro. A small enterprise is defined as: average number of employees in a business year is equal or less than 50 employees, net revenues is equal or less than 7.3 million euro, and active value in balance sheet of an enterprise is equal or less than 3.65 million euro. A large enterprise is defined as: average number of employees in a business year is more than 250 employees, net revenues is more than 29.200 million euro, and active value in balance sheet of an enterprise is more than 14.6 million euro.

The surveys in the Slovenian micro and small wood industry enterprises with the written questionnaire were conducted between the third quarter of 2008 and the beginning of 2009. The written questionnaire was accompanied by a cover letter and pre-paid return envelope. The answers on the questions were in the form by using the Likert's scale (Easterby-Smith et al., 2005). There were five possible responses on the basis of the intensity of agreement or disagreement with the possible response on the question by the Likert's scale, where 1 means not important at all, 2 is not important, 3 is neutral, 4 important, and 5 very important.

In 2007 the population of the Slovenian micro and small enterprises in the wood industry comprises of 2,342 enterprises, and there were 18 large enterprises (Table 1). In the randomly selected survey sample were included almost 21% of the population of the micro and small enterprises, which were engaged in the wood industry. This means around 700 micro and small enterprises. The completed and returned were 168 questionnaires.

Table 1:

Population of enterprises in the wood industry in Slovenia, 2007

	Number of enterprises		Number of employees	
Standard Classification of Activities	DD20	DN36	DD20	DN36
Micro enterprise (0 – 9 employees)	1,520	1,568	3,030	3,139
Small enterprise (10 – 49 employees)	119	117	2,326	2,524
Total number of micro and small enterprises	1,639	1,685	5,356	5,663
Large enterprises (more than 250 employees)	6	12	3,385	5,212
Total number of enterprises in population	1,645	1,697	8,741	10,875

Note: DD20 – Manufacture of wood and wood products. DN36 – Manufacture of furniture, manufacturing not elsewhere classified.
Source: SORS 2009

Our main thesis is that the entries and exits of micro and small enterprises, and economic efficiency in the wood industry in Slovenia, are directly associated with the dynamics in the number and importance of the large enterprises in this industry. In addition to the unique enterprise survey data, we employ also statistical time series data for the years 1989 to 2007. As the methods of the empirical analyses we employ descriptive statistics and t-test analysis of the survey data, and time series regression analysis (e.g. Forster et al. 2006, Mele 2010).

DYNAMICS OF LARGE ENTERPRISES AS DETERMINANT OF DYNAMICS OF MICRO AND SMALL ENTERPRISES IN THE WOOD INDUSTRY

The basic theoretical and empirical knowledge on enterprise performance, entrepreneurship, and market dynamics of entry and exit of enterprises are based on studies for western market economies, for transition and emerging market economies (Antončič et al., 2002; Hudson, 1986; Dunne et al., 1988; Davelaar, 1991; Machin and Reenen, 1993; Storey, 1994; Geroski and Walters, 1997; Audretsch et al., 2006; Smith et al., 2007; Kraus and Schwarz, 2007; Bojnec and Xavier, 2004, 2005, 2007). We aim to investigate the changes in the number and importance of large wood industry enterprises on the dynamics of entry of newly established small enterprises as a response to the emerging gaps in supply of products and services, which have occurred with the exit of large enterprises or with the changing their size.

CHANGES IN LARGE ENTERPRISES ON DYNAMICS OF MICRO AND SMALL ENTERPRISES

Literature argues that dynamics of enterprise exit increases with the increases in financial instability, which is consistent with hypothesis on enterprise life cycle (Vernon, 1996). Both dynamics of entry and dynamics of exit of enterprises vary with respect to rate of nominal and real financial stability. Economic cycle, which is defined by macro-economic variables such as developments in demands, rate of unemployment and growth in supply, causes on the rate of profitability (Geroski and Machin, 1993; Machin and Van-Reenen, 1993; Geroski et al., 1997), which are determining the dynamics of entries and exits of enterprises.

The analysis of the opinions of the respondents in the Slovenian wood industry enterprises on the question how dynamics in the reduction of the number of large enterprises determines the dynamics of entry of micro and small enterprises, shows that the dynamics in the reduction in the number of large enterprises on the dynamics of entry of micro and small

enterprises in the wood industry is less clear or relatively modest (Table 2). The average value of the responses is 3.09 (Likert scale from 1 to 5) with standard deviation 1.142 of estimates.

Table 2:
Impact of reduction in the number of large enterprises on the dynamics of micro and small enterprises in the wood industry in Slovenia, 2009

Impact of reduction in the number of large enterprises on:	N	Interval of estimate of mean value: Mean value	Modus	Median	Standard deviation
• dynamics of entry of micro and small enterprises	168	3.09	3	3.00	1.142
• dynamics of exit of micro and small enterprises	165	3.00	3	2.00	1.161

Notes of opinions: 1 – not important at all; 2 – not important; 3 – neutral; 4 – important; 5 – very important. N = number of observations.

The analysis of the opinions by the respondents on the question how reduction in the number of large enterprises in wood industry in Slovenia determines the dynamics of exit of micro and small enterprises in the wood industry according to the mean value of the opinions by the respondents show similar or even smaller importance than on the dynamics of entry of newly established micro and small enterprises in the wood industry. For the former the mean value of responses is equal 3 (neutral) with standard deviation of estimate 1.161. On the basis of previous analysis and our results we can conclude that the reduction in the number of large enterprises in the wood industry determines the dynamics of entry and exit of micro and small enterprises in a smaller degree, while crucial determinants of dynamics seem to be factors of demands for enterprise products and services and of enterprise enabling macro-economic environment such as rate of unemployment and degree of financial stability.

IMPACT OF OUTPUT DEMAND ON DYNAMICS OF ENTRY OF MICRO AND SMALL ENTERPRISES

As a consequence of the reduction in the number and size structure of large enterprises, there is a reduction in a local supply of products and services, which is substituted by more efficient domestic enterprises and foreign import competition (Bojnec and Xavier, 2007). The empirical results on the question in which degree new demand, which is determined by the exit of large enterprise from the output market, determines the entry of a greater number of newly established micro and small enterprises, which are substituting output supply in the wood industry, shows modest positive association on the dynamics of entry of newly established micro and small enterprises in the wood industry. The average value of opinions by the respondents is 3.43 (Likert scale from 1 to 5), which means neutral or relatively modest impact of newly emerged output demands on the dynamics of entry of micro and small enterprises in the wood industry (Table 3).

Table 3:
Impact of output demand on dynamics of entry of micro and small enterprises in the wood industry in Slovenia, 2009

	N	Interval of estimate of mean value	Modus	Median	Standard deviation
		Mean value			
Impact of output demand on dynamics of entry of small enterprises	165	3.43	4	4.00	1.000

Notes of opinions: 1 – not important at all; 2 – not important; 3 – neutral; 4 – important; 5 – very important. N = number of observations.

The previous research on the dynamics of micro and small enterprises in the wood industry has shown that on the decision for the start up and entry of enterprises are determined by factors of environment of micro and small enterprises and factors of the role of entrepreneurs (Kocjančič and Bojnec, 2008). Among the factors of the enterprise enabling environment are significant for example the share of market sales, ability of financing of current operation and delay payments with payments disorder. Therefore, we analyse and compare the opinions of the respondents on the set question, which shows that the increased output demand, which resulted as the consequence of the exit of large enterprises from the market, has modest positive impact on the dynamics of entry of micro and small enterprises in the wood industry.

IMPACT OF COMPETITION FROM MICRO AND SMALL ENTERPRISES ON INDICATORS OF EFFICIENCY

Labour intensive branches such as the wood industry show a greater dynamics of entry of micro and small enterprises than exits. As a result, this leads to a higher concentration in the branch, which might in a negative way determine enterprise business performance and leads to greater rates of exits of enterprises in a certain branch (Bojnec and Xavier, 2004, 2005, 2007).

We use five questions to investigate the impact of the greater number of micro and small enterprises in the Slovenian wood industry on the rate of competition and indicators of efficiency in the wood industry. In these questions are captured impacts of increased number of new micro and small enterprises on the rate of value-added, employment rate, rate of value-added per employee, rate of competition, and rate of economic efficiency of growing survived enterprises. This analysis of the opinions by the respondents on these questions gives an overview on the extent in which the increased number of new micro and small enterprises in the wood industry determines enterprise performance by individual selected indicators of enterprise efficiency. Table 4 shows that on the basis of the opinions by the respondents on the asked question we can conclude that the increased number of micro and small enterprises has neutral up to important impact on the investigated indicators of enterprise efficiency in the wood industry in Slovenia. The greatest is the impact of the increased number of micro and small enterprises on the economic efficiency of the growing survived enterprises.

Table 4:
Impact of competition from micro and small enterprises on indicators of enterprise efficiency in the wood industry in Slovenia

Impact of a greater number of small enterprises on:	N	Interval of estimate of mean value: Mean value	Modus	Median	Standard deviation
• rate of value-added in wood industry	156	3.06	3	3.00	1.011
• employment rate	156	3.29	4	3.50	0.990
• rate of value-added per employee	156	3.38	4	3.50	1.062
• competition and rate of profitability of capital	168	3.23	4	3.00	0.966
• economic efficiency of growing survived enterprises	168	3.41	4	4.00	1.017

Notes of opinions: 1 – not important at all; 2 – not important; 3 – neutral; 4 – important; 5 – very important. N = number of observations.

New micro and small enterprises are often oriented into innovative activities and have important role in job creation. Market dynamics by entry of new, more efficient enterprises and exit of less productive and less efficient enterprises have important role in reallocation of resources from less to more productive ones (Scarpetta et al., 2002, Foster et al., 1998). We can conclude that the increased number of the newly established micro and small enterprises determines all aspects and indicators of wood industry enterprise performance and efficiency. Newly established and in innovation oriented micro and small enterprises are creating competitive pressures, which causes different resource allocation and income distribution from less to more productive and efficient enterprises.

IMPACT OF INDICATORS OF EFFICIENCY ON INVESTMENT ACTIVITIES

The rate of value-added per employee and the rate of capital profitability are factors that have impacts on investments and particularly on investments in advanced technological equipment. In cases that the values of indicators are lower than alternative opportunity revenues, then we can expect that capital starts to move out of a branch. We ask the respondents two questions on the impact of indicators of efficiency on investments in the Slovenian wood industry: first, what is the impact of the rate of value-added per employee in the industry on the investments in new technological equipment, and second, what is the impact of rate of capital profitability on investments. The analysis of opinions by the respondents on the asked questions gives the evidence in what extent the individual factors of efficiency are determining investment activities in the wood industry. Table 5 presents the opinions of the respondents on the asked questions. Both the rate of capital profitability and the rate of value-added per employee determine importantly the decisions on the investments in the wood industry in Slovenia.

Table 5:
Impact of indicators of micro and small enterprise efficiency on investments in the wood industry in Slovenia

Determinants:	N	Interval of estimate of mean value: Mean value	Modus	Median	Standard deviation
Impact of value-added per employee on investments in technological equipment	162	4.00	4	4.00	0.946
Impact of capital profitability on investments	162	4.30	4	4.00	0.787

Notes of opinions: 1 – not important at all; 2 – not important; 3 – neutral; 4 – important; 5 – very important. N = number of observations.

Vernon (1966) argues that the life cycle of demands and foreign direct investments are reflected in international migration of labour intensive branches. We can conclude that the rate of value-added per employee and the rate of capital profitability determine importantly on investments in advanced technological equipment as well as on total investments. In other case we could expect flows of capital from the branch or movement of production into less developed or developing countries with cheaper costs of labour.

RESULTS OF TESTING RESEARCH HYPOTHESES AND REGRESSION ANALYSIS

Testing research hypotheses

In the Slovenian wood industry is relatively high concentration of enterprises: 1% of enterprises contribute 25% of total revenues, while 3% of the largest enterprises contribute more than 50% of total revenues (SKEP GZS 2007). On the basis of these empirical facts we set the first research hypothesis:

Hypothesis 1 (H1): The reduction in the number and size structure of the large enterprises in the wood industry in a greater degree determines on the dynamics of entry of new micro and small enterprises than on the dynamics of exit of the existing micro and small enterprises.

To test H1, we employ t-test with the following two variables: NLE_ESE – impact of number of large enterprises on dynamics of entry of micro and small enterprises, and SLE_ESE – impact of average size of large enterprises on dynamics of entry of micro and small enterprises.

Table 6:
***t*-distribution (number of large enterprises, average size of large enterprises)**

t-distribution of variables: NLE_ESE – number of large enterprises / entry of micro and small enterprises, SLE_ESE – average size of large enterprises / entry of micro and small enterprises

	test value = 3					
	t-test	df	p-value	Average deviation	95% interval of confidence: Minimum	Maximum
NLE_ESE	1.014	167	0.312	0.089	-0.08	0.26
SLE_ESE	-1.404	167	0.162	-0.125	-0.30	-0.05

On the basis of the sample of micro and small enterprises in the wood industry, we cannot conclude that the smaller number of large enterprises and smaller average size of large enterprises (reduction in the number of employees in large enterprises) are positively associated with entry of new micro and small enterprises. Because the significance level is greater than α=0.05 (Table 6), we cannot conclude that the reduction in the number and size structure of large enterprises in the wood industry determines greater dynamics of entry of new micro and small enterprises.

Labour intensive branches due to low entry capital requirements show greater share of entries of new enterprises than exits of the existing enterprises, because labour is relatively cheaper factor for new enterprises (Bojnec and Xavier, 2007). Fastest dynamics of entry of new micro and small enterprises is reflected in increasing branch competitive supply, which increases branch market competition. Following from this, we define the second hypothesis:

Hypothesis 2 (H2): Greater dynamics of entry of new micro and small enterprises than exit of existing of micro and small enterprises has the implication on an additional reduction in the values of indicators of value-added per employee and consequently with this has a negative impact on business performance of the wood industry as a whole.

To test H2, we employ t-test with the following three variables: ESE_VAE – impact of entry of new micro and small enterprises on value-added per employee, ESE_RCP – impact of entry of new micro and small enterprises on rate of capital profitability, and ESE_EGSE – impact of entry of new micro and small enterprises on economic efficiency of growing survived enterprises.

Table 7:
***t*-distribution (value-added per employee, rate of capital profitability, and economic efficiency of growing survived enterprises)**

t-distribution of variables: ESE_VAE – entry of micro and small enterprises / value-added per employee, ESE_RCP – entry of micro and small enterprises / rate of capital profitability, ESE_EGSE – entry of micro and small enterprises / economic efficiency of survived growing enterprises

	test value = 3					
					95 % interval of confidence	
	t-test	df	p-value	Average deviation	Minimum	Maximum
ESE_VAE	4.522	155	0.000	0.385	0.22	0.55
ESE_RCP	3.114	167	0.002	0.232	0.08	0.38
ESE_EGSE	5.235	167	0.000	0.411	0.26	0.57

On the basis of the survey data we can conclude that the average score for the answers, which is greater than 3 (neutral) by using the Likert's scale from 1 to 5, is consistent with the set hypothesis $H_{0:}\ \mu_0>3$ and inconsistent with the alternative hypothesis $H_{A:}\ \mu_1\leq 3$. Due to this on the basis of the empirical results in Table 7, we can conclude that the increased dynamics of entry of new micro and small enterprises has the implications for the reduction in the value of indicators for the value-added per employee. The entry of new micro and small enterprises contributes to the increased competition in the wood industry. With the increased competition and dynamics in the market selection process this causes the economic efficiency of the growing survived enterprises in a positive direction.

REGRESSION ANALYSIS

With the regression analysis we analyse two hypotheses. We first test *hypothesis 3 (H3) on the dependence of the number of micro and small enterprises in the wood industry from the number of large enterprises and the number of employees in the large enterprises.*

In the regression analysis we use data on the average number of large enterprises (NLE), the average number of micro and small enterprises (NSE), the average number of entries of micro and small enterprises (ESE), and the average number of employees in large enterprises (ELE). We use time-series data by the individual years in the period 1989-2007 in the wood industry for the groups DD20 and DN36. The source of data is the SORS 2009 (SI-Stat). We use linear regressions, which are estimated by the ordinary least square (OLS) method. We estimate the following NSE linear regression function: NSE = a+b1*NLE+b_2*ELE. The estimated regression function is: NSE=5257.385+134.672*NLE–0.477*ELE [regression (1) in Table 8]. The regression results indicate that the number of micro and small enterprises in the wood industry on average increases by 135 if the number of large enterprises in the wood industry increases by 1. This suggests positive complementary effects between the number of micro and small enterprises and the number of large enterprises in the wood industry. The positive association implies that the number of micro and small enterprises and the number of large enterprises have increased during the wood industry and overall economic expansion during the analysed period.

Table 8:

Estimated regression models, 1989-2007

Dependent variable	Constant	NLE	ELE	Adjusted R^2	F-test
(1) NSE	5257.385	134.672	-0.477	0.39	6.718 (Sig. 0.008)
	(10.556)***	(2.187)**	(-2.733)***		
(2) ESE	154.892	7.207	-0.016	0.13	1.142 (Sig. 0.345)
	(2.819)***	(1.057)	(-0.817)		

***/**: statistically significant, respectively at the 1% and 5% levels.
Note: NSE – number of micro and small enterprises, ESE – number of entries of micro and small enterprises, NLE – number of large enterprises, and ELE – number of employees in large enterprises.

In addition, the regression results confirm H3 that the number of micro and small enterprises in the Slovenian wood industry on average increases by 0.48, when the number of employees in large enterprises declined by 1. This implies that the number of micro and small enterprises in the wood industry increases with the declines in the number of employees in the large wood industry enterprises. However, it is likely that during the economic growth there is an increase in demands for labour both in large and small enterprises. Due to this, a certain number of employees in large enterprises in the wood industry are likely to recognize entrepreneurial opportunities, which is arising from increases in output market demands and decide to shift from employment in large enterprise into self-employment in micro and small enterprise. This can cause a short-term labour mismatch in large enterprises.

Second, we test *hypothesis 4 (H4) on the dependence of the number of entries of micro and small enterprises in the wood industry from the number of large enterprises and the number of employees in the large enterprises in the same branch.*

We estimate the following ESE linear regression function: ESE= a+b_1*NLE+b_2*ELE. The estimated regression function is: ESE=154.892+7.207*NLE–0.016*ELE [regression (2) in Table 8]. On the basis of our regression results we cannot reject the H4 that the dynamics in

the number of large enterprises and the dynamics in the size structure of large enterprises are determining the dynamics of the entry of new micro and small enterprises in the wood industry. We find a positive linear association between the number of large enterprises and the number of micro and small enterprises in the Slovenian wood industry. As expected, the number of micro and small enterprises in wood industry increases with the decline in the number of employees in large enterprises in the wood industry.

We can conclude that the increases in output demands, which are associated with positive economic developments, are also a positively associated with the increases of the number of large, micro and small enterprises in the wood industry. On the other hand during the periods of positive economic developments the increase in the number of micro and small enterprises in the wood industry is also due to the decline in the number of employees in the large enterprises.

CONCLUSION

The wood industry in Slovenia is faced by transformation and structural changes, which are determined by the increased output market competition from suppliers at the enlarged EU markets. On the other hand, there are opportunities for demands and sales of products and services at local, regional, EU and global markets. This can be important for employment and incomes. The rate of value-added per employee and the rate of profitability of capital show relatively high association with investments and particularly investments into new technological equipment. The greater entry of newly established micro and small enterprises with the greater output market competition encourages the greater innovation focus and increased degree of productivity of successful survived growing enterprises, which are forced by market pressures mechanisms and market selection processes to create new products and services with a higher value-added per a unit of product. Consequently, this increases also the degree of value-added per employee. This is also a way that contributes to the improved performances and efficiencies of the wood industry enterprises in catching up to value-added per employee, which on average is achieved by the manufacturing activities and the Slovenian economy as a whole.

Unlike to our theoretical expectation and hypotheses that the reduction in the number and size structure of large enterprises in the wood industry in a greater extent causes the dynamics of entry of new micro and small enterprises, the empirical results show small to less important impact of the reduction in the number and size structure of large enterprises in the wood industry on the dynamics of micro and small enterprises in the wood industry. Therefore, as an issue for future research are determinants of efficiency in the wood industry enterprises in Slovenia. The Slovenian wood industry enterprises lack financial means, which are needed for restructuring and growth, and for entry into foreign more competitive markets. In the Slovenian wood industry exports are still important wood raw materials and semi-processed products with relatively low value-added per product. This has been a survival strategy in the past, but it is a challenging issue for future growth and survival as an issue for future research.

REFERENCES

Antončič, B., Hisrich, R.D., Petrin, T. and Vahčič, A., (2002), *Podjetništvo*, (Ljubljana: GV založba).

Antoncic, B., (2007), "Intrapreneurship: a comparative structural equation modeling study", *Industrial Management & Data Systems* 107 (3): 309-325.

Audretsch, D. B., Keilbach, M. C. and Lehmann, E. E., (2006), "*Entrepreneurship and economic growth"*, (Oxford: Oxford University Press).

Bierly, S. and Muzyka, F. D., (2000), *Mastering entrepreneurship: complete MBA companion in entrepreneurship*, (London: Prentice Hall, Financial Times Business Ltd.).

Birch, D. L., (1979), *The job creation process*, (Unpublished report: MIT Program on Neighbourhood and Regional Change).

Bojnec, Š. and Xavier, A., (2004), "Entry and exit in transition economies: the case of the Slovenian manufacturing sector", *Post-Communist Economies,* 16 (2): 191–214.

Bojnec, Š. and Xavier, A., (2005), "Firm and labour dynamics in Slovenian manufacturing", *Društvena istraživanja,* 14 (6): 1103–1127.

Bojnec, Š. and Xavier, A., (2007), "Determinants of firm exit in the Slovenian manufacturing", *Industrial Management & Data Systems,* 107 (5): 715–727.

Brandt, N., (2004), *Business Dynamics in Europe*, (Paris: OECD).

Brown, G., Hewitt, P., Eichel, H., Clement, W., Mer, F. and Dutreil. R., (2004), *Towards an enterprising Europe,* (A paper by the French, German and UK Governments).

Davidsson, P., Lindmark, L. and Olofssen, C., (1994), "New firm formation and regional development", *Sweden Regional Studies Association* 28 (4): 395–410.

Davelaar, E. J., (1991), *Regional Economic Analysis of Innovation and Incu*bation, (Aldershot: Avebury).

Dunne, T., Roberts, M. J. and Samuelson, L., (1988), "Patterns of Firm Entry and Exit in US Manufacturing Industries", *Rand Journal of Economics* 19 (2): 495-515.

Easterby-Smith, M., Thorpe, R. and Lowe, A., (2005), *Raziskovanje v management*, (Koper: Faculty of Management, Koper).

Foster, J.J., Barkus, E. and Yavorsky, C., (2006), *Understanding and using advanced statistics*, (London: SAGE Publications Ltd).

Foster, L., Haltiwanger, J. and Krizan, C. J., (1998), *Aggregate productivity growth: Lessons from microeconomic evidence*, (Cambridge: National Bureau of Economic Research).

Geroski, P., and Machin, S., (1993), "Innovation, profitability and growth over the business cycle", *Empirica,* 20 (1): 35-50.

Geroski, P., and Walters, C., (1997) "Corporate growth and profitability", *Journal of Industrial Economics,* 45 (2): 171-189.

Hudson, J., (1986), "Company liquidations in England and Wales", *Applied Economics,* 18 (2): 219-235.

Kirchhoff, B. and Phillips, B. D., (1988), "The effect of firm formation and growth of on job creation", *Journal of Business Venturing,* 3 (4): 261–272.

Kraus, S. and Schwarz, E., (2007), "The role of pre-start-up planning in new small business", *International Journal of Management and Enterprise Development,* 4 (1): 1-17.

Kocjančič, J. and Bojnec, Š., (2008), "Factors of small enterprise dynamics in the wood industry", *International Journal of Management and Enterprise Development,* 5 (5): 529-540.

Kožar, V., (2006), "Kako uresničiti vizijo in doseči razvojni preboj", *E-informacije, glasilo GZS, Združenje lesarstva*, 2. Http://www.gzs.si/pripone/13486/ oei27545d13486a27 6a9550a .doc (December 2008).

Machin, S. and Reenen, V. J., (1993), "Profit margins and this business cycle: evidence from UK manufacturing firms", *Journal of Industrial Economics,* 41 (1): 29-50.

Mele, M., (2010), "A "time series" approach on the Chinese exchange rate regime", *Ekonomska istraživanja*, 23 (3): 1-11.

Minniti, M., Bygrave, W. D. and Autio, E., (2006), *Global entrepreneurship monitor 2005 – executive export*, (London: London Business School).

Picot, G. and Dupuy, R., (1998), "Job creation by company size class: The magnitude, concentration and persistence of job gains and losses in Canada", *Small Business Economics Journal,* 10 (2): 117-139.

Robson, M. T., (1996), "Macroeconomic factors in the birth and death of UK firms: evidence from quarterly VAT registration", *The Manchester School* 64 (2): 170-188.

Scarpetta, S., Hemmings, P., Tressel, T. and Woo, J., (2002), *The role of policy and institutions for productivity and firm dynamics: evidence from micro and industry data*, (Paris: OECD).

Schumpeter, J., (1934), *The theory of economic development*, (Cambridge: Harvard University Press).

SKEP GZS, (2007) *Poslovanje gospodarskih družb v letu 2006. Pregled in analiza po dejavnostih*, (Ljubljana: Gospodarska zbornica Slovenije).

Smith, W. L., Schallenkamp, K. and Eichholz, D.E., (2007), "Entrepreneurial skills assessment: an exploratory study", *International Journal of Management and Enterprise Development,* 4 (2): 179-201.

SORS, (2008), *Poslovni subjekti, novo nastala podjetja brez predhodnika,* (SI-Stat podatkovni portal), Http://www.stat.si/pxweb/ Database /Ekonomsko/14_poslovni _sub jekti/ 03_1 4 184_demogr_podj/01_14510 _novonastala/01_14510_novonastala .asp, (12. 6. 2008).

SORS, (2009), *Poslovni subjekti, število podjetij,* (SI-Stat podatkovni portal), Http:// www. stat.si/pxweb/Database/Ekonomsko/14_poslovni_subjekti /01_14188_ podjetja / 01 _1 4 188_ podjetja.asp, (14. 2. 2009).

Storey, D. J., (1994), *Understanding the small business sector*, (London: Routledge).

Sufian, F., (2010), "Assessing the impact of financial sector restructuring on bank performance in a small developing economy", *Ekonomska istraživanja*, 23 (2): 11-34.

Vernon, R., (1966), "International investment and international trade in the product cycle", *Quarterly Journal of Economics,* 80 (2): 190-207.

