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Content

From the Editor

This issue of the South East Journal of Economics and Business provides eleven papers that will be well-regarded by theorists, teachers, and practitioners from the SEE countries and others around the world. This issue is also the first one that we publish completely as an electronic journal. We certainly hope that this way we will reach wider audiences and provide for greater intellectual impact.

Tanja M. Hribernik and Igor Jakopanec in their paper titled "Pension Funds, the Requirement of Providing the Minimum Guaranteed Return and Excessive Legislative Restrictions of Pension Fund's Investments" demonstrate using a combination of empirical data from two Slovenian pension funds and some hypothetical one that by precisely matching the investments' characteristics to the characteristics of the pension fund's liabilities, some important financial risks can be mitigated, while others can even be hedged entirely. They also demonstrate that with the implementation of a proper policy of risk measurement and management, complemented with stress testing practices, excessive legislative restrictions for investments are no longer necessary. Some restrictions can even hinder portfolio diversification and the risk management process.

"Financial Services in VAT System in the European Union and Croatia" is the paper written by Ivana D. Lutilsky, Sanja B. Tominac and Martina Dragija. The authors present differences in financial services VAT treatment. They investigate treatment of financial services in VAT system in EU countries as well as in the Croatia in order to reveal differences and improvement possibilities. Results show that there is a need for significant improvement in VAT system, especially in Croatia. Furthermore, European Union countries apply tax regulation since 1977. The research of VAT treatment of financial services indicates that there is unequal application of tax exemptions and adverse tax competition in EU countries. Nevertheless, Croatia is still adjusting its legislation (tax treatment of financial services) with the EU provisions. The paper thus provides comparative analysis of treatment of financial services in VAT system in EU and Croatia that could be useful for new consideration of financial services position in VAT system in Croatia.

Boris Tihi and Nermin Oruc in the paper titled "The Competitive Location Assessment – MCI Approach" investigate the list of determinants that influence customers to create a short-term preference to a particular store. A survey among 240 households in Sarajevo was conducted in order to reveal their preferences. Results of the MCI model have identified several main stores' characteristics which have the key influence on customer patronage decisions. The findings also suggest that customers, in making their patronage decisions, and hence making their preferences to a particular store, choose among a limited list of alternatives, which implies that competition among outlets is more space limited that in may be expected.

The fourth paper in this issue of the Journal is "Research and Development and Tax Incentives." It is written by Sabina Hodžić. In many countries, tax incentives are a popular mean to achieve political, economic and social objectives. Their aim is to reach and accelerate certain activities of public interest. Furthermore, one of the objectives is to accelerate the development of a certain industry and influence on the growth of investigations and investment in foreign capital. Innovation is the key element that helps to achieve company's competitive advantage. Global competition is forced to offer unique products with added values on the market. Tax incentives for research and development are an important factor of innovation. This paper aims to present the importance of research and development, as well as the role of tax incentives. States should use their fiscal policy to stimulate investment in research and development through various forms of tax reliefs. The Republic of Croatia applies tax incentives for research and development but to a significantly less extent than other European Union countries.

"Two Decades of Croatian Transition: A Retrospective Analysis" is submitted by Nebojsa Stojcic. Over the past two decades many Central and South East European countries underwent the process of transition from centrally-planned towards market economy. Among them, the case of Croatia stands as particularly interesting. Owing to a number of reasons Croatia had the potential to be among the forerunners of transition. However, in realizing this potential the country was constrained by numerous political and social turbulences which made its transition path somewhat unique. The objective of this paper is to explore to which extent have favorable initial conditions of Croatian transition been exploited over past two decades. The focus of analysis is on four dimensions of transition: institutional reforms, macroeconomic performance, changes in economic structure and international trade. The general message coming from analysis is that much of Croatia's initial advantage was lost over past two decades because of the war, the unfavorable political climate in 1990s, late integration into regional, European and global economic institutions and slow restructuring of enterprises.

The sixth manuscript is "Impacts of the Location on the Bank Call Center Services: The Case of Turkey" and it is written by Ahmet H. Özkan. The CRM sector represents the quality of a company. The quality of a company might be evaluated by taking the services of a call center as a measure by the customers, because CRM is the most interactive point of the operations of all companies. The call centers represent the companies with a 7/24 service. The CRM companies have to search for the ways to increase the quality of their service. The call center companies started to move to Anatolia after government incentives. The purpose of this study was examining the results of this change. The bank call centers in the big cities and the Anatolian bank call centers are compared to each other. SERVQUAL is used to compare the service quality of the call centers. 100 questionnaires are used to evaluate the services of the bank call centers and 100 customers are interviewed. The banks with Anatolian call centers and the banks without Anatolian call centers are compared to each other by using the results of the interviews and questionnaires. The service quality of the call center of the banks with Anatolian call centers seems to be higher than the others. The reason of better performance of Anatolian bank call centers are tried to explain by using some observations. These reasons can be taken into account by any CRM companies to provide a better service. This paper is a proof of that the CRM agents are affected by the stress factors and the environment. Therefore, the stress levels have to be decreased for the employees for a better service. Selecting the true location is the most important step on diminishing the stress levels.

Mihaela B. Simionescu contributes "Predicting Macroeconomic Indicators in Czech Republic Using Econometric Models and Exponential Smoothing Techniques." Econometric modeling and exponential smoothing techniques are two quantitative forecasting methods with good results in practice, but the objective of the research was to find out which of the two techniques are better for short run predictions. Therefore, for inflation, unemployment and interest rate in Czech Republic some accuracy indicators were calculated for the predictions based on these methods. Short run forecasts on a horizon of 3 months were made for December 2011-February 2012, the econometric models being updated. For Czech Republic, the exponential smoothing techniques provided more accurate forecasts than the econometric models (VAR(2) models, ARMA procedure and models with lagged variables). One explication for the better performance of smoothing techniques would be that in the chosen countries the short run predictions more influenced by the recent evolution of the indicators.

The eight article in this issue of the Journal is titled "Multi-Level Analysis of Authentic Leadership from Turkish Construction Engineers Perspective." Adnan Ceylan and Semra Özkan explore authentic leadership in Turkey from a multilevel perspective. They use the authentic

leadership measure developed by Walumbwa, Avolio, Gardner, Wernsing and Peterson in 2008. They also test validity of the AL measure in a different cultural context.

"Employment-Adjusted Human Development Index" is authored by Mehmet T. Taner, Hakan Mihci, and Bulent Sezen. This paper investigates whether the inclusion of employment as a criterion into the HDI would yield a different ranking of the nations. In this study, estimates of the proposed Employment-adjusted Human Development Index (E-HDI) are provided for seventy-seven countries for the 2000-2007 period, and comparisons are made both for changes in human development index (HDI) and ranks over time in each country and for differences between the E-HDI and UNDP's HDI across countries. The experience of a relatively large number of 77 sample countries has offered promising results in the path to improve the current status of HDI, and hence, to overcome the weakness in terms of ranking of countries. The additional indicator, i.e. employment improves the explanatory power of the HDI and makes significant contributions to its reliability. The major limitation of the present study has been the lack of data for a number of the human development indicators for the rest of the countries in the world. The employment-adjusted index has a great potential to make HDI more operational. By means of E-HDI, human development performance of the countries can be better evaluated and compared with other countries by using additional information obtained from the employment position of the citizens.

Reza M. Garfamy contributes the paper "Supply Management: A Transaction Cost Economics Framework." Transaction Cost Economics (TCE) is an economic theory that provides an analytical framework for investigating the governance structure of contractual relations within a supply chain. The purpose of this paper is to examine the existing research in an effort to understand the potential effects of transaction costs on the vertical coordination of a supply chain. The paper creates many insights into how supply chains are organized under different governance structures. These insights can certainly be shared via the development and introduction of related propositions. The conceptual typology of contractual relations developed herein can help researchers better understand the scope of both the problems and the opportunities associated with supply management. It will be of value, therefore, not only to researchers who desire to expand their research into this area, but also to those who have already investigated this topic but in isolation or with limited scope.

The last manuscript in this issue of the Journal is "The Influence of Globalization in Promoting Entrepreneurship in Malaysia" by Anantha Raj A. Arokiasamy. Entrepreneurship is increasingly becoming a very relevant instrument in promoting economic growth in a country. Thus the role of globalization in promoting entrepreneurship in Malaysia is analyzed in this context. In this regard, universities as teaching and research units and according to their potential and capabilities play an important role in the development, entrepreneurship and job creation. What affect does globalization have on an economy? Globalization of education and entrepreneurial studies has allowed efficient access to the scientific environment and culture of various countries. Given the ever-changing world in which we live, this paper aims to explain the importance of investigating educational and research activities of universities converged towards globalization and entrepreneurship.

Finally, we would like to invite you to submit a paper and contribute to our Journal. We encourage all researchers to submit high-quality papers dealing with theoretical and practical issues of economies and business processes of the countries of South East Europe.

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Pension Funds, the Requirement of Providing the Minimum Guaranteed Return and Excessive Legislative Restrictions of Pension Fund Investments

Tanja Markovič Hribernik, Igor Jakopanec *

Abstract:

To reduce the exposure of the pension fund's members to financial risks, legislation in Slovenia and some other countries promises a so-called minimum guaranteed return and at the same time hinders the portfolio diversification process of pension funds. We intend to demonstrate in this article, on a case study basis and using a combination of empirical data from two Slovenian pension funds and a hypothetical one, that by precisely matching the investments' characteristics to the characteristics of the pension fund's liabilities, some important financial risks can be mitigated, while others can even be hedged entirely. We also intend to demonstrate that with the implementation of a proper policy of risk measurement and management, complemented with stress testing practices, excessive legislative restrictions for investments are no longer necessary. Some restrictions can even hinder portfolio diversification and the risk management process.

Keywords: pension funds, minimum guaranteed return, asset-liability management, risk management, portfolio regulation, Slovenia

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1. Introduction

For the last decade, developed countries have been facing a growing demographic problem. As life expectancy increases, the average age of the population continues rising. There are more and more elderly people and governments have already been forced to reduce first pillar pension benefits. Every individual will be encouraged to cover the difference by saving for extra pension benefits. The managers of pension funds are therefore faced with increasing responsibility for the profitable and – mostly – prudent management of their members' assets.

To reduce the exposure of the pension fund's members to financial risks, legislation in some countries promises a so-called minimum guaranteed return and at the same time hinders the portfolio diversification process of pension funds. If the portfolio manager takes excessive risks and earns negative returns, the difference between the actual (negative) return and the minimum guaranteed return must be covered from his or her own capital. As managers are discouraged to put their solvency at risk, a more conservative approach to investment policy is preferred, which is often associated with relatively poor potential returns and the reduced interest of employed people in participating in supplementary pension savings.

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The purpose of this article is a detailed analysis of the connection between the requirement of providing the minimum guaranteed return and managing financial risks on the one hand, and the investment structure of pension funds on the other. On a case study basis, and using a combination of empirical data from two Slovenian pension funds and a hypothetical one, we will demonstrate that by using an asset-liability management (ALM) approach, complemented with stress testing practices, excessive legislative restrictions for investments are no longer necessary.

In portfolio management, the ALM strategy became important after 2001, when shocks on the stock exchange due to events connected with September 11 in the U.S. severely reduced numerous pension funds' available resources for covering liabilities. However, the history of ALM models is longer. The earliest ALM models in literature were deterministic models and duration matching techniques and were applied to find the best portfolio. The stream of future benefit payments was assumed to be known in advance with certainty. Examples of these models are those of Macaulay (developed in 1938), Redington (developed in 1952) and Bierwag et al. (developed in 1983). These models, in which only bonds were considered as possible investments, were used until the mid 1980s. After that, bond models were used in which the future stream of benefit payments were stochastic. However, alternative portfolios were again found by duration matching techniques. Examples of these models are those by Fabozzi and Fabozzi (1989), Cox, Ingersoll and Ross (1985), Jacob, Lord and Tilley (1987) and Norris and Epstein (1989). Duration matching techniques have some major drawbacks. One of them is if interest rates change unexpectedly. Then reinvestment risk has to be considered. In addition, these types of models are extremely sensitive to the specific term structure model used.

In the late 1980s the first integrated analyses for ALM problems were made, using simulation models (see for example Van der Meer (1989) and Boender, van Aalst and Heemskerk (1998)). The added value of these models is the ability to use many scenarios. A major drawback of the simulation techniques is that many choices with respect to policies have to be kept fixed. To overcome the drawbacks of simulation, stochastic linear programming models (SLP) were used to tackle ALM problems. Instead of exogenous variables, as in simulation, decisions become endogenous. While simulation is based on evaluation, SLP is based on optimization (i.e., searches for the best solution). For applications of stochastic programming in ALM for pension funds see for example Consigli and Dempster (1998), Dert (1995), Kouvenberg (2001), Hilli et al. (2003) and Dupacova and Polivka (2009). Even this technique is not without constraint. The major one is its relatively long solution time, which is also the reason why the simulation technique is usually used in practice.

In this paper we will use the simulation technique. In order to evaluate the negative impact of unlikely events on a portfolio, stress tests will be also used. The paper is organized as follows. In section 2 the theoretical background is given, where circumstances that turn more attention to ALM in recent years are also given. In section 3 the data are explained and empirical analysis, i.e. simulation, is done. The methodological framework is included in section 3 as readers can better follow the steps of the simulation. A discussion of the results and recommendations are given in section 4. Finally, some concluding remarks are given in section 5.

2. Theoretical Background

2.1. Pension plans and investment objectives

Pension funds have their special features, which are defined in the pension plan. According to what is defined, pension plans can generally be divided into defined benefit (DB) pension plans and defined contribution (DC) pension plans (Reilly and Norton 1999, p.66). A defined benefit (DB) pension plan promises to pay retirees a specific income stream after retirement. A defined contribution (DC) pension plan is a plan where the minimum contributions by the plan sponsor, or the plan member, or both, are fixed as part of the plan's rules/contract (Yermo 2001, p. 4). The plan does not promise set benefits. The plan's risk is borne by the employees. Some DC pension plans may have additional promises. DC plans with promises are plans where the plan sponsor, provider or administrator offers some form of insurance against financial and/or longevity risk. A DC plan with a guaranteed return is the main type of defined contribution plan with promises.

Whatever the type of pension plan, it should also include the pension plan's anticipated investment policy. In Slovenia, for example, a regulation in December 2006 was accepted that demands a more accurate determination of the Statement of Investment Policy and

the methods of risk measurement and management implemented by the pension fund's manager (Uradni list RS 2006b, p. 15455). The statement should include investment objectives and policy, fundamental and additional restrictions on investments, a benchmark for the measurement of portfolio performance, investment management techniques and methods of risk measurement and management.