DINAMIKA PODUZEĆA DRVNE INDUSTRIJE U SLOVENIJI

SAŽETAK

Ovaj rad istražuje utjecaj dinamike velikih poduzeća drvne industrije na dinamiku mikro i malih poduzeća koji rade u toj djelatnosti koristeći podatke anketnog upitnika i statističke serije podataka. Osim toga ulazak i izlazak mikro i malih poduzeća drvne industrije objašnjavan je sa faktorima potražnje, dodane vrijednosti i profitabilnosti kapitala. Empirijski rezultati pokazuju relativno skroman učinak dinamike velikih poduzeća na dinamiku mikro i malih poduzeća u drvnoj industriji. Stopa dodane vrijednosti po zaposleniku i stopa profitabilnosti kapitala značajno su povezane s novim ulaganjima, osobitu u novu tehnološku opremu. Lakši pristup financijskim sredstvima za mikro i mala poduzeća po prihvatljivim jamstvima i smanjenje troškova financiranja kapitala su među mogućim mjerama za poboljšanje razvoja poduzetništva u drvnoj industriji i lakši prodor mikro i malih poduzeća na strana tržišta. Pored toga bi trebalo smanjiti izvoz sirovina i poluproizvoda, te povećati izvoz proizvoda i usluga sa većom dodanom vrijednosti.

***JEL klasifikacija**: D22, L25, L69, C12, C81;*

***Ključne riječi:** Dinamika poduzeća, konkurencija, drvna industrija, Slovenija*

Theodore Tsekeris[1]
Charalambos Tsekeris[2]

UDK 338.47
PRELIMINARY PAPER
PRETHODNO PRIOPĆENJE

DEMAND FORECASTING IN TRANSPORT: OVERVIEW AND MODELING ADVANCES

ABSTRACT

The main purpose of this paper is to comprehensively explore and productively overview the growing research field of demand forecasting in transport. In this analytic context, it seeks to describe, critically discuss and fruitfully elaborate on relevant mechanisms and models of demand forecasting, as well as on the particular development and implementation of systematic (or system-wide) approaches. The overview of various theoretical and methodological developments in current prediction models eventually advocates the use of consumer demand models (of dynamic character) to predict demand shares among alternative modes of transport.

Keywords: Transport models, traffic forecasts, household expenditure, consumer demand, intermodal competition.

JEL Classification Codes: C50, D11, L90, L91, R41.

1. INTRODUCTION

Modern societies experience a growing demand for passenger and freight movement. Accurate forecasting of the total passenger and freight demand and the competitive (or substitutive) and complementary relationships among transport modes are necessary inputs in planning, designing, evaluating and regulating transport and supply chain systems. Transport investment, especially investment in highway, rail, airport and sea port infrastructure requires long-term financial commitments and the sunk costs can be very high if the investment projects fail to fulfill their design capacities. Therefore, accurate prediction of the long-term demand for using transport or some other public capital (e.g., water supply, electricity, fuel, information and communication) infrastructure often forms an important part of the overall project appraisal.

Also, the prediction of the transport demand and competition relationships can support the marketing and strategic planning of the transport firms, and the efforts for decoupling economic growth from transport intensity and promoting more energy-efficient and environment-friendly means of transport (CEC, 2006). From the perspective of firms, estimates of expected consumer demand constitute a crucial element in all scheduling and planning activities, in order to improve the business profitability. Thus, public transport operators and logistics firms have major interest in developing and interpreting the results of accurate and reliable demand forecasting models.

[1] Research Fellow in Transport Economics, Centre of Planning and Economic Research (KEPE), 11 Amerikis, Athens 10672, Greece. Email: tsek@kepe.gr

[2] Adjunct Lecturer, Department of Psychology, Panteion University of Social and Political Sciences, 136 Syngrou Ave., 176 71, Athens, Greece. E-mail: tsekeris@gmail.com (corresponding author)

The above tasks also stress the need for estimating relevant own- and cross-price elasticities as well as level-of-service elasticities for different transport modes and commodities. Furthermore, the rapid growth of transport technology and policy initiatives for the provision of integrated transport services underline the need for development and implementation of systematic (or system-wide) approaches. Such approaches can identify the trends of transport demand, and the complementarity and substitution relationships among alternative transport modes. The next section analyzes major determinants of demand, which are usually considered in the specification of forecasting transport models. Next, the forecasting mechanisms involved in the traditional four-stage transport planning process are presented. An overview of forecasting methods in transport is then provided, with particular emphasis on system-wide approaches in transport demand forecasting. A number of theoretical and methodological developments in current prediction models are reported. Especially, the use of consumer demand models is advocated to predict demand shares among alternative modes of transport. Data needs and limitations are also examined.

2. DETERMINANTS OF TRANSPORT DEMAND

The demand for passenger and freight transport and logistics services is influenced by a multitude of factors, which are considered in the relevant prediction models. The economy, as reflects the Gross Domestic Product (GDP) or total added value of a country, and the gross output or added value of a region, affects the general derived demand. The current global economic crisis had an evidently large impact on the amount of international freight transport services as well as on the demand for transport products and services, especially on the maritime and aviation sectors. The structure of the economy, in terms of the resources, goods, and services, e.g., specialization on particular products, and cultural, trade and tourism services, affect the level of transport demand and modal shares.

The supply or upgrading of transport infrastructure and services of better quality (higher frequencies, larger seat capacities, higher speed, increased safety and comfort), as well as the supporting infrastructure (e.g., those of Intelligent Transport Systems or ITS) may result in induced demand. Enhanced utilization of existing transport infrastructure capacity (e.g., through implementing congestion mitigation measures) can increase the level-of-service, in terms of travel speeds, reliability and safety, reduce operating costs and raise transport demand.

The technology containerization, double stacking, automation and robotics, handling and interchange systems, and automated terminals are key determinants of the transport demand shares across different types of facilities and regions. Also, enhanced packaging and recycling processes may add value to the provided services and offer increased transportability of products. Such technological changes can additionally involve ‘smarter’, less energy intensive and more flexible fleets that increase occupancy rates and offer reverse distribution.

The spatial structure of cities - and of systems of cities - influences the amount of travel, in terms of ton-km and passenger-km, and modal choice. A dispersed and low-density urban area is typically connected with longer trip distances and lower mass public transit ridership than a high-density urban area. Planning and traffic regulations, and measures to strengthen mixed-use urban developments may adversely affect the travel distances and travel frequency, and promote more environmentally friendly and energy efficient transport modes, including cycling and pedestrian movements.

The ongoing economic process of globalization does have a positive impact on ton-km traveled, particularly through air cargo and long-distance maritime services, and on passenger-km through international air transport services. The promotion of intermodal and

combined transport, for instance, through appropriate technologies and construction and operation of freight villages, encourage the use of railroad and short-distance shipping in the European Union. Moreover, international agreements concerning trade and transport can increase trans-national traffic flows, reduce delays and cross-border bottlenecks, and raise the level-of-service through simplified customs procedures. Such international agreements may refer to the Open Skies agreement between EU and the USA, the development of free trade zones in the Mediterranean regions, and (infrastructure, tariff and regulation) agreements in the road and rail transport sector between the countries around the Black Sea and Eastern Mediterranean region.

The design and spatial organization of inventories, warehousing and just-in-time practices can significantly affect the amount of shipments and line hauls. Institutional changes (e.g., market deregulation/liberalization), like those promoting the use of third-party logistics (3PL) services, and strategic alliances between carriers, shippers, producers and retailers, can increase the level of competition, and potentially yield lower distribution costs, improve the level-of-service and increase transport demand. Government and/or regulator (financial, administrative, environmental and other) policies which affect fuel costs, taxes, and subsidies do also have an impact on passenger and freight transport demand. Summing up, all the above factors should be carefully considered in specifying and assessing the performance of transport prediction models.

3. DEMAND FORECASTING IN THE TRANSPORT PLANNING PROCESS

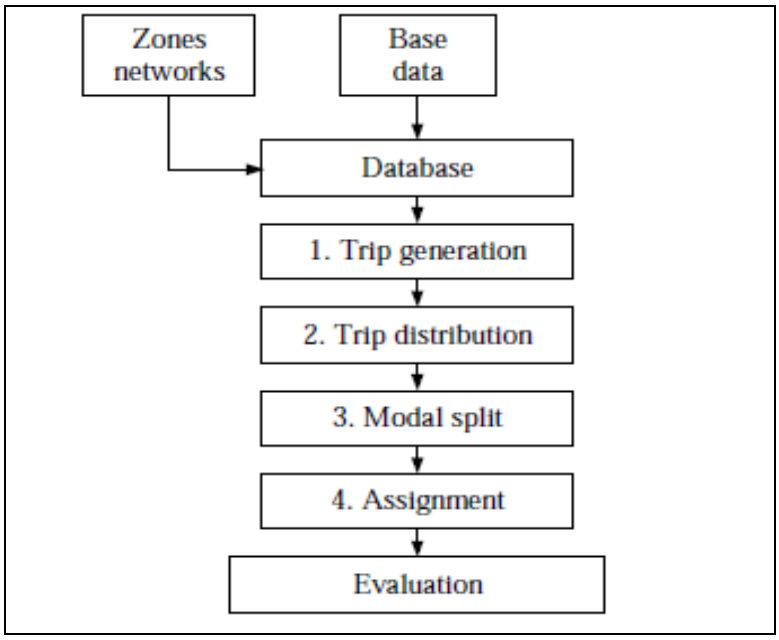
Transport demand forecasting models can be generally categorized according to the steps involved in the traditional four-stage transport planning process (see Figure 1). These steps include: (a) trip generation, (b) trip distribution, (c) modal split (or mode choice), and (d) traffic assignment.

3.1 TRIP GENERATION

Trip generation from and attraction to specific origin-destination (or production-attraction) traffic zones in which the study area is partitioned are based on the socio-economic, demographic and land use characteristics of each zone. Most of the trip generation studies employ econometric and, at a lesser extent, time series analysis techniques. The econometric models use linear or log-linear regression analysis to estimate the relationship between transport demand and its determinants.

Figure 1

The traditional four-stage transport planning model



The time series techniques involve extrapolate historic trends in transport demand into the future without considering the underlining causes of the trends. The most frequently used methods in this approach include (seasonal) exponential smoothing and Box-Jenkins procedure, which can predict the medium- or long-term demand for shipment of goods and movement of passengers.

In the trip generation stage, econometric models are established to forecast passenger transport demand, in terms of passenger vehicle trips or passenger vehicle kilometer traveled (VKT) based on future population projections. Freight demand is typically estimated by use of econometric models, in terms of freight vehicle trip, freight VKT, and freight vehicle ownership. Demand for light truck and regular truck is sometimes estimated in separate models. These passenger and freight demand prediction models can be estimated for both weekday/weekend, and by travel distance, region and trip purpose (or type of commodity). The linear regression model of trip generation can be generally expressed as follows:

$$y = a + \sum_{i=1}^{k} \beta_i x_i \,, \qquad (1)$$

where y is the dependent variable (e.g., generated passenger or freight VKT), x_i are the independent (explanatory) variables related to the attributes of passengers/freight and transport system, and β_i are the corresponding coefficients to be estimated during the model calibration process.

Category analysis is also used to predict passenger transport demand by specific set of criteria, such as car ownership, household size and income ranges. The following set of equations can be regarded as typical example models of this approach:

$$y_{ik} = HH_i R_{iG} f_{ik} \qquad (2)$$

where y_{ik} are the generated passenger trips at traffic zone i with purpose k, HH_i is the number of households at zone i, R_{iI} is the trip production rate of households of income group G (e.g., between 1000 – 1500 Euro) and f_{ik} is the proportion (%) of total trips to be made at traffic zone i with purpose k.

$$y_{ik} = HH_i R_{iC} f_{ik} \tag{3}$$

where R_{iC} is the trip production rate of households with car ownership index C (e.g., 1.5 private passenger cars per household member).

$$y_{ik} = \sum_{n=0}^{3} HH_i P_{in} R_{inG} f_{ik} \tag{4}$$

where P_{in} is the proportion of households with n number of private passenger cars and R_{inG} is the trip production rate of households with n number of private passenger cars belonging to income group G.

3.2 TRIP DISTRIBUTION

Trip distribution refers to the allocation of the trip demand among traffic origin-destination pairs, according to the distance or some other trip cost (impedance) function designating the (time, monetary or generalised) cost between zone pairs. The result of this step is the construction of a complete origin-destination (O-D) table. The cost (impedance) function of travel between an origin-destination pair $i-j$ of spatial (or time) separation d_{ij} can be expressed through an exponential relationship:

$$f(d_{ij}) = e^{-c(d_{ij})}, \tag{5}$$

where $c > 0$ is a cost coefficient to be calibrated. Then, the predicted number of trips to be carried out between $i-j$ pair can be given through a (doubly constrained) gravity model of trip distribution as follows:

$$y_{ij} = \alpha_i P_i \beta_j A_j f(d_{ij}), \tag{6}$$

with (possible) constraints on the total number of produced and attracted trips:

$$\sum_j y_{ij} = P_i, \tag{7}$$

$$\sum_i y_{ij} = A_j, \tag{8}$$

where P_i are the predicted trips produced from zone i, A_j are the predicted trips attracted to zone j, and α_i and β_j are the corresponding origin and destination balancing factors of the

gravity model to be calibrated. The estimation of the (doubly constrained) gravity model follows an iterative optimization process until satisfying the predetermined convergence criteria (see Sen and Smith (1995)). Dynamic extensions of the gravity model in transport systems have been suggested in (Dendrinos and Sonis, 1990; Tsekeris and Stathopoulos, 2006).

3.3 MODE CHOICE

Mode choice implies the modal split of the O-D trip demand for the available means of transport along the origin-destination pairs. This step typically considers the distinction between private and public transport (both vehicular and railroad) traffic (see Ortuzar and Willumsen, 2001). In the discrete choice theoretic framework (see Ben-Akiva and Lerman, 1985), the utility function U of a user can be generally expressed as:

$$U_{in} = V_{in} + \varepsilon_{in}, \tag{9}$$

where V_{in} is the systematic utility component that individual n associates with alternative i in the choice set. In the above equation, the utility is modeled as a random variable in order to reflect the uncertainty through the error term ε. A linear in the parameters function is denoted as follows:

$$V_{in} = \sum_{k=1}^{K} \beta_k x_{ink}, \tag{10}$$

where β is the vector of K coefficients associated with the alternative choices (here, of transport modes) and x are the explanatory variables or attributes of alternative i. Assuming the ε follows a logistic (Gumble) distribution, the probability Π that a given individual n chooses alternative i is given by:

$$\Pi_i = \frac{e^{\mu V_{in}}}{\sum_j e^{\mu V_{in}}}, \tag{11}$$

where μ is a parameter and j denotes an alternative of i. The above equation denotes the multinomial logit model which is widely applied in the mode choice analysis.

3.4 TRAFFIC ASSIGNMENT

The traffic assignment process maps the predicted O-D trip demand per mode into the transport network paths and constituent links, based on the prevailing supply conditions. The solution of the capacity-restrained traffic assignment problem is equivalent with that of Nash equilibrium in game theory. Specifically, according to the first principle of Wardrop (1952), an equilibrium state is reached in the transport network when all users choose paths so that experience the least travel cost and no bilateral change of route can be further made to reduce path travel cost. Consider a network where traffic flow q_a traverses link a of path k between origin r and destination s, with c_a being the travel cost experienced by the users of that link. Also, f_k^{rs} is the path flow along k and q^{rs} is the trip demand between origin r and

destination s. Then, the traffic assignment problem can be mathematically expressed as a minimization problem, as follows:

$$Min \sum_a q_a c_a , \tag{12}$$

with the following constraints

$$\sum_k f_k^{rs} = q^{rs} , \tag{13}$$

and

$$f_k^{rs} > 0 \tag{14}$$

A number of additional constraints can be also imposed to ensure the flow propagation between consecutive links, and the first-in first-out (FIFO) principle at network intersections.

3.5 EXTENSIONS OF THE FOUR-STAGE TRANSPORT PLANNING PROCESS

A typical problem met in the application of the sequential transport planning process is the inconsistency of the resulting predictions, when the output of a later stage (e.g., O-D path costs obtained from the traffic assignment stage) becomes input in an earlier stage (e.g., O-D trip cost in the trip distribution stage). This shortcoming has triggered the development of the so called combined transport planning models, which involve the simultaneous estimation of two or more stages of the overall process. Such models include the combined trip distribution and traffic assignment model, the combined trip distribution and mode choice model, the combined trip distribution, mode choice and traffic assignment model, and so on. Further extension of the combined transport planning models to include long-term (residential and/or employment) location choices, land values and housing rents based on changes in accessibility etc., have resulted in the so called combined urban location and travel choice models (Boyce and Bar-Gera, 2004). Other relevant extensions include integrated land use-transport modes, encompassing wider location choices.

Furthermore, the consideration of the time dimension in departure time choice leads to the formulation of dynamic trip demand models. The consideration of the time-varying traffic conditions in transport networks subsequently leads to the deployment of dynamic traffic assignment (DTA) models. These models are particularly important for the investigation of the users' behavior and network performance under the effects of Intelligent Transport Systems (ITS) applications and other dynamic transport management measures.

4. OVERVIEW OF DEMAND FORECASTING METHODS IN TRANSPORT

A wide range of forecasting methods have been proposed in the field of transport and logistics. These models can be generally distinguished into: (a) deterministic vs. stochastic, (b) static vs. dynamic, (c) macroscopic (or aggregate) vs. microscopic (or disaggregate), and (d) analytical vs. simulation models. The combination of macro-level (e.g., region- or nation-wide) transport demand forecasting models, typically based on variants of the four-stage planning model, with microscopic or mesoscopic traffic simulation approaches, tend to be commonplace nowadays in U.S. transport planning communities (Holyoak and Stazic, 2009).

The use of a single variable or multiple variables in the model specification gives rise to univariate vs. multivariate prediction models, respectively. The univariate time-series analysis of transport demand includes Kalman filtering, smoothing and Box-Jenkins procedures. Other procedures refer to the application of Generalised Autoregressive

Conditional Heteroskedastic (GARCH) models, which have been widely used in the financial modeling context in order to investigate the volatility of the time series. The dynamic or time-varying forecasting models encompass the Compertz growth and learning curve models (e.g., to predict car ownership levels), autoregressive processes, autoregressive distributed lag model (ADLM), autoregressive (integrated) moving average (cause-effect) model (AR(I)MA(X)), seasonal regression models (e.g., those of additive seasonality, multiplicative seasonality and seasonal fractional models) and time varying parameter (TVP) models. Other models refer to gradual switching regression, support vector regression and transfer function models. Multivariate models include the multivariate ARIMA, state-space models and the multivariate GARCH.

Another distinction includes the use of exact analytical vs. approximate models, such as those employing Artificial Intelligence techniques. These techniques have attempted to address complex issues associated with the intrinsic stochasticity, non-linearity and non-stationarity of transport flow time series. Such models encompass fuzzy rule-based methods, evolutionary computation, swarm intelligence, neural network techniques and hybridized (e.g., geno-fuzzy, neuro-fuzzy etc) approaches.

The artificial neural network (ANN) method is a computing technique that tries to imitate the learning process of a human brain. The unique features of ANNs, such as the ability to adapt to imperfect data, nonlinearity, and arbiter function mapping, make this method a useful alternative to the classical (statistic) regression forecasting models. Empirical evidence shows that ANNs generally outperform the classical time-series and multiple regression models in traffic forecasting.

The genetic algorithms (GAs) rely on a stochastic process, which utilizes information about the performance of the system to be optimized in relation to values of different control parameters. In this process, an initial population of candidate solutions is tested and, subsequently, a new, genetically improved population is produced which contains candidates with a higher probability to reach the optimal solution. Each of the candidate solutions consists of a sequence of values of the control variables, and it takes the form of a string (chromosome), i.e., a binary coded value forming a string of 0s and 1s or real numbers in the decimal numbering system, called alleles. The GA stochastic process is composed of three genetic operators, which refer to the reproduction, crossover and mutation.

Moreover, Bayesian statistical inference methods enable the representation of causal dependencies between sets of random variables and the computation of the joint posterior distribution of these random variables, conditional on prior distributions of each variable and data. The computation of the posterior joint distribution can be performed using Markov Chain Monte Carlo (MCMC) or Latin Hypercube simulation methods to account for unobservable sources of risk in transport forecasts.

In order to avoid the spurious regression which often appears in traditional regression analysis based on ordinary least squares (OLS), great effort has been made to further advance the econometric approach in the context of transport modelling and forecasting. Modern econometric methods, such as the vector autoregressive (VAR) and error correction model (ECM) have emerged as the main forecasting methods. In contrast with the other single-equation models, where the explanatory variables included should be exogenous, the VAR and VEC models treat all variables as endogenous, and each variable is specified as a linear relationship of the others. More sophisticated procedures, such as General-to-specific (GETS) models, can allow for non-linear and asymmetric relationships between variables.

A growing number of both simulation and empirical studies have appeared in the literature over the last decades to find ‘optimal’ combinations of forecasts. Traditional approaches presented in such studies for combining forecasts are focused on linear combination methods, such as successive averaging, various types of unconstrained or

constrained Least-Squares techniques and multiple objective linear programming models. More recent efforts include the development of Bayesian updating procedures for combining information (probabilities, probability distributions, or forecasts) from various prediction mechanisms.

Nonetheless, there are many cases where linear combination may result in the optimal combination at a particular point, but not the best forecast, by failing to make full use of the existing individually processed information. In particular, such cases can arise when the relationship between individual forecasting models and the 'best' forecast is not limited to a linear relationship, due to the combination of models with different functional form, such as the Kalman filter with a linear form and the ANN models with nonlinear form. In such cases, the true underlying conditional expectation of the forecast can be a nonlinear function of the information sets on which the individual forecasts are based, resulting in a bias to the linearly combined forecasts.

Therefore, nonlinear combination of forecasts should be preferred, in which case the forecasting function can be viewed as a nonlinear information system processing the information provided by the individual forecasting models. In such a case, Artificial Intelligence-based techniques should be favored in comparison to the existing statistical approaches. This is because the latter are cumbersome to apply when using real-world complex datasets, requiring assumptions on complicated multivariate likelihood functions and error distributions. However, only a limited number of Artificial Intelligence techniques have been hitherto proposed and tested to produce nonlinear combinations of forecasts, including ANN models and fuzzy systems.

5. SYSTEM-WIDE APPROACHES IN TRANSPORT DEMAND FORECASTING

Most of the existing demand models in transport and logistics, especially those composed of a single equation, imply a separability of the services offered by different transport modes. Namely, they consider demand responses to changes in tariffs (or fares) or service levels only in a specific market. Nonetheless, failure to include the effect of changes in prices and service levels of competing modes can lead to bias in the demand elasticity estimates. Several transport demand models have been employed to jointly estimate changes in both the levels and shares of demand for two or more transport modes. These models mostly correspond to abstract-mode, modal-split and discrete-choice (such as, logit) approaches. The structural equation models (SEMs) provide a flexible framework for expressing cross-equation interrelationships among dependent and explanatory variables, while the seemingly unrelated regression (SUR) techniques are employed to address problems of biased parameter estimation due to cross-equation error correlation.

In addition, agent-based simulation approaches (Teodorovic, 2003; Ivaldi and Vibes, 2008) are increasingly implemented in the last years to address the complex phenomena of transport and supply chain processes (e.g., see Liedtke (2009), Roorda et al., 2010). They can microscopically represent the various forces acting upon a particular agent or actor of the system, e.g., individual, household, firm, government, at any location, thus deriving a discrete step-by-step simulation of its trajectory. This approach enables the path dependency and occurrence of outcomes which may deviate from a single steady-state equilibrium point in the prediction horizon. This deviation is due to the consideration of bounded rationality, varying degrees of intelligence and autonomy, learning capabilities and unique characteristics of myopic agents.

The ability to capture both the intra-personal variability in the perceptions and attitudes of each individual as well as inter-personal variability allows the bottom-up emergence of diverse types of behavioral response mechanisms to covariates of demand.

Agent-based models facilitate the representation of the interaction among individuals and the collective dynamics of congestion phenomena, in contrast with the conventional discrete choice models which tend to produce biased outputs. Nonetheless, the current inability of agent-based models to provide reliable forecasts beyond a short prediction horizon has rendered them most useful for transport policy and sensitivity analysis, rather than for medium- or long-range transport planning purposes.

System-wide economic forecasting models may include computable general equilibrium models or partial equilibrium models. In the partial equilibrium models, which are the most commonly adopted, the pricing of marginal transport cost produces optimal welfare when there are no pricing constraints in the transport sector, while the generalized equilibrium models focus on the interaction between transport pricing and inefficiencies in the rest of the economy. TREMOVE is an important partial equilibrium model, which is widely used in Europe for the evaluation of (environmental) policies in the transport sector. It uses nested constant elasticity of substitution functions to simulate interactions between road and public transport pricing and demand profiles, assuming that the total labour supply is fixed.

All the aforementioned approaches typically rely on *a priori* restrictions on the demand elasticities and intermodal substitutability, which are not underpinned by the economic theory of demand. On the contrary, analytical, system-wide modeling approaches are consistent with the theory of consumer demand. This framework allows determining the substitution and complementarity relationships among different transport modes, through the cross-price elasticity measures, together with the own-price and income effects.

6. CONSUMER DEMAND SYSTEMS

In consumer demand systems, travel expenditure shares as dependent variables constitute important transport policy variables and proxies for the demand for each transport mode. A number of empirical studies can be found in the literature for the system-wide analysis of transport consumption (expenditure) patterns. These studies employ either time series or cross-section data at the aggregate or disaggregate (individual or household) level. On the one hand, the analysis of travel expenditures with disaggregate information is typically based on the use of cross-section data from consumer or household sample surveys. In such studies, the interest concentrates on the relationship, in terms of the aggregate elasticity value, between expenditure on a particular item and income, holding prices constant, through using the well-known Engel curve analysis. Namely, this kind of analysis does not help determine the level of competition among alternative passenger transport modes, since price effects are considered as fixed.

System-wide consumer demand models can be described as simultaneous systems of expenditure equations that approximate the utility-maximizing behavior of consumers. The generalized theory of consumer demand provides a sound economic background and interpretation in the system-wide analysis of expenditure patterns with regard to consumer behavior when changes occur in variable factors such as own price, income and substitute goods (or services). In the current context, consumer demand models can allow the joint determination of different mode choice preferences by considering cross-price effects.