Regarding investment objectives, the following two are possible, i.e. capital preservation and capital appreciation (Reilly and Norton 1999, p. 45–47). Capital preservation means that the investors want to minimize their risk of loss, usually in real terms. They seek to maintain the purchasing power of their investment. Generally, this is a strategy for strong risk-averse investors. Capital appreciation is an aggressive strategy for investors who are willing to take on risks in order to meet their objectives. Under this strategy, growth primarily occurs through capital gains. Since pension funds in Slovenia are required to promise a minimum guaranteed return, a capital preservation strategy is usually selected.

2.2. Risks pension funds are exposed to with an emphasis on investment risks

For pension fund managers, identifying and managing risks is key to their stable operation and functioning. Even pension funds are exposed to different kinds of financial risks, and here more attention is directed primarily toward investment risks. Regarding investment risks, the following key types should be taken into consideration: market risk or interest-rate risk, reinvestment risk, credit risk or default risk, marketability risk or liquidity risk and exchange rate risk (Fabozzi 2000, p. 5).

Market risk or interest-rate risk (sometimes also called the price risk) is the risk of the debt security's price changing as a result of a change in the general level of interest rates or a change in the interest rates of specific securities. For an investor who potentially has to sell a security before its maturity date, an increase in interest rates will mean the realization of a capital loss.

It is possible for an investor to manage interest rate risk with the proper accounting treatment of an investment. With respect to the financial reporting of assets, there are three possible methods: (1) market value, (2) amortized cost or historical cost, and (3) the lowering of cost or market value (LCM). In the market value method, an investment is valued at its market value. It is said to be "marked to market". In the amortized cost method, the value reflects an adjustment of the acquisition cost for debt securities purchased at a discount or premium from their maturity value (Fabozzi 2000, p. 452). This method is sometimes referred to as "book value accounting." It is important to note that real cash flow is the same regardless of accounting treatment, but there can be substantial differences in financial statements using these three methods.

Reinvestment risk is the risk that the interest rate, at which interim cash flows can be reinvested (reinvestment rate), will fall. It is assumed that the cash flows received from a debt security are reinvested. The additional income from such a reinvestment, sometimes called interest-on-interest, depends on the prevailing interest-rate levels at the time of reinvestment, as well as on the reinvestment strategy. Reinvestment risk is greater for longer holding periods, as well as for debt securities with large, early, cash flows, such as high-coupon bonds. It should be noted that interest-rate risks and reinvestment risks have offsetting effects. That is, the interest-rate risk is the risk that interest rates will rise, thereby reducing the security's price. In contrast, the reinvestment risk is the risk that interest rates will fall, thereby reducing additional revenue from interest-on-interest (Fabozzi 2000, p. 6). With the precise matching of the duration of assets and liabilities, both risks can be offset.

Marketability risk, or liquidity risk, is defined as the uncertainty introduced by the secondary market for an investment. The investor expects to be able to convert the security into cash and use the proceeds for current consumption or another investment. The more difficult it is to make this conversion, the greater the liquidity risk (Reilly and Norton 1999, p. 20). Some authors (Holmes 2002, p. 84) relate liquidity risk more generally to the ability (or inability) to buy or sell securities at short notice at a fair or good price. The primary measure for the marketability or liquidity is the size of the spread between the bid price (the price at which a security can be sold) and the ask price (the price at which a security can be purchased) as quoted by a dealer. The greater the dealer spread, the greater the liquidity risk (Fabozzi 2000, p. 8).

Credit risk or default risk refers to the risk that the issuer of a security may default, and the exchange rate risk or currency exchange risk is the risk associated with the value of foreign currency holdings caused by fluctuations in currency markets. The likelihood of

incurring this risk rises as investors buy and sell assets around the world.

Managing all types of risks demands prudent action by pension fund managers in order for them to meet their obligations. As governments are also interested in including as many employees in supplementary pension schemes as possible (the condition for this is also adequate protection of the insured individual) efforts to unify the pension fund market and investment legislation as well as introduce adequate risk measurement and management methods have been stepped up also at the international level (i.e., the European Commission and the OECD) in the past decade. In this regard, the asset-liability management (ALM) of pension funds has also become increasingly important.

2.3. Portfolio management and the ALM strategy

A basic assumption of portfolio theory is that an investor wants to maximize the returns from his investments for a given level of risk, while simultaneously considering all the assets and liabilities and connections between them. The creation of an optimum investment portfolio is not simply a matter of combining a lot of unique individual securities that have desirable risk-return characteristics; the relationship between them should also be considered as the returns from all these investments interact (Reilly and Norton 1999, p. 189).

Both the asset and liability side of the pension fund balance sheet can contribute to the risk. On the asset side, risks can involve both asset-liability mismatching (where assets are not adequately structured to meet benefits when they become due) and return related risks (where insufficient income is generated to cover liabilities) (OECD 2007, p. 3). An institutional investor is concerned with both the amount and timing of liabilities, because its assets must produce cash flow to meet any payments it has promised to make in a timely way.

Portfolio management, when considering assets and liabilities, offers the following alternative approaches to asset allocation: immunization, cash-flow matching, shortfall risk management and asset-liability management (Davis 2001b, p. 5).

With immunization, the investor tries to stabilize the value of the investment at the end of the holding period, i.e. to hold an entirely riskless position. This is typically done, in light of the interest rate risk, by appropriately adjusting the duration of the assets held to that of the liabilities. It necessitates a constant rebalancing of the portfolio, as well as the existence of assets that have a similar duration as that of liabilities (Davis 2001b, p. 5). Portfolio immunization attempts to balance two components of interest rate risk, i.e. price risk and reinvestment risk. The price risk and the reinvestments caused by a change in interest rates have opposite effects on ending-wealth position (Reilly and Norton 1999, p. 709). An increase in interest rates will cause an ending price below expectations (if the bond is sold before maturity), but the reinvestment rate for interim cash flows will be above expectations. A decline in market interest rates will cause the reverse situation. In an immunized portfolio, whether market rates rise or fall, the value of the portfolio at the end of the time horizon should be close to its target value.

Using cash-flow matching strategy, pension fund managers attempt to immunize their balance sheets by matching the projected payments of pension benefits with cash-flow generated by investments (Laboul 2006, p. 8). One way institutions can meet their liabilities is to construct a portfolio of assets – usually bonds – that generate cash flows matching liability cash flows. Most institutions have rejected this approach because it generally eliminates the opportunity to generate excess returns. Instead, they have established a return target for their assets and then invest in a mix of stocks, bonds and other asset classes with the goal of meeting or beating that return target. With this approach, also known as the asset-driven approach, success is measured by how well the portfolio's investments perform versus market benchmarks (Pacific Investment Management Company 2007, p. 1-3).

Shortfall risk management (or portfolio insurance) approaches put particular stress on avoiding downward moves in the context of minimum solvency levels for pension funds. Shortfall risk sees the investor as maximizing the return of the portfolio subject to a ceiling on the probability of incurring a loss (e.g. by shifting from equities to bonds as the minimum desired value is approached). Through such means, the value of a portfolio may be prevented from falling below a given value, such as that defined by the value of a guaranteed return, defined benefits, or the minimum funding level of a pension fund (Davis 2001b, p. 5).

Asset-Liability-Management (ALM) is an investment technique wherein the long term balance between assets and liabilities is maintained by the choice of a portfolio of assets with similar return, risk and duration characteristics to liabilities. The characteristics of an individual asset may

differ from those of the liabilities, but at the portfolio level they should be matched (Davis 2002, p. 6). It can be defined as the ongoing process of formulating, implementing, monitoring, and revising strategies related to assets and liabilities in an attempt to achieve financial objectives for a given set of risk tolerances and constraint. ALM is relevant to, and critical for, the sound management of the finances of any institution that invests to meet liabilities (Hess 2000, p. 6).

Liability-driven investing shifts the focus of asset allocation back to the real purpose of the assets, which is to meet liabilities. Thus, the defining element of a liability-driven investment approach is that portfolio performance is benchmarked against the institution's liabilities, rather than a benchmark with no direct relation to the liabilities. This is also how the strategy got its name. It is a flexible strategy, so portfolios can take many different forms depending on the institution's desire for excess returns and tolerance for risk (Pacific Investment Management Company 2007, p. 1–2). In order to select the right investments we first have to know the characteristics of the liabilities.

No two institution's liabilities are the same, but virtually all liabilities have one characteristic in common: falling interest rates cause liabilities to increase, while rising rates cause liabilities to decline[1]. Therefore, falling interest rates may be the single largest risk that institutions face in relation to their liabilities (Pacific Investment Management Company 2007, p. 2). To hedge this risk, many institutions implementing a liability-driven approach turn to bonds. Bonds typically appreciate in value when interest rates decline, and therefore tend to be among the most common ingredients in a liability-driven portfolio. A second common characteristic is that most liabilities are long-term. The longer-term the liabilities are, the more sensitive they are to changes in interest rates. For example, a drop in interest rates will cause liabilities owed 30 years in the future to increase more than liabilities owed 10 years in the future. Similarly, longer-term bonds are also more sensitive to changes in interest rates. Therefore, another common element in liability-driven investing is that bonds held in the portfolio tend to be long-term bonds. Aside from the common use of long-term bonds, liability-driven portfolios can vary significantly from institution to institution. Some institutions, for example, can have liabilities that are sensitive to inflation and may employ inflation-linked bonds to hedge inflation risk. Other institutions may have a higher tolerance for volatility in the portfolio relative to liabilities, and may therefore employ alternative asset classes.

Pension fund investment and risk management practices have often focused more on asset returns instead of the actual liability structure of the pension balance sheet. In part, this is because assets are more easily adjusted in the short term to meet changing circumstances than pension liabilities. In practice, many pension funds have pursued investment strategies measured relative to broad market indices (OECD 2005, p. 36,71).

Several factors drive institutions towards liability-driven investing. The most significant of these factors is probably the fact that asset-driven strategies left many pension plans and other institutions with deficits relative to their liabilities after 2001 and 2002, when the shocks on the stock exchange due to events connected with September 11 in the U.S. severely reduced numerous pension funds' available resources for covering liabilities. Shortfall in assets relative to liabilities forced pension fund managers to cover the difference from their own capital.[2] As data shows, the pension funds' projected benefit obligation (PBO) funding declined globally in 2001 and 2002 due to a combination of falling interest rates and modest or negative equity returns. The euro zone PBO funding ratio went from more than 120% at the beginning of 2001 to less than 80%[3] in just two years. The U.S. and U.K. experienced a similar shift from surplus to deficit during the same period. The PBO ratio of Japanese pension funds was already below 60% in 2003 (Pacific Investment Management Company 2007, p. 2).

Pension funding ratios have improved in subsequent years as a result of the combination of rising interest rates and higher equity market returns, though even more as the result of the sound management of pension funds assets as well as taking more into account the characteristics of pension fund liabilities. Those pension funds that did not adapt their investment strategy were hit again by the appearance of the global financial crisis in 2008.

[1] The market value is the present value of future liabilities, discounted at a proper interest rate. When interest rates rise, the present (or the market) value falls (Fabozzi 2000, p. 451).

[2] The consequences are the same in the case of the inability to achieve the minimum guaranteed return in pension funds in Slovenia and other countries, where managers offer similar guarantees.

[3] A PBO ratio of 80% means that a pension fund has 0.80 EUR of assets available to cover 1 EUR of projected pension liabilities.

As noted by Davis (2001a, p. 7) minimum funding levels and limits on overfunding provide tolerance limits to the variation of assets around the value of liabilities. If the assets are selected in such a way that their risk, return and duration characteristics match those of liabilities, there is a "liability immunizing portfolio". This protects the portfolio against risks of variation in interest rates, real earnings growth and inflation in pension liabilities.

3. The Data and Empirical Analysis

A practical example of a pension fund investment policy taking into account the requirement to achieve the minimum guaranteed return and managing risk using the asset-liability management (ALM) strategy is presented and analyzed here. Because pension fund managers in Slovenia usually do not disclose their data to the public, a combination of publicly accessible data from two Slovenian pension funds is used; other data are hypothetical or invented. The number and structure of insured individuals is taken from the Capital Mutual Pension Fund (Kapitalski vzajemni pokojninski sklad; managed by *Kapitalska družba;* 2010 data), and the data on the investment and liabilities structure is taken from the insurance fund of the pension investment company *Moja naložba* (2012 data).

The effect of the risk of abnormal events on the portfolio will be verified using stress tests (i.e., sensitivity and scenario tests). The majority of investment risks that the manager is exposed to while managing the portfolio will be defined; in addition, suitable methods of measuring these risks will be identified and suggestions for their management will be presented.

The process of asset-liability management will be based on a synthetic defined contribution (DC) pension fund with 130 million EUR of assets and 36,000 pension plan members. Assets and liabilities will be matched through risk, return and duration characteristics. As previously indicated, asset-liability management helps the manager hedge, or at least limit, the negative impact of financial risks that they are exposed to when managing a pension fund.

In the first step, we estimated the average duration of a pension fund's liabilities while considering the pension plan members' structure. A more accurate calculation of duration can be prepared by actuaries, based on different mathematical assumptions: members' age and gender structure, mortality tables, projected returns, selected discount rates, pension benefits promised, the probability of exiting pension insurance or switching to another pension plan, etc. To simplify the calculation of the average duration, the following assumptions can be stated:

- the number of pension plan members structured by age and gender is sufficient to calculate the duration of liabilities (other parameters can be disregarded),
- the distribution of pension plan members within an individual age group is even,
- retired pension plan members will receive pension benefits in a lump-sum (instead of a monthly annuity).

Age group (in years)	Average (in years)	Female members		Male members	
		Number	Assets (in EUR)	Number	Assets (in EUR)
from 11 to 20	15	0	0.00	18	9,646.75
from 21 to 30	25	930	1,036,662.22	1,774	2,481,977.42
from 31 to 40	35	3,622	10,802,364.17	5,799	20,529,246.93
from 41 to 50	45	4,949	17,166,278.09	8,037	36,378,284.56
from 51 to 60	55	3,430	11,637,980.78	5,918	24,291,070.08
from 61 to 70	65	283	808,091.34	1,230	4,805,251.43
from 71 to 80	75	0	0.00	10	53,146.23
	Sum	13,214	41,451,376.60	22,786	88,548,623.40

Table 1: Age and gender distribution of pension plan members
Data source: Kapitalska družba (2011, p. 14)

	Females	Males	Average
Average age	45.09 years	45.96 years	
Retirement age	63.00 years	65.00 years	
Duration of liabilities	17.91 years	19.04 years	18.68 years

Table 2: Calculation of average liabilities duration (weighted by assets)
Source: own calculations

The average age of pension plan members can be calculated using the following equation:

$$\overline{AGE} = \frac{1}{A} * \sum_{i=1}^{7} \left(age_i * a_i \right), \quad (1)$$

where:

$\overline{AGE}$ = *average age of pension plan members (in years), A = sum of pension fund's assets (in EUR),* age_i = *average age at group i (in years),* a_i = *assets at group i (in EUR).*

Using the information about the pension plan members' age, gender and the sum of assets saved, we were able to calculate that the average plan member will retire and exit the pension plan after 18.68 years.

If we are to match the duration of assets to duration of pension liabilities, we have to select investments with similar interest rate sensitivity as that of liabilities. Most of the funds were invested in long-term government and corporate bonds. It is also possible to invest a part of assets in shares and mutual funds, as they are considered to have no maturity. By precisely matching the duration of assets to the duration of liabilities, interest-rate risk and reinvestment risk get perfectly hedged. The manager of the fund can also afford a smaller deviation from a perfect match with the intent of earning higher returns. The pension fund would then be more vulnerable to financial risks.

The second step has been to match assets and liabilities from the required return point of view. The pension fund's liabilities can be divided into three components:

- net premiums received (sum of gross premiums received, net of the front-end fee),
- guaranteed return earned (minimum guaranteed return added to net premiums received, as promised by the manager in the pension fund's plan),
- a return above the guarantee or provisions (the positive difference between actual returns earned and guaranteed returns promised[4]).

[4] In Slovenia, the process of creating and drawing provisions is explained in greater detail in the Pension and Disability Insurance Act (Uradni list Republike Slovenije 2006a, p. 11133–11134).

We supposed for our pension fund that the minimum guaranteed return promised by the pension plan is 60% of the average annual return on Slovenian government securities with a term to maturity above one year. For the year 2012, this is 2.30%. The management fee is 1.20% p.a., deducted from the pension fund's return. The minimum guaranteed return is added only to net premiums received, increased by the guaranteed return already earned. The manager of the pension fund does not promise a guaranteed return on provisions (return in excess of the guarantee). Should a pension fund's assets fall below the guaranteed value (sum of net premiums received and the guaranteed return already earned), the manager is not allowed to charge his management fee. Until the provisions are formed again, the manager's goal should be to earn a return, above the guaranteed return, for at least the amount of the management fee.

Liability	Min. guaranteed return	Management fee	Required rate of return
Provisions	–	–	–
Guaranteed return	2.30%	1.20%	3.50%
Net premiums received	2.30%	1.20%	3.50%

Table 3: Pension fund's liabilities structure and the required rate of return

Source: own calculations

Before we select the investments that are to be matched to our pension liabilities, we have to structure the fund's liabilities from a risk point of view. Let us keep our liabilities structured to net premium received, a guaranteed return and provisions formed. Asset-liability management can also be called surplus management (see Fabozzi 2000, p. 450). It is actually a tradeoff between managing shortfall risk and taking an acceptable risk to earn a sufficient return on the assets invested.

Liability	Share	Risk allowed
Provisions	5.00%	High
Guaranteed return	9.00%	Moderate
Net premiums received	86.00%	Low

Table 4: Pension fund's liabilities structure and risk

Source: own calculations

Assets	Value	Share	Share	Value	Liabilities
Other currencies (USD, GBP)	6,500,000.00	5.00%	5.00%	6,500,000.00	Technical provisions
Local currency (EUR)	123,500,000.00	95.00%	9.00%	11,700,000.00	Guaranteed return
			86.00%	111,800,000.00	Net premiums received
Total	130,000,000.00	100.00%	100.00%	130,000,000.00	*Sum*

Table 5: Currency structure of assets and liabilities
Source: own calculations

Assets	Duration	Return	Share	Risk	Share	Return	Duration	Liabilities
Shares	–	–	5.00%	High	5.00%	–		Technical provisions
Mutual funds	–	–	9.00%	Moderate	9.00%	2.30%		Guaranteed return
Liquidity reserve	0.01	3.00%	11.00%	Low	86.00%	2.30%		Net premiums received
Bonds – corporate	3.85	5.30%	35.00%					
Bonds – government	6.02	4.50%	40.00%					
Average	4.37	4.63%	100.00%		100.00%	2.30%	18.68	*Average*

Table 6: Risk, return and duration structure of assets and liabilities
Source: own calculations

Investment	Average yield	Average duration	Modified duration
Liquidity reserve	3.00%	0.01	0.01
Bonds – corporate	5.30%	3.85	3.66
Bonds – government	4.50%	6.02	5.76
Average	4.63%	4.37	4.18

Table 7: Debt securities structure with duration and return ratios
Source: own calculations

For every gross premium received, only front-end fees can be charged by the manager. The net premium will then fall into the net premiums received category. As this category may never drop below the sum of all premiums paid to the fund, the manager can only afford a minimum risk. At the end of every month, the guaranteed return is calculated on net premiums received, as a percentage, as promised in the pension plan. If the actual return falls below the guaranteed return, provisions may be used by the manager of the fund to cover the difference. It is possible that the actual return falls below 0 within a certain period. For the amount of the guaranteed return earned, the manager is allowed to take moderate risks. Because there is no guaranteed return promised on a pension fund's provisions, the manager can be allowed to expose this share of the pension fund's liabilities to maximum risk. But he or she must keep in mind not to let the fund's provisions fall below 0. This would be the case if the actual return would fall below the guaranteed return, and the provisions would not be sufficient to cover the deficit. The manager would then have to form additional provisions from his or her own capital.

To estimate how unfavourable events affect a pension fund's capitalization, stress tests can be performed. In our case, we used two fundamental techniques. To study the impact of exchange rate risk and stock exchange decline on a pension fund's portfolio return, sensitivity tests were used. Since the impact of interest-rate risk is more difficult to comprehend, a scenario test was used with the minimum guaranteed return as the key financial driver. In the following tables, we have summarized the characteristics of the pension fund's liabilities as defined in the beginning of this chapter. The characteristics of a pension fund's assets are hypothetical and not precisely matched to liabilities. Stress tests help us understand how a mismatch between assets and liabilities can affect the return. To simplify the case we assumed that there are no new premiums paid to the pension fund during the observation period. In our asset-liability management case, currency risk, price risk and interest-rate risk were put into focus.

Stress Test I.: a -10% decline of a basket of foreign currencies against the EUR

Euro-denominated investments represent 95% of a pension fund's assets. The other 5% is invested into securities, denominated in currencies, like USD, GBP or JPY. For Euro-denominated investments we will assume an average annual return of 4.67%.

Assets	Value (t)	Return (in %)	Value (t + 1)
Other currencies (USD, GBP, JPY)	6,500,000.00	–10.00%	5,850,000.00
Local currency (EUR)	123,500,000.00	4.67%	129,265,500.00
Total	130,000,000.00	3.94%	135,115,500.00

Table 8: Impact of a decline of foreign currencies on the portfolio (in euros)
Source: own calculations

Assets	Value (t)	Return (in %)	Value (t + 1)
Stocks	6,500,000.00	–20.00%	5,200,000.00
Mutual funds	11,700,000.00	–15.00%	9,945,000.00
Liquidity reserve	14,300,000.00	3.00%	14,729,000.00
Bonds – corporate	45,500,000.00	5.30%	47,911,500.00
Bonds – government	52,000,000.00	4.50%	54,340,000.00
Total	130,000,000.00	1.64%	132,125,500.00

Table 9: Impact of stock market decline on the portfolio (in EUR)
Source: own calculations

Liabilities	Value (t)	Return (in %)	Value (t + 1)
Technical provisions	6,500,000.00	–	4,212,247.00
Guaranteed return	11,700,000.00	2.30%	14,540,500.00
Net premiums received	111,800,000.00	2.30%	111,800,000.00
Total	130,000,000.00	0.44%	130,552,747.00
Management fee	0.00	1.20%	1,572,753.00
Guaranteed value of the fund	123,500,000.00	2.30%	126,340,500.00

Table 10: Impact of stock market decline on a fund's liabilities (in EUR)
Source: own calculations

As shown in Table 8, a -10% decline of investments, denominated in other currencies, would lead to a -650,000.00 EUR loss. On the other hand, securities, denominated in Euros, would yield 5,765,500.00 EUR of positive return. Together, the pension fund's assets would rise by 5,115,500.00 EUR or 3.94%. As calculated in Table 3, the required return on a pension fund's liabilities is 3.50%. With the return actually earned, the pension fund's manager is able to cover the minimum guaranteed return and charge a 1.20% management fee. An additional return of 0.44% (3.94% - 3.50%) would increase the fund's technical provisions. Since the share of the fund's investments in foreign currencies is small, the exchange rate risk is not that important. The manager can afford small currency mismatches between assets and liabilities to increase the diversification of the fund's assets, and therefore decrease the price risk, which represents a much greater threat.

Stress Test II.: a -20% decline in the stock market

Our pension fund is exposed to equity directly and indirectly with the investments in mutual funds. Because the mutual funds can also diversify their assets in the investment with less risk (bonds, treasury bills or bank deposits), we assumed that their decline could only reach 75% of the stock market decline. We also assumed that the volatility of the stock market had no effect on the bond market. Our focus remained on the impact of the stock market decline with other factors constant.

A -20% decline in stock prices would represent a capital loss of -1,300,000.00 EUR, and a -15% (20% × 0.75) decline in mutual funds would mean another -1,755,000.00 EUR negative return to the pension fund. Other investments would add 5,180,500.00 EUR of positive return. In total, the pension fund's assets would increase by 2,125,500.00 EUR or 1.64%.

The guaranteed value of the fund is the sum of net premiums received and the guaranteed returns already earned. At the end of the year, the pension fund's manager must be able to increase the guaranteed value of the fund by at least the guaranteed return, which is 2.30%. As the net premiums received can only be

Scenario		Fund's value (t + 1)	Tech. provisions (t + 1)	Management fee (t + 1)
% decrease:	–4.93%	132,840,500.00	6,500,000.00	1,586,562.37
% decrease:	–20.00%	130,552,747.00	4,212,247.00	1,572,753.00
% decrease:	–57.87%	126,340,500.00	0.00	0.00

Table 11: Impact of stock market decline on management fee and provisions (in EUR)

Source: own calculations

increased by new premiums paid to the fund, the sum will be added only to the guaranteed returns already earned. Because the pension fund's assets are still above the guaranteed value, the manager is allowed to charge the fund for the management fee, which is deducted from technical provisions. The management fee is calculated as 1.20% of the average pension fund's value. The pension fund's net return, following the deduction of the management fee, is 0.44% (1.64% - 1.20%).

Should the negative trend in the stock market continue and the manager already decrease the technical provisions to 0, the difference between the actual return and the minimum guaranteed return would have to be covered by his own capital. He would also lose the right to charge his management fee. Using "goal seek" in our model, it is possible to calculate the maximum percentage of the stock market decline, where the manager would still be entitled to charge the management fee without decreasing technical provisions or the percentage at which he would lose all technical provisions.

If the stock market declined by -4.93% (and therefore mutual funds by -3.70%), the return on other investments would still be sufficient to cover both the guaranteed return and the management fee. Technical provisions would remain intact. On the contrary, in the case of a -57.87% decline in stock prices (and a -43.40% decline in mutual funds), the manager would lose all technical provisions and earn no management fee. The pension fund's value at the end of the year would only be equal to the guaranteed value of the fund. Any further decline in the pension fund's investments would require the manager to cover the loss from his own capital. To avoid such a risk, he would have to adjust the structure of investments to a new structure of liabilities. The share of equity investments should be reduced to match the level of technical provisions. If a pension fund's technical provisions are reduced to 0, it would be prudent to reduce equity investments to 0 as well. Their share can be increased again, when the actual returns exceed the guaranteed return.

Stress Test III.: A 100-Basis Point Increase Across the Yield Curve

The most important risk that the pension fund manager is exposed to is interest rate risk. We tested the scenario of an increase across the yield curve by 100 basis points. At the same time, we assumed that the yield curve was flat and that there was a parallel shift upward on all durations at the beginning of the observation. Until the end of the year, the yield curve remains unchanged. The influence of the stock market was disregarded. We used the information about debt security diversification, duration and return ratios from Table 7. But before we discuss the stress test results, let us explain how the ratios were calculated and how to interpret them. The price (market value) of a bond at a new required return was calculated using the following equation (Reilly and Norton 1999, p. 567):

$$P = \sum_{t=1}^{n} \frac{C_t}{(1+y)^t} + \frac{M}{(1+y)^n},$$

where:

P = price of a bond, y = interest rate (required annual yield), C_t = coupon payment in year t, M = maturity value, n = number of years to maturity (term to maturity).

As shown by the equation, the price of a bond equals the present value of the cash flows, discounted at the required annual yield. The price of a bond changes inversely with the change in the required yield. As the required yield increases (decreases), the present value of the cash flows decreases (increases). However, the relationship is not linear. For a given change in basis points, the percentage price increase is greater than the percentage price decrease (Fabozzi 2000, p. 23).

The volatility of a bond's price is dependent on its maturity. With all other factors remaining constant, the longer the maturity of a bond, the greater the price volatility resulting from a change in market yields.

Assets	Value (t)	Coupon (in %)	New yield	Coupon payments
Shares	6,500,000.00	–	–	–
Mutual funds	11,700,000.00	–	–	–
Liquidity reserve	14,300,000.00	3.00%	4.00%	–
Bonds – corporate	45,500,000.00	5.30%	6.30%	semiannual
Bonds – government	52,000,000.00	4.50%	5.50%	annual
Total	130,000,000.00	4.63%	5.63%	

Table 12: Investment portfolio at the beginning of the investment horizon (in EUR)
Source: own calculations

Assets	Coupon payment	Interest-on-interest	Market value	Sum
Shares	–	–	–	6,500,000.00
Mutual funds	–	–	–	11,700,000.00
Liquidity reserve	429,000.00	0.00	14,300,000.00	14,729,000.00
Bonds – corporate	2,411,500.00	37,981.13	43,912,050.00	46,361,531.13
Bonds – government	2,340,000.00	0.00	49,400,000.00	51,740,000.00
Total	5,180,500.00	37,981.13	107,612,050.00	131,030,531.13
Guaranteed value				126,958,000.00

Table 13: Impact of an interest rate increase on investment portfolio (in EUR)
Source: own calculations

The duration of a bond is a more appropriate measure for time characteristics than the term to maturity, because it considers both the repayment of capital at maturity, and the size and timing of coupon payments prior to final maturity. Duration is defined as the weighted average time to full recovery of principal and interest payments (Reilly and Norton 1999, p. 587–588):

$$Dur\ (in\ years) = \frac{\sum_{t=1}^{n} \frac{t \times C_t}{(1+y)^t} + \frac{n \times M}{(1+y)^n}}{P}, \quad (3)$$

where:

Dur = duration, C_t = interest payment that occurs in period t, M = maturity value, P = bond price, t = time period in which the payment occurs (t = 1,…, n), n = number of time periods to maturity, y = yield to maturity.