There has existed for some time a variety of aggregate demand systems for investigation of the budget allocation preferences of consumers (for a comprehensive review, see Andrikopoulos and Brox (1997)). These include the Linear Expenditure System (LES) and the Rotterdam system. However, the Almost Ideal Demand System (AIDS), referred to here as AI (Deaton and Muellbauer, 1980), is considered to be the most empirically robust and consistent with the general theories of demand and choice. The AI system is based on a multi-stage budgeting process where, first, utility-maximizing consumers allocate their total

budget between travel and the other commodities, and, then, allocate expenditures among individual travel commodities. Different from the single-equation econometric models, AIDS is a system-of-equations approach, normally employed to examine transport demand in a number of destinations or markets, and uses transport expenditure shares as dependent variables. The AIDS approach has a much stronger underpinning of economic theory. Hence, it is more powerful than its single-equation counterparts with respect to transport demand elasticity analysis, such as substitution and complementary effects between alternative destinations under study.

7. DATA SOURCES AND LIMITATIONS FOR TRANSPORT DEMAND ANALYSIS

As far as data issues are concerned, the data collection frequency can be annual, quarterly, monthly, for long-range or medium-term forecasting purposes, or even hourly or of a few minutes for the case of real-time travel prediction purposes. The data may focus on specific points of the transport network, traffic analysis zones, and regions/countries as origins or destinations. The use of both cross-sectional and time-series information can simultaneously capture spatial and temporal variations affecting transport demand, giving rise to dynamic panel data regression approaches (Tsekeris, 2008). The appropriate treatment of dynamics through such approaches is crucial for avoiding possible bias in the elasticity estimates of transport demand and estimating both short- and long-run elasticities. In addition to the use of transport flow (number of passenger, amount of cargo, pass-km and ton-km) data from censuses, household travel surveys, firm surveys, interviews and diaries, transport expenditure can be used to capture the transport demand of households and firms, capturing both the amount and frequency of travel.

Approaches to human interactions and mobility mostly relied on census and survey data were often incomplete and/or limited to a specific context. Ongoing advances in information and telecommunication technologies opened the path to the general exploitation of proxy data for human interaction and mobility, such as transport expenditure. Analogously, modern mobile phones and personal digital assistants combine sophisticated technologies such as Bluetooth, Global Positioning System, and WiFi, constantly producing detailed traces on our daily activities. Popular websites for currency tracking (for instance, http://en.eurobilltracker.com and www.wheresgeorge.com) collect a massive number of records on money dispersal that can be used as a proxy for human mobility.

Traditional data sources employed in the analysis of transport expenditures can significantly affect the underlying assumptions and quality of estimation results of the various methods. These traditional sources can be generally distinguished into four categories:

(a) Household Budget Surveys (HBS) or Consumer Expenditure Surveys (CES) at the level of households or individuals,
(b) Household or personal travel surveys and travel diaries,
(c) The system of National Accounts,
(d) Revenues of public transport firms (or carriers) originated from fares.

The use of Household Budget Surveys or Consumer Expenditure Surveys has been generally found to provide a more consistent analysis of the travel consumption patterns, in comparison to the use of data from household or personal travel surveys or diaries and data from National Accounts. Most travel surveys do not investigate consumer expenditure behavior, while others tend to overestimate travel money budgets, since they concentrate only on local areas and, hence, they typically underestimate money expenditures for long-distance

trips. In addition, HBS are conducted on a factual basis, in comparison to the frequential basis of travel surveys, which lead to the overestimation of the most repeated and frequent expenditure items (typically, those related to private vehicle and public transport).

Moreover, the use of disaggregate data from stated preference surveys concerning the willing-to-pay for different travel services and goods, through employing discrete-choice models, enriches the existing knowledge on travel consumption behavior. Specifically, such data allow representing the effect of a range of hypothetical scenarios involving price variations as well as changes in other (personal, social, economic, institutional and regional) factors influencing demand on household travel budget shares for specific (origin-destination) markets and sets of alternative modes of transport.

The possibility of travel expenditure aggregation for distinct population groups with different socio-economic (e.g., by income, education and car ownership) and demographic (e.g., by gender, age of household head and number of household members) characteristics can provide further insight into the analysis of travel consumption and market competition conditions. For instance, estimation of income and price elasticities for various population groups would allow a more detailed examination of the distribution of the impact of a petrol price increase or public transport fare reduction on travel budget allocation among low, medium and high income households. In turn, this outcome might help support the formulation of specific transport policies (e.g., subsidies and travel discounts) for target population (e.g., multi-member and low-income families, student) groups.

8. CONCLUSIONS AND OUTLOOK

Current problems related to transport demand forecasting are mainly associated with the consistency and comparability of elasticity estimates resulting from different modeling approaches, natures of data, measuring units and countries. Combined travel demand models can substantially generate consistent estimates of trip generation, trip distribution, modal split and network assignment without major increases in neither computational nor data requirements relative to the four-step forecasting approach. Despite that the availability of many different models would possibly suggest that the best practice would have been identified, the forecasting accuracy of long-term travel forecasts cannot generally be considered as satisfactory. Demand shocks due to the recent economic crisis, natural and man-made disasters and other unexpected events may exacerbate accuracy losses. New system-wide approaches to transport are still required, which would better correspond to the vital need for a fiscally, socially and environmentally sustainable development, as well as to the recognition and acknowledgment of travel as a mainly derived demand. The exploitation of new data sources from advanced (e.g., web-based) communication technologies can address some of the existing limitations in transport demand analysis. In addition, recent modeling advances can improve the behavioral generality of these models, by linking aggregate travel demands to individual-level choice theory in a theoretically consistent manner and developing linkages to dynamic travel demand estimation.

REFERENCES

Andrikopoulos, A.A. and Brox, J.A. (1997) *Demand Analysis: Theory and Practice*. North Waterloo Academic Press, Waterloo, Canada.

Ben-Akiva, M. and Lerman, S.R. 1985, *Discrete Choice Analysis: Theory and Application to Travel Demand.* The MIT Press, Cambridge, MA.

Boyce, D., and Bar-Gera, H. (2004) Multiclass combined models for urban travel forecasting. Networks and Spatial Economics, 4 (1), 115-124.

Commission of the European Communities, 2006, *Green paper: A European Strategy for Sustainable, Competitive and Secure Energy*. Office for Official Publications of the European Communities, Luxembourg. Available at http://ec.europa.eu/ energy/green-paper-energy/index_en.htm

Deaton, A. and Muellbauer, J. (1980) *Economics and Consumer Behavior*. Cambridge University Press, New York.

Dendrinos, D.S., and Sonis, M. (1990) *Chaos and Socio-Spatial Dynamics*, Springer, New York.

Holyoak, N., and Stazic, B. (2009) Benefits of linking macro-demand forecasting models and microsimulation models, *ITE Journal*, 79 (10), 30-39.

Ivaldi, M. and Vibes, C. (2008) Price competition in the intercity passenger transport market: A simulation model, *Journal of Transport Economics and Policy*. 42 (2), 225-254.

Liedtke, G. (2009) Principles of micro-behavior commodity transport modeling, *Transportation Research Part E: Logistics and Transportation Review*, 45 (5), 795-809.

Ortuzar, J. de D. and Willumsen, L.G. (2001) *Modelling Transport*. John Wiley & Sons, Third Edition, New York.

Roorda, M.J., Cavalcante, R., McCabe, S., and Kwan, H. (2010) A conceptual framework for agent-based modelling of logistics services, *Transportation Research Part E: Logistics and Transportation Review*, 46 (1), 18-31.

Sen, A. and Smith, T.E. (1995) *Gravity Models of Spatial Interaction Behavior*. Springer, New York.

Teodorovic, D. (2003) Transport modeling by multi-agent systems: a swarm intelligence approach, *Transportation Planning and Technology*, 26 (4), 289-312.

Tsekeris, T. and Stathopoulos, A. (2006) Gravity models for dynamic transport planning: development and implementation in urban networks, *Journal of Transport Geography*, 14 (2), 152-160.

Tsekeris, T. (2008) Consumer demand analysis of complementarity-substitution relationships among passenger transport modes in Greece, *International Journal of Transport Economics*, 35 (3), 415-449.

Wardrop, J. G. (1952) Some theoretical aspects of road traffic research, *Proceedings of the Institution of Civil Engineers* II, 1, 325-362.

PREDVIĐANJE POTRAŽNJE U PRIJEVOZU: PREGLED I NAPREDAK U MODELIMA

SAŽETAK

Cilj ovog rada je opsežno istražiti i dati produktivan pregled rastućeg polja istraživanja predviđanja potražnje u prijevozu. U tom analitičkom kontekstu, rad želi opisati, kritički raspraviti i uz konkretne rezultate obraditi relevantne mehanizme i modele predviđanja potražnje, kao i specifičan razvoj i implementaciju sistematskih pristupa. Pregled raznih teoretskih i metodoloških napredaka u trenutnim modelima predviđanja zagovara korištenje modela potrošačke potražnje (dinamičkog karaktera) za predviđanje udjela potražnje među alternativnim načinima prijevoza.

***Ključne riječi**: modeli prijevoza, predviđanje prometa, potrošnja kućanstva, potrošačka potražnja, konkurencija među načinima prijevoza*

Bojan Pecek*
Andrej Kovacic**

UDK 65.012.4:334.724
PRELIMINARY PAPER
PRETHODNO PRIOPĆENJE

BUSINESS PROCESS MANAGEMENT: USE OF SIMULATION IN THE PUBLIC SECTOR

ABSTRACT

Methods and techniques of business process management as known in the private sector are being used more and more in the public sector. This paper demonstrates their applicability to systems where the human factor is more important. It describes a case study of filling unoccupied capacities in an old people's home. The simulation techniques are used as a replacement for the exact deterministic planning. Our research shows that by using the simulation it is possible to predict the effects of the renovation and the duration of the processes and bottlenecks and to thereby avoid bad decisions.

Keywords*: public administration management, modelling, simulation, iGrafx*

1. INTRODUCTION

Reserve management is a process that ensures that adequate official public sector foreign assets are readily available to and controlled by the authorities for meeting a defined range of objectives for a country or union (IMF, 2009). Organisations are often not aware of the 'internal reserve' they have at their every day functioning. Specially when they are not forced to keep the track of every expenditure. It usually happens when they have an absolute monopoly on the market. This is often the case in the sphere of public services.

Our case study dealt with an old people's home. It operates in an environment, where demands fully exceed available capacities. There are more than 17.000 applications on the waiting list at the moment (SSZS, 2009) for about 18.500 places. Therefore there is no wonder that not enough attention was paid to the fulfilment time of the released place. The existing information system of the old people's home was not organised in the way of showing the lost time between the event of the released place and the occurrence of its new reoccupation.

Two main goals have been stated for the research. The first one was to prove that in the admission process in the old people's house there are internal reserves in the organisation. Some of them can be acquired with the new organisation of the process. The second goal was to demonstrate that the discrete simulations can be a substitute for the incomplete information system. They are some kind of extension to the existing information system. This is a similar thesis that has been already confirmed by Moon and Phatak (Moon and Phatak, 2005). They demonstrated that the limited planning functionality of the Enterprise Resource Planning (ERP) system can be complemented by the discrete-event simulation models.

* Faculty of Administration, University of Ljubljana, Gosarjeva 5, 1000 Ljubljana, Slovenia, bojan.pecek@fu.uni-lj.si
** Faculty of Economics, University of Ljubljana, Kardeljeva ploščad 17, 1000 Ljubljana, Slovenia andrej.kovacic@ef.uni-lj.si

In the aim of achieving these stated goals two models of the admission process have been developed. In the first one the existing process as it was organised before the reorganisation was modelled. The second model represents the same process after the reorganisation. Both models have been produced with the MicroGrafx iGrafx Process 2007 software. Simulations of the both models show gains and benefits of the reorganisation. By the comparison of results from both models the second goal was achieved. It was proved that the simulations can play a significant role in the information system where they can expose data which cannot be gained through the regular software supporting the Enterprise Resource Planning.

2. BUSINESS PROCESS MODELLING AND SIMULATION MODELLING

Simulation can be used in the analysis of any system to ensure the quality and efficiency of stochastic, complex processes that operate in resource-constrained environments. Furthermore, most service systems are fairly well defined discrete processes (Laughery et al., 1998). After the first simulations which were used to simulate the production process they are more often used also to analyse services. Need for the usage of simulations in the public sector suggested Rouillard (Rouillard, 1999). Now, simulations are a constituted part of modelling and analyse which are the first phase of the Business Process Management lifecycle by the Service Oriented Architecture SOA (Juric and Pant, 2008). They are a common tool for testing a new process model before the implementation (Harmon, 2003), (Kritchnchai and MacCarthy, 2002), (Eldabi et al., 2002), (Robertson and Perera, 2002).

There are many cases of simulation usage for processes in the public sector. Greasley and Barlow (Greasley, 2005) analyzed a business process approach to a change in a custody-of-prisoner process. Ozbay and Bartin (Ozbay and Bartin, 2003) studied an incident management situation with the Arena simulation package. Hlupic and de Vreede (Hlupic and de Vreede, 2005) used simulation modelling and analysis to reduce the risk of business process innovation in an outpatient's department. Kovacic and Pecek (Kovacic and Pecek, 2007) studied the influence of the law changes on the process productivity of the social grant application. It is common to all of these studies that the main observed value is the transaction cycle time. By Kaplan and Norton (Kaplan and Norton, 1996) it is the indicator of throughput time. It helps to visualize the impacts and implications on a new process (Chen, 1999).

In our research one other very important key performance indicator was exposed. We wanted to find out the number of the unused beds per year or average number of days needed to reoccupy the released place. It shows the agility of the administration finding a new patient. As the information system was not able to give the answer about the time lost between the release place and the reoccupation we decided to gain this data from the simulation model.

Rockwell Arena software is the most popular software for the discrete simulation modelling (Anglani et al., 2002), (de Swaan Arons and Boer, 2001), (Perera and Liyanage, 2000), (Fowler and Rose, 2004). Micrografx iGrafx Process 2007 is a similar tool to the Arena. They both provide a simulation support environment (SSE) in which it is possible to quickly create system models interactively and manage all phases of the simulation project, including generation of the simulation code execution of the simulation (Seila, 2005), (Melao and Pidd, 2006). For the research iGrafx was chosen. The deciding point represented the fact that iGrafx uses swimmlane diagram for the basic process drawing instead of plain block diagram which is the case in the Arena software. There are only few articles mentioning this software with the connection to the simulation engineering (Bosilj Vuksic et al., 2002), (McCharty and Stauffer, 2001), (Groznik et al., 2003), (Noakes, 2005) and (Kovacic and

Pecek, 2007). For a drawing technique a swim lane diagram has been chosen. It is one of diagrams used in the Unified Modelling Language which is by many authors recognised as a 'de facto industrial standard for the information engineering' (Engels et al., 2000), (Siau and Halpin, 2001), (Pender, 2003).

3. THE EXISTING PRACTICE OF THE PROCEDURE OF ADMITTANCE

The observed home cares for about 200 patients. On average, capacities are released between 60 and 65 times a year (2006: 62; 2007: 69; 2008: 59). The procedure for accepting a new client was simple and more or less, carried out as follows: The client filled in an application. Administration accepted it and analysed space available. If there were no place available, administration prepared information on the temporary overcrowded status and sent it to the applicant. He or she was suggested to try again next time after two of three weeks. If there was a free place available then the applicant was registered and sent for a medical check-up. The medical council decided whether the applicant really needed medical nursing and was suitable for the acceptance. In such case the competent commission convened taking place the morning following the examination. On the basis of the free places and the medical council's diagnosis, the acceptance commission made a final decision on the acceptance of the applicant. According to the health care and needs, applicants were sorted into four categories: self-dependent, occasional help needed, demanding and 24-hour demanding. The applicant might be refused if the type of the free place and the client's demands were not compatible. In the case of a rejection, information on the rejection was prepared otherwise, the administration prepared a contract. The applicant or his/her relatives signed the contract. (In the majority of cases, the relatives accepted the stated conditions). The applicant referred to was accepted the following morning when his or her documents were prepared. The medical council described the needed nursing. If the conditions of the contract were not accepted the applicant withdrawn.

In the case when the applicant was refused due to the overcrowding, results of the medical counsel or by the acceptance commission, the he or she was advised to try again after two or three weeks. The most surprising fact was the realisation that no waiting list or similar reference was kept for the rejected applications. As to the question of "why", the answer was a simple: "there is no need for it. In many cases, after a new free place would be released and offered, the applicant would not need it any more". Regarding the next item concerning the fact that there is a free place unoccupied till the next application arrives, the very convincing answer from authorities was given: applications arrive every day, so it does not represent any problem at all.

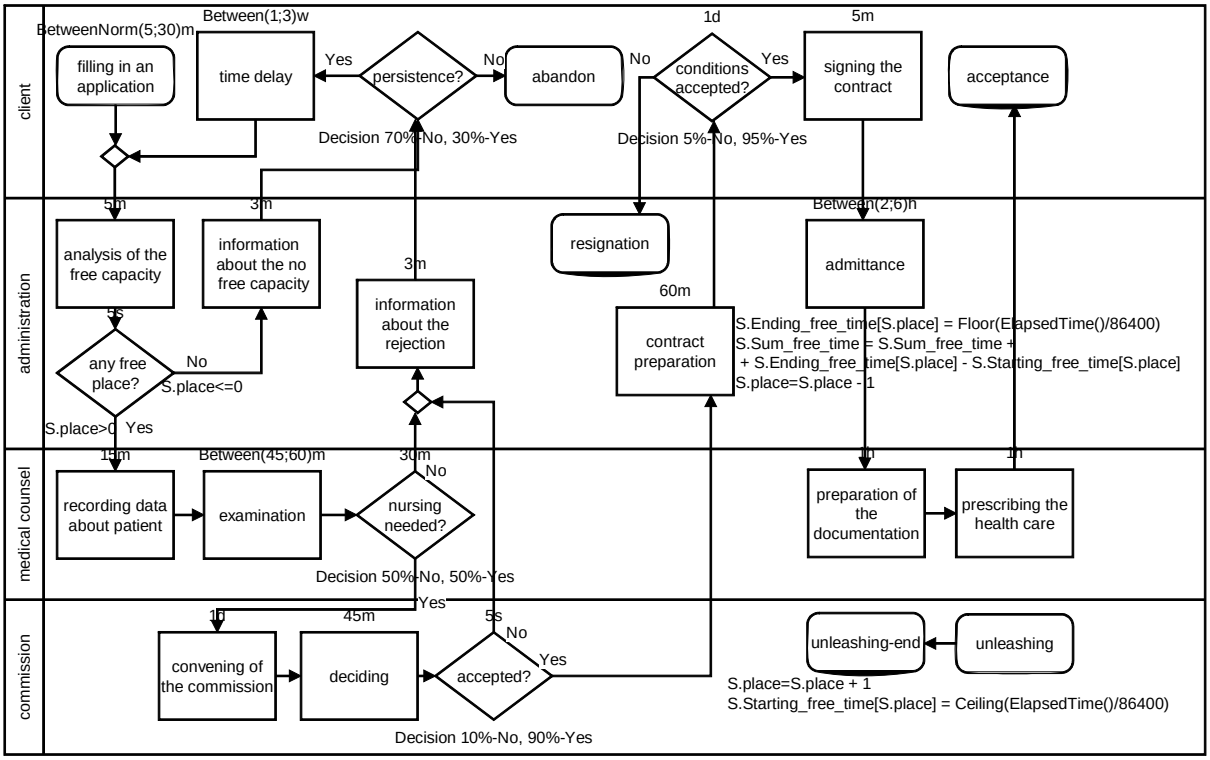
The existing bookkeeping system did not offer any tracking about the unoccupied places and therefore was not able to give any information on the vacancies available at the old people's house. We could say it was not able to furnish any figures about the lost opportunities. Any unoccupied place of at least one day represents a lost opportunity for the institution as it cannot be charged to anyone. Although it may be hard to imagine it, the reason for not tracking the lost opportunities was very simple: nobody was ever interested in this kind of data. The main goal of the existing information system was to keep track of all payments and to request debtors to pay their bills.

3.1. THE SIMULATION MODEL FOR THE ADMITTANCE

The model of the described procedure of admission is presented in Figure 1. In the diagram data on the process dynamics is shown. The abbreviation ‘d’ stands for days, ‘m’ for minutes and ‘s’ for seconds. Data was given by the operative staff.

Figure 1.

Model of the Acceptance Process AS-IS



With the intention of making the model as realistic as possible, three additional modifications of the activities have been made. The activity “convening of the commission” was marked as only taking place at the end of the day, while “examination” and “admittance” occur in the morning. Both definitions are entered into the program on the page describing input properties of the action by marking “collect transactions on input” with the “gate by time” option.

Two transaction generators are implemented in our model. The first one simulates occurrences of released places. The frequency of transactions was calculated by the data, that there is on average, about 60 to 65 releases per year. Therefore, transactions are generated with the uniform distributed time of between 1 and 12 days. This generator is integrated in the activity “unleashing”. The second one simulates appearances of applications. It was assured, that they arrive nearly every day, at least every second day. Therefore, the uniform distributed ‘interarrival’ time between 0 and 2 days was the frequency of the generator implemented into the activity called “filling in an application”.

The goal of the simulation is to calculate the number of the lost days. These are days when one place – one bed is unoccupied. This aim is reached with the help of attributes and several in-built functions. The first generator which simulates the occurrences of the releases

has only one task: it increases the number of free places. It is done in the numeric scenario attribute "S.place". At the same time the temporary current simulation day is recorded in the numeric scenario attribute "S.Starting_free_time". This is done by the built-in function "ElapsedTime()" which returns the temporary simulation time in seconds.

In the decision "any free place?" the procedure continues over the path "yes" if the attribute "S.place" is greater than zero, otherwise it continues over the path named "no".
After the new member is admitted in the activity Admittance, the current time from the simulation clock is recorded again. The difference of days between the Starting_free_time and the Ending_free_time is summed into the scenario attribute "S.Sum_free_time".

3.2. Results of the simulation

The simulation scenario was prepared to simulate 55 years with 5warm up years. We planned the number of repetitions of the simulation with the different seed number according to the procedure described in Karian and Dudewicz (Karian and Dudewicz, 1999). Noting that the same procedure is also described in Harrell et al. (Harl et al., 2004):

Step 1: we decided to make 15 initial runs (n0 = 15) of the simulation for the first estimation of the number of the lost – unoccupied days. From the $\omega = t_{n_0-1}^{-1}((1+P^*)/2)/d =$ a confidence P* = ,99 and the tolerance interval ± 100 days in a 50 year period a $t_{n_0-1}^{-1}(0{,}99) = t_{14}^{-1}(0{,}99)$ = 2,624 was stated from the *Student's t*-distribution.
Step 2: 15 occurrences of the simulation for the observed model were completed. Results for each individual run are given in Table 1.
Step 3: Calculations from the sample for $\overline{X}(n_0)$ = 20360,6 and s = 952,73 were made.
Step 4: A number of occurrences (n) of simulation runs for the stated confidence of 0,99 and a tolerance (d) of ± 100 days were set: $n = \max\left\{n_0 + 1, \left\lceil \left(t_{n_0-1}^{-1}\left(\left(1+P^*\right)/2\right)\right)^2 s^2/d^2 \right\rceil\right\}$, where $\lceil . \rceil$ denotes rounding up to an integer. So $n = \max\left\{16, \lceil (2{,}624)^2 * (952{,}73)^2/(100)^2 \rceil\right\}$ $= \max\{16, \lceil 624{,}94 \rceil\} = \max\{16{,}625\} = 625.$
Step 5: 625 simulation's runs each with the different initialisation of the random number was undertaken. 58 minutes were needed to complete the simulations on the computer powered by 2,4 GHz CPU.
Step 6: A calculation for the 625 simulation runs was made and $\overline{\overline{X}}$ = 20100,22 was calculated
Step 7: We can claim with a confidence of 0,99 that the average lost number of days in a 50 year time is between 20000,22 days and 20200,22 days. It means that there is on the average about 402 days lost per a single year.

Table 1.

Results of Simulations of the AS-IS Model of the Acceptance Process

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	X	SD
Sum of free days	19379	21428	20896	18910	20849	20685	18876	20889	20778	19719	20592	21573	20411	18941	21483	20360	952,73
Accepted number	2969	3021	2982	2945	3009	3006	2951	3038	3049	3017	3036	3020	2995	2988	3019	3003	31,05
Releases in 55 years	3269	3329	3281	3240	3323	3326	3243	3337	3347	3306	3334	3325	3310	3283	3315	3304,5	33,72
Examinations in 55 years	7649	7794	7675	7580	7775	7779	7588	7809	7826	7734	7801	7779	7741	7682	7758	7731,3	78,77

3.3. VERIFICATION AND VALIDATION OF THE MODEL

Verification is the process of making sure that the simulation program actually represents the intended model (Pidd, 1998), (Chung, 2003), (Banks et al., 2001), (Law and Kelton, 2000), (Harrell et al, 2004), (Seila, 2005). Validation is the process of determining if the model is useful representation of the real system (Seila et al., 2003), (Birta and Arbez, 2007), (Wainer, 2009).

For the first test it was considered the number of the released places per year. It was established that this number varied between 60 and 62 persons. It confirms the expected number according to data of the last three years. On the other hand the activity "analysis of the free capacity" was executed about 19500 times per simulation – in the 50 year period time. It means that there were inquiries every day! This confirms that both generators simulate reality of the process. The main validation the observation of the exact free bed was observed. It was a difficult task as it required manually detail tracing of the everyday changes of the occupation of resources. This supervision was taking place for a month and a half. During this time seven releases have been traced. It was expected that on average a released bed is reoccupied in about 6,7 days (402 days divided by 60 acceptances). The actual data have shown that on the average this period is longer. There were manual observations of seven cases. It has taken 9, 7, 12, 6, 9, 6 and 11 days which gives average of 8,6 days with σ = 2,19. The detail analysis of the reason has shown that there were subjective reasons that extended the process – like illness of the administrator, vacations, holidays, etc. It should be included in the model, but it would demand the detail observation of the probability that something goes wrong and thus expanding the process. Anyway, the analysis has shown that the actual data do not differ from the simulated result $(z=(\bar{x}-\mu)/(\sigma/\sqrt{n}) = (8{,}6-6{,}7)/(3{,}16/\sqrt{6}) = 0{,}78$. At least it was concluded that the model was not pessimistic. Right on the contra it even calculated an optimistic version when everything goes as planned. Therefore it was stated that the model satisfies the expectations and therefore the model was verified and validated.

4. THE NEW PROCESS OF THE ADMITTANCE

After the calculation of wasted time for the current process, arose the most interesting question: "what do we gain, if applications are not rejected, but put in a waiting queue list? Will it have any effect on the efficiency of the institution?" Therefore a new modified version of the acceptance process was established. It was organised on the following foundations:

- Each candidate is obligated having the prescribed medical exam of his/hers abilities on his own expenses at any doctor of the common cases. The diagnosis is added to the application.
- Each application is accepted and placed into the waiting list.