Modified duration is a measure of the sensitivity of a bond's price to interest-rate changes, assuming that the expected cash flow does not change with interest rates. It can be used as a measure of interest-rate risks. The modified duration shows the approximated change of a bond's, or a bond portfolio's, market value when the interest rates change. It can be calculated using the equation (Fabozzi 2000, p. 360):

$$Dur_{mod} = \frac{Dur}{(1+y)}, \quad (4)$$

where:

Dur_{mod} = modified duration, Dur = duration, y = yield to maturity.

An investor who purchases a bond can expect to receive a return from one or more of these sources: the periodic coupon interest payments made by the issuer, any capital gains (or capital losses) when the bond either matures, is called, or is sold, and interest income generated from reinvestment of the periodic cash flows (interest-on-interest). If an investor has received coupon payments prior to the bond's maturity, they should be reinvested in order to earn additional income. Interest-on-interest can be calculated using the equation for the future value of an ordinary annuity (an ordinary annuity involves the (re)investment of equal sums at equal intervals at an equal interest rate) (Fabozzi 2000, p.14,44):

$$P_n = A\left[\frac{(1+r)^n - 1}{r}\right], \quad (5)$$

where:

P_n = interest on interest, A = amount of the annuity, r = rate of return, n = number of years to maturity.

The reason we are using this equation is that we are reinvesting fixed periodical coupon payments at a fixed rate of return. The future value can then be calculated using the expected reinvestment rate of return. The data calculated from these equations are summarized in Table 12 and 13. The key financial driver for stress testing is the

Liabilities	Value (t)	Return (in %)	Value (t + 1)
Technical provisions	6,500,000.00	–	2,506,347.94
Guaranteed return earned	11,700,000.00	2.80%	15,158,000.00
Net premiums received	111,800,000.00	2.80%	111,800,000.00
Management fee	0.00	1.20%	1,566,183.19
Total	130,000,000.00	0.79%	131,030,531.13
Guaranteed Value of the Fund	123,500,000.00	2.80%	126,958,000.00

Table 14: Impact of an upward shift of the yield curve on pension liabilities (in EUR)
Source: own calculations

Date of issue	Maturity date	Coupon	Value (in EUR)	Duration	Modified duration
1 Jan 2012	1 Jan 2041	3.50%	130,000,000.00	18.67	18.04

Table 15: Basic data on selected government bond
Source: own calculations

minimum guaranteed return that affects both sides of a pension fund's balance sheet.

The rise of interest rates would increase the required yield of our debt securities by 100 basis points. Each group of investments can be considered a single debt security with a fixed (average) coupon and annual or semiannual coupon payments.

The parallel shift in the yield curve has no effect on coupon payments (as coupons are fixed), but it does alter the returns from interest on interest. The coupons from corporate bonds maturing after the first 6 months (semi-annually) have already been reinvested at a higher reinvestment rate. The coupons from government bonds that mature at the end of the year (annually) have not yet been reinvested. Because the required yield has increased, the market value of all debt securities has decreased. If the modified duration of a pension fund's assets was perfectly matched to the modified duration of a pension fund's liabilities, the change in interest on interest would be offset by the change in price. Because this is not the case, the reinvestment risk and interest rate risk are not perfectly hedged. The pension fund's total annual return is therefore only 1,030,531.13 EUR or 0.79%.

The minimum guaranteed return was calculated as the average yield to maturity of all Slovenian government bonds, with a term to maturity of 1 year or more. As the average yield to maturity of government bonds increases, the minimum guaranteed return increases. However, because the guaranteed return is calculated every 6 months (and remains fixed for the following 6 months), it will only affect the required rate of return on the pension fund's liabilities in the second half of the year. On an annual level, the minimum guaranteed return will therefore increase only by half, i.e. 50 basis points to 2.80%. The new guaranteed value of the fund would be 126,958,000.00 EUR**.**

Thus higher guaranteed return must be added on top of the pension fund's guaranteed value. Since the actual return is below the minimum guaranteed return, the difference must be covered by technical provisions. The management fee will also be deducted from technical provisions. Their total reduction is almost 4 million EUR. If we were testing the impact of a stock market decline, the reduction of technical provisions would be the same as a -31.24% decline in stock prices and a -23.43% decline in mutual funds. Because debt securities represent most of the pension fund's portfolio, interest rate risk has the largest effect on the capitalization of the pension fund. Interest rate risk can be managed with the more accurate (modified) duration matching of assets and liabilities. It is also possible to hedge interest rate risk using the amortized cost valuation method.

For the selected pension fund it has been estimated that the average duration of liabilities is 18.68 years. In order to determine the liabilities' sensitivity to changes in the general level of interest rates, the modified duration of liabilities also has to be calculated. The pension fund manager has to attribute at least the minimum guaranteed return of 2.30% to liabilities every year. At the same time, the actual return must also suffice to cover the management fee of 1.20%. The required return on liabilities thus amounts to a total of 3.50%. Based on these data, the following can be calculated:

New return	Coupon payments	Interest on interes	Market value	Sum	The difference
2.00 %	84,994,000	16,836,997.45	151,099,000.00	252,929,997.45	5,741,028.27
2.50 %	84,994,000	21,670,377.66	144,781,000.00	251,445,377.66	4,256,408.47
3.00 %	84,994,000	26,784,053.72	138,775,000.00	250,553,053.72	3,364,084.53
3.50 %	84,994,000	32,194,969.18	130,000,000.00	247,188,969.18	0.00
4.00 %	84,994,000	37,921,080.57	127,660,000.00	250,575,080.57	3,386,111.39
4.50 %	84,994,000	43,981,415.71	122,525,000.00	251,500,415.71	4,311,446.53
5.00 %	84,994,000	50,396,135.26	117,637,000.00	253,027,135.26	5,838,166.08

Table 16: Total return of bond at various levels of required return (in EUR)

Source: own calculations

future value of liabilities = 130,000,000.00 * (1 + 3.50 %)$^{18.68}$ = 247,188,969.18 EUR

$$\text{modified duration of liabilities} = \frac{18.68}{(1+3.50\%)} = 18.05$$

The estimated modified duration of liabilities thus equals 18.05. If the manager seeks to eliminate interest-rate risk and reinvestment risk at the same time, he or she has to invest the pension fund's assets in investments whose modified duration matches the liabilities. In this case, the manager could purchase a government bond with a maturity of 29 years and a 3.50% coupon rate. The modified duration of this bond equals 18.04, which almost completely matches the liabilities.

The bond will be held for 18.68 years, which corresponds to the duration of our liabilities, and will then be sold at the market price valid at that time. In addition to interest payments, the total return of the bond is thus also affected by changes in the market price (interest-rate risk) and the return generated from the reinvestment of the interest payments already received (reinvestment risk). The estimate takes into account the presumption that the required return changes immediately after the purchase of the government bond and remains the same until it is sold. In addition, it is also presumed that the yield curve is flat and that it shifts upward or downward evenly for all maturities when the required return changes.

The table shows that if the required return remains unchanged (i.e., 3.50%), the manager will generate a total return of EUR 247,188,969.18 from the bond, which is exactly the same as the estimated sum of future liabilities. Any change in the general level of interest rates does not affect the amount of coupon payments; however, interest on interest does change. If the required return is reduced, the manager will have to reinvest the interest already paid in new investments at the new, lower rate of return. At the same time, due to the lower required return the manager will be able to sell the bond at a higher market price. The generated capital profit more than covers the loss of interest. The opposite applies when the interest rate increases. Due to reinvesting paid-out interest in more profitable investments, the income from interest on interest increases. However, with higher required return the bond has to be sold below its nominal value. Nonetheless, the additional income from interest more than covers the capital loss generated by selling the bond.

4. Discussion and Recommendations

To sum up, a great advantage of this strategy is that a change in the general level of interest rates never has a negative impact on the pension fund return. In fact, if the required return is changed significantly in either the positive or negative direction, the manager can generate a greater surplus of the actual return over the required return. The risk of a decrease in the investment market value due to an increase in the general level of interest rates (interest rate risk) and the risk of a decrease in the income from interest on interest due to a decrease in the general level of interest rates (reinvestment risk) cancel each another out. With precise matching of the duration of assets with the duration of liabilities, the actual pension fund return is never lower than the required return.

On the other hand, there are also some disadvantages to this strategy. In the long term, the actual return will never significantly exceed the required return. That is, the strategy limits the return that could be generated by investing in bonds with a duration that does not equal the duration of liabilities. In case of low interest rates, the manager can intentionally invest in short-term bonds and thus expose the pension fund to reinvestment risk. Anticipating that the interest rates will rise in the future,

the manager will be able to reinvest the matured bonds and principals in more profitable investments, and thus boost the total return of the portfolio.

A further weakness of this strategy is also the fact that it demands constant adjustment of assets and liabilities. In our case, a one-off change in the general level of interest rates was presupposed, but in real life market interest rates change constantly. Changes in the required return cause changes in the duration of the portfolio. At the same time, the closer to the maturity date, the shorter the investment durations become. Due to these two factors the portfolio has to be constantly adjusted to the pension fund's liabilities, which incurs transaction costs.

In matching the duration of assets and liabilities one should also not forget the model of estimating the minimum guaranteed return. With greater changes in the general level of interest rates, the amount of guaranteed return will also change. The manager will have to find new investments that will correspond to the changed characteristics of the liabilities. Using the estimation method, a manager in Slovenia can do this in six months time. However, if the manager does not take action, due to the mismatch he or she will expose the fund's assets to interest-rate risk or reinvestment risk with all its positive and negative consequences.

It is possible for the manager of the fund to completely eliminate currency risk by only selecting investments that are denominated in the same currency as the pension liabilities are denominated in. Other investments would then only be included if they increase portfolio diversification and decrease price risk. Because there is no guaranteed return on technical provisions, this portion of the liabilities can be matched with equity investments that have a higher price risk. As long as the actual return is below the minimum guaranteed return, the manager will be forced to reduce the fund's exposure to riskier investments. As soon as the actual return exceeds the guaranteed return, technical provisions will rise and the manager will be able to increase the share of equity investments. With an accurate (modified) duration matching of assets and liabilities, the interest rate risk and reinvestment risk can be completely offset. Short-term interest rate volatility can be hedged with the amortized cost valuation method. The manager can also use the market value valuation, adjusting the duration of investments to expected interest rate movements. If interest rates are expected to rise, the manager can shorten the average duration of the portfolio. The manager will increase reinvestment risk and reduce the price risk of the debt securities portfolio. Returns (or interest on interest) from the reinvestment of matured bonds and coupon payments will more than offset the loss of the portfolio's market value. If interest rates are expected to fall, the manager will buy bonds with a longer duration than the duration of pension liabilities. This will increase the portfolio's price risk. Because the required returns will fall, bond prices will rise. The capital gain from the increased portfolio's market value will more than offset the reduced income from interest on interest.

As the interest rates rise or fall, the minimum guaranteed return changes. The manager can avoid the risk of underperforming the guaranteed return with partial portfolio indexation, where the guaranteed return is considered a benchmark. He can invest a part of the pension fund's assets into reference government bonds, used in the minimum guaranteed return calculation. Additional returns can be made investing in bonds of similar duration and credit risk, but with a higher yield to maturity. Allocating entire net premiums received in government bonds and prime corporate bonds will significantly reduce a pension fund's credit risk exposure. More risk can be avoided by investing the guaranteed return already earned in mutual funds with a properly diversified investment policy, with no significant restrictions to an individual industry or region. Technical provisions can be matched with investments in blue chip shares of companies with sound financial statements and high market capitalization. A fund's assets should be allocated only in those investments with a high turnover ratio (shares) or a market maker (bonds). For pension plan members at the age of 55 or above, the liquidity reserve should be formed from investments in bank deposits and short-term debt securities (treasury bills, certificates of deposit, commercial paper). In this way, the liquidity risk and biometric risks will be much easier to hedge. A pension fund's assets should also be managed in such a way that they retain their purchasing power. The risk of real asset value depreciation can be hedged with investments in bonds that are linked to inflation. This will help the manager earn a real rate of return regardless of the actual inflation rate in the future. During the asset allocation process, regulative and pension plan investment restrictions should always be obeyed.

After the pension fund's manager is able to implement the proper method of risk measurement and management, additional regulative restrictions on investments are no longer needed. Moreover, governments should never impose investment

restrictions that would limit pension funds to the domestic market (i.e. restricting investments in foreign capital markets), forbid investments in shares or mutual funds or set a minimum limit of government securities. These restrictions hinder the diversification of the pension fund's assets and therefore make risk management more difficult.

5. Conclusions

Asset-driven portfolio management with the single investment goal of earning the highest return possible is not suitable for pension funds, as well as blind investment in those assets that are included in the minimum guaranteed return's calculation.

Asset-liability matching considerably eases the portfolio and risk management of a pension fund. With a selection of investments that are perfectly matched to the pension fund's liabilities, when considering duration, profitability and riskiness, it is possible to limit some of the financial risks, while others can even be hedged entirely**,** as we also intended to demonstrate in our paper, using empirical data from two Slovenian pension funds.

Using the information about plan members by age and gender and the structure of pension liabilities with the required rate of return, it is possible for the manager to determine the average duration, required rate of return and proper level of risk that would be suitable for liabilities. This information should help the manager select investments that are best fitted to the above-mentioned criteria. Once the investments are matched to liabilities by duration, return and risk are allocated, a portfolio sensitivity analysis can be run. This is actually a supplementary tool for a statistical model of a value-at-risk calculation. It helps the manager to define the risks that pose the greatest threat to a pension fund and take additional measures to protect the investments of pension plan members from financial market shocks.