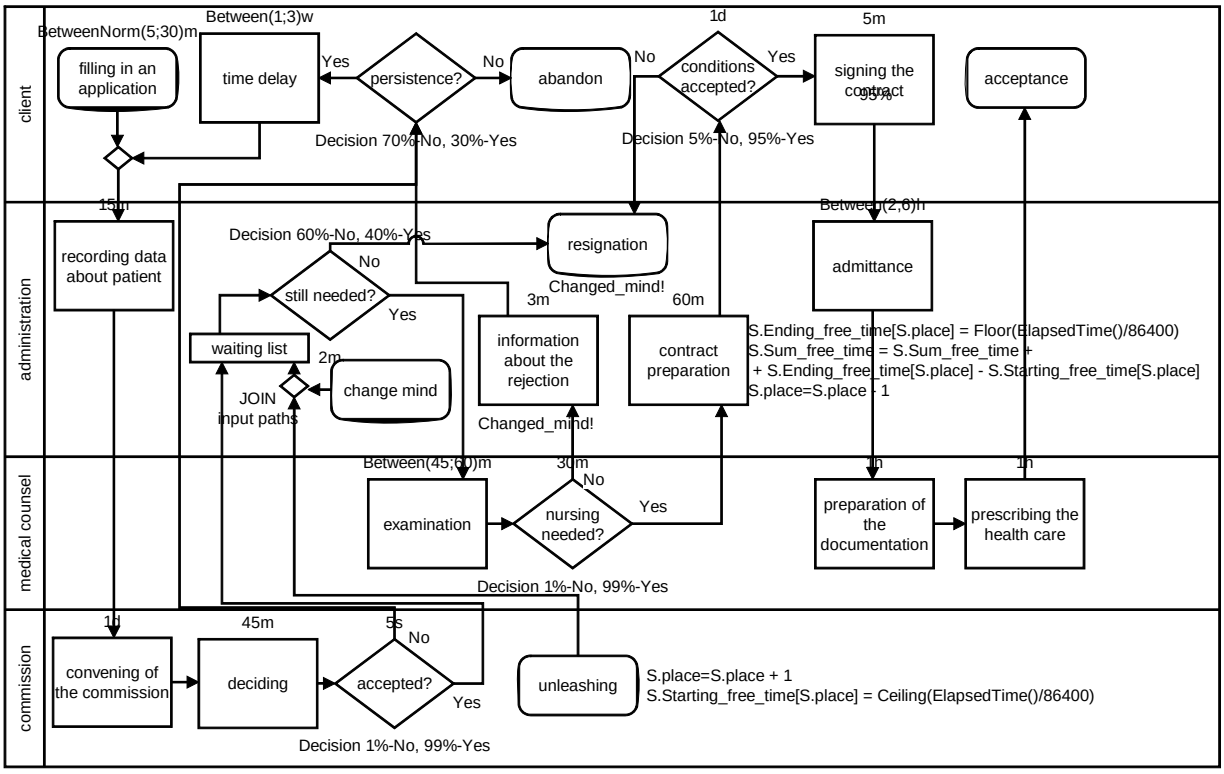
Now the process after the transaction generator goes to the administration which records the data about the patient. Afterwards the commission confirms the candidate and inserts him into the waiting queue. Commission does not have many reasons to refuse the application. It decides according to the submitted medical certificate gained from the general doctor out of the institution. Therefore we stated that only 1% of applications are rejected. After a new place is released the first one in the waiting queue is called and medically examined. The medical counsel can reject the applicant only if the medical state is different according to the diagnosis enclosed to the application. It may happen only in the case of dramatic change of health during the waiting time in the queue. Therefore the same probability was used. If the nursing needed is confirmed by the medical counsel a contract is prepared, signed by the client and he or she is admitted. The counsel prepares the documentation and prescribes the health care.

There is a very important decision called ‘still needed’ after the new application from the waiting list is started. Now it may happen that the selected applicant who is finally called for the admittance is not interested for the life in the institution any more. Either he or she has found a new solution or the service is not needed any more. Therefore we predicted that more than the half of the offered person will refuse the invitation (60%). It such case there needs to be a feedback signal into the waiting list that another candidate from the waiting list is lunched for the admittance.

This was performed by inviting the third generator ‘change mind’. In the case that a feedback signal is need a new scenario attribute “S.changed_mind” is increased by 1. And every time when this attribute is increased, the “change mind” generator generates a new transaction into the waiting list where a new waiting applicant is picked up from the waiting queue and lunched for the acceptance. The model of the new reorganised procedure is represented on the figure 2.

Figure 2.

Model of the New Modified Acceptance Process TO-BE



4.1. RESULTS OF THE SIMULATION OF THE MODIFIED PROCESS

The simulation scenario for the modified process was the same to the previous one. It simulates 55 years with 5warm up years. The same procedure as for the previous model was used (Karian and Dudewicz 1999) and (Harrell et al. 2004) was used to calculate the number of simulation repetitions:

Step 1: Again 15 initial runs of the simulation have been performed. With the same level of the confidence P* = 0,99 and the tolerance interval ± 100 days in a 50 year period a $t_{n_0-1}^{-1}(0,99) = t_{14}^{-1}(0,99) = 2,624$ was stated from *Student's t*-distribution.

Step 2: 15 occurrences of the simulation for the observed model were completed. Results for each individual run are given in the Table 2.

Step 3: Calculations from the sample for $\overline{X}(n_0) = 9341,6$ and s = 716,86 were made.

Step 4: A number of occurrences (n) of simulation runs for a tolerance (d) of ± 100 days were set: $n = \max\{16, \lceil (2,624)^2 * (716,86)^2 / (100)^2 \rceil\} = \max\{16, \lceil 353,8 \rceil\} = \max\{16,354\} = 354.$

Step 5: Additional 354 simulation runs were undertaken.

Step 6: A calculation for the 354 simulation runs was made and $\overline{\overline{X}} = 9148,12$ was calculated

Step 7: We can claim with a confidence of 0,99 that the average lost number of days in a 50 year time is 9148,12 ± 100 days. It means that there is on the average about 183 lost days in a single year.

Table 2.

Results of Simulations of the Modified TOBE Model of the Acceptance Process

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	X	SD
Sum of free days	8976	9036	8945	8866	11350	10396	8759	9051	9118	9044	9117	9367	10104	8939	9056	9341,6	716,86
Accepted number	2968	3018	2981	2945	2991	2994	2948	3036	3051	3016	3035	3015	2995	2988	3018	2999,9	31,23
Releases in 55 years	3269	3329	3281	3240	3323	3326	3243	3337	3347	3306	3334	3325	3310	3283	3315	3304,5	33,72
Examinations in 55 years	3475	3534	3488	3446	3513	3521	3446	3545	3560	3516	3544	3531	3505	3491	3523	3509,2	34,34

The simulation shows that the new, reorganised process has shorten the time of the new reoccupation of the released bed from 402 down to 183 days. It means that the new process has reduced the time of reoccupation of the released free place for nearly 55 %. Now, there is the average waiting time for a new client nearly exactly 3 days. For the first test it was considered the number of the accepted patients. The numbers from the both models have been compared. Both numbers are identical. They generate the same number of releases and also the number of the accepted people also differs very little. Therefore it can be assumed that both generate the same conditions. Again manual observation and tracking of the free time was performed for 15 cases this time. In six cases the reoccupation time was 2days, in seven cases 3, one case 4 and in two cases 5 days. It gives an average of 2,93 days and deviation of 1,03.

5. INTERPRETATION OF RESULTS

Simulations of the both models clearly show that the number of lost days when an unoccupied place or places occur seriously decrease when the new organisation of the process is organised through the creation of the waiting list. The calculation show that on average it can be expected that 219 days per year less will be lost in a new type of the process organisation.

In the year 2009 one day in the house of the old people's home was charged 40 €. It means that there was about 8700 € saved money. Perhaps someone will claim that the net saving of the reorganisation is low. Perhaps someone will even say that it was not worth developing the simulation model for such a paltry sum. But there is one and perhaps the most important reason for the research. It has been proven that there are internal reserves in the organisation which can be used instead of just waiting for rising up prices. And this is a very important message to the organisation in the environment where needs highly overload the offers.

There are also some other aims realised by the reorganisation of the procedure. Medical counsel does not need any more to record candidate's data for the medical exam. It can be done by the administration. The most gained value represents the fact that in the new model only a bit more than the accepted patients are examined by the internal old people's house staff. Candidates need to gain the medical certificate in advance from the general doctor. Therefore just a routine verification is needed to confirm that the state of the person has not drastically changed since the examination was performed. The number of the examinations has therefore significantly decreased from 7731 down to 3509 in 55 year period. (The warm up time of 5 years in included in this number). It is worth mentioning that this activity is far the most expensive at all. It needs a doctor and the nurse who are always over occupied with the everyday work.

6. CONCLUSION

Today's rapidly changing business environment, competition and technological changes are forcing organisations to rapidly react to market needs and to ensure continuous business improvement. Analysis and design of organizational processes can be assisted by the development of business process simulation models. Simulation can provide a valuable mechanism for addressing the problem of quantitative and qualitative evaluation of prospective designs of business processes. Furthermore, simulation can facilitate experimentation with and study of multiple perspectives of organizations, thus contributing towards a holistic view of enterprises and, ideally, towards increasing the quality of change decisions. The benefits realized from an investment in simulation methodology and tools are both tangible and intangible. Most savings are expected in the reduction of the amount of time required for manual calculations, a decrease in the amount of time required to perform analyses, an improvement in the quality of solutions, and an increase of reusable corporate assets (business models, business rules and knowledge). Concerning this case study the general acceptance of the simulation approach provides benefits to internal and external business process activities. Internal benefits are quality, time, cost reduction, innovations, customer service, or product performances that create long-term profitability for the organization.

By giving important numbers for the decision simulations have proved to be not only the exotic laboratory experimental tools any more. They can become and they need to be a part of the enterprise business process renovation. The main idea of business renovation is to look at organisations from the process point of view. Business renovation is not about changing the current state, but creating a new and more competitive organisation. Many projects in the past have failed since the orientation of projects was strictly on business processes that generated major changes but without involving other aspects. Business renovation, besides business processes, also includes other organisation aspects like organisational structures, technology, people and culture. The last two aspects mentioned are in a way the most important one when organisations seek to implement changes suggested in project documentation. A business renovation project is a difficult and long-term project. It is important that it includes professionals with a precisely defined strategy. The risk involved in such projects is very high as the project team may confront many obstacles. The basis to start such a project is to have the complete support and co-operation of top management which has power to control the employees and which can also interfere if problems arise.

This case study confirms that the analysis and carefully used simulation of business processes is indeed useful since it provides insights into the policies, practices, procedures, organization, process flows and consequently shifts people's minds from a functionally to a process-oriented orientation. Both hypotheses stated at the beginning of the research have been proved. Without any serious effort a new type of the process was proved to be legitimate. No extra money was invested into the reorganised procedure. It on the other hand returns serious savings to the institution.

REFERENCES

Anglani, A., Grieco, A., Pacella, M., Tolio, T. (2002). Object-Oriented Modeling and Simulation of Flexible Manufacturing Systems: a Rule-based Procedure. *Simulation Practice and Theory*, vol. 10, no. 3/4, pp. 209 – 234.

Banks, J., Carson II, J. S., Nelson, B. L., Nicol, D. M. (2001). *Discrete-Event System Simulation.* Prentice Hall.

Birta, L. G., Arbez, G. (2007). *Modelling and Simulation.* Springer Verlag.

Bosilj-Vuksic, V., Indihar Stemberger, M., Jaklic, J., Kovacic, A. (2002). Assessment of E-Business Transformation Using Simulation Modeling. *Simulation*, vol. 78 no. 12, pp. 731–744.

Chen, M. (1999). BPR methodologies: Methods and tools. In Business Process Engineering, edited by D. J. Elzinga et al. Kluwer Academic Publishers, Massachusetts.

Chung, C. A. (2003). *Simulation Modeling Handbook.* CRC Press.

de Swan Arons, H., Boer, C. A. (2001). Storage and Retrieval of Discrete-Event Simulation Models. *Simulation Practice and Theory*, vol. 8, no. 8, pp. 555-576.

Eldabi, T., Z. Irani, R. J. Paul, Love, P. E. D. (2002). Quantitative and qualitative decision-making methods in simulation modeling. Management Decision, vol. 40, no. 1, pp. 64–73.

Engels, G., Heckel, R., Sauer, S. (2000). UML – A Universal Modeling Language?. *In Application and Theory of Petri Nets 2000*: 21st International Conference ICATPN, edited by M. Nielsen and D. Simpson. Aarhus, june 2000. Springer Verlag, Berlin.

Fowler, J. W., Rose, O. (2004). Grand Challenges in Modeling and Simulation of Complex Manufacturing Systems. *Simulation,* vol. 80, no. 9, pp. 469 – 476.

Greasley, A. (2005). Using system dynamics in a discrete-event simulation study of a manufacturing plant. International Journal of Operations & Production Management, vol. 25, no. 6, pp. 534–548.

Groznik, A., Kovacic, A. Jaklic, J. (2003). Simulation modeling in practice - towards e-government. Information Technology Interfaces, 2003. ITI 2003. *Proceedings of the 25th International Conference,* 16/07/2003.

Harmon, P. (2003). Business process change. Morgan Kaufmann publishers.

Harrell, C., Ghosh, B. K., Bowden, R. O. (2004). *Simulation Using ProModel.* McGraw Hill.

Hlupic, V., de Vreede G. J. (2005). Business process modeling using discrete-event simulation: current opportunities and future challenges. International Journal of Simulation & Process Modeling, vol. 1, no. 1/2, pp. 72–81.

IMF (2009). Guidelines for Foreign Exchange Reserve Management. http://www.imf.org/external/np/mae/ferm/eng/index.htm#I, hit November 2009.

Juric, M. B., Pant, K. (2008). Business process driven SOA using BPMN and BPEL. Packt publishing, Birmingham - Mumbai.

Kaplan, S. R., Norton, D. P. (1996). The balanced scorecard. Harvard Business School Press.

Karian, A. Z., Dudewicz, J. E. (1999). *Modern Statistical Systems and GPSS Simulation.* CRC Press.

Kovacic, A., Pecek, B. (2007). Use of Simulation in a Public Administration Process. Simulation, vol. 83, no. 12, pp. 852-861.

Kritchanchai, D., MacCarthy, B. (2002). A procedure for establishing a reference state in qualitative simulation of operational systems. Industrial Management & Data Systems, vol. 102, no. 6, pp. 332–340.

Laughery, R., Plott, B., Scott-Nash, S. (1998). Simulation of Service Systems. In Handbook of Simulations, edited by J. Banks. John Wiley & Sons.

Law, M. A., Kelton, W. D. (2000). *Simulation Modelling and Analysis.* McGraw-Hill.

McCarthy, B. M., Stauffer, R. (2001). Enhancing six sigma through simulation with igrafx process for six sigma. *Proceedings of the 2001 Winter Simulation Conference*, Arlington, VA, pp. 1241–1212.

Melao, N., Pidd, M. (2006). Using Component Technology to Develop a Simulation Library for Business Process Modelling. *European Journal of Operational Research,* vol. 172, no. 1, 163-178.

Moon, Y. B., Phatak D. (2005). Enhancing ERP system's functionality with discrete event simulation. Industrial Management & Data Systems, vol. 105, no. 9, pp. 1206–1224.

Noakes, C. M. (2005). Transportation simulation ontime in iGrafx software. In Proceedings of the 2005 Waste Management Conference, Tucson, Arizona.

Ozbay, K., Bartin, B. (2003). Incident Management Simulation. Simulation, vol. 79, no. 2, pp. 69–82.SSZS (2009). Overview over the waiting list. http://prosnje.ssz-slo.si/SSZSHtmlPregledi/pregled_cakajocih.aspx, hit November 2009.

Pender, T. (2003). *UML Bible*. Wiley Publishing.

Perera, T., Liyanage, K. (2000). Methodology for Rapid Identification and Collection of Input Data in the Simulation Manufacturing Systems. *Simulation Practice and Theory*, vol. 7, no. 7, pp. 645 – 656.

Pidd, M. (1998). *Computer Simulation in Management Science.* John Wiley & Sons.

Robertson, N., Perera, T. (2002). Automated data collection for simulation?. Simulation Modeling Practice and Theory, vol. 9, no. 6/7/8, pp. 349-364.

Rouillard, L. (1999). Technology and simulation: For a participative democracy in the era of new public management. International Review of Administrative Sciences, vol. 65, no. 3, pp. 371-380.

Seila, A. F., Ceric, V., Tadikamalla, P. (2003). *Applied Simulation Modeling.* Thomson Learning.

Seila, A. F. (2005). The case for a standard model description for process simulation, *International Journal of Simulation and Process Modelling*, vol. 1, no. 1/2, pp.26–34.

Siau, K., Halpin, T. (2001). *Unified Modeling Language: System Analysis*, Design and Development Issues. Idea Group Publishing.

Wainer, A. W. (2009). *Discrete-Event Modeling and Simulation.* CRC Press.

UPRAVLJANJE POSLOVNIM PROCESIMA: KORIŠTENJE SIMULACIJE U JAVNOM SEKTORU

SAŽETAK

Metode i tehnike upravljanja poslovnim procesima koje poznajemo iz privatnog sektora sve se više koriste i u javnom sektoru. Ovaj rad prikazuje njihovu primjenjivost na sustave u kojima je ljudski faktor važniji. Opisuje slučaj popunjavanja slobodnih mjesta u jednom staračkom domu. Koriste se tehnike simulacije u zamjenu za točno determinističko planiranje. Naše istraživanje pokazuje da korištenje simulacije omogućuje predviđanje efekata renoviranja i trajanja procesa i uskih grla a time i izbjegavanje loših odluka.

***Ključne riječi**: upravljanje javnom administracijom, modeliranje, simulacija, iGrafx*

Marko Paliaga,
Željko Strunje,

UDK 339.138:334.7>(497.5)
PRELIMINARY PAPER
PRETHODNO PRIOPĆENJE

RESEARCH OF IMPLEMENTATION OF INTERNAL MARKETING IN COMPANIES IN THE REPUBLIC OF CROATIA

ABSTRACT

Marketing has a strong role in creating products and services offered in the market in today's particularly dynamic and turbulent business environment marked by daily struggle to keep market positions and realise competitive advantages. Unlike external marketing, internal marketing is still insufficiently researched and used in Croatian companies. Internal marketing comprises marketing know-how, skills, tools, methods and techniques used on the internal market (within the company) with the objective of achieving synergistic effect of all employees in conformity with basic targets, the mission and strategies of the company. The focus of this paper is the research of characteristics of internal marketing of companies working in the Croatian market. The aim of the research was to determine, by means of a preliminary research, the implementation of principles and internal marketing concept in Croatia and its representation within Croatian companies. Previous works and experiences published in foreign publications indicate advantages of implementation of this concept within companies in addition to a great impact on creation of competitive advantages, particularly in terms of services, customer satisfaction and loyalty of both customers and companies' own employees.

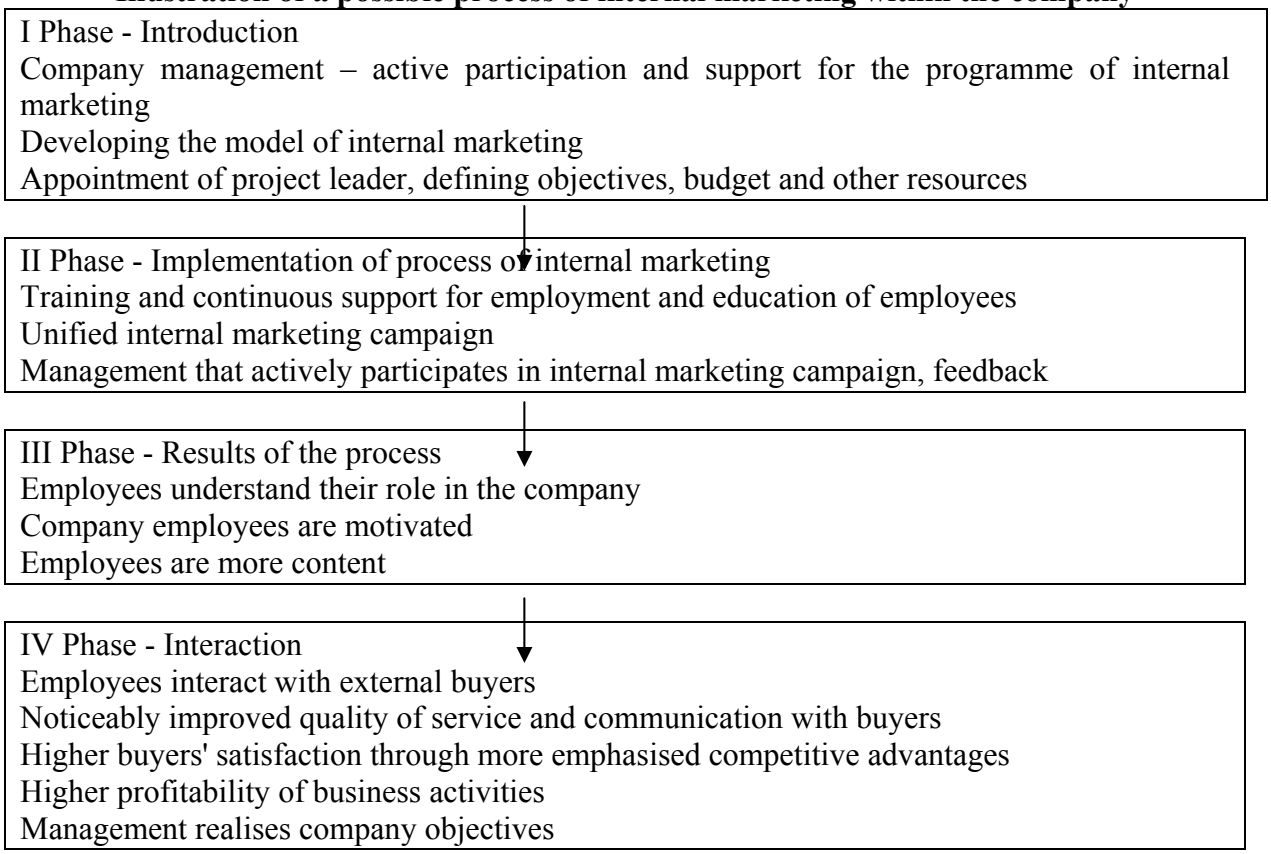
Key words: *internal marketing, services marketing, employees, management*

1. INTRODUCTION

Companies spend most of their time planning marketing activities in relation to users of their products/services in the external market. Do they wonder if similar activities adjusted to the internal market (within the company) may be used with their own employees? Who should be in charge of planning and implementing such activities? What qualities should such person possess and in which department should s/he work? Do Croatian companies even recognise the importance of quality and carefully developed communication within the company? An idea of internal marketing lies on the fact that employees represent the first market for each company. For this reason, employees are the ones who should be educated and informed about their company, its activities and basic objectives, the mission and vision of the company for which their work and, naturally, about benefits and functions offered by products or services of the company to end buyers in external markets. Employees at all levels and in all functions have to be actively included in the process. The basic premise and internal marketing concept are various activities within the company whose primary objective is recognizing company products and services and developing total buyer orientation in all company employees. The role of employees and their relation to the company is decisive in service-based and in manufacturing activities alike, for their work and behaviour affect services for buyers, overall quality, and consequently, the overall sale of products or services (Groenroos, 1990, Gummesson 1995., Matjič, 2002, McDonald and Payne, 1997., Berginc, 2003.). There are numerous models that indicate a correlation between internal and external marketing (Piercy, 2010.). Among other, the function and role of internal marketing is a faster

acceptance of all activities of external marketing within the company (Berry and Parasurman, 1991.).

Illustration of a possible process of internal marketing within the company



Source: authors, partially adapted based on Bašić (2010)

Internal marketing is implemented by leading service based and manufacturing companies (Ballantyne, 2010., Kotler 2000). Some of best practice examples include Johnson & Johnson, Motorola, Xerox, Merck & Company, Alcoa, Matsushita and others (William E. Halal, 2000., Kotler, 2000.). As a matter of fact, internal marketing should precede activities of external marketing, because excellent services and customer relations produce employee satisfaction (Sihombing and Gustam 2007.).

2. REVIEW OF LITERATURE RELATED TO INTERNAL MARKETING

DEFINITIONS OF INTERNAL MARKETING

Internal marketing concept emerged and appeared in literature in the early 1970s (Yang, 2010., Rafiq and Ahmed, 2004.). Authors Varey and Lewis (2000.) argue that internal marketing developed from services marketing. Although it has existed for almost thirty years, this concept has not become widely accepted by managers, while its potential benefits are often grossly neglected (Bannon, 2005.). Mornay (2010.) claims that most companies have failed to successfully implement internal marketing concepts due to a lack of knowledge and insufficient understanding of all components and their influences within the company. In short, most previous research of possible application of internal marketing may be viewed through four key aspects: treatment of employees as internal customers (Berry, 1981., Green 1994.), development of employees' orientation towards internal and external customers

(Piercy and Morgan, 1991.), orientation of internal marketing towards human resource management (Hwang, Chi, 2005.) and development of internal exchange (Bak, 1994.)
Marketing experts have recently focused more attention on internal market, particularly in the second half of the 1990s, aware of the need to balance internal and external marketing as a precondition of successful performance (Groenroos, 1990., Janičič, 1990., McDonald and Payne, 1997., Piercy and Morgan, 1991., Došen, Prebežac, 2000.). Numerous authors argue that successful marketing approach is possible solely if internal and external marketing are integrated into company as a joint and mutually dependent system (Caruana, Calleya, 1998.).

According to the American Marketing Association (AMA), internal marketing is oriented towards company employees and it enables employees to efficiently perform their tasks (Kotler, 2000.). Internal marketing is actually a border between internal organisation and external markets (Gummesson, 2000). Basic activities of internal marketing are internal informing of employees, internal training of employees, creating togetherness, teamwork atmosphere and motivation (Jarvi, 2009.).
Došen and Prebežac (2000.) claim that internal marketing acts as a process of total management of numerous functions in the company. It works in two manners. First, it secures that employees at all levels, management included, understand and experience company business operations and all activities in the light of the environment that generates an awareness of importance of customers. Second, it secures that all employees are prepared and motivated for customer-oriented behaviour. Basic premise of internal marketing is that internal exchange between the company and groups of its employees has to function efficiently as a precondition of successful business activities in the external market. According to Rafiq and Ahmed (2000.), internal marketing is a planned effort used by marketing as an approach to overcome organisational resistance to changes. Its purpose is to organise, motivate, inter-functionally co-ordinate and integrate employees towards the efficient implementation of corporate and functional strategies to achieve customer satisfaction through a process of creating motivated and customer oriented employees. Mornay (2010) maintains that internal marketing is an excellent tool that helps in the implementation of strategic plans.