We intended to demonstrate that after the manager is able to prudently handle a pension fund's assets, properly diversify, invest in liquid investments, define, measure and manage exposed risks, additional regulation restrictions on investments are no longer needed. Some restrictions can even hinder portfolio diversification and the risk management process. Therefore, governments should instead establish proper supervision over pension fund managers and keep today's active population appropriately informed about expected future pension benefits.

Endnotes

[1] The market value is the present value of future liabilities, discounted at proper interest rate. When interest rates rise, the present (or the market) value falls (Fabozzi 2000, p. 451).

[2] The consequences are the same in the case of inability to achieve the minimum guaranteed return in pension funds in Slovenia and other countries, where managers offer similar guarantees.

[3] A PBO ratio of 80% means that a pension fund has 0.80 EUR of assets available to cover 1 EUR of projected pension liabilities.

[4] In Slovenia, the process of creating and drawing provisions is explained in greater detail in the Pension and Disability Insurance Act (Uradni list Republike Slovenije 2006a, p. 11133–11134).

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Financial Services in the VAT System in the European Union and Croatia

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Abstract:

This paper presents differences in the VAT treatment of financial services. We investigated the treatment of financial services in the VAT system in EU countries as well as in Croatia, in order to reveal differences and improvement possibilities. The results show that there is a need for significant improvement in the VAT system, especially in Croatia. Furthermore, European Union countries have applied tax regulations since 1977. The research on the VAT treatment of financial services indicates that there is unequal application of tax exemptions and adverse tax competition in EU countries. Nevertheless, Croatia is still adjusting its legislation (the tax treatment of financial services) with EU provisions. Our paper thus provides a comparative analysis of the treatment of financial services in the VAT system in EU and Croatia that could be useful for the new consideration of the financial services position in the VAT system in Croatia.

Key words: financial service, VAT, tax exemption, European Union, Croatia

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1. Introduction

The Value Added Tax (VAT) is the most abundant tax form in Croatia. Since the VAT was implemented in the Croatian tax system, financial services sector has had a specific tax position. Financial intermediation formed 5,4 % of the gross domestic product of Croatia in 2007, with an expressed tendency for growth (CBS, 2010). The aim of this paper is to research the position of financial services in the VAT system in Croatia and the European Union. In the European Union there is debate about the reform and modernization of the existing tax treatment of financial services, because of legal and economic distortions in the financial industry and its users. At the same time big changes in the Croatian Law on VAT came into force on 1st January 2010, and caused significant changes in VAT impact on the financial industry. Those changes represent a big challenge for all financial services providers in Croatia. Financial services are the economic services provided by the finance industry, which encompasses a broad range of organizations that manage money, including credit unions, banks, credit card companies, insurance companies, consumer finance companies, stock brokerages, investment funds and some government sponsored enterprises.

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2. Financial Services and VAT in the European Union

The category of tax exemptions includes, among others, financial services. That fact is an issue of long debate of economic theory and tax practices. While the reasons for other exemptions in the VAT system are acceptable for the public sector, exemptions for financial services are not. Difficulty in determining the tax base is not a sufficient argument for tax exemptions. The critics' opinion is that financial services must be taxable in order to respect the principle of VAT neutrality. Economic distortion would be avoided in this way. Despite those reasons, in almost every country, financial services are not taxable. The main reasons for this are the following (Šimović *et al*, 2006, p.174):

- Inability to determine added value on the transaction level, i.e. difficulties in determining the tax base, and
- Fear of overflow of tax burden on interest rate levels.

2.1. Obsolescence of Existing Legislation and Discrepancy in Application in EU Countries

Since the 6th Directive was adopted in 1977, financial services in EU countries are excluded from VAT taxation. This means that the VAT is not calculated on the delivery of financial services, and the deliverer cannot calculate a VAT receivable deduction for inputs that are used in financial service delivery. This exemption was prescribed by article 13.B. of the same Directive. In the text there is an option for financial service taxation and each EU member state is allowed to prescribe its own limitations for that option (Sixth Council Directive 77/388/EEC, 1977). Despite this, every member state chose not to tax financial services for the abovementioned reasons.

Nonetheless, a service fee is often intertwined with other components of financial transactions and its amount is very hard to identify at the level of individual transactions.

The figure below illustrates the cash flow components by deposit-credit bank transactions.

It is very understandable why tax authorities are not disposed to tax these transactions, as today there is no efficient mechanism that can separate the value of the agential activity of the financial agent, which should be the object of taxation.

The volume of financial services is the same also in the relatively new Directive 2006/112/EC that was adopted on 1st January 2007. The Directive is especially interesting given the big changes that have occurred, as well as the financial industry's rapid development in the last thirty years. In this sense, in article 135 of the Directive 2006/112/EC the following financial services exemptions are prescribed (Council Directive 2006/112/EC):

- Approval and contracting of loans, and credit management;
- Contracting or any kind of credit guarantee trade or other securities for money, and credit guarantee management;
- Transactions, including intermediation in connection with deposit and current accounts, payments, assignments, debts, checks and other transferable instruments, but excluding collection;
- Transactions, including intermediation in connection with currency, banknotes and coins that are used as a legal payment instrument, with the

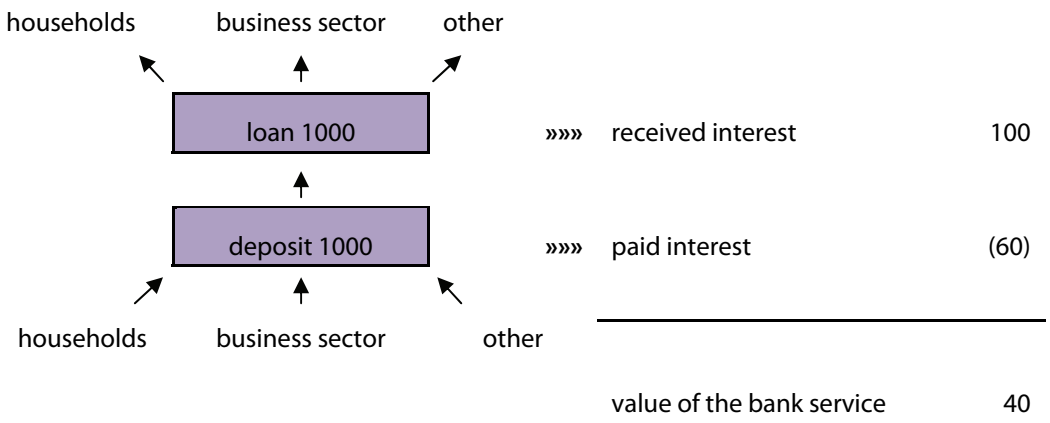

Figure 1: The value of bank services to deponents and credit users
Source: (Ernst & Young, 2009, 12)

Country	VAT calculation on factoring service/commission	VAT calculation on interest/discount
Austria	YES	NO
Belgium	YES	YES
Cyprus	YES	NO
Czech Republic	YES	NO
Denmark	YES	NO
Estonia	YES	NO
Finland	NO	NO
France	YES	YES
Greece	YES	YES
Ireland	YES	YES
Italy	NO	NO
Lithuania	YES	YES
Latvia	YES	NO
Hungary	NO	NO
Netherlands	YES	NO
Germany	YES	YES
Poland	YES	YES
Portugal	NO	NO
Romania	YES	YES
Slovakia	YES	NO
Slovenia	YES	YES
Spain	YES	NO
Sweden	YES	YES
United Kingdom	YES	NO

Table 1: VAT calculation on factoring service sin EU member countries
Source: (International Factors Group, 2008)

exemption of collection items;

Member states and financial institutions have the common problem of interpreting the definition of tax exemptions from article 135 of Directive 2006/112/EC. The abovementioned brought the implementation of various solutions into national legislations, which led to the inconsistent application of the VAT on the common market. The consequences have been different conditions for economic subjects in filing the VAT, i.e. interpretations vary by member state. Many international financial institutions when expanding their business on new markets are forced to negotiate with every member state about exemption interpretations. This represents significant costs and barriers for investments. Table 1 provides an overview of the unequal application of the VAT in EU member countries.

For tax administration there are risks of lost tax revenues, and for legal entities legal insecurity precludes long-term planning and causes segregation of significant items for the taxation problem's resolution.

2.2. Deduction and Distribution of VAT Receivables

By the Directive 2006/112/EC general conditions are prescribed that must be satisfied cumulatively in order to deduct VAT receivables from an incoming invoice (Council Directive 2006/112/EC):

- That taxpayer has an invoice for the delivered goods or services that has been issued according to the Directive;
- That there are no expenses for which there is no possibility for tax deduction such as expenses for luxury, entertainment and pleasure; and
- That obtained goods and services are used for taxable transactions purposes.

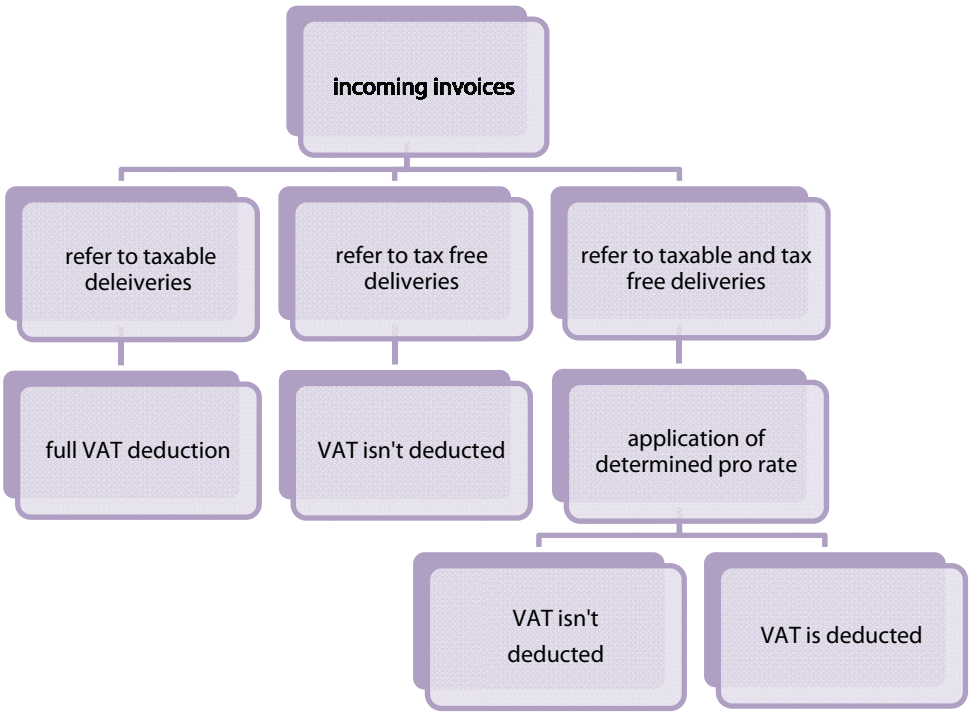

Figure 2: VAT receivables deduction by financial institutions
Source: authors

Financial institutions with headquarters in the European Union do not have the possibility to deduct VAT receivables on financial service deliveries in the European Union, but have the possibility for financial service deliveries outside the European Union.

Essentially, on the basis of relations between taxable and nontaxable deliveries of tax payers, the percentage of VAT receivable deduction for income invoices (that refer to taxable and exemption deliveries) should be calculated. There is a calculation of VAT receivable deduction precisely defined as the following fraction on an annual level (Council Directive 2006/112/EC):

Total amount (without VAT) of deliveries for which there is a right to VAT deduction
Total amount of deliveries included in numerator and deliveries for which there is no possibility for VAT deduction

From the calculation of the part of the VAT receivables that can be deducted, some value significant items that could disturb the actual condition, i.e. bring VAT receivables deductions that do not arise from actual taxable business from regular activities. Amounts that are excluded from calculation include (Council Directive 2006/112/EC):

- The amount of deliveries of capital goods that are used from taxpayers in business,
- The amount of occasional deliveries of real estate, and
- The amount of occasional financial transactions from article 135 of the Directive.

The tax that has to be deducted in the current year is calculated on the basis of transactions from the previous year, and that deduction is temporary and has to be adjusted in the final VAT calculation. According to the abovementioned, tax payers can deduct the entire amount of VAT receivables in the tax period that can be directly assigned to taxable deliveries, as well as the amount of VAT receivables calculated as a product of the VAT deduction rate and the total amount of VAT for invoices that can be assigned to taxable and tax free deliveries. The VAT that is included in incoming invoices that are connected to tax free deliveries of financial institutions cannot be deducted by the tax payer. Those rules are concisely shown in Figure 2.

In practice, incoming invoice analysis is a very demanding process. For financial institutions the process of analysis and incoming invoice registration consists of several phases. The key factor in the process is the phase of identification and incoming invoice classification in

one of the three abovementioned categories. Often it is very difficult to resolve to which outgoing delivery an incoming invoice can be assigned. The decision of the tax payer about the way incoming invoices are classified leave insecurity and possible adjudication for tax inspectors. As in the financial industry there are large systems with enormous amounts of data that demand the automatization of business processes, the legal insecurity of this field generates high administrative costs and represents a considerable criticism to the existing financial services position in the VAT system.

2.3. Economic Effects of the Existing Tax Status of Financial Services

The economic effects of the existing tax status of financial services arise first from the fact that financial institutions which deliver services and which are according to article 135 of the Directive VAT free cannot deduct VAT receivables included in incoming invoices, and that are connected to those tax free deliveries. In this way, the tax included in incoming invoices represents a cost component of financial institutions, and increase the prices of their services. A non-deductable tax is called a hidden VAT and causes the cascade effect of VAT (European Commission, 2006, p.6). An example representing the cascade effect from financial services in practice is presented here:

Accounts payables 100+20(VAT) → **Bank** 200 → **Client-entrepreneur** 400+80 VAT (480)

100+20+80(profit) 100+20+80+100(own cost)+100(profit)+80(VAT)

Table 2: Example of cascade effect by financial services
Source: (European Commission, 2006, 6)

The result of tax exemption of financial services is declared in the fact that the tax included in the incoming invoice represents the cost to the bank and is a part of the financial service price. That hidden VAT represents the cost component of the client and is a part of the product or service price. It is evident that the tax examination from the first example causes economic distortions in the cascade effect of VAT, which increases the prices of the financial industry and also the service of other users of financial services. For financial service users tax exemptions cause higher incoming costs, which have a negative impact on the prices of their products and services, i.e. their competitiveness. For financial institutions tax exemptions or the cascade effect of the VAT results in either decreased profitability or higher prices that have a negative impact on their business. Despite the fact that the non-deductable tax is included in the price of financial services for a natural person, the geniality of exemption is recognised in the fact that there is no VAT taxation (the costs of labour and profit) for banks. It can be concluded that the exemption of financial services has an impact on the higher prices of those services for business subjects and the lower prices of the same services for final users. Due to the fact that one of the basic characteristics of VAT is its regression, it can be concluded that the financial services exemption has a corrective effect (European Commission, 2006, p.20).

It is clear that the VAT can be a deciding factor in decision-making for financial institutions regarding isolating certain activities from banks. The non-deductable VAT, either partly or on the whole, nullifies all of the positive effects of isolating these activities. In fact, in certain circumstances it is possible that the initial intention of cost reduction leads to cost increases.
If we assume that the only goal of isolating activities is cost reduction, it is clear that such savings must cover the non-deductable VAT. The higher the VAT rate, the higher the amount of savings needed.

As the main goal of isolating activities is to achieve savings, the tax exemption of financial services causes the adverse effect. That is, it increases the costs of financial institutions. This is the reason why providers of financial services often resort to vertical activity integrations (self-supply) (European Commission, 2007, p.20). Financial institutions become inclined to ensure deliveries of certain taxable services inside the company (for example IT services, data processing) rather than use services from external suppliers that generate the problem of a non-deductable tax. Because of the tax benefit of internalization, financial institutions are stimulated to choose sub-optimal business models which have negative impacts on the sector competitiveness of financial services in the European Union (European Commission, 2007, p.20).

This also does not lead to the positive development of competition in the field of financial services. In fact, smaller financial institutions do not have the financial capacities to ensure all of the activities can be done internally and are forced to use services from suppliers. As mentioned in the model weighted with non-deductable VAT, this generates additional significant difficulties in market competition with bigger and financial forceful financial institutions. It is important to mention that in the context of economic distortion measurement, differences in VAT rates in the member states have a significant role in EU member states. This results in the preferential status of financial institutions in countries with lower standard VAT rates (PricewaterhouseCoopers, 2006, p.13). As those differences are significant there is the problem of the disloyal competition of financial services providers in the EU.

The following table shows the impact of different tax rates in two EU member states on financial institution competitiveness.

	Tax free deliveries	
Incoming expenses	**Cyprus**	**Sweden**
Total incoming expenses (without VAT)	10.000	10.000
Total labour costs	1.000	1.000
Total costs of taxable inputs	9.000	9.000
VAT rate	15%	25%
VAT by incoming costs	1.350	2.250
Total incoming costs	11.350	12.250
Case 1. VAT included in selling price	**Cyprus**	**Sweden**
Total revenues (without VAT)	13.350	14.250
Income before taxes	2.000	2.000
Case 2. VAT included in margin	**Cyprus**	**Sweden**
Total revenues (without VAT)	12.000	12.000
Income before taxes	650	(250)

Table 3: The impact of different tax rates in EU members on financial institution competitiveness
Source: authors

By international transactions, this impact of VAT rates could bring significant comparative advantages to financial services providers from countries with lower tax rates (PriceWaterhouseCoopers, 2006, str.13). Of course, that is just an example that does not take into account other factors which have impacts on the competitiveness of financial institutions in European Union, but is more than sufficient to confirm the consequences of non-harmonized tax rates in EU member countries. Except differences in tax rates, there is also the impact of differences in national legislations and the possibility that one country provides for financial institutions in optimizing its status. Although difficulties in connection with the VAT do not have the most dominant impact on their business decisions, it seems that the role of tax-mitigating circumstances is not negligible. That is visible from the year-long financial institution struggle in order to convince the national authorities and European Commission of the necessity of solving VAT problems for the financial services sector. The reaction of member countries goes in two directions (European Commission, 2006, p.8):

- Exclusively focusing on tax collection, where the member country gives priority to budgetary concerns and estimates a low risk of financial sector mobility; or
- Prevailing macroeconomic interest in attracting or maintaining key industries that are the most significant for certain member states, and where factor costs are high and/or risk of industry mobility exceeds budget interests.

According to the research of *PriceWaterhouseCoppers* from 2006, financial institutions in the European Union consider the differences in tax treatment of financial services to represent the source of competitive advantages for financial institutions that have headquarters in countries with optimal tax regimes for financial services. Those countries are the United Kingdom, Luxembourg, Ireland and Belgium (PriceWaterhouseCoopers, 2006, p.17). Despite the long harmonization process of the VAT system in the European Union, significant differences have arisen in the first way from possibilities that are allowed by the Directives to member states, namely from the interpretation and implementation of the Directives and the solutions that are applied in practice.

Concerning the possibilities for tax exemption by cost distribution, the difference between what is legally allowed and what is practically achievable is especially interesting. This situation refers to the part of new member countries that have introduced provisions into national legislations but without directions. Legal insecurity due to numerous obscurities in this field is still present.

On the global level the VAT regime in the European Union has a significant impact on the international competitiveness of the financial institutions of the European Union. The absence of taxes or favorable tax treatment of financial services undoubtedly can provide significant price advantages for financial institutions with headquarters outside the European Union. Due to the existing treatment of financial services, banks with headquarters in the European Union are motivated to do their business outside the European Union. It is common practice for the largest financial institutions of the European Union to establish subsidiaries in countries outside the European Union.

2.4. Reform and Modernization of the Financial Services Tax System

When in 1977 by the Sixth Directive tax exemption for financial services was presented, it was considered a transitional solution. That belief prevailed because of the disadvantages of tax exemption (without VAT receivables deduction), which is not appropriate for proclaimed VAT neutrality (European Commission, 2007, p.7). Non-deductable VAT and the resulting cascade effect with all of its economic distortions was considered unacceptable. The European Commission aimed for the development of a full taxation model of financial services in order to remove the distortions caused by tax exemptions. But despite its wishes, just twenty years ago it started to audit the tax treatment of financial services. As the only method that has shown potential as a starting point in the direction of the abovementioned auditing, the possibility of full taxation of financial services was proposed through a cash-flow mechanism (De la Feria *et al*, 2009).

This would mean that transactions by which the fee is hidden in the margins of all cash inflows to banks are treated as taxable deliveries that are taxed by a general tax rate, and that all cash flow outflows are treated as inputs, with the right to VAT deduction. However, this method showed certain disadvantages. This method would involve calculating and paying large amounts of taxes and VAT receivable deductions in different periods which would not be good for the liquidity of business subjects and national budgets (European Commission, 1996, p.95). It is unacceptable that business subjects have to calculate and pay VAT, which makes its need for financing additionally weighted. This could be an especially difficult burden for smaller financial institutions with smaller financial capacities. Serious problems could arise in the case of changes to the tax legislation.

In order to remove these disadvantages of the cash flow method, the tax experts Satya Poddar and Morley English proposed in 1997 the modification of the original cash flow method by using special accounts for tax calculation (*tax calculation account method),* (De la Feria *et al,* 2009, p.26). The essence of the TCA method is in fact that the transfer of capital funds from banks to users, as well as capital refunds, are not taxable.

The taxable issue is the part of the calculated interest rate which represents the implicit fee for the service, while the so-called clean or normal interest as a part of total interest does not fall under taxation (European Commission, Taxation and Customs Union, 1996, p.105). The tax authorities should determine the level of the clean interest rate, and for that purpose there is an interest rate on government bonds or interest rate by which the government is indebted. By defining the clean interest rate, the tax authorities directly determine which part of the bank fee represents the fee for financial services which is taxable. Also, by the TCA method, the risk of tax legislation change is decreased. There are some disadvantages in connection with the complicated calculation of the tax obligation with respect to the cash flow method. Defining a clean interest rate is also a problem, because any interest rate that is too high leads to the enhanced taxation of savings and decreased credit taxation, with a distortion effect on the financial activities of economic subjects (European Commission, Taxation and Customs Union, 1996, p.105). It was proved that the TCA method can be applied to all financial services, including the most complex, such as derivatives, and that it does not cause a cascade tax effect. Despite the abovementioned conclusions, the proposal was reflected in the Fiscalis seminar in 2004. The concept of full taxation of financial services was abandoned by the Commission (European Commission, 2007, p.9). It seems that the administrative complexity of this method was the insuperable barrier to the eventual application of financial services taxation. It should be mentioned that no country outside the European Union had a simple and appropriate method for financial services taxation. All of the leading states in the world (except the United States) apply value added tax and have a common question regarding financial services taxation. Usually, countries have exemptions on most financial services deliveries whilst implementing certain mechanisms for the "struggle," with the most significant disadvantages of

that exemption, especially in the field of negative impacts on international competitiveness. In spite of the adjudication issue, there is broad professional consensus that the exemption of financial services is the only realizable solution (European Commission, 2007, p.9).

3. Financial Services and the VAT in Croatia

In almost all of the countries which apply the VAT, including EU member countries, financial services are usually exempted from VAT taxation. The Croatian system of VAT applies tax exemptions on financial services deliveries, but in a different way. The specific tax treatment of financial services in the Croatian system of VAT lasted from 1 January 1998 to 31 December 2009.

3.1. Status of Financial Services in the VAT System Before 1st January 2010

The Croatian approach to the tax exemption of financial services was presented in June 1995 when Croatian parliament passed the Law on VAT, by which the aforementioned tax was introduced into the Croatian tax system. Bank services, savings banks services, insurance and reinsurance companies' services were exempt from the VAT. That exemption was extended to the Croatian national bank and the exemption is conditioned just for those institutions whose business is arranged by special regulation (Official Gazette, 1996, 60/96; Official Gazette, 1995, 47/95). If financial services are made by entrepreneurs that are not a bank, savings bank or insurance and reinsurance company, they are taxable. The essence of institutional exemption is the provision of financial services and not the character of the financial service. The consequence of these regulations is that the identical service is sometimes taxed and sometimes not. For example, the advisory service that was provided by a "regular" non-banking company is taxable; when it was provided by a bank, it is exempt. In the next table the impact of institutional exemptions on market competition is shown. This example shows the impact of VAT receivables as the target profit level is identical for both suppliers (the VAT rate was increased in Croatia from 23% to 25% on 1st March 2012).

cost of delivery receiver	**service supplier**	
	Bank	**"regular" company**
end user	100	125 (VAT in price)
business subjects	100	100+(25)
non-residents	100	100

Table 4: The impact of institutional exemption on market competition and "regular" business subjects
Source: authors

As one can see, the bank achieves a significant competitive advantage ahead of the regular company. The end user cannot deduct the tax which increases the price of the received service by 23% in comparison with the identical delivery from the bank. In order to be competitive with institutionally exempted companies, other companies can decide to decrease their own profitability for that tax burden. In both ways it is evident that institutional exemption puts financial institutions in a preferential tax situation.

When it is about deliveries to business subjects, the VAT is neutral for entrepreneurs and delivery receivers due to fact that they can deduct VAT receivables. In spite of this, there is an additional financial burden for entrepreneurs that has impacts on liquidity. This is the reason why entrepreneurs are liable to identical bank deliveries. However, in this situation the issue of VAT receivables that can change the affinity of a business subject-service receiver should be mentioned.

we consider deliveries to non-residents it is evident that the bank and regular company as service suppliers are in the same situation. The delivery from the bank is not a taxable issue, no matter who is on the side of the service receiver. On the other hand, the service delivery of a regular company to non-residents in most cases is not taxable. That means that the abovementioned service will be taxed in the country of the service receiver, which is a foreign business subject – the receiver has to apply the reverse charge mechanism of taxation and calculate the VAT on the received service, no matter by whom the service was provided.

All of the abovementioned can be applied in the case of interest rate, although with some additional specifications. In fact, the interest as a fee for financing was taxable till 31 December 2009. The tax base consisted of interest and if it was lower than 6%, the tax basis was the interest of 6% annually. From January 2006 that percentage was decreased to 4%.

Interest taxation depends on the tax status of the person that charges the interest, i.e., if interest is charged by the tax payer, it will be taxable, and vice versa. The exception to this rule exists in the case of financial funds investments in banks and savings banks for tax payers. In this case the interest is not taxable, and regards a logical exception for interest on the deposits of tax payers.

As a consequence of the prescribed institutional exemption, banks and savings banks have not been considered a permanent tax payer and were not recorded in the register of tax payers, meaning that the abovementioned institutions did not have the possibility to deduct VAT receivables.

There are significant distortions caused by institutional exemptions in practice. One of the key principles of the VAT is that the same service has to be taxed in the same way. Based upon the abovement problems, the neutrality of VAT is degraded.

3.2. Status of Financial Services in the VAT System after 1st January 2010

Possibly the most important novelty that arose from the new Law on VAT regards the cancellation of institutional exemptions of financial services. In accordance with Directive 2006/112/EC functional exemptions of financial services were introduced into the Croatian tax system. That means that for tax exemption the character of the financial service is important.

The following are exempt from VAT payment (Official Gazette, 2009, 87/09):

- loan approval,
- contracting of credit guarantees,
- transactions in connection with current accounts, savings accounts, shares, etc.,
- investment fund management.

3.3. Problems in Implementation of the VAT on Financial Services and Possible Solutions towards Greater Legal Safety and Efficiency For Entrepreneurs

Due to institutional exemption there was no need for considering financial services. The lack of clarity of the regulations and the absence of practical experience represented additional burdens to financial institutions and other providers of financial services by implementing the functional exemption of financial services. Two main problems in the process should be isolated:

1. determining the correct tax status of financial services, and
2. the question of VAT deduction.

When we talk about possible solutions in order to improve the existing position of financial services in Croatia, the key role and responsibility in this process should be transferred to the tax authorities. Without a changed approach from the tax authorities, neither improvement is possible. The approach should include a more active role by tax authorities in finding solutions to help business subjects.

As possible solutions in order to ensure a higher level of legal security and efficiency for suppliers of financial services but also for tax administration the following measures were proposed (Šalata, 2011, p.155):

- Adopting new regulation or procedures that will define tax exemptions for financial services in detail,
- Allow abjuration of the right to deduct VAT receivables without legal penalty,
- Enable the right to deduct VAT receivables for financial services provided in foreign countries,
- Introduce arrangements for cost distribution,
- Extend the option for taxation, and
- Enable the creation of VAT classes.

The creation of one collective document that will define the application of tax exemptions is a logical solution towards the increased legal security of financial services providers. Such a document would significantly contribute to cost reduction. All parties should be involved in its creation, and they should investigate the economic essence of financial transactions and analyze foreign practices and solutions.