FUNCTION OF INTERNAL MARKETING AND EMPLOYEE RELATIONS

Internal marketing works as a twofold process of holistic management of numerous functions in the company.. Internal marketing is a permanent process in the company where the organisation motivates and empowers employees at all levels with the objective of constantly creating a positive experience for customers (Mulhern and Schultz, 2010.).
The function of internal marketing is internal exchange between the company and its employees that has to function efficiently before the company may be successful in realising its objectives related to external market (Gronroos, 1990.). Furthermore, internal marketing has to be viewed both as business philosophy and as a process (Covey, 2000.). Ferguson and Brown (1991.) argue that marketing has a twofold function, namely securing production and sales and caring about its employees. In fact, the original concept of internal marketing is aimed at implementing the philosophy and practice of external marketing to all persons – employees serving external customers with the objective of employing and keeping the best personnel and for the best employees to be able to work in the best possible way (Franjić, Šverko 2000.). In addition to the previous premise, authors Križman and Bušelić (2001.) argue that satisfying employee needs has the primary role in satisfying the needs of users of external market because only a satisfied employee will adequately provide quality services to customers. Internal marketing has evolved as a concept due to the need to constantly improve

all employees involved in production, providing services and customer relations (partially based on Gudmundskon, Lundbreg, 2009.).

INTERNAL MARKETING CONCEPT

Basic concept of internal marketing is founded on two aspects. First, that each employees has his/her internal customers and that s/he is also an internal customer. Second, employers have to secure advantages, benefits and extra services for their employees, make them content, which will lead to better business performance in external markets and customers (Gronroos, 1990.) In addition to internal marketing as a process and concept oriented towards employees within the company (Green, Walls and Schrest, 1994.), internal marketing has recently also been focused on planning and implementing the process of improving all kinds of exchange within the company by coordinating and improving processes of exchange between the company and its employees, between the management and departments, between departments and department employees. According to internal marketing concept, the entire company becomes an internal market through the process of decentralisation and through viewing departments as profit centres, a sort of inter-department competitors (Ballantyne, 2010). Nowadays, internal marketing concept makes internal parts of the company compete with each other, selling and buying like in external markets. Furthermore, internal marketing concept is also oriented towards the transformation of internal employees into internal customers making them each other's customers within the organisation. The whole organisation improves its external customer relations only by satisfying the needs and desires within the company (Piercy and Morgan, 1991., Gronroos 1990., Janičič, 1990., Green, Walls, Schrest, 1994., Snoj and Mumel, 1998.). Internal marketing has to be co-ordinated with external marketing and a marketing-oriented company has to treat it as its priority. Marketing orientation certainly has to be preceded by development, communication and implementation of programmes of external marketing. The above definitions of internal marketing indicate the importance of motivation and satisfaction of employees and creation of internal market and internal customers within the company with the objective of satisfying customers in external markets and realising company objectives, mission and strategy. Such statement is closely related to the object of the present research explained and analysed hereinafter and used in drawing further conclusions about the subject matter.

3. IMPLEMENTATION OF INTERNAL MARKETING CONCEPTS AND MARKETING MIX

OBJECTIVES OF INTERNAL MARKETING

To justify the introduction and use of internal marketing, we need to define clear objectives of internal marketing and precisely explain its concept. Objectives of internal marketing are defined in internal and external market (Snoj, Mumel, 1998., Franjić, Šverko 2000.) There are three basic objectives of internal marketing (Bašić, 2008.): the first objective is related to internal market and it comprises investments in employees so that they feel they belong to the company, understand the vision of the company and its strategic objectives and how they will be realised. The second and third objective are related to external market and they refer to investments in customers geared at developing good long-term business relations and reaching competitive advantages, which is the basic premise for survival of the company in the market struggle. Additional objectives of internal marketing are employee motivation (Gronross, 1991., Hay 1999.), an increase of employee satisfaction (Lings, 1999.), maximizing employee efficiency (Thomson and Whitwell, 1993.), harmonising employee

relations (Snoj, 1998.), and keeping quality personnel (Green, Walls and Schrest, 1994.). These objectives also explain the understanding of internal marketing concept (partially according to Barry 1981., Gronroos 2002.) as a strategic view of employees as internal customers who perceive their work tasks as internal products that fulfil the needs of internal customers and finally, of external customers. They imply directing and educating employees to keep and create customer-salesman relations, namely customer-oriented employees and mutual synergic effects that produce competitive advantages as the final objective of each company.

INTERNAL MARKETING MIX

The term marketing mix implies combinations of certain elements used in achieving company objectives and fulfilling customers' needs and desires. Marketing mix includes 4 basic variables: Product, Promotion, Price and Distribution, and recently, particularly in terms of services, the 4 elements are added additional 3 P elements; Process, Personnel and Physical Environment. As with external marketing, internal marketing also comprises the 4 well-known elements of marketing mix oriented towards the internal market. In this respect, Product denotes policy, programme and service with which the management tries to act on its internal customers-employees, Price refers to the cost of internal programmes, services and policy, Distribution focuses on policies, programmes and services, and Promotion refers to internal sales, internal advertising, internal public relations and publicity, internal incentives and disincentives.

The recognition of elements of marketing mix of internal marketing is indispensable in defining and recognising elements that already exist in the company and, on the other hand, elements that still have to be developed. The table below shows a graphic representation of 4P elements of marketing mix.

Table 1.
Four elements of internal marketing (4P)

PRODUCT	Programmes, policies and services (education, informing) – everything that has to be planned and continuously monitored that is oriented directly to employees. Research, planning and education are part of product of internal marketing.
PRICE	Price or cost of internal programmes, policies or services. Every investment has its price. Cost and benefit ratio of changes has to be defined.
PLACE	Place/location of programme implementation, policy, services, responsibility for implementation and submission of programmes, policies and services
PROMOTION	Internal sale, internal public relations, internal advertising, internal incentives and disincentives, internal website

Source: authors, based on (Janičić 1990., Flipo, 1986., Devetak 1999., Bašić, 2008.,)

ELEMENTS OF INTERNAL MARKETING MIX

There are four elements that constitute the component of product defined by several authors: selection of employees (Groonroos, 2000., Hogg and Carter, 2000), education and training of employees (Gronroos, 2000., Cahill, 1995.), teamwork (Bak, 1994.) and empowerment of employees. The first element of internal marketing mix is a product that includes policies, programmes, services, research, planning and education related to the improvement of work and activities of all employees-internal customers.
The price of internal marketing mix is the cost of internal programmes, services, education, and research with the objective of their implementation. The price in internal marketing comprises salaries each employee receives on a monthly basis that consist of variable and fixed part, incentives related to successful implementation and application of products of internal marketing mix and awarding system necessary for a successful implementation of the programme of internal marketing.

Flipo (1986.) maintains that distribution refers to the location where activities are performed within the company or in the vicinity of internal customers. Distribution as element of internal marketing mix denotes the place-location of the programme, policies and services that can be related to the company that implements internal marketing. Distribution in internal marketing also comprises the schedule of workplaces, career development and monitoring.

Several authors claim that communication with company employees is the key component in the creation of relations with employees seen as internal customers (Gronroos, 2000., Rafiq and Ahmed, 2000.). Activities of promotion of internal marketing are geared at company's own internal market in terms of promoting internal programmes, policies and services. They comprise the internal improvement of sales, internal public relations, internal advertising, internal promotion and personal contact-personal sales. Media used in internal marketing include personal contacts with each employee, internal e-mails for informing employees, internal website, internal ads and internal newsletter.

A proper definition of elements of marketing mix of internal marketing requires an analysis of the state of the company and known degree of development of elements of marketing mix of internal marketing. This is followed by an explanation of each individual element of marketing mix of internal marketing and elaboration of the proposal of manner of implementation of each element within the company. Definition and explanation of elements of marketing mix are followed by their implementation and, finally, control in the function of monitoring, correcting, developing and adjusting erroneous activities with the objective of providing feedback and insisting on constant improvement. Internal marketing certainly comprises a large number of measures and target groups, so that most companies might be faced with the problem which department should take over the responsibility for internal marketing. There are three possible solutions: establishing a special department for internal marketing, operationalization of internal marketing based on the project principle and individual needs in the company or through the expansion of marketing department. Based on steps proposed for the implementation of marketing mix and organisation of internal marketing, research results and their analysis, the following section will illustrate steps that are or are not implemented in Croatian companies. The authors will eventually propose guidelines for future development of internal marketing in Croatia.

4. PRELIMINARY RESEARCH OF IMPLEMENTATION OF INTERNAL MARKETING CONCEPT IN CROATIAN COMPANIES

DEFINING SCOPE OF RESEARCH AND SAMPLE

For the needs of the present paper, we have carried out a research of companies in the area of the Republic of Croatia using the selected questionnaire. Questions were structured based on authors' opinions and experience and the pilot research in the Republic of Croatia performed by Inga Bašić (2008.). Our research was carried out on the sample of 1,500 largest companies in the Republic of Croatia based on the number of employees and total revenues according to the database of Business Croatia. We have sent 1,500 questionnaires to e-mail addresses of selected companies. Selected sample provided 155 correctly filled out questionnaires from Croatian middle-sized and large companies, or 10.33%, which suffices for a preliminary research of this type. Nevertheless, considering the size of the sample, there may be certain shortcomings in the interpretation of results. Before the research, the questionnaire was tested on 3 experts that have not participated in the research[1]. Testing of the questionnaire did not reveal any important shortcomings.

The following hypotheses have been made for the needs of the research:

H1: Internal marketing is not a relatively new term in Croatia, both in theory and in practice,

H2: Internal marketing in Croatia has a positive effect on the satisfaction of most employees

H3: Internal marketing in Croatia has a positive effect on organisation, business activities and competitiveness.

The research was carried out solely on large and medium-sized companies with highest revenues presuming that internal marketing could be developed only in most advanced companies. Research was carried out from 01.02.2010 to 01.05.2010.

PRESENTATION OF RESEARCH RESULTS

The results of the research are shown below, in tables and descriptions. Based on activities, research featured 52.81 of manufacturing and 47.19 of service based companies, an almost equal percentage. According to the number of employees, 71.11% of companies belong to the category of 50-250 employees, and 28.89% to the category of over 250 employees. The questionnaire was filled out only by key persons (management) in charge of marketing, internal marketing, or directly by directors or members of the management board, hereinafter referred to as "respondents".

ORGANISATION OF INTERNAL MARKETING IN CROATIAN COMPANIES

The results indicate that internal marketing in Croatian companies is mostly organised either as human resources service (24.24%) or within marketing department (33.33%). 34.34% of respondents indicated that internal marketing is not carried out in proposed services but outside them.

[1] Note: the test was carried out by the agency Alphera from Pula and professors of Juraj Dobrila University, 2010.

Table 2
State which business function within your company perform activities of internal marketing

Answers	in %
No answer	1.01
Human resources	24.24
Special unit for internal marketing	4.05
Within marketing department	33.33
Not listed	34.34
I do not know	3.03
Total:	100.00

Source: authors' research, 2010, possibility of 1 answer

Range of activities of internal marketing and its integration in Croatian companies
Results of our research show that persons in charge of internal marketing in Croatian companies for the most part (57.79%) concentrate on tasks of informing employees and organising various thematic (internal and external) workshops.

The research indicates a relatively high degree of implementation and integration of internal marketing within the company in as many as 64.45% of all cases (grades 3, 4 and 5), while other respondents stated that in their case the degree was low (grade 1 and 2). The largest obstacles affecting the development and functioning of the system of internal marketing are lack of budget and personnel (35%), relatively unclear position within the company of persons in charge of internal marketing (24.29%), lack of interest of the management and administration for internal marketing (15.71%). The same percentage (15.71%) indicate that employees do not collaborate and support employees in charge of implementation of programme of internal marketing. 80.68% of respondents believe that implementation and integration of internal marketing within the company successfully affects customer satisfaction in the company. 78.89% of respondents are convinced that internal marketing directly affects the creation of competitive advantages and successful performance.
The results of our research show that 40.66% of respondents maintain that all their employees actively participate and support activities of internal marketing, while 59.34% of respondents believe that their employees do not participate at all or are indifferent to activities of internal marketing. The latter data does not favour Croatian companies and it certainly indicates shortcomings in the implementation and integration of internal marketing within the company. The following table clearly shows serious understanding of the need to implement internal marketing of respondents (management).

Table number 3
In your company, the management understands internal marketing and instruments of internal marketing:

Answers	in %
No answer	0.00
Very important and decisive for long-term development of company	40.66
Important but not significant for company development	31.87
Not important, activities are carried out but do not considerably affect the company	9.89
Completely irrelevant activities that have to be cancelled in the future	17.58
Total:	100.00

Source: Authors' research, 2010.

The above data show importance and understanding of the need to integrate and implement internal marketing within Croatian companies. Only a small percentage, 17.58% of managements of Croatian companies does not understand the need for internal marketing and maintains it should be cancelled.

Motivation, relation to and understanding of internal marketing in Croatian companies

The below table states that 68.54% of respondents believe and claim that internal marketing has a positive effect on their employee satisfaction.

Table 4
Based on your knowledge and research within the company, estimate the influence of internal marketing on your employee satisfaction:

Answers	in %
No answer	0.00
Very important	20.22
Important	48.32
Neither important nor irrelevant	24.72
Completely irrelevant	6.74
Total:	100.00

Source: Authors' research, 2010.

An almost identical percentage (66.77%) refers to employees' better understanding of the vision, mission and strategy of the company thanks to integrated implementation of activities of internal marketing. These employees certainly contribute to productivity and overall results of their companies more than those who do not know the future direction of their career. Furthermore, according to respondents' estimates, activities of internal marketing and its integration within Croatian companies in 71.11% of all cases contribute to better understanding of objectives and work tasks of company employees. Instruments of internal marketing in the Republic of Croatia are distributed through internal meetings (27.20%), intranet –internal network (19.60 %), personal contacts 23.20 % and through adverts, posters and notice boards (17.20%). It is interesting that in only 10% of cases, instruments of internal

marketing are distributed and shown to employees through the website. The most widely used instruments of internal marketing are organised and specialised workshops, short reports to employees, internal meetings and internal newsletter.

Contribution and limitations of results and guidelines for future researches

All results of the present research indicate a relatively high level of integration and implementation of internal marketing in the Republic of Croatia. It would be interesting to research and compare the implementation of concepts of internal marketing in companies with less than 50 employees. We believe we would get completely opposing results and that the implementation of the set of instruments of internal marketing probably grows with the size of the company expressed by the number of employees and total revenues. The following table presents research results in relation to research hypotheses.

Table 5- Summary presentation of some research results

	Research hypotheses	Research results, N=155
H1	Internal marketing is not a relatively new term in Croatia	In 91 % of researched companies, there is some form of organisation of internal marketing. In 64.65 % of researched companies, there is a high level of integration of internal marketing
H2	Internal marketing in Croatia has a positive effect on the satisfaction of employees	68.54 % of respondents believe that activities of internal marketing have a positive effect on employee satisfaction in their company
		66.77 % of respondents believe that the implementation of internal marketing in their company contributes to better understanding of the vision, mission and company strategies of the employees, which makes them secure and more content.
H3	Internal marketing in Croatia has a positive effect on organisation, business activities and competitiveness	78.89 % of respondents believe that internal marketing directly affects the creation of competitive advantages and successful business performance
		80.68 % of respondents believe that the implementation of internal marketing concepts has a positive effect on customer satisfaction
		40.66 % of respondents believe that internal marketing is important for long-term development of the company
		71.11 % of respondents believe that the implementation of internal marketing helps their employees understand the objectives of their company, which directly affects business results.

Source: authors, 2010.

In terms of the above results, the situation in observed Croatian companies may be evaluated as positive. Internal marketing has been recognised as a need, and a large number of activities and instruments are used in the observed companies. As a mater of fact, researched companies

recognise internal marketing. In most cases, respondents maintain that activities of internal marketing directly affect satisfaction of their customers. By the same token, most respondents believe that activities of internal marketing contribute and directly affect the improvement of competitive advantages of their company. Consequently, the present research indicates and confirms the fact that activities of internal marketing undoubtedly have a positive effect as a tool of motivation, which is reflected on a high degree of active participation of employees in activities of internal marketing.

Through the statement "internal marketing affects satisfaction of customers of our company" and the results expressed herein, we can conclude that a large majority of all respondents is aware of the importance and impact of internal marketing both on employee satisfaction and on the consequent satisfaction of users of products and services in the external market. Besides, respondents maintain that activities of internal marketing for the most part significantly affect employees' enhanced understanding of the company vision, mission and objectives and their proper understanding of work tasks.

The research also indicated that respondents believe there is still a relatively high degree of employees' lack of understanding of activities of internal marketing- 31.87% (indifferent regardless of activity) and of the management (17.58% of managers claim that activities of internal marketing are irrelevant, Table n. 3) who in 49.54% of all cases believe that activities of internal marketing are important but not decisive for the company (Table n. 3). The largest obstacles for the implementation of internal marketing are still a lack of budget for the implementation of activities of internal marketing (18.57%), according to previous researches, 11.61%[2], unclear position of employees in charge of works of internal marketing - either within human resource department or in marketing department (25%), and lack of interest of the management and employees with the same percentage (15.71%), according to previous researches, undefined objectives and tasks of internal marketing (28 % of respondents)[3].

The above results lead to the conclusion that the first step towards a more intense and efficient removal of barriers would certainly be more intense education of the management about needs and results that may be achieved using a systematic application of instruments of internal marketing. Besides, persons within the company in charge of implementing activities of internal marketing should dedicate more attention to their colleagues and employees in terms of better marketing and understanding benefits and results of an integrated system of internal marketing through measurable indicators of efficiency. All companies should collaborate with experts in the field of internal marketing to create and implement the most efficient programmes and activities. In that case, neither engagement nor securing budget would be limiting factors for the implementation.

5. **FINAL CONSIDERATIONS**

Internal marketing is based on seeing employees as internal customers, activities and work tasks are seen as internal products aimed at offering internal products that meet needs and desires of internal and external customers to achieve company objectives. The goal of internal marketing is focusing attention of employees on those internal activities that need to be developed, maintained and improved for the purpose of company performance and strengthening the company in external market. New manners of work undoubtedly require that companies and employees continuously acquire new knowledge and skills –construction of the company with permanent education will be increasingly important in the future. In this context, internal marketing concept focused on continuous improvement of employees and

[2] Note: Inga Bašić, M.A., research results for the need of M.A. thesis "Interni marketing u funkciji motiviranja zaposlenika", University of Zagreb, 2008., p. 101

[3] Ibid., 2008., p. 101

their understanding of the company for which they work will be decisive in the creation of highly competitive and advanced companies.
Research results show a high level of implementation and understanding of internal marketing concept in Croatian middle-sized and large companies. By the same token, results indicate a high correlation between the understanding and support of the management to internal marketing and the impact of internal marketing on employee satisfaction. A premise that requires further consideration is that the degree of integration and applicability of internal marketing increases with the size of company, the number of employees and total revenues. Results of the present research show that Croatian companies do not significantly stay behind in terms of implementation and understanding of internal marketing compared to companies of the neighbouring European countries. Further efforts and research should be performed in order to find measurable effects of activities of internal marketing so that its development and implementation in Croatian companies might increase and expand.

BIBLIOGRAPHY

1. Ballantyne, David: "A relationship mediated theory of internal marketing", Swedish school of economics and business administration, Helsinki, Finland, www.hanken.fi, 11.01.2010.
2. Bašić, Inga: "Interni marketing-konkurentska prednost poduzeća", www.posao.hr , 15.01.2010.
3. Bašić, Inga: "Interni marketing u funkciji motiviranja zaposlenika", M.A. thesis, University in Zagreb, 2008., p. 101
4. Bannon, Declan P.: "Internal marketing and political marketing", Paisley Business School, University of Paisley, PSA, 2005.
5. Bateson, J.E.G: "Managing services marketing", Dryden Press, Orlando Fl, 1992., p. 269.
6. Berry, L.L: "The employee as customer", Journal of Retail Banking, vol. 3., March 1981.
7. Berry L.L., Parasurman A, Zeithaml V.: "Refinement and reassessment of the SERVQUAL scale", Journal of Retailing 67, 4, pp.420-450., 1991.
8. Berginc, Dario: "Upravljanje odnosov: Prispevek k interdisciplinarnosti trženjske znanosti", Akademija MM, 10, pp.31-40, 2003.
9. Bradley R. Barnes, Martin T Fox, D.S. Morris: "Exploring the linkage between internal marketing, relationship marketing and service quality: a case study of a consulting organisation", Routledge, Total Quality Management, vol. 15., No. 5-6, 593-601, July-August 2004.
10. Bak, C.A., Voght, L.H., et.al.: "Management by team: an innovative tool for running a service organisation through internal marketing", Journal of Service Marketing, vol. 8., No 1, pp 37-47, 1994.
11. Caurana A., Calleya P.: "The effect on internal marketing on organisational commitment among retail bank managers", International Journal of bank marketing, vol 16., no 3, pp. 108-116., 1998.
12. Covey Stephen R: "Načela uspješnog vođenja", Ljubljana, Mladinska knjiga, p.276, 2000.
13. Devetak Gabrijel: "Temelji trženja in trženjska zasnova podjetij", Koper, Visoka šola za menedžment, p. 2002, 1999.
14. Flipo, Jean Paul: "Service firms: independence of external and internal marketing cervices", European Journal of Marketing 20, 8, pp.5-13, 1986.

15. Ferguson, J.M.; Brown, S.W.: "Relationship marketing and association management", Journal of Professional Services Marketing", Journal of Professional Services Marketing, vol. 7, No 2, pp.137-147, 1991.
16. Gronroos, Christian: "Defining marketing: a market oriented approach", European Journal of Marketing, 23, 1, pp. 34-39., 1991.
17. Gronroos, Christian: "Service management and marketing-managing the moments of truth in service competition", Maxwell MacMillan International Edition, Lexington Books, Lexington Mass, 1990, p. 222.
18. Gronroos, Christian: "Service management and marketing: a customer relationship approach", 2nd edition, John Wiley & Sons, Ltd. Chichester, 2000.
19. Gudmundson Anna, Lundberg Christine: "Internal marketing, a way of improving service quality", ETOUR, Ostersund, Sweden, 2009.
20. Gummesson Evert: "Internal marketing in the light of relationship and network organisations" Internal Marketing, Routledge, New York, 2000., p. 27
21. Gummesson Evert: "The new marketing-developing long term interactive relationships", Marketing Strategies-New Approaches, New Techniques, Pergamon, Oxford, pp. 83-102, 1995.
22. Green, W.E., Walls, G.D., Schrest, L.J.: "Internal marketing-the key to external marketing success", The Journal of Services Marketing, 8, 4, pp. 5-13, 1994.
23. Halal Wiliam: "From hierarchy to enterprise-internal markets are foundation for a knowledge economy", Internal Marketing, Routledge, New York, 2000., p.8.
24. Hog, G. Carter S.: "Employee attitudes and responses to internal marketing", Internal Marketing Directions for Management, Routledge, London, pp. 109-124, 2000.
25. Hwang Ing San, Chi Der Jang: "Relationship among internal marketing, employee job satisfaction and international hotel performance, empirical study", International Journal of Management, vol. 22, no. 2, June 2005., pp. 285-293.
26. http://www.marketingpower.com/_layouts/Dictionary.aspx?dLetter=I, 15.12.2009.
27. Jarvi, Pentti: "Internal marketing and commitment of the employees when managing the customer oriented business", School of Business and Economics, University of Jyvaskyla, Finland, 2009.
28. Janičić, Zlatko: "Marketing strategija menjave", Gospodarski vjesnik, Ljubljana, 1990.
29. Kotler, Philip: "Marketing management", NJ, Prentice Hall, 2000.
30. Križman Pavlović, Bušelić: "Interni marketing – imperativ kvalitete usluga javnih službi", Proceedings Marketing države-marketing hrvatske države, CROMAR, Pula, 2001, p. 61.
31. Lings, Ian: "Managing service quality with internal marketing schematics", Long Range Planning, 32,4, pp. 453-463., 1999.
32. Ozretić Došen, Prebežac: "Interni marketing u uslužnim poduzećima, primjer zrakoplovnih kompanija", Journal Acta Turistica, School of Business and Economics Zagreb, June 2000, no. 1, p. 20.
33. Matajič, Mateja: "Trženje temelječe na odnosih med podjetji, v slovenskih razmerah-konceptualni modle in empirična prevreba", Akademija MM, 9, pp. 29-44, 2002.
34. Mornay Roberts Lombard: "Employees as customers-an internal marketing study of the AVIS car rental group in South Africa", African Journal of Business Management, vol. 4(4), pp. 362-372, April 2010.
35. McDonald, Malcolm, Payne Adrian: "Marketing Planning", Butterworth Heinemann, Oxford, 1997.
36. Mulhern Frank, Schultz Don: "Internal marketing best practise study" www.performanceforum.org/fileadmin/pdf/ , 11.11.2010.

37. Piercy, Nigel;Morgan, Neil: "Internal marketing-the missing half of the marketing programme", Long Range Planning, 24, 2, pp. 82-93,1991.
38. Piercy, Nigel F: "Marketing implementation, organisational change and internal marketing strategy", download IT, www.download-it.org/learning resources.php, 11.11.2010.
39. Rafiq M;Ahmed P.K.: "Advances in the internal marketing concept: definition, synthesis and extension" Journal of services marketing, vol. 14, no. 6., 2000, p. 453.
40. Sihombing Simona, Maredo Gustam: "The effect of internal marketing on job satisfaction and organisational commitment", University of Pelita Harpan, Karawaci, The 1 PPM National Conference on Management Research, November 2007.
41. Snoj, Boris; Mumel, Damjan: "Da li stupanj konkurencije okolini utječe na intenzivnost upotrebe aktivnosti i iz područja internog marketinga?", Akademija MM, 1997.
42. Snoj, Boris: "Menedžment usluga", Koper, Visoka škola za menedžment, p.186, 1998.
43. Šverko, Ivan; Franjić Zoran: "Internal marketing in profit and non-profit organisations, contribution to democratisation", 25th annual macromarketing conference; "Macromarketing contribution to democratisation and socio-economic development", Lovran, June 22-25, 2000.
44. Šverko, Ivan, Franjić, Zoran: "Interni marketing u funkciji razvoja tržišne demokracije", International Scientific Symposium; "Market democracy in Croatia - situation and prospects", Varaždin, 26-27 October 2000, published in conference proceedings "Market democracy in Croatia - situation and prospects", Varaždin, pp. 287 -303.
45. Thomson, Kevin: "Managing your internal customer-the key to getting better results", Financial Times, London, 1996.
46. Voima, Paivi; Christian Gronroos: "Internal marketing-a relationship perspective", V.J.Baker, Encyclopaedia of marketing, Thomson International, pp. 747-751, 1999.
47. Varey R.J., Lewis, B.R: "Internal marketing, directions for management", London, Routledge, 2000.
48. Yang, Jen-Te: "Development and emergence of the internal marketing concept", Department of Hotel and Restaurant Management, National Kaohsiung Hospitality College, Taiwan, http://www.hicbusiness.org/biz2003proceedings/Jen-Te%20Yang.pdf, 01.11.2010.