Providers of financial services should be allowed to give up the right to VAT receivables deduction. Smaller financial institutions are affected by the current solution because they are forced on additional administrative costs which exceed the financial effects of VAT receivables deduction. The expected positive effects on government revenues should encourage tax authorities to support this measure.

In order for there to be an equal position for Croatian providers of financial services with European competitors there should be the ability for Croatian subjects to deduct VAT receivables for financial services that are provided in foreign countries. Through this, the competitiveness of Croatian providers on the global financial market would

be increased. The expected negative impact on the national budget would be replaced by increased engagement of Croatian subjects in foreign countries.

The current regulations about taxation possibilities are very tight and have too many restrictions. Introducing taxation possibilities on the basis of certain transactions will help providers to optimize their right for VAT receivables deduction and the cascade tax effect would be minimized. The main positive effect would be an increased base for direct taxes calculation.

All of the abovementioned measures towards increased legal security and efficiency for entrepreneurs are not exclusively geared toward the Croatian financial industry. Most of the measures have already been incorporated into the national tax systems of many EU member countries, and are foreseen as a part of the tax treatment of financial services reform. By adopting these measures Croatia would enter the group of countries with a stimulatory legal framework for the provision of financial services, and one that manages and develops actively its most abundant tax source.

4. Conclusions

Regulations on the taxation of financial services in the European Union date from 1977. Aside from the fact that the rules are obsolete and cannot follow the development of the financial industry, their problems include numerous obscurities. These resulted in the unequal application of exemptions and damaging tax competitiveness in EU member countries. Distortion of VAT neutrality through the application of the tax exemptions of financial services brought numerous negative economic effects. In 2007 Directive COM/2007/47 was issued which introduced measures for reaching goals and explaining tax exemptions. Despite certain critics, the proposed measures represent an improvement with respect to the existing solutions.

With regard to Croatia, general consideration of the VAT system regarding financial services shows that it is unsatisfactory. An initially good VAT system has continuously deteriorated, instead of being upgraded with solutions that would follow the practical needs of tax payers and simplify its application.

Since the VAT was introduced in the Croatian tax system the financial services sector has had special tax treatment. Despite all of the negative characteristics of the institutional exemptions of financial services, after twelve years of application the exemption of financial services under a functional principle was introduced.

It is practically inexplicable why at a point when the European Union is proposing new regulations towards the modernization of existing financial services tax treatment, Croatia has adjusted its legislation with provisions from 1977. Instead, Croatia could learn from foreign experiences and past mistakes.

In the forthcoming period, and especially when Croatia enters the European Union, it is expected that further development of the financial industry and an increase in its portion of the Croatian GDP will occur. Within its region, the Croatian financial sector is considered the most developed. In today's technologically developed and highly globalised world, the financial industry is extraordinary mobile, and under the pressure of cost efficiency it demands continuously the most optimal destinations for its activities.

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Competitive Location Assessment – the MCI Approach

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Abstract:

In this paper, we have investigated the list of determinants that influence customers to create a short-term preference to a particular store. A survey among 240 households in Sarajevo was conducted in order to reveal their preferences. The results of the MCI model have identified several main stores' characteristics which have a key influence on customers' patronage decisions. The findings also suggest that customers, in making their patronage decisions, and hence making their preferences to a particular store, choose among a limited list of alternatives, which implies that competition among outlets is more space limited than had been expected.

Keywords: Store choice behaviour, retail gravity model, revealed preference

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1. Introduction

The most important decision, which to a great extent determines the success of any retail outlet, is the choice of its location. In order to achieve the best possible capture of customers from the location we choose, our choice should be led by our knowledge about the store choice behaviour of customers in the trade area of our new outlet.

Since Hotelling (1929) and Christaller (1933), economists have tried to derive the optimal number, size and placing of retail outlets by assuming that utility maximising individuals will shop at the closest store and tend to minimise the costs of shopping. Yet every day we observe that customers travel to very distant sites to shop just because of its particular features that differentiate it from other stores, so we may assume that an individual's utility is affected by the characteristics of the store where they shop.

The main aim of this analysis is to identify the main determinants of store choice behaviour that cause these observed deviations from the predictions of simple models, with empirical evidence obtained by research about the store choice behaviour of hypermarket customers in Sarajevo, Bosnia. The survey amongst 240 households is conducted in Sarajevo, one of the fastest growing markets in transition and one of the least concentrated retail markets, which raises its attractiveness for the entrance of new international chains.

The model employed for this purpose is the Retail Gravity Model, augmented by the inclusion of the MCI coefficient. The model incorporates both the attraction influences of stores' attributes and the deterring influence of the distance between store and customer on the customer's store choice behaviour, and the interaction of these two influences to estimate the probability of patronisation of particular stores by customers from particular areas.

Since this analysis of the determinants of hypermarket store choice was conducted for the first time in Sarajevo,

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we assumed that the results of this analysis could be very interesting for decision-makers in those companies.

The remainder of this paper is divided into four sections. In the next section, the evolution of both location theories and store choice models is presented, with particular emphasis on evaluation of modern theoretical developments and empirical work. In section three, we present the methodology, description of data collected through a survey and the main empirical findings of this work. Finally, section four gives conclusions and managerial implications based on the empirical evidence presented in section four, along with some limitations of the study and directions for further research.

2. Literature Review

2.1. Location theory

Competitive location literature is concerned with analysis of the optimal location of stores within either discrete or continuous space.

The first of these theories, developed by Haig (1927; cited in Brown, 2001), is bid rent theory. Assuming easy travelling in any direction, a free property market and perfectly informed and profit-maximising buyers and sellers, this theory predicts that different activities on the demand side of the land property market are aware of advantages which central location offers, and therefore bid for it by means of the rent they are willing to bear. Such competition for inelastic land supply will, in the long run, result in a situation where all central urban sites will be occupied by the most competitive activities and thus put land to "its highest and best use"[1]. This theory does not have much applicative value and has many critics, because of its strong assumptions and ahistoric nature.

The second well-known theory is named after its author, Howard Hotelling. In short, Hotelling's theory assumes uniform distribution of buying power along a segment and "patronising closest store" consumer behaviour. On the basis of these assumptions, he derives the optimal location for two facilities (ice cream vendors along a beach strip). When there is no competition, all customers patronise one facility. But after introduction of another facility, customers patronise the closer one, which introduces a breaking point and splits the segment into two sub-segments, where the segment left of the breaking point patronises the facility placed to the left, and vice versa. In order to capture as much of the rival's customers as possible, the best move for the left facility is to change its location and move to the left beside the facility placed on the right side. Subsequent actions and reactions by rivals will continue up to a Nash equilibrium situation, where all competing facilities will be located at the centre of the area, clustered around the breaking point, and none will any have incentive to change its location.

The third theory, and the one which is of the most interest to us, is spatial interaction theory (Reilly, 1929; cited in Drezner, 1994b). Reilly's "Law of Retail Gravitation", based on the Newtonian law of planetary attraction, takes into consideration not only distance but also the attractiveness of a particular site. This theory also predicts that there will be a break point where the customer will be indifferent between two stores. Initially developed for the determination of flows of customers between two cities, this law was soon applied to different issues, such as international trade, immigration flows, tourism, etc.

Introduction of the store's attractiveness, besides distance, as a determinant of consumer choice, where these two determinants influence such decisions in opposite directions, may be considered the main achievement of this theory.

This theory is further developed by Huff (1964; cited in Drezner, 1994b) and Nakanishi and Cooper (1974), who introduce a probabilistic approach to this rather deterministic theory, offering techniques for empirical analysis of a customer's store choice behaviour in their application to operational issues that retailers face, such as determination of capture area, choice of the best location for new outlets, analysis of the efficiency of current marketing program, and so forth.

Finally, another location theory is central place theory (Christaller, 1933; cited in Brown, 2001). Central place theory is based on strong assumptions such as a uniform distribution of identical, perfectly informed customers served by sellers who sell at f.o.b. prices, subject to free entry and equivalent costs and behaving in a competitive, profit-maximizing manner. Furthermore, they assume uniformly priced and equally easy - in all directions - travelling. Fulfilment of these assumptions predicts 'closest store' patronising behaviour of customers in the case of single-purpose shopping.

[1] Brown, 2001

2.2. Store choice literature

Customer store choice behaviour is concerned with the choice of a particular outlet to shop at, out of all possible alternatives.

We shall classify all store choice models into three broad groups (Colome and Serra, 2003). Within the first group of models are those models that use a descriptive – deterministic approach; the other two groups, revealed preference models and direct utility models, use a stochastic approach.

Descriptive – deterministic models use observations or normative assumptions in order to determine consumer behaviour. The three most important models of this group are analogue modelling, the normative theory approach and Reilly's law of retail gravitation.

Revealed preference models rely upon information revealed by consumers' past behaviour to make predictions about consumers' possible future store choice behaviour. This group of models can further be divided into three sub-groups: spatial interaction models; discrete choice logit models; and dynamic spatial models.

Each of these models relies upon Luce's axiom regarding the probability of patronage as a function of consumers' utility received from patronage. This axiom states that the probability of patronage of any particular store may be expressed as ratio between the utility for the customer in patronising that store and the sum of utilities of patronising all alternatives.

Spatial interaction models are based on Reilly's law of retail gravitation. Huff (1963; cited in MacKenzie, 1989) was the first to develop a probabilistic formula for the determination of consumer patronage behaviour by introducing Luce's axiom to Reilly's original formula. Since utility, according to Reilly, is positively related to size of store and negatively related to distance between customer and store, this means that the probability that a customer will patronise a particular store may be expressed by the following formula:

$$p_{ij} = \frac{U_{ij}}{\sum_j U_{ij}} = \frac{\frac{S_j \beta_1}{d_{ij} \beta_2}}{\sum_j \frac{S_j \beta_1}{d_{ij} \beta_2}}$$

where:

p_{ij} – probability that consumer from zone i will patronise store j,

U_{ij} – utility for customer i from shopping at store j,

S_j – size of store j,

d_{ij} – distance between costumer i and store j,

β_1 and β_2 - sensitivity parameters that have to be estimated

In order to overcome the "single attribute" problem in explaining a store's attractiveness in Huff's formula, Nakanishi and Cooper (1974) introduced the multiplicative competitive interaction (MCI) coefficient[2] into this formula, which allows for more than one variable in explaining the attractiveness of the store. Their model looks as follows:

$$p_{ij} = \frac{U_{ij}}{\sum_j U_{ij}} = \frac{\frac{\prod_k A_{kj} \beta_{k1}}{d_{ij} \beta_2}}{\sum_j \frac{\prod_k A_{kj} \beta_{k1}}{d_{ij} \beta_2}}$$

where:

A_{kj} – vector of k attractiveness variables of store j; k = 1, 2, … l

β_{kj} – vector of k coefficients on attractiveness variables of store j; k = 1, 2, … l

Calibration of such a model can be done by OLS, after logarithmic transformation and then dividing each variable by its geometric mean (Nakanishi and Cooper, 1974). Thus, the final version of their model, with k variables for stores' attractiveness, is as follows:

$$\ln \frac{p_{ij}}{\widetilde{p}_{ij}} = \beta_o + \beta_1 \sum_k \frac{A_{kj}}{\widetilde{A}_{kj}} - \beta_2 \frac{di_j}{\widetilde{d}_{ij}} + u_{ij}$$

where:

$\widetilde{p}_{ij}$ - geometric mean of variable p_{ij}

$\widetilde{A}_{kj}$ – $(\Pi A_{kj})^{1/m}$ – geometric mean of variable A_{kj}, k = 1, 2, … m

d_{ij} – $(\Pi d_{ij})^{1/m}$ – geometric mean of variable d_{ij}

The possibility of estimating this model by OLS further contributed to its attractiveness for application in retail business decision-making processes and for its wider use relative to models based on information integration or conjoint techniques.

Discrete – choice logit models use techniques such as logit, multinomial logit, and nested logit to derive probabilities for customers' patronisation. Huff's model can be considered a particular case of discrete choice

[2] This coefficient is a vector of variables capturing the store's attractiveness.

models known as multinomial models, developed by McFadden (1974).

The problem with both Huff's and McFadden's model is satisfaction of the so-called 'independence of irrelevant alternatives' property. This means that models do not take into account the change of probabilities of patronising existing stores caused by the entrance of a new store. Under this property, introduction of a new outlet will increase the denominator of these models, and therefore decrease the probability of patronising any other alternative in equal proportions, which is not supported by the existing empirical evidence.

Finally, dynamic spatial models are recent developments concerned with the analysis of retail market area evolution and open new directions to analysis of spatial phenomena. The main representative of this group of models is Allaway's Spatial Diffusion Model, based on diffusion theory.

The main shortcoming of revealed preference models is the context–dependence of their approach. For example, if stores' characteristics are very similar amongst all of the analysed stores, it will cause the regression analysis results to show statistical insignificance for that variable. This does not necessarily mean that it is unimportant to customers, but only that they choose other attributes to discriminate among stores, since that particular attribute does not give them scope for discrimination. Therefore, conclusions drawn from the results of these models cannot be simply applied to other trade areas.

The third group of models, and the second to use a stochastic approach, is the group of direct utility assessment models. These models use information integration (Louviere and Gaeth, 1987), conjoint (Popkowski and Timmermans, 2001) or logit techniques (Drezner et al., 1998) to estimate the consumers' utility function. It is made by obtaining data on consumers' estimating market shares for new, innovative retail formats, when there is no possibility to obtain past data. The most important representative of these models is one developed by Ghosh and Craig (1983), based on game theory.

The vast majority of methods presented here are intuitively very simple and have been broadly used for empirical analysis of retail trade attraction. Yet a paper by Clarkson et al. (1996), which provides empirical analysis of the usage of particular location techniques amongst major retailers in the UK, reveals that revealed preference models are predominant.

According to the above discussion, and taking into account the characteristics of Sarajevo trade area and the availability of data, it has been decided that the Retail Gravity Model with the MCI coefficient is the most appropriate model for the purpose of analysing consumer store choice behaviour. The model is based on the revealed-preference approach to the analysis of choice behaviour. The survey will be used to reveal past customers' patronage behaviour.

Hypotheses

The original Reilly's Law of Retail Gravitation states, in brief, that the probability of patronising store *j* by a customer *i* is positively correlated with the size (or attractiveness) of the store and negatively related to the squared distance between customer *i* and store *j*, based upon Newton's formula[3]. The main purpose of the analysis is to identify the main attractiveness attribute that customers use for the evaluation of alternative sites.