Other used unmentioned sources:

49. Rajyalakshmi Nittala, A. Vijaya Kameswari: "Internal marketing for customer satisfaction in retail sector", Dept. of Commerce and Management Studies, volume 3, number 3, September 2009, pp. 207-220, http://www.pdftop.com/ebook/internal+marketing/ 15.11.2010.
50. Anne Souchon and Ian Lings, Aston University: "Adopting internal marketing practices across national borders: key propositions and implications", http://www.pdftop.com/ebook/internal+marketing/ 15.11.2010
51. Forum for People Performance Management and Measurement, Internal Marketing Best Practice Study, http://www.pdftop.com/ebook/internal+marketing/, 16.11.2010.
52. Survey Results, Training Efficiency: Internal Marketing, http://www.pdftop.com/ebook/internal+marketing/ , 16.11.2010.

ISTRAŽIVANJE IMPLEMENTACIJE INTERNOG MARKETINGA U PODUZEĆIMA U REPUBLICI HRVATSKOJ

SAŽETAK

Marketing ima važnu ulogu u stvaranju proizvoda i usluga prisutnih na tržištu današnjeg izrazito dinamičnog i turbulentnog poslovnog okruženja kojeg označava svakodnevna borba za zadržavanje tržišnih pozicija i ostvarivanje konkurentne prednosti. Za razliku od vanjskog marketinga, unutarnji marketing je još uvijek nedovoljno istražen i korišten u hrvatskim poduzećima. Interni marketing uključuje know-how, sposobnoti, alate, metode i tehnike koje se koriste na internom tržištu (unutar poduzeća) s ciljem ostvarivanja sinergije svih zaposlenih u skladu s temeljnim ciljevima, misijom i strategijama poduzeća. Ovaj rad je usredotočen na istraživanje karakteristika internog marketinga u poduzećima prisutnim na hrvatskom tržištu. Cilj istraživanja je odrediti, putem preliminarnog istraživanja, implementaciju principa i koncepta internog marketinga u Hrvatskoj i njegovu zastupljenost u hrvatskim poduzećima. Prethodni radovi i iskustva objavljeni u stranim publikacijama ukazuju na prednosti implementacije ovog koncepta unutar poduzeća uz snažan utjecaj na stvaranje konkurentne prednosti, osobito u pogledu usluga, zadovoljstva potrošača i odanosti kako klijenata tako i zaposlenika poduzeća.

***Ključne riječi**: interni marketing, marketing usluga, zaposlenici, management*

Gordana Kordić[1]
Igor Živko[2]

UDK 336.7(4-67:497.5):378.633-057.875>(497.5)
336.7(4-67:497.6):378.633-057.875>(497.6)
PRELIMINARY PAPER
PRETHODNO PRIOPĆENJE

MONETARY SOVEREIGNTY IN CONTEXT OF EUROPEAN INTEGRATIONS
Comparative Study upon a Student Population in Croatia and Bosnia and Herzegovina

Abstract

Monetary sovereignty allows control over national monetary policy, exchange rate and currency circulation and is a sign of national central banks' independence. It is an instrument for fulfilling national economy goals and, especially in small countries, is an ultimate part of national sovereignty (like the hymn or national flag).

On the other hand, the process of (European) monetary unification requires from member countries to transfer their national sovereignty to a supranational level. The monetary policy than becomes a "one-size-fits-all" and is oriented towards common goals, putting national interests to the second place. The common opinion, especially in transition countries, is that entering European economic and monetary union is their final and ultimate goal that requires long term, committed fulfilling of rigorous criteria. But, the recent crises throughout European monetary union can be discouraging for accession countries, while the common monetary policy is confronting serious difficulties.

This paper analyses recognition on monetary sovereignty in context of European integrations on a sample of student population for the final years of undergraduate study at Faculties of Economics and Business in Zagreb (Croatia) and Mostar (Bosnia and Herzegovina). Our aim was to explore their perception of both monetary sovereignty and European integrations in turbulent circumstances of global financial crisis. The study was based on a questionnaire and, oriented primary to the qualitative explanations, included also the ranking of given (dis)advantages of the sovereignty and integrations on a given scale.

Key words: *sovereignty, monetary policy, Croatia, Bosnia and Herzegovina*
JEL: E42, E58

1. INTRODUCTION

Monetary sovereignty (especially in smaller countries) traditionally is considered as an important part of national economic and political sovereignty. Although it is manifested mainly through the control of national monetary and exchange rate policy (including the national currency emission), in its overall sense it is a complex issue that consists of more than just an economic aspect.

As the opposite from national monetary sovereignty, there are processes of economic and monetary integration. They result in transposing national monetary sovereignty to the supranational level, common currency and *one-size-fits-all* monetary policy, as is the case of European Union counties. Additionally, for the full membership in the euro zone, accession

[1] Faculty of Economics and Business, University in Zagreb, Trg J. F. Kennedyja 6, Zagreb, Croatia, Phone ++ 385 1 238 33 33, Fax ++ 385 1 233 5623, e-mail: gkordic@efzg.hr
[2] Faculty of Economics, University in Mostar, Matice hrvatske b.b., Phone ++ 387 36 355 100, Fax. ++ 387 36 355 107, e-mail: igor.zivko@sve-mo.ba

countries need to fulfil numerous criteria, given in Maastricht and Copenhagen Treaties. But, besides the common arguments in the debate of pros and cons of full membership in the European economy and monetary union, the current global crises shed a new, more cautious, light on the future of European integrations. There is a wide and growing discussion on characteristics and roots of *euroscepticism*, a term that was coined in the 1980s, referring to the (growing) scepticism about the European integrations. Although the euroscepicism was not a question of our primary interest, it is assuredly important for the research. Yet, countries in transition (including the two from our sample) still consider EU membership as their ultimate goal and the proof of success in economic policies.

Our interest for the study was to recognise the attitude and the pros and cons of European integrations (and, on the contrary, national sovereignty) on the side of younger population that has some knowledge and a critical attitude to the subject. That is why goals of the study were twofold: to explore the attitude of students' population about the accomplishments of national monetary sovereignty and, secondly, analyse both positive and negative consequences of European integrations, based on rankings of the (dis)advantages for both sovereignty and integrations. Because of the rigid monetary policies during the previous years (resulting in stable currencies and high levels of foreign – exchange reserves, but also in real economy rigidities) and the high level of euroization, national currencies were primary accomplishing the transaction function of money. Furthermore, global financial crisis opened numerous new questions in terms of central banking and, jeopardizing the stability of European union and euro, shed a new light on the benefits and costs of full EU membership.

The paper is organized as follows: after the introduction, there is a short discussion on theoretical and literature background of monetary sovereignty. In the third part, we present the results of the research in both countries and a discussion. Finally, the last part concludes.

2. ON MONETARY SOVEREIGNTY – LITERATURE REVIEW AND THEORETICAL BACKGROUND

The role of central bank, monetary sovereignty and characteristics of monetary and economic integrations are widely described in literature. The relation between political and monetary sovereignty is particularly important for small open economies, considering also the consequences of monetary integrations. Monetary sovereignty includes essentially three exclusive rights for a given state (Mann, 1992, 460):

- the right to issue currency, that is, coins and banknotes that are legal tender within its territory
- the right to determine and change the value of that currency; and
- the right to regulate the use of that currency or any other currency within its territory.

Božina, L. (2008, 507 - 508) is analysing motivation for giving up national political and monetary sovereignty in exchange for a membership in any kind of integration. Although this, supranational sovereignty might ensure the sense of stronger financial stability and protection in a globalized world, the question of its control still remains open. Apart from the gold standard models, in monetary systems based on inconvertible paper currency central bank has to be independent, especially from political pressures. Still, there are no clear evidence that the political autonomy of central bank would lead to price stability and credibility.

The countries from our sample have strong limitations on their monetary sovereignty; especially in terms of currency board arrangement in B&H. Currency board's currencies are based on the full, on-demand convertibility with stable, foreign anchor currency that is usually regulated by the national law on central bank. In such cases, national monetary sovereignty is only formal and central bank is a *warehouse* institution while exchange rate stability is the ultimate goal. Despite the fact that *de jure* regime in Croatia is described as

managed floating, its narrow margins of fluctuation, strong commitment of national central bank to price stability goal and high level of euroisation (reflected also in exchange reserves) makes it *de facto* a *quasi* currency board. So, the politics in both countries during the previous period resulted in stability but also, since based on the exchange rate anchor, were rather passive.

The European integration processes result in transposing of national sovereignty to the supranational level of European central bank (ECB), with governors of national central banks in counselling functions. The concept developed by the ECB requires independence in terms of (1) institutional independence; (2) legal independence; (3) personal independence of the members of its decision-making bodies; (4) functional and operational independence; (5) financial and organizational independence.

It has been mentioned in the introduction of the paper that there is a common perception on the necessity of EU membership and fulfilling all the criteria required as the ultimate goal for the accession countries. Still, there is a rising "popularity" of euroscepticism, apart from the political parties and on the ground of "ordinary" people. The euroscepticism in Croatia on the sample of student population was studied at the Department of Economics at the University Juraj Dobrila in Pula (Kersan-Škabić, I., Tomić, D. (2009)). The results indicated that the roots of euroscepticism are in economic costs of Croatian entrance in the EU. Besides the lost of sovereignty (that was indicated as a reason for being euro sceptical), they also highlighted the fear of poverty and exploitation of national resources and stronger emigration pressures. On the other hand, there were observed some positive aspects of EU membership, such as better employment possibilities, higher living standards and more efficient state of law. Our interest in terms of the euroscepticism was partial and oriented primary on its influence on our analyses of monetary sovereignty. In our research we analysed the level of criticism to the EU membership separately using the ranks of given statements about (dis)advantages of monetary sovereignty and integrations.

3. RESEACH OF STUDENTS POPULATION ATTITUDE ON MONETARY SOVEREIGNTY AND EUROPEAN INTEGRATIONS

As previously explained, our first goal was to explore student's statements about monetary sovereignty and advantages of its retaining while the second goal was oriented to he perception of membership in European economic and monetary union. Specific objective of this research is an attempt to determine the level of influence of national monetary regime characteristics in the two countries included in the research (considering monetary autonomy in Croatia and currency board in B&H) on students' attitude about the importance of national monetary sovereignty on its path to the wider economic integration. Research was conducted among third year students of business economics that are familiar with the concept of monetary sovereignty. That is why the criterion for the selection of the sample included in the survey within the whole undergraduate student population was the Monetary Policy course (at least attending the lectures) both at the faculties in Mostar and Zagreb. This type of research has been done only within limited areas so far, like those on the Istria region that is cited also in this paper. There are no relevant researches for the whole student population in B&H and Croatia. Future researches should be extended to other students of Faculties of Economics in Croatia and Bosnia and Herzegovina and aimed towards the actualization of the sovereignty issues in terms of financial instability.

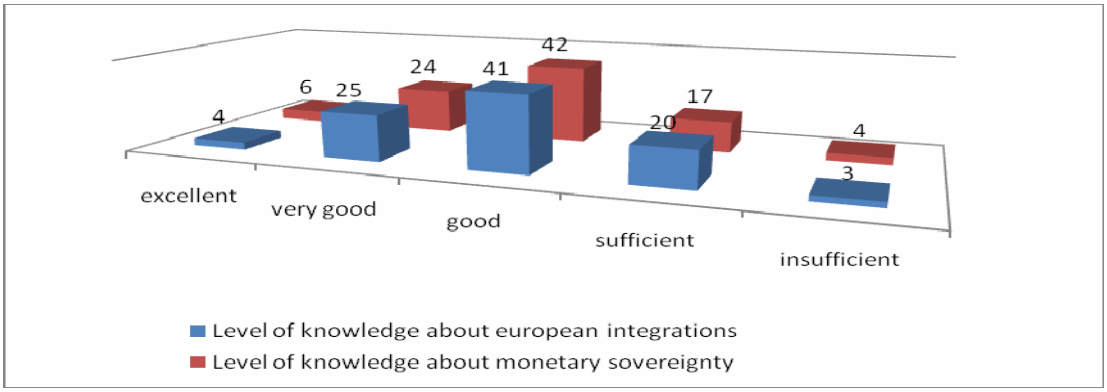
3. 1. RESEARCH METHODOLOGY

The research was done during May and June 2010 using the questionnaire, on a sample that consisted of 93 students from the Faculty of Economics and Business in Zagreb, Croatia and 53 from the Faculty of Economics in Mostar, Bosnia and Herzegovina. Students anonymously filled the questionnaires during the class, after the aims of research were explained. The same questionnaire was used for both countries. The questionnaire was structured towards more qualitative, than quantitative research methodology and descriptive statistics that leaves us scope for further research in the field of study, especially with the recent consequences of global crises on the EU member countries.

3. 2. RESEARCH RESULTS

The sample for Croatian part of research consists of 93 students of the final year of undergraduate study on the Faculty of Economics & Business (at the University of Zagreb). During the earlier years of study they passed courses with elementary knowledge on the European integrations and monetary sovereignty so the researchers assumed that they were representative sample. However, the first step was to ask the students to self-esteem their level of knowledge about European integrations and monetary sovereignty[3]

Graph 1.
Self esteemed level of knowledge on monetary sovereignty and European integrations, case of Croatia



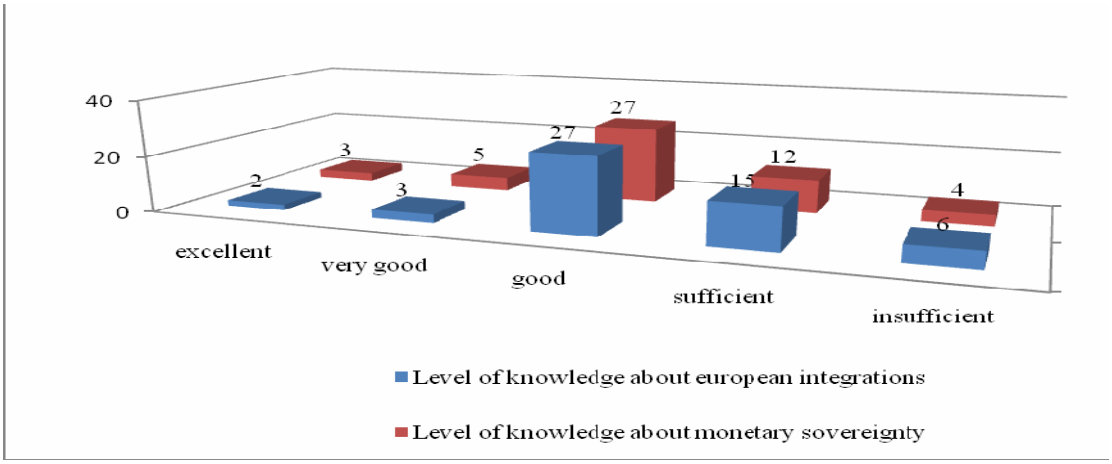
Source: author's calculations based on the questionnaires

The majority of students in Croatian sample (Graph 1.) verified their knowledge as "good" both in terms of European integrations (41 or 44%) and monetary sovereignty (42 or 45%). Furthermore, the answers were in ranges from very good to sufficient (92, 4% for the level of knowledge about European integration and 89, 2% on monetary sovereignty), while extreme values (excellent and insufficient) had low shares. This has shown that there is a solid base for further discussion on the subject.

[3] For easier evaluation, we used a five-grade scale, similar to those used on the students' exams

Graph 2

Self esteemed level of knowledge on monetary sovereignty and European integrations, case of B&H



Source: author's calculations based on the questionnaires

The majority of students in the B&H (Graph 2.) sample verified their knowledge as "good" both in terms of European integrations (27 or 51%) and monetary sovereignty (27 or 51%). This has shown that there is a solid base for further discussion on the subject.

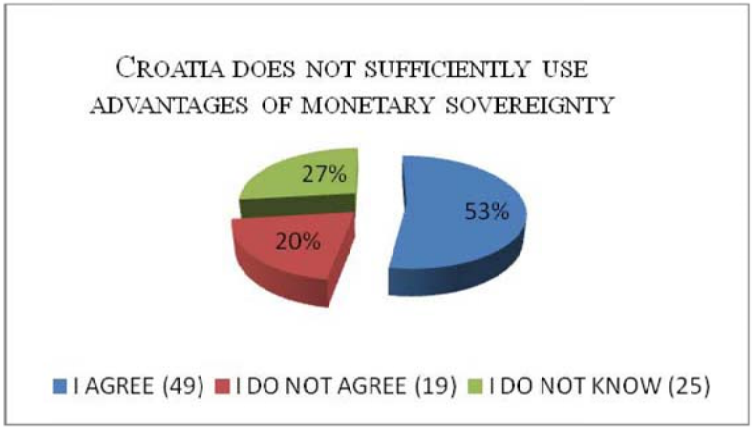
Next four questions were related to the perception of the (dis)advantages of national monetary sovereignty and the consequences from participation in wider economic and monetary integrations.

The 53% of students from the sample agreed with the statement that *Croatia does not sufficiently use advantages of monetary sovereignty (Graph 2.1.)*, while 20% disagreed. A little surprising was the high share (27%) of those that were indecisive about the right answer. The 72% of students in Bosnia and Herzegovina from the sample agreed with the same statement *(Graph 3. 1.)*, while 19% disagreed. Just 9% of the students from this sample were indecisive. With given answers on first set of questions students population showed rather negative perception with current monetary regime, despite the stability of national currencies, especially in B&H. Orthodox currency board that has been in use in this country since 1997, with its strong restrictions of national monetary policy discretion is recognized as a strong barrier to the monetary but also to the active economic policy.

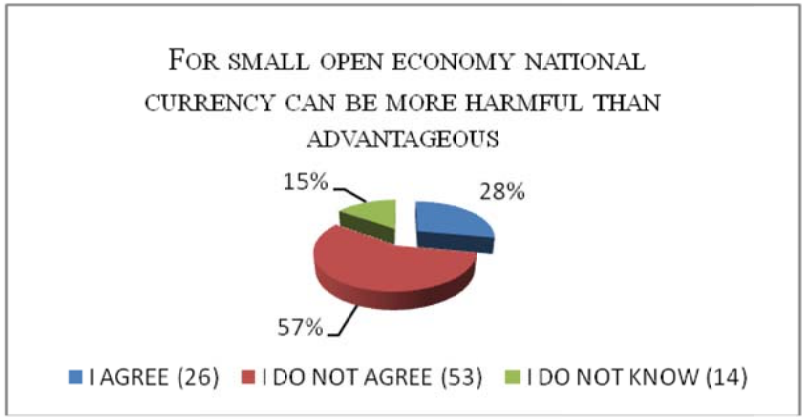
On the other hand, 57% of Croatian students did not agree with the statement that *for small open economies national currency can be more harmful than advantageous (Graph 2.2.)*, while 28% agreed. Lower than for the previous question, but still rather high (15%) was the share of those that not agree nor disagree. The results for B&H were quite similar since 58% of students did not agree with the statement *(Graph 3. 2.)*, while 34% were negative. Lower than in Croatia, but still rather high (8%) was the share of those that did not have a clear opinion.

Graph 2. (1. and 2.)– Monetary sovereignty: advantages and disadvantages, case of Croatia

1.

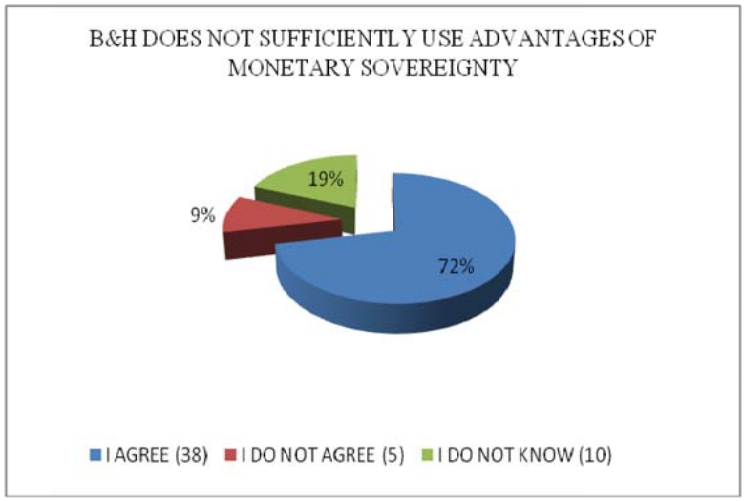


2.

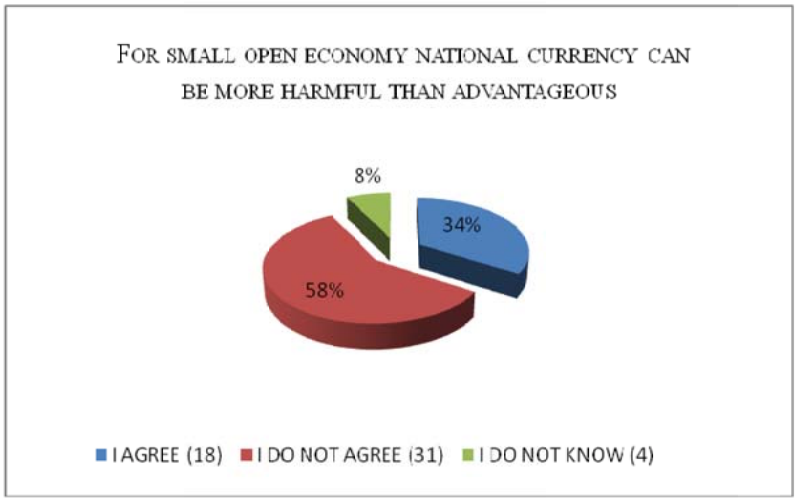


Graph 3. (1. and 2.)– Monetary sovereignty: advantages and disadvantages, case of B&H

1.



2.



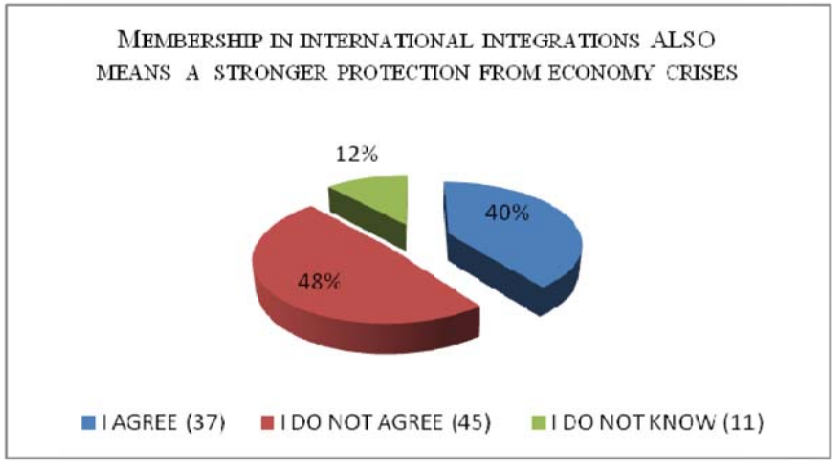
Source: author's calculations based on the questionnaires

Besides the problems that the European Union is confronting during this global financial crisis, the level of support for monetary integrations is still rather high. In terms of membership as a protection from economy crisis, 68% of students in B&H agreed, while 8% were indecisive; the rest of them (24%) disagreed (the statement assumed that *membership in international integrations also means a stronger protection from economy crises, Graph 5. 1.)*. Rather high share, 59% of examinees, agreed with the statement that *membership in European Union for B&H has more advantages than disadvantages,* while 32% disagreed and 9% were indecisive (Graph 5. 2.). This strong support is not surprising and was expected considering the criticism on insufficient use of national monetary policy (shown in the previous set of questions) and knowing that the currency board rules result in strong adjustment of the two economies.

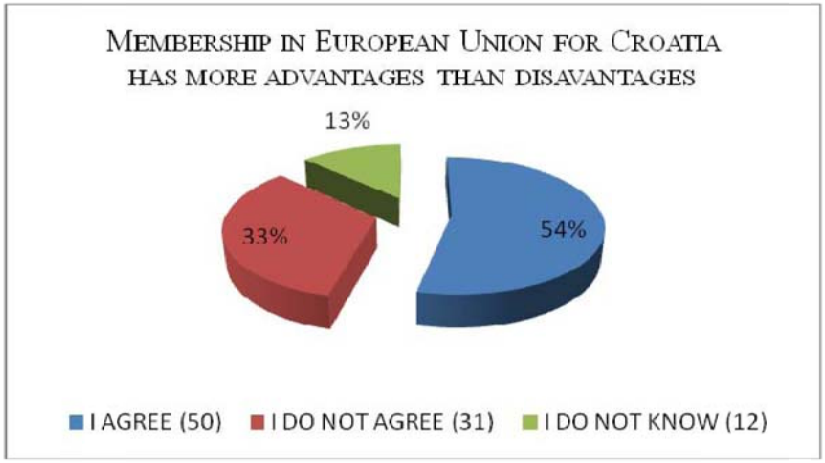
In the Croatian sample, the students were more indecisive (Graph 4. 1.): 48% of students did not agree, while 40% agreed that *the membership in the integrations would mean protection from economy crisis*. The rather high amount (12%) did not have a clear answer. Positive attitude on the *advantages of European integrations* is shown in the 54% of agreement, while 33% disagreed and the rest (13%) were indecisive (Graph 4. 2.).

GRAPH 4. (1. AND 2.) –EUROPEAN INTEGRATIONS: ADVANTAGES AND DISADVANTAGES, CASE OF CROATIA

1.