H_0 - 1: Customers evaluate stores on the basis of a range of store attributes

Another issue we wished to address in this analysis was customers' driving patterns, and for that reason we have chosen Sarajevo as a particularly adequate trade area for such analysis. An explanation follows. Sarajevo city is oval shaped, placed in the narrow valley of the Miljacka river. If we would like to put two equal sized circles within such an oval, the first group of hypermarkets would be concentrated roughly in the middle of one circle, and other group within the other circle. Within each of these groups of stores, there are differences between them that allow different customers to choose the one they like. If travel patterns would show that customers are mainly shopping within the one half of the city where they live, it would suggest that customers are reluctant to travel beyond the area where they already have a sufficient variety of stores. Hence we may define an additional hypothesis that we would like to test, which may be expressed as follows:

[3] According to the Newton's formula, coefficient on size is set to be 1, and coefficient on distance is set to be 2. Before Nakanishi and Cooper's (1974) solution for transformation of the gravity model into linear form, these values for coefficients were widely defined a priori, in order to avoid cumbersome non-linear regression analysis.

H_0 - 2: In their store choice decision-making process, customers evaluate alternative sites up to a certain "reservation distance".

We planned to test this by defining the breaking point between the two clusters of stores. The break point for the purpose of our analysis may be regarded as the limit up to which customers evaluate alternative stores at all, which is explained through the notion of "reservation distance" (Ghosh and Craig, 1991). The first cluster consists of four stores located in the eastern to central part of the city, and the other cluster consists of four stores located in the western part of the city[4]. Then, we planned to compare the number of customers who shop at one of the stores placed in their 'zone of origin' with the number of customers who shop at stores in the other zone. If the majority of customers (more than 50 %) shop at stores not from their zone, it would suggest a rejection of the hypothesis.

3. Empirical Analysis of Store Choice Behaviour

For the purpose of testing the hypotheses set forth in the previous chapter, and the completion of the task to identify the main variables of customer behaviour, a regression analysis of data collected by interviewing customers in Sarajevo was conducted. The model is based on the revealed-preference approach to the analysis of choice behaviour. The data are cross-section data for the period June – July 2005. The dependent variable in this model is the probability of patronage of store j by customers living in area i. Patronage is defined as the patronage of the "main store", preferred over the other alternatives. According to Rhee and Bell (2002, p.227), "the main store is defined as the store that receives the greatest allocation of consumer expenditures in the associated interval". The allocation of customers to the particular store he or she prefers was done on the basis of customers' answers to questions on the number of shopping trips to all of the stores together and the number of trips to particular stores in a given month. Customers' estimations of the importance they give to some store characteristics in their decision-making process and of their individual characteristics were used as regressors. The regression analysis was then run according to the MCI model in order to estimate the relationship between the regressand and the regressors defined above.

3.1. The Methodology

The methodology used for completion of this task is combined from and largely relies upon methodologies used in Colome and Serra (2003), Dennis et al. (2002), Smith and Sanchez (2003) and Yavas (2003).

The first step is identification of key supermarket attributes that play the main role for customers in their store choice decision-making process. A wide range of attributes has been drawn from existing marketing and consumer behaviour literature, along with location theory and store choice empirical analyses. Particularly extensive lists of these attributes may be found in McGoldrick (2002) and Smith and Sanchez (2003). Second, the wide list of attributes has been reduced due to data availability and the financial limitations of the project. A survey plan was then specified in order to collect all data necessary for the analysis, sources of data identified and the questionnaire designed[5]. Finally, estimation of the model has been conducted to obtain estimates of coefficients of variables identified in the previous steps.

3.2. Data Description

Hypermarket attributes. Store choice is a large multi-attribute problem. According to the existing literature, there are dozens of attributes which should be included among the list of relevant ones. According to the limited financial and human resources for conducting the research, we have first identified a list of 32 attributes that may be relevant. We then surveyed several teachers, researchers and marketing managers from Sarajevo, in order to shorten the list further. Thus, we made a final list of ten questions in our questionnaire. A survey among customers living in Sarajevo has been conducted in order to collect responses on the importance they give to these various attributes in making a decision where to shop. Importance is measured on a 1 – 5 scale, according to Hutcheson and Moutinho (1998).

Distance. Values for distance between a consumer's origin of trip and preferred store are obtained from answers to questions 5 and 6, which provide data on the consumer's main origin of shopping trip (whether it is home or office) and their perception of the median driving time between the origin of their trip and preferred store, respectively. Driving time as a measure of distance has been chosen as preferred over the distance measured

[4] Detailed map of Sarajevo with marked locations of supermarkets is available at request.

[5] The questionnaire is available on request

in meters, since we assumed that driving time will capture the disutility of shopping. This also makes different perceptions of distance by customers who use different modes of transport more comparable. In addition, the distance of the hypermarket from the city's main transport artery has been included as an additional variable which should improve capture of the stores' accessibility.

Competition. The level of competition is measured by Fotheringham's (1988) formula for competition, which states that the level of competition is positively related to the size of competitive stores and negatively related to the squared distance between the observed store and rival stores. This model states that the degree of competition decreases exponentially with an increase in the distance between stores, similar to the basic idea of OLS regression analysis. We have chosen to use driving time in this formula as well, since we used this measure for distance between customers and stores, and it seems more appropriate to use the same measures in both cases.

Advertising. We were not able to obtain the actual level of advertising expenditures for all hypermarkets. On the basis of a priori experience, we know that most hypermarkets conducted their advertising campaigns during the introduction period of the store (several months after opening) and all other advertising is limited to promotional flyers and catalogues. Hence, we believe that we may capture most advertising effects on customer behaviour through collecting data on the number of promotional flyers distributed to customers per month and two dummy variables for whether the hypermarket has any additional TV or outdoor campaign during the months we conducted the research (June and July)[6].

Relative prices. A variable on relative price is defined as a sum of deviations of store prices for the best selling products from the lowest price amongst all stores[7]. The product groups that capture the majority of expenditures of households are identified on the basis of results of the survey on households' expenditures conducted by the Statistics Office of Bosnia and Herzegovina[8]. In order to identify products that can be used for comparison, we have excluded all products that are not present in each of the hypermarkets analysed as well as products subject to promotional activities in any of these hypermarkets at the time of collecting the actual prices[9]. Thus, we identified the final list of twelve products that satisfied all these conditions. This way we identify the main products that are part of the common basket content of the majority of customers on most shopping trips and thus the products that customers use to form an impression about the overall price level of the hypermarket.

Basket size. The rationale for inclusion of the basket size variable lies in the assumption that customers weigh most of the store's attributes according to the value of the products for which they intend to shop there (Bell et al., 1998). The variable for basket size is obtained from answers to the question from a questionnaire, namely the one on the average expenditures per shopping trip.

Consumer demographics. The other three questions on customers' demographics, those on the size of their household, age of person in charge of shopping and household's monthly income, were present in a questionnaire and used for the creation of variables. These three variables have shown high statistical significance in most empirical work. Thus we decided to include it in our model, as well.

Tenant stores. One of the main distinctions between hypermarkets in Sarajevo is the presence or non-presence of tenant stores within the hypermarket's building. Four of the hypermarkets analysed (Mercator, Robot Commerce Hrasno, Robot Commerce Rajlovac and VF Komerc Wisa) have tenant stores, and four others (Velpro, VF Komerc Korea, Interex and Sam Shop) do not have tenant stores. The rationale for including a dummy variable for the presence of tenant stores is the assumption that tenant stores extend the product offer of a site, and thus its attractiveness.

3.3. A Survey

Taking into consideration the limited financial and human resources for the completion of the survey, it was decided to limit the number of respondents to 240 customers from the Sarajevo city area.

[6] Usually, the dummy variable for the stores that were opened in the last 12 months is used along with these two variables in order to capture the effect of opening period intensive advertising and a public relation campaign. Inclusion of this dummy in the model has been planned initially. However, since only Robot Rajlovac falls into this category, and since it is excluded from the list of hypermarkets due to the survey results, this variable has not been included in the model.

[7] Taking the deviations from the lowest price has computational reasons. This way we will have only positive values, which enable us to make a logarithmic transformation.

[8] LSMS – Living Standard Measurement Survey, Agency for Statistics of Bosnia and Herzegovina, 2005

[9] This was the period between 7. and 20. of July, 2005.

In order to achieve the highest possible representativeness of such a limited sample, the Sarajevo area was divided into 30 sub-areas, which constitutes an exhaustive list for questions about the origin of shopping trips. Eight households from each sub-area were then chosen for interviewing at random. Furthermore, interviewers were instructed to obtain cooperation from the member of the household who is in charge of weekly shopping and to ensure that the interviewee is shopping at one of the eight hypermarkets, and not at other types of shops (such as smaller supermarkets or open markets). In case interviewers could not obtain these conditions, they were instructed to choose another household next to the previous one.

We have to take into account the issue raised by Colome and Serra (2003) regarding limitations on the computation of geometric means. In case that any of the sub-areas defined does not have at least one customer shopping at any of the hypermarkets considered, the geometric mean for that particular relation would be equal to zero, which would make any further analysis infeasible. In order to make as many zones as possible, taking into account this computational problem, it was decided to divide Sarajevo into 30 sub-areas and to collect at least 8 questionnaires from each sub-area, which gives 240 questionnaires in total. The rationale for collecting 8 answers on the questionnaire is the trade-off between the purpose of the survey and limited resources. We believed that we should have at least 8 answers from each sub-area, because it gives at least the minimum chances for getting answers that solve the computational problem mentioned above.

Since we expected a priori that some of the sub-areas would not satisfy the abovementioned computational limitation, such areas were combined with the closest sub-area in order to make a new sub-area with this limitation satisfied. Also, after the data were collected, we excluded three hypermarkets (Velpro, Robot Rajlovac and Sam Shop) from the initial list because one did not appear as the preferred store for any customers in our sample, and the other two stores had customers who preferred them mainly in their original sub-areas, so it was impossible to derive areas such that each has customers who prefer each of these hypermarkets[10]. Therefore, we finally created 9 zones that, along with the final list of 5 hypermarkets, gave us 45 grouped observations, based on 204 individual ones[11]. It can be expected that estimates based on these nine groups will be reliable (Gujarati, 2003), since we have at least 19 individual observations in each group, which is sufficiently large for this purpose.

From the descriptive analysis of data collected, we can see first that more women are in charge of shopping, which is in line with our expectations. Out of 240 customers, 158, or 65,83 %, are women. This exceeds the percentage of women in the whole population, which is 51.2 %[12]. Furthermore, the level of preference for the store as a percentage of shopping trips to the preferred store from the total number of shopping trips to any of the hypermarkets, according to the analysis of answers to questions 2 and 3, is 78.8 %. The more important finding is that 102 out of 240 customers from the sample, or 42.5 % of customers, state that they shop at one store only. It is also worth noting that 55 customers go shopping once a month only, which may be surprising. However, since we have not included shopping trips to other store formats, this only suggests a high level of inter-format competition that hypermarkets face from supermarkets, open markets, and other retail formats present in Sarajevo.

The average expenditure per shopping trip of customers within the sample is 87.24 KM. The average monthly budget of households within the sample is 885.53 KM. Answers to question 5 reveal that 156 out of 240 customers use a car as their main mode of transport for shopping. Others answered differently; namely, 62 go shopping mainly by public transport, 18 of them by foot and 4 use some other type of transport. All four respondents who answered "other mode of transport" have specified "taxi" as the alternative mode. Customers have different perceptions about the time they need to get to their stores. For 23 customers it takes less than 5 minutes, and for 46 it takes between 5 and 10 minutes. For 89 it takes 10 to 15 min, and for 82 customers it takes even more than 15 min; average driving time is 12.55 minutes. It is important to mention that customers who live very close to each other and use the same mode of transport have sometimes very different perceptions of the distance to the store. We have also checked the

[10] This does not deteriorate the quality of the analysis conducted, since we excluded the hypermarkets which we concluded that are local or out-of town in nature and do not compete with other in-town hypermarkets directly.

[11] We have excluded 36 observations on customers preferring excluded stores and from the sub-areas 1, 28 and 29. These sub-areas are irrelevant for the analysis of the Sarajevo trade area, since most of the questionnaires from these sub-areas are from customers preferring excluded stores.

[12] Thematic Bulletin 03 - Gender, Agency for Statistics of Bosnia and Herzegovina, January 2005

number of customers living in the sub-area where some of the shops are placed. Out of the 50 customers interviewed in those areas, 32, or 64 %, shopped mainly at the store from the same zone.

All attributes are estimated as the main one, or as of above average importance, for choosing a hypermarket by a significant number of respondents. This supports our decision to include these attributes among those for which we wished to obtain information on the importance customers give to them.

3.4. Regression Analysis

The model we intend to use for the regression analysis states that the probability of patronage depends on the ratio of attractiveness of the patronised store to the sum of attractiveness of all alternative stores. Since we have measured the attractiveness of only the preferred store at the individual level, we have to group the data in order to create zones, which will have at least one customer for each of the alternative stores. In order to have zones that contain at least one customer patronising each of the alternative stores, and thus enable computation of the geometric means, we have rearranged data in the following way. First, we have excluded three stores that do not satisfy the condition of having customers from more than the closest sub-area. Those hypermarkets are Velpro, Robot Rajlovac and Sam Shop. Second, we have excluded three areas, since customers from those areas mainly shop at the stores placed in those sub-areas, which means that the excluded hypermarkets are local in nature and are not direct competitors to the other hypermarkets. We then combined the remaining 27 sub-areas in a manner that yielded the final list of 9 zones for the regression analysis. Answers on all questions at the individual level were averaged over the store within each zone. Hence we have obtained the final list of 45 observations (9 zones x 5 stores). Finally, the values obtained by averaging individual data were divided by the geometric mean over all stores within one zone, according to the suggestion by Nakanishi and Cooper (1974).

The MCI model chosen for the analysis of determinants of store choice, developed by Nakanishi and Cooper (1974), may be expressed as follows:

(see Appendix 1)

After log-centered transformation of the previous equation (Nakanishi and Cooper, 1974), we obtain the following equation, which may be estimated by OLS:

(see Appendix 2)

To estimate the model (using the Microfit 4.0 econometric package), the following variables were defined[13]. First, the list of attractiveness variables has been made. The variables named A1 to A10 are the answers collected to questions about the importance of stores' attributes. The problem of a limited number of final observations, and therefore the wish to save as many degrees of freedom as possible, forced the solution in which we have presented these answers through a binary variable; namely, where answers to the these questions that were 4 and 5 on the scale were given a value of 1, and other answers were given the value 0. The