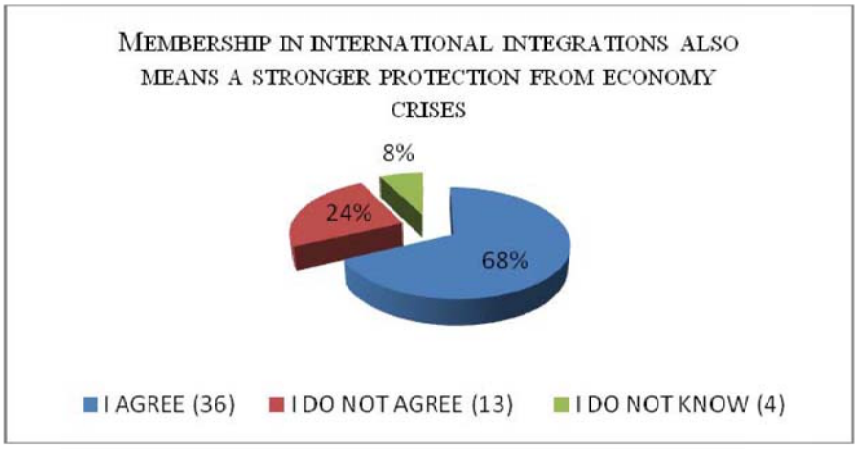


2.

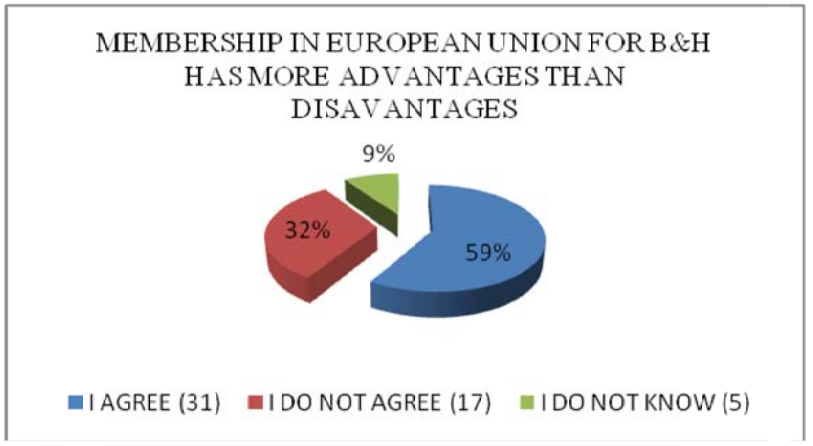


GRAPH 5. (1. AND 2.) –EUROPEAN INTEGRATIONS: ADVANTAGES AND DISADVANTAGES, CASE OF B&H

1.



2.

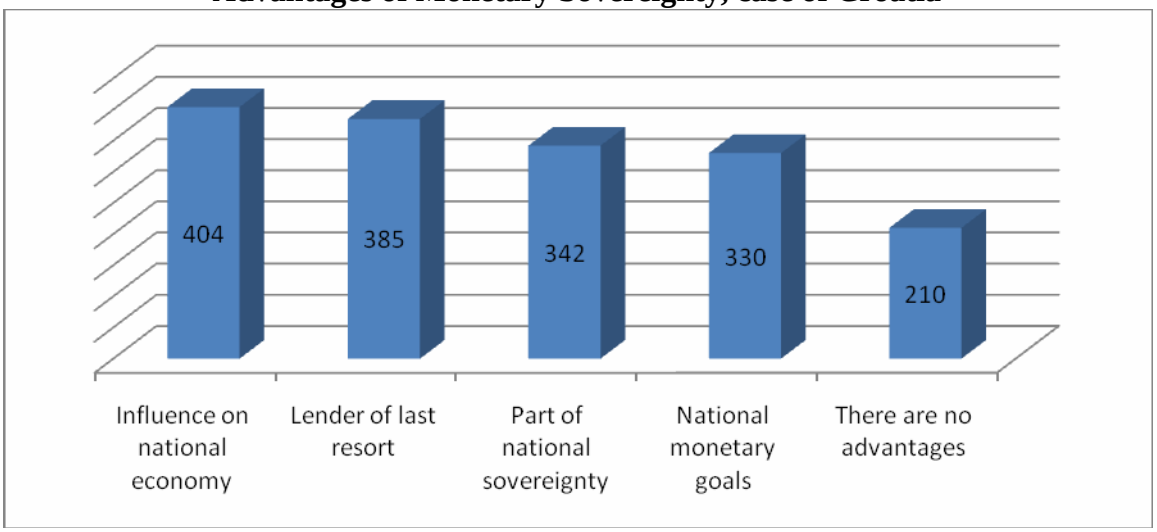


Source: author's calculations based on the questionnaires

Our next set of questions was oriented on ranking the advantages of monetary sovereignty and those of EU membership. The examinees were asked to verify the statements on a scale from 1 – 5 based on their importance (as a points from 1 (the lowes) to 5 (the highest)) on the advantages of monetary sovereignty.

Graph 6.

Advantages of Monetary Sovereignty, case of Croatia



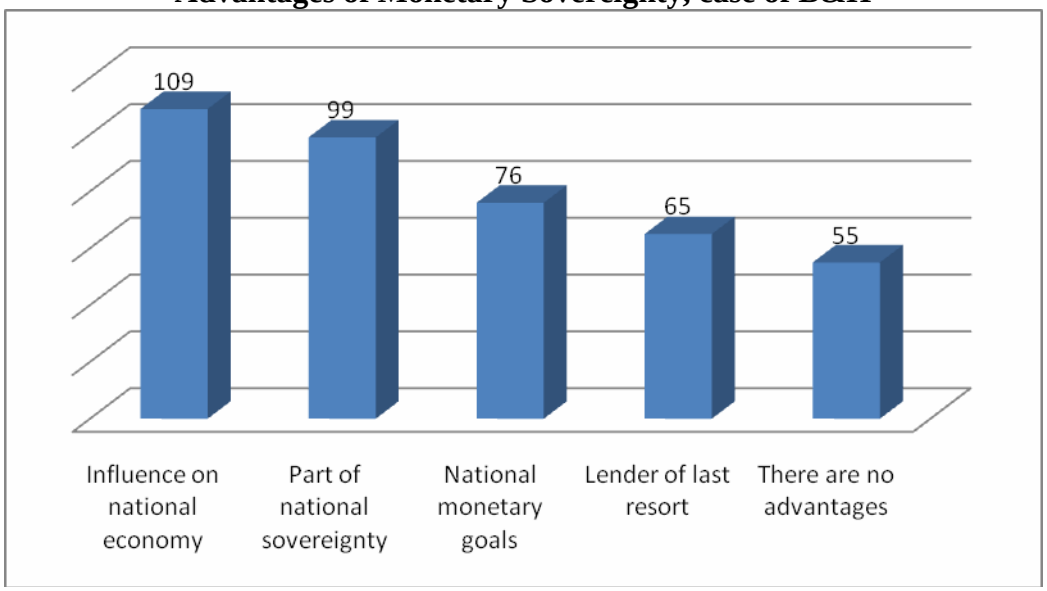
Source: author's calculations based on the questionnaires

In terms of *the advantages of monetary sovereignty* (Graph 6) the best ranks in Croatia were given to the "classic" functions: possibile influence of (independent) monetary policy to the national economy with its measures and instruments and, on the second place, the lender of last resort function in the case of crisis. The results confirmed recognition of monetary sovereignty as a part of national sovereignty described above giving it the third place rank. It is closely followed with the possiblility to favor national monetary goals. As anticipated, the lowest ranks were given to the statement that there are no advantages of monetary sovereignty. On the part of B&H (Graph 7.), the results were quite similar. Expectedly, the best rank was given to the possible positive influence of independent, active monetary policy.

Lower than in Croatia, fourth placed rank of a function of lender of last resort is a result of monetary regime, since Central bank of Bosnia and Herzegovina cannot provide this function to the commercial banks in B&H

Graph 7.

Advantages of Monetary Sovereignty, case of B&H

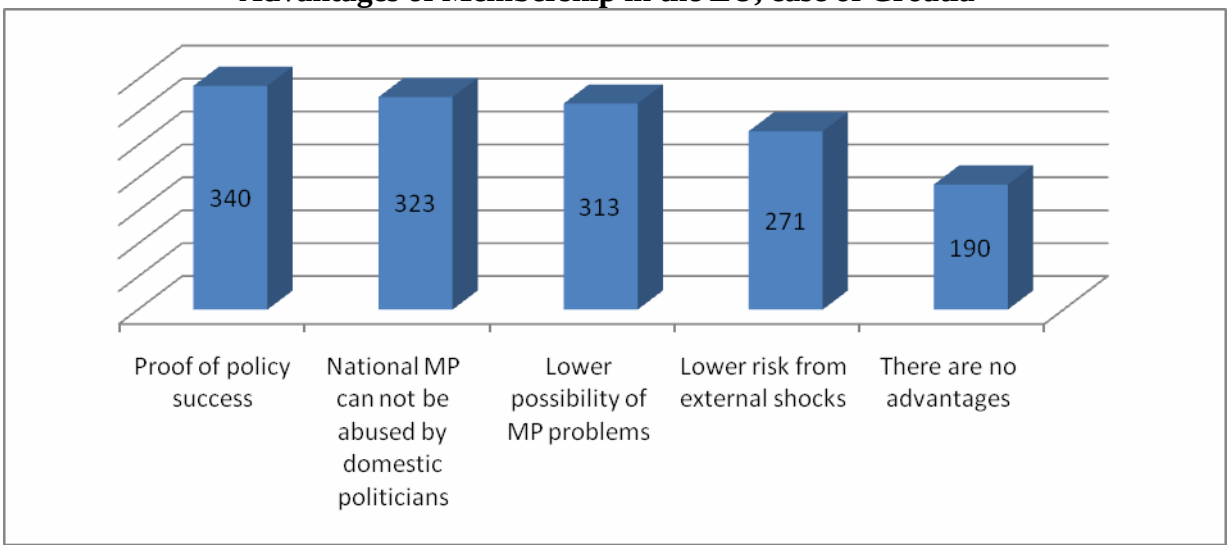


Source: author's calculations based on the questionnaires

The same model was used for ranking *the advantages of the EU membership* (Graph 8 for Croatia). The best total ranks, with rather small distances, the examinees in Croatia gave to the facts that (consecutive) the EU membership is a proof of policy success in terms of fulfilling the predetermined criteria, national monetary policy within an integration can not be abused by the domestic politicians and EU membership will reduce the possibility of problems in terms of monetary policy. The modest ranks were given to the possibility of lowering the risk from external shocks as an advantage of EU membership, while, again not suprisingly, the lowest ranked was the answer that there are no advantages of membership in the EU.

Graph 8.

Advantages of Membership in the EU, case of Croatia

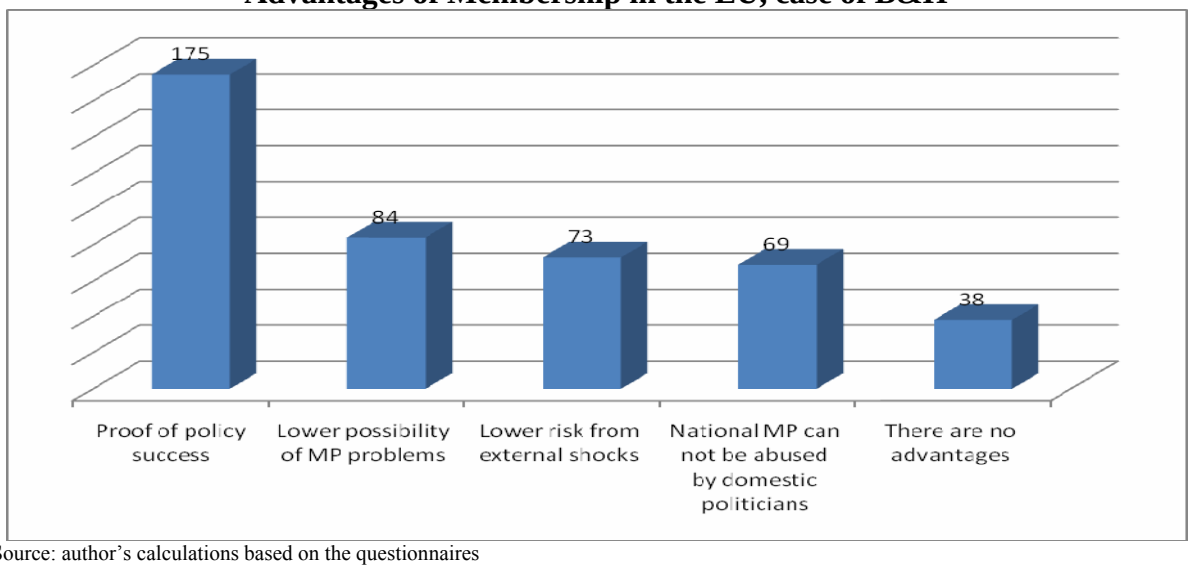


Source: author's calculations based on the questionnaires

In terms of B&H (Graph 9) the highest total rank was also given to the proof of policy success, while all other statements had more than double lower ranks.

Graph 9.

Advantages of Membership in the EU, case of B&H



Source: author's calculations based on the questionnaires

Analyzing the advantages of monetary integration for candidate country or, in other words, the arguments that can justify losing monetary sovereignty are: lower possibility of monetary policy problems (currency board is unique logical solution for country with complex social order and unresolved political problems), fear from political pressure and central bank independence in connection with it accountability to nation, and protection from external shocks.

CONCLUSION

Monetary sovereignty is a part of national sovereignty and is probably the most visible in policy of independent national central bank and national currency. On the other side, there are benefits and costs of economic and monetary integrations, especially for small open economies. There is a live and ongoing debate on national exchange rate policy, but our interest was oriented primary on the students of the faculties of economics that already have some knowledge on the matter and are informed on the subject.

We used a qualitative questionnaire in order to analyse the level of knowledge and the attitude about the european integrations of the students population in Bosnia and Herzegovina and Croatia. The motivation for research was complex. First, we were interested in the perception of consequences of orthodox monetary policy on monetary sovereignty perception in terms of the global financial crises. Second, we aimed to explore the opinion about the monetary union membership, since it is usually considered as the ultimate goal for those countries, even in case of negative consequences to the member countries. Finally, we tried to rank the (dis)advantages of monetary sovereignty and EU membership that are commonly mentioned in the literature.

The results obtained with this research presented a rather high level of criticism to the monetary policies in the two countries, especially in B&H. Generally, in both countries the attitude to the European integrations is positive, although the opinion that the wider integrations also means protection from economy crises had stronger support in B&H than in Croatia. Influence of monetary sovereignty on national economy was ranked as its most important advantage, while EU membership in both cases was recognised as a proof of successful policy in the previous period. Although there is a support to the process of

monetary integrations, the students are aware that the EU membership will not protect them from the potential future economy crisis, although it can protect them from the political pressures and lower the possibility of problems in monetary policy.

REFERENCES

Božina, L. (2008): *Monetarna teorija i politika*, Sveučilište Jurja Dobrile u Puli, Odjel za ekonomiju i turizam „dr. Mijo Mirković“, Pula, Croatia

Centralna banka Bosne i Hercegovine, www.cbbh.ba

European central bank, www.ecb.eu

Goodman, J.B. (1992): Monetary Suvereignity - The Politics of Central Banks in Western Europe, Cornell University, New York, USA.

Hrvatska narodna banka, www.hnb.hr

Kersan-Škabić, I.; Tomić, D.(2009): „Recognising Euroscepticism in Croatia – Study Upon a Student Population“, Ekonomska istraživanja, Pula, Croatia

Kordić, G**.,** Živko, I. (2008): *„*Central Bank's Independence in South Eastern European Countries, Journals International Scientific Publication, Economic & Business, (164-173),

Lovrinović, I., Ivanov, M. (2010): *Monetarna politika*, RRiF, Zagreb, Croatia

Lovrinović, I., Kordić, G**.,** Nakić, M.: (2010): *„* Choice of Exchange Rate Regimes: Case of ex-Yugoslavia Countries*“*, World Academy of Science, Engineering and Technology, (Issue 66 (1197 - 1203), edt. Ardil, C.), Paris, France

Mann, F. A. (1992): „ Legal Aspect of Money“, Oxford, UK.

Subbarao, D. (2010): „Redefining Central Banking“, Finance and Development, June 2010, International Monetary Fund

MONTARNA SUVERENOST U KONTEKSTU EUROPSKIH INTEGRACIJA
Komparativna studija na studentskoj populaciji u Hrvatskoj i Bosni i Hercegovini

Sažetak

Monetarna suverenost omogućuje kontrolu nacionalne monetarne politike, tečaja i kolanja valute te je znak neovisnosti centralne banke. To je instrument ispunjavanja nacionalnih ekonomskih ciljeva i, posebno u malim zemljama, krajnji pokazatelj nacionalne suverenosti (poput himne i državne zastave). S druge strane, proces (Europskog) monetarnog ujedinjavanja od zemalja članica zahtijeva prijenos njihovog nacionalnog suvereniteta na nadnacionalnu razinu. Monetarna politika tako postaje jednaka za sve i usmjerena zajedničkim ciljevima, stavljajući nacionalne interese u drugi plan. Uvriježeno je mišljenje, posebice među tranzicijskim zemljama, da je ulazak u Europsku ekonomsku i monetarnu uniju njihov najveći i krajnji cilj koji iziskuje dugoročno i predano ispunjavanje rigoroznih kriterija. No nedavna kriza koja se osjetila u cjelokupnoj Europskoj monetarnoj uniji može za zemlje pristupnice biti obeshrabrujuća jer je zajednička monetarna politika suočena s ozbiljnim teškoćama.

Ovaj rad analizira prepoznavanje monetarnog suvereniteta u kontekstu Europskih integracija na uzorku studentske populacije na zadnjim godinama dodiplomskog studija na Ekonomskim Fakultetima u Zagrebu (Hrvatska) i Mostaru (Bosna i Hercegovina). Naš je cilj bio istražiti njihovu percepciju monetarnog suvereniteta i Europskih integracija u turbulentnim okolnostima globalne financijske krize. Istraživanje se baziralo na upitniku i, uz orijentaciju uglavnom na kvalitativna objašnjenja, uključivalo je rangiranje danih prenosti/mana suvereniteta i integracija na zadanoj skali.

Ključne riječi*: suverenitet, monetarna politika, Hrvatska, Bosna i Hercegovina*

Camelia SURUGIU[1]
Nuno Carlos LEITÃO[2]
Marius Răzvan SURUGIU[3]

UDK 338.48(498)
REVIEW
PREGLEDNI RAD

A PANEL DATA MODELLING OF INTERNATIONAL TOURISM DEMAND: EVIDENCES FOR ROMANIA

Abstract

This paper analysis the determinants of international tourism demand for Romania and it quantifies their influences. The authors elaborate two models, a fixed-effects model and the Tobit model, to estimate tourist inflow data from twenty-three European countries, for the period 1997-2008. In the fixed effects static panel model, we find that GDP per capita, bilateral trade, population, prices are the main determinants of tourism flows to Romania. For the Tobit model, all the variables taken into consideration, GDP per capita, bilateral trade, population, geographical distance, prices are influencing the international tourism demand. Both models indicate that trade, population, and income are more important determinants than relative prices or geographical distance between Romania and countries of origin.

Key words: *international demand, tourist arrivals, panel data model, trade, Romania*

1. INTRODUCTION

Tourism role in the economy is a very important one, being a provider of many employment opportunities, and an important part of the production process that takes place in the economy of any country.

Even if during the last decades, tourism became one of the major industries in the world economy, in Romania, it is still struggling to regain its position in the European tourism, lost after '90s, due to economic, social and political transformations. Although declared "priority field of the national economy" (see Order no. 58/1998 regarding the organisation and development of the tourism activity in Romania), tourism sector had to deal with various problems, thus affecting domestic and international tourism demand.

As most experts suggest, through econometric models and empirical evidences, tourism sustains the economic development (Wahab and Pigram, 1997; Sinclair, 1998; Balaguer and Cantavella - Jordá, 2002; Sharpley and Telfer, 2002; Pender and Sharpley, 2005; Brau et al, 2008; Brida et al, 2008; Soukiazis and Proença, 2008; Zortuk, 2009), but still the causality relations are more complex, the economic, social, political, environmental, technological factors having a strong influence on tourism activities.

In the last years, international tourism demand attracted more economists and statisticians to estimate and forecast it, using various statistic and econometric models and different approaches of influence. Basically, the scientific tourism world identifies cause and effect relationships between tourism demand (tourist spending, tourist arrivals, tourist overnights) and variables that cause the tourists' flow.

The demand for international tourism and the choice of tourist destinations may be

[1] Ph.D., Scientific Researcher III, National Institute for Research and Development in Tourism, 17 Apolodor Street, Bucharest, Sector 5, Romania, Postal Code 050741, cameliasurugiu@gmail.com;
[2] Ph.D., Professor of Economics, ESGTS, Polytechnic Institute of Santarém, Santarém, Portugal E-mail: nunocarlosleitao@gmail.com;
[3] Ph.D., Scientific Researcher III, Institute of National Economy, Romanian Academy, 13 Calea 13 Septembrie, Bucharest, Sector 5, Romania, Postal Code 050711, mariussurugiu@yahoo.com.

subject to significant shifts for a number of reasons, including variations in income, prices, trade relations, as well as unexpected events, such as major terrorist attacks, political changes or climate changes, other special events. Even though international tourism is a form of international trade, it may be better dealt with in a single industry study (Eilat and Einav, 2004). International trade represents an engine for creating sustainable development opportunities for other components of the economy.

Romanian tourism industry passed through its ups and downs, tourism demand being strongly affected by the economic, social, political, environmental factors (i.e. fall of communism, transition period to the market economy, poor image abroad, environmental phenomena as floods or heat wave, avian flue). Starting with the '90s, Romanian tourism industry entered in a new era, mostly marked by significant decreased in tourism demand. Romanian tourism market became volatile and tourism demand more sensitive to market changes. The slow process of privatisation, low investments, decreasing in standard of living and purchasing power, poor management, lack of the tourism policies, strong competition of other tourist countries (i.e. Bulgaria, Turkey, Greece, Austria, Italy) were few of the causes, that have reduced substantially Romanian tourism activity and tourism demand. The strategy to promote Romania's tourism offer wasn't strongly enough to overcome the weakness of the already formed image of potential travellers. The important tour operators oriented to other tourism markets due to the low quality of services and the unbalance between prices and quality of tourism packages. The increase in tourist arrivals began starting with 2002 once with the revival of the Romanian economy. The increases in international arrivals show the changes occurring in social, economic and political context. This new openness of Romania marked the international relations with other world countries, having direct influence on the tourism flows.

In this general context, the present paper constructs a fixed-effects model for international tourist flows to Romania, from twenty-three European countries, for the period 1997-2008. We also introduced the Tobit model to estimate tourism demand. This methodology is important in forecasting, having policy implications. We analyse the determinants of tourist inflow in Romania taking into consideration a series of variables such as GDP per capital, international trade flows, population, distance and prices.

The paper is organized as follows. The second section surveys the existing tourism literature and discusses the variable of influence on tourism demand. The third presents the methodological approach and model specification by presenting two demand models to estimate inflow arrivals, one is the fixed-effects model, the other being Tobit model, and then discuss the empirical results and their economic interpretation. In panel data, pooled OLS, fixed-effects (FE) and random-effects (RE) estimators are used in this type of study. The RE estimator was excluded because our sample is not random. Furthermore, the Hausman test rejects the null hypothesis RE versus FE. The forth section concludes the paper results.

2. RELATED LITERATURE ON DETERMINANTS OF TOURISM DEMAND

The tourism literature comprises a large number of papers regarding the tourism demand trying to model it using various techniques starting with simple or multivariate regressions (Garín-Muñoz and Amaral, 2000; Luzzi and Fluckiger, 2003; Allen and Yap, 2009), panel or pool data analysis, cointegration procedure (Lim and McAleer, 2001; Durbarry, 2002; Seetanah, 2006; Mervar and Payne; 2007), gravity models (Muhammad and Andrews, 2008; Hanafiah and Harun, 2010; Leitão, 2010), trends extrapolations, structural equations, data mining, neural network model (Law and Au, 1999), qualitative models. Except for simple guesswork, time-series and regression techniques have largely dominated the estimation models for international tourism demand. In using multiple regressions,

problems of misspecification in addition to heteroscedasticity, multicollinearity and autocorrelation arise, these technical problems not being always considered or resolved (Morley, 1993). Multiple regression models may assume different forms (i.e. Logit, Probit models) and different approaches (i.e. Confirmatory or Sequential).

International tourism demand models use most frequently, as dependent variables, the tourist arrivals/departures and the expenditures/receipts (Lim, 1997). The authors attempt to estimate an equation of the demand for tourism in order to analyse the different variables that influence the tourism demand (tourist arrivals, tourist nights spent) in a given destination. Income expressed as per capita gross domestic product or gross national product or national income or real income, total personal income, permanent income (Song and Witt, 2000; Garín-Muñoz and Amaral, 2000; Lim and McAleer, 2001; Luzzi and Fluckiger, 2003; Eilat and Einav, 2004; Nordström, 2005; Maloney and Rojas, 2005; Seetanah, 2006; Phakdisoth and Kim, 2007; Kareem, 2007; Mervar and Payne, 2007; Song and Fei, 2007; Muhammad and Andrews, 2008; Habibi et al, 2009; Allen and Yap, 2009; Garín-Muñoz, 2009; Hanafiah and Harun, 2010; Leitão, 2010) and relative prices (Song and Witt, 2000; Garín-Muñoz and Amaral, 2000; Lim and McAleer, 2001; Luzzi and Fluckiger, 2003; Eilat and Einav, 2004; Nordström, 2005; Phakdisoth and Kim, 2007; Kareem, 2007; Song and Fei, 2007; Habibi et al, 2009; Garín-Muñoz, 2009; Allen and Yap, 2009; Hanafiah and Harun, 2010; Leitão, 2010) are most commonly used variables. Exchange rates (Garín-Muñoz and Amaral, 2000; Lim and McAleer, 2001; Luzzi and Fluckiger, 2003; Eilat and Einav 2004; Maloney and Rojas, 2005; Seetanah, 2006; Phakdisoth and Kim, 2007; Kareem, 2007; Song and Fei, 2007; Muhammad and Andrews, 2008; Hanafiah and Harun, 2010) were used as a proxy variable for price or together with the price variables.

Other exogenous variables are also considered, like distance or transportation costs (Lim and McAleer, 2001; Phakdisoth and Kim, 2007; Muhammad and Andrews, 2008; Allen and Yap, 2009; Hanafiah and Harun, 2010; Leitão, 2009), infrastructure as roads (Seetanah, 2006; Phakdisoth and Kim, 2007); population (Hanafiah and Harun, 2010; Leitão, 2010), tourism infrastructure as accommodation capacity (Seetanah, 2006), advertising expenditure (Song and Witt, 2000), consumer tastes or fashion (Song and Witt, 2000; Eilat and Einav 2004), common language (Eilat and Einav, 2004). Usually, econometric models used by the authors also include dummy variables as crisis or extreme situations / special factors such as crime rate, political instability, special events, climate change (Eilat and Einav 2004; Garín-Muñoz and Amaral, 2000; Phakdisoth and Kim, 2007; Kareem, 2007; Mervar and Payne, 2007; Song and Fei, 2007; Habibi et al, 2009; Allen and Yap, 2009; Garín-Muñoz, 2009; Taylor and Ortiz 2009; Hanafiah and Harun, 2010). Some factors have a higher influence than others in different countries; still, certain variables like income, prices and exchange rates remain mostly used in econometric modelling. There is no theoretical or empirical consensus as to the proper set of independent variables to use (Morley, 1993).

In the early years of modelling tourism demand, log-linear regression was the predominant functional form (Li et al, 2005). Static regression models can suffer from a number of problems, including structural instability and spurious regression (Song and Witt, 2000). In order to avoid these problems, dynamic analysis have started to be explored in determining tourism demand (Moleny and Rojas, 2005; Garín-Muñoz and Montero-Martin, 2007; Phakdisoth and Kim, 2007; Kareem, 2007; Song and Fei 2007; Habibi et al, 2009; Garín-Muñoz, 2009; Allen and Yap, 2009; Leitão, 2010). Advanced econometric methodologies such as cointegration, error correction models, vector autoregressive models, time varying parameter models and panel data approaches can be employed to overcome the problems associated with the traditional single-equation demand models (Song et al, 2008). For example, Seetanah (2006) derives an Error Correction Model (ECM) for international demand in Mauritius, dealing with problems of non-stationary time series and spurious

correlation. General-to-specific approach was applied by Song and Witt (2003), Song and Fei (2007).

A substantial attention has been given to other factors such as international trade, which has a significant influence on tourism demand. The questions rising from here refer to: Is international trade sustaining tourism demand? Is it a new or an old paradigm for international tourism in Romania?

A long-term bidirectional relationship between tourism and trade exists and this relationship is positive. The empirical results show that international trade plays a major role in influencing business tourism demand (Turner and Witt, 2001). Also, a country's exports have a positive effect on tourist arrivals (Muhammad and Andrews, 2008). Phakdisoth and Kim (2007) found that bilateral trade, which captures the economic relationships, also has a positive correlation with the tourist arrivals in Laos. Habibi et al (2009) found that the trade openness has an insignificant and positive impact on the tourism demand in Malaysia. The causality nexus in the sense trade causes tourism can appear since business travels are required to begin and to maintain the international trade of goods and services (Santana-Gallego et al, 2009). According to Leitão (2010), bilateral trade brings with it a preference for home-country products and can reduce transaction costs between home and host country.

Other authors don't find a strong relation between bilateral trade and international tourism. Using as proxy the intensity of the economic relations between countries, gross annual value of bilateral trade in goods between countries, respectively, Eilat and Einav (2004) model is showing that fluctuations over time in trade for a given pair of countries are uncorrelated with fluctuations in international tourism.

Shan and Wilson (2001) applied the methodology of Granger no-causality test to examine the causality linkage between international trade and international travel from China. The results indicate two-way causality running between trade and travel, thus encouraging the introduction of trade variable in tourism demand modelling.

Other authors analysed the causality relation resulting from tourism as tourist visits have impact on trade. Thus, tourism is thought to be able to promote cross-border exports by initiating entrepreneurial activities as a result of learning about new business opportunities, while travelling and demand for new products to be consumed back home may be created as a consequence of learning about them during foreign travel (Gil-Alana and Fischer, 2007). On the other hand, there are some criticisms on international tourism, Sinclair and Tsegaye (1990) founded that, although tourism has the advantage of high growth rates and is a major source of foreign currency receipts, earnings from international tourism did not bring about a significant decrease in the instability of export earnings of most of the developing and industrialised countries.

In our opinion trade and tourism are simultaneous sustaining one another, as international trade plays a prominent role in generating tourist flows from one country to another, stimulating for example inbound tourism to Romania from the European trade partners. On the other hand, tourism sustains trade through the consumption of different goods and services by travellers.

3. METHODOLOGICAL APPROACH AND MODEL SPECIFICATION

Starting from the tourism literature, we determine which socio-economic variables of influence on international tourism demand for Romania case study should be included in the model and in what form. Before presenting the results of our estimations, we discuss the dependent indicators and explanatory variables, describe the data model and address the hypothesis.

3.1. ECONOMETRIC MODEL: EXPLANATORY VARIABLES AND DATA MODEL DESCRIPTION

For the researchers, tourist arrivals are the most common variable used in creating econometric models of tourism demand, beside the tourism expenditure and overnights.

In our empirical analysis, the estimation of international tourism demand in Romania from twenty-three different countries[4], which represent 65-75% of all foreign arrivals in Romania, between the years 1997 and 2008, was finished. The data used to create the foreign tourists number series, as dependent variable, are annually collected from Romanian National Institute of Statistics. To avoid the seasonality problems, annual data were used.

First of all the descriptive statistics for panel data is presented in the following table.

Table 1:

Descriptive statistics for panel data, 23 countries

Variables	Mean	Median	Minimum	Maximum	Standard. Deviation	Coefficient of Variation	Skewness	Ex. kurtosis
LogTOU	4.271	4.248	3.129	5.371	0.510	0.119	0.057	-0.670
LogGDP	4.160	4.326	3.131	4.628	0.351	0.0845	-0.924	-0.059
LogTrade	1.462	1.514	0.154	2.660	0.654	0.447	-0.104	-0.972
LogPOP	7.128	7.010	6.297	7.917	0.455	0.064	0.371	-1.022
LogDIST	3.103	3.198	2.476	3.474	0.248	0.0798	-0.759	-0.015
LogPR	0.268	0.029	-1.052	2.214	0.595	2.222	1.589	2.118

Source: data processed by authors

Following the literature review, we consider that demand for travel exports in Romania is a function of income, trade openness, population, distance between the origin country and Romania, prices.

$$TOU_{it} = f(GDP, TRADE, POP, DIST, PR) \quad (1)$$

Where

TOU_{it} is the number of foreign tourist arrivals; *GDP* is the income in tourist generating countries; *TRADE* is the bilateral trade; *POP* is the total population in tourist generation countries; *DIST* is the geographical distance between Romania and the tourist generating countries; *PR* is the price.

A series of hypothesis were formulated, considering how the selected variables will influence the international tourism demand in Romania.

Hypothesis 1: Tourism demand will be influenced by income of the tourists from the countries of origin

The income' measure selected in this paper is the Gross Domestic Product per capita in the country of origin of tourists, expressed in constant 2000 US$ and was collected from the World Bank. According to the literature, we expect that the number of foreign tourist arrivals to increase in Romania as the income in tourists' origin country increase. Therefore, the expected sign for the estimated coefficient of this variable is positive (Garín-Muñoz and

[4] The countries selected are Austria, Belgium, Bulgaria, Denmark, Switzerland, Finland, France, Germany, Ireland, Italy, Luxembourg, Norway, Netherlands, Poland, Portugal, Czech Republic, United Kingdom, Slovakia, Slovenia, Spain, Sweden, Turkey, and Hungary.

Amaral, 2000; Luzzi and Fluckiger, 2003; Phakdisoth and Kim, 2007; Muhammad and Andrews, 2008; Habibi et al, 2009; Hanafiah and Harun, 2010; Leitão, 2010).

Hypothesis 2: International trade flows play an important role in sustaining tourism demand.

In this study, volume of trade is hypothesized to affect the tourism demand for Romanian tourist destinations and it was therefore contained in the model to help explain the demand. The decision to include trade in tourism demand estimation is in line with that of Turner and Witt (2001), Eilat and Einav (2004), Phakdisoth and Kim (2007), Habibi et al (2009), Leitão (2010). Trade openness was estimated as:

$$TRADE_{it} = \frac{X_i + M_i}{GDP_{Romania} + GDP_k} \quad (2)$$

Where

X_i represents the annual exports of Romania to the country of origin of each tourist at time *t* and M_i represents the annual imports of Romania from each tourist's country of origin at time *t*. GDP_k is the GDP per capita in tourist countries (constant 2000 US$). The data for exports and imports were collected from Romanian National Institute of Statistics. We expect a positive sign for this variable.

Hypothesis 3: Population changes in a country could positively sustain tourism flows

The impact of population changes in a country is important to analyse. Most studies do not consider this variable, because population tends to be highly correlated with income (Leitão, 2009, 2010). The world population is getting bigger over time, clearly showing that all tourism multipliers are positively correlated with the natural log of population (Hanafiah and Harun, 2010). The population data were collected from the World Bank. We expect a positive sign for this variable.

Hypothesis 4: International tourism demand is directly influenced by the distance from the countries of origin of the tourists and tourism destination country.

Distance from the origin countries to the destination country is a powerful motivation for travellers. If all else remains equal, travellers will choose a destination that takes less time to reach there (Phakdisoth and Kim, 2007). The distance increases the transportation costs and thus the travel expenditure. The data source is CEPII database (Centre d'Etudes Prospectives et d'Informations Internationales). We expect a negative sign for this variable.

Hypothesis 5: The prices of goods and services from a particular tourism destination have a direct influence on the tourism demand.

The price variable used for this study is purchasing power parities (EU27=100), meaning the price level differences across countries and expresses how many currency units a given quantity of goods and services costs in different countries. The data were collected from Eurostat.

According to the theory, the demand for international tourism is an inverse function of relative prices. As the cost of living in a particular destination is lower than those in the origin country of tourist, the greater the tourism demand and vice versa. The general level of prices in destinations is taken into account by travellers when making travel decisions (Eilat and Einav, 2004). We therefore expect a negative sign for this variable.

Therefore, the econometric model on estimating tourism demand takes the following representation:

$$LogTOU_{it} = \alpha + \beta_1 \times LogGDP_{it} + \beta_2 \times LogTRADE_{it} + \beta_3 \times LogPOP_{it} + \beta_4 \times LogDIST_{it} + \beta_5 \times LogPR_{it} + \varepsilon_i \quad (3)$$

Where, the variables were expressed in logarithm form. α is the constant term, β_n are the coefficients of each variable taken into consideration, ε_i is the error term.

Two types of models were developed to estimate the international tourism demand for Romania, namely a fixed-effects model and Tobit Model. The following sections discuss the results of each econometric model.

3.2. RESULTS AND DISCUSSIONS

Given the model and data in which fixed effects estimation would be appropriate, Hausman-test tests whether random-effects estimation would be almost as good. The Hausman test rejects the null hypothesis random-effects versus fixed-effects. In our case, the random-effects estimator was excluded because our sample is not random.

Table 2:

Hausman test
Null hypothesis: GLS estimates are consistent
Asymptotic test statistic: Chi-square(5) = 49.993
P-value = 1.39068e-009

Source: data processed by authors

The results of fixed effects estimator are described in Table 3. The general performance of the model is very satisfactory. The explanatory power of the Romanian tourism demand regression is very high (R-squared=0.9596).

According to the results displayed, most of the variables have the expect signs and level of significance. A series of t-test at 1% and 5% significant level have been applied on each independent variable against the dependent variable. From the above panel model equation, *LogGDP*, *LogTRADE*, *LogPR* share the same significant level of 1%. *LogPOP* is significant at 5%. Just *LogDIST* was not significant.

Table 3:

Determinants of tourism demand: fixed effects

Variables	**Panel Model**		**Expected Sign**
	Coefficient	**t-Statistics**	
LogGDP	1.353	(4.957)***	(+)
LogTRADE	0.466	(6.764)***	(+)
LogPOP	1.612	(2.087)**	(+)
LogDIST	0.270	(1.419)	(-)
LogPR	-0.508	(-5.546)***	(-)
α	-14.227	(-2.443)**	
Observations = 276, Cross-sectional units=23, Time-series length = 12	R-squared = 0.9596		

T-statistics (heteroskedasticity corrected) are in round brackets.
Note: ***/**- statistically significant, respectively at 1% and 5% level, respectively
Source: data processed by authors

The sign of *LogGDP* is positive, indicating that tourism demand is highly correlated

with GDP of the tourists' origin countries, which shows the impact on the standard of living (Garín-Muñoz and Amaral, 2000; Eilat and Einav, 2004; Seetanah, 2006; Phakdisoth and Kim, 2007; Kareem, 2007; Mervar and Payne, 2007; Muhammad and Andrews, 2008; Garín-Muñoz, 2009; Hanafiah and Harun, 2010; Leitão, 2010). Tourism demand in Romania is heavily dependent on the economic situation of the generating countries. GDP is one of the variables used in estimating tourism demand which describes the level of economic development, and its sign in the model corresponds also with the purchasing power, spending ability. According to the estimated short-run elasticity value (+1.353), tourism to Romania is considered by foreigners as a luxury service. A 1% increase in GDP per capita in the origin markets leads to a 1.353% increase in tourism arrivals to Romania. Hence, tourism demand is elastic on the short-run variation of the standard of living in generating countries. The income elasticity is above unity and thus confirms the idea that the international travel is a luxury good.

We expect that international trade would have a positive impact on the number of arrivals in Romania from any given country. The result corresponds to Eilat and Einav (2004), Muhammad and Andrews (2008), Leitão (2010) findings. Trade partners are an important vehicle to expand tourism (Leitão, 2009, 2010). The results indicate that tourism demand is inelastic to bilateral trade and has a positive correlation with the dependent variable. Tourism demand is not very responsive to changes in trade volume between Romania and respective countries.

The variable population ($LogPOP$) finds a positive sign, as we expected, and corresponds to the results of Hanafiah and Harun (2010), Leitão (2010). An increase of 1% of population of the origin country would generate 1.612% increased in foreign tourist arrivals to Romania.

As it regards relative price, the variable reduces the number of tourists to travel (Garín-Muñoz and Amaral, 2000; Seetanah, 2006; Phakdisoth and Kim, 2007; Garín-Muñoz, 2009; Hanafiah and Harun, 2010; Leitão, 2010), and the negative sign of the coefficient is the same as the expected one. The estimated price elasticity is -0.5077 suggesting that this demand is price inelastic. Different studies have used different measures of price explaining the differences in estimating price elasticities. Eilat and Einav (2004) suggest that tourism demand to less developed countries is not very sensitive to fluctuation in prices, explained by the fact that prices in these countries are relatively low.

The Table 4 presents the estimation results using Tobit model. The general performance of model is satisfactory. All explanatory variables are significant at 1% level ($LogGDP$, $LogTRADE$, $LogPOP$, $LogDIST$ and $LogPR$).

The variable GDP (the income in tourist generation countries) is statically significant, with an expected positive sign. Vanegas (2009) and Phakdisoth and Kim (2007) also found this result. One of the main determinants of tourism demand is the positive impact in the Romanian economy.

The variable $LogTRADE$ (bilateral trade) is statistically significant with a correct sign. This result demonstrates that bilateral trade promotes tourism. The studies of Eilat and Einav (2004), and Phakdisoth and Kim (2007) found this result.

The coefficient of the total population in tourist generation countries ($LogPOP$) finds a positive sign. Jud and Joseph (1974) and Fuji and Mark (1981) also found a positive sign.

Table 4:

Determinants of tourism demand: **Tobit Model**

Variables	Tobit Model		Expected Sign
	Coefficient	t-Statistics	
LogGDP	0.931	(21.324)***	(+)
LogTRADE	0.602	(18.351)***	(+)
LogPOP	0.3172	(7.752)***	(+)
LogDIST	-0.3158	(-4.059)***	(-)
LogPR	0.122	(6.942)***	(-)
C	-1.799	(-8.308)***	
SIGMA	0.166	(23.494)***	
Observations = 276, Cross-sectional units=23, Time series length = 12			
Log likelihood	102.493		

T-statistics (heteroskedasticity corrected) are in round brackets.

*** - statistically significant at 1% level.

Source: data processed by authors

In relationship with the relative price (PR), the dominant paradigm consider a negative sign (see Phakdisoth and Kim, 2007; Vanegas, 2009; Naudé and Saayman, 2005), and our result is positive. For Carey (1991) and Leitão (2009), the logarithm of price of tourist service (*LogPR*) presents a positive effect on tourism demand. Leitão (2009) refers that the tourism in Portugal tends to be a high quality service instead of a more expensive destination.

Overall, all independent variables are significant towards the dependent variable and it shows that there are significant relationships between these variables. In other words, there are relationships between tourism demand and trade, income, distance, population, and price.

4. CONCLUDING REMARKS

This study investigated the impact of various specific factors across countries on tourist demand in Romania. Panel data using fixed-effects model results suggested that 96% of the variation in Romanian tourist inflows could be explained by real GDP per capita, trade relations, population and prices. All of the independent variables were significant in the panel data analysis, fixed-effects model, except for the distance. For the second model used, Tobit model respectively, all the variables, GDP per capita, bilateral trade, population, distance and prices significantly influenced the foreign arrivals. Overall, the greatest determinant of Romanian's tourist arrivals is real GDP per capita. We found that GDP per capita, trade and population have a significant positive influence on international arrivals, while for distance the results indicate that it has a negative influence on inflows, as expected. Generally, these estimates are in line with the results of previous empirical studies.

This research need to be extended as other factors have stronger influence on the tourism demand such as climate changes. Climate change is likely to have a significant impact on tourism flows (Taylor and Ortiz, 2009).

In order to sustain the international tourist arrivals in Romania is necessary for an increase in the income per capita and the results suggest that the international tourist flows are sustained by international trade and bilateral trade relations.

ACKNOWLEDGEMENT:

This paper is supported by the Sectorial Operational Programme Human Resources Development (SOP HRD), financed from the European Social Fund and by the Romanian Government under the contract number SOP HRD/89/1.5/S/62988.

REFERENCES

Allen, D., Yap, G., (2009), "Modelling Australian domestic tourism demand: A panel data approach", 18th World IMACS/MODSIM Congress, Cairns, Australia, http://mssanz.org.au/modsim09.

Balaguer, J., Cantavella-Jordá, M., (2002), "Tourism as a long-run economic growth factor: the Spanish case", *Applied Economics*, 34: 877-884.

Brau, R., Lanza, A., Usai, S., (2008), *Tourism and sustainable economic development: Macroeconomic models and empirical methods*, Edward Elgar Publishing Limited.

Brida, J.G., Carrera, E.J.S., Risso, W.A., (2008), "Tourism's Impact on Long-Run Mexican Economic Growth", *Economics Bulletin,* 3-21: 1-8.

Durbarry, R., (2002), "Long run structural tourism demand modelling: An application to France", Discussion Paper, http://www.nottingham.ac.uk/ttri/discussion/2002_1.pdf.

Eilat, Y., Einav, L., (2004), "Determinants of international tourism: A three-dimension panel data analysis", *Applied Economics,* 36-12: 1315-1327.

Garín-Muñoz, T., Amaral, T.P., (2000), "An econometric model for international tourism flows to Spain", *Applied Economics Letters*, 7: 525-529.

Garín-Muñoz, T., Montero-Martin, L.F., (2007), "Tourism in the Balearic Islands: A dynamic model for international demand using panel data", *Tourism Management, 28-5: 1224-1235.*

Garín-Muñoz, T., (2009), "Tourism in Galicia: domestic and foreign demand", *Tourism Economics*, 15-4: 753–769.

Gil-Alana, L.A., Fischer, C., (2007), "International traveling and trade: further evidence for the case of Spanish wine based on fractional VAR specifications", Contributed Paper prepared for presentation at the 105th EAAE Seminar 'International Marketing and International Trade of Quality Food Products', Bologna, Italy, http://www.bean-quorum.net/EAAE/pdf/EAAE105_Paper072.pdf.

Habibi, F., Rahim, K.A., Ramchandran, S., Chin, L., (2009), "Dynamic model for International Tourism Demand for Malaysia: Panel Data Evidence", *International Research Journal of Finance and Economics,* 33: 207-217.

Hanafiah, M.H.M., Harun, M.F.M., (2010), "Tourism demand in Malaysia**:** A cross-sectional pool time-series analysis", *International Journal of Trade, Economics, and Finance*, 1-1: 80-83.

Kareem, O.I., (2007), "A Panel Data Analysis of Demand for Tourism in Africa", A Paper Presented at the 12th Africa Econometric Society (AES) Annual conference, Cape Town, South Africa.

Law, R., Au, N., (1999), "A neural network model to forecast Japanese demand for travel to Hong Kong", *Tourism Management*, 20: 89-97.

Leitão, N.C., (2009), "Portuguese tourism demand", *Journal of Global Business and Technology,* 5-2: 63-72.

Leitão, N.C., (2010), "Does trade help to explain tourism demand? The case of Portugal", *Theoretical and Applied Economics*, XVII-544: 63-74, http://www.ectap.ro/articole/451.pdf.

Li, G., Song, H., Witt, S., (2005), "Recent Developments in Econometric Modeling and

Forecasting", *Journal of Travel Research*, 44-1: 82-99.
Lim, Ch., McAleer, M., (2001), "Cointegration analysis of quaterly tourism demand by Hong Kong and Singapore for Australia", *Applied Economics*, 33: 1599-1619.
Lim, C., (1997), "Review of international tourism demand models", *Annals of Tourism Research*, 24-4: 835-849.
Luzzi, G.F., Fluckiger, Y., (2003), "An econometric estimation of the demand for tourism: The Case of Switzerland", *Pacific Economic Review*, 8-3: 289-303, Blackwell Publishers Ltd (a Blackwell Publishing Company).
Maloney, W.F., Rojas, G.M., (2005), "How elastic are sea, sand and sun? Dynamic panel estimates of the demand for tourism", *Applied Economics Letters*, 12: 277-280.
Mervar, A., Payne, J.E., (2007), "Analysis of Foreign Tourism Demand for Croatian Destinations: Long-Run Elasticity Estimates", *Tourism Economics*, 13-3: 407-420.
Morley, C.L., (1993), "Forecasting tourism demand using extrapolative time series methods", *The Journal of Tourism Studies*, 14-1: 19-25.
Muhammad, A., Andrews, D., (2008), "Determining Tourist Arrivals in Uganda: The Impact of Distance, Trade and Origin-Specific Factors", *African Journal of Accounting, Economics, Finance and Banking Research*, 2-2: 51-62.
Naudé, W., Saayman, A., (2005), "Determinants of Tourists Arrivals in Africa: A Panel Data Regression Analysis", *Tourism Economics*, 11-3: 365-391.
Nordström, J., (2005), "Dynamic and stochastic structures in tourism demand modeling", *Empirical Economics*, 30: 379-392.
Pender, L., Sharpley, R., (2005), *The Management of Tourism*, SAGE Publications.
Phakdisoth, L., Kim, D., (2007), "The determinants of inbound tourism in Laos", *ASEAN Economic Bulletin*, 24-2: 225-237.
Santana-Gallego, M., Ledesma-Rodríguez, F., Pérez-Rodríguez, J.V., (2009), "Tourism and trade in OECD countries. A dynamic heterogeneous panel data analysis", http://www.ub.edu/jei/papers/SANTANA_GALLEGO-CORTES_JIMENEZ.pdf.
Seetanah, B., (2006), "Analysing Transport Capital as a Determinant of Tourist Arrival in a Co-integration and Error Correction Framework", *International Review of Business Research Papers*, 2-2: 15-29.
Sharpley, R., Telfer, D., (2002), *Tourism and development: Concepts and Issues*, Cambrian Printers Ltd.
Shan, J., Wilson, K., (2001), "Causality between trade and tourism: empirical evidence from China", *Applied Economics Letters*, 8: 279-283.
Sinclair, M.T., Tsegaye, A., (1990), "International tourism and export instability", *Journal of Development Studies*, 26-3: 487 – 504.
Sinclair, M.T., (1998), "Tourism and Economic Development: A Survey", *The Journal of Development Studies*, 34-5:1-51.
Song, H., Witt, S.F., (2000), *Tourism Demand Modelling and Forecasting: Modern Econometric Approaches*, Advances in Tourism Research Series, Pergamon, Oxford.
Song, H., Witt, S.F., (2003), "Tourism Forecasting: The General-to-Specific Approach", *Journal of Travel Research,* 42: 65-74.
Song, H., Fei, B., (2007), "Modelling and forecasting international tourist arrivals to mainland China", *China Tourism Research*, 3-1: 20-40.
Song, H., Witt, S.F., Li, G., (2008), *The advanced econometrics of tourism demand*, Taylor & Francis E-Library.
Soukiazis, E., Proença, S., (2008), "Tourism as an alternative source of regional growth in Portugal: a panel data analysis at NUTS II and III levels", *Portuguese Economic Journal,* 7: 43-61.
Taylor, T., Ortiz, R., (2009), "Impacts of climate change on domestic tourism in the UK: a

panel data estimation", *Tourism Economics*, 15-4: 803–812.
Turner, L.W., Witt, S.F., (2001), "Factors influencing demand for international tourism: tourism demand analysis using structural equation modelling", *Tourism Economics*, 7-1: 21-38(18).
Vanegas, Sr. M., (2009), "Tourism Demand Response by Residents of Latin American Countries", *International Journal of Tourism Research*, 11: 17-29.
Wahab, S., Pigram, J.J., (1997), *Tourism, development and growth*, Routledge.
World Travel and Tourism Council, (2008), *The 2008 Travel & Tourism Economic Research: European Union, Travel&Tourism-The Winds of Change.*
Zortuk, M., (2009), "Economic Impact of Tourism on Turkey's Economy: Evidence from Cointegration Tests", *International Research Journal of Finance and Economics*, 25: 231-239.
ec.europa.eu/eurostat.
http://www.cepii.fr/anglaisgraph/bdd/bdd.htm.
www.worldbank.org/.
www.insse.ro.

MODELIRANJE PANEL PODATAKA MEĐUNARODNE TURISTIČKE POTRAŽNJE: SLUČAJ RUMUNJSKE

SAŽETAK

Rad analizira odrednice međunarodne turističke potražnje za Rumunjskom i kvantificira njihov utjecaj. Autori obrađuju dva modela, model fiksnih efekata i Tobit model, kako bi procijenili podatke o priljevu turista iz dvadeset i tri europske zemlje u periodu od 1997 do 2008. U statičkom panelnom modelu fiksnih efekata nalazimo da su BDP per capita, bilateralna trgovina, stanovništvo i cijene glavne odrednice turističkih tokova prema Rumunjskoj. Za Tobit model, sve u obzir uzete varijable, BDP per capita, bilateralna trgovina, stanovništvo, geografska udaljenost i cijene, utječu na međunarodnu turističku potražnju. Oba modela upućuju na to da su trgovina, stanovništvo i prihod važnije odrednice nego relativne cijene i geografska udaljenost Rumunjske od ishodišnih zemalja.

Ključne riječi: *međunarodna potražnja, turistički dolasci, model za panelne podatke, trgovina, Rumunjska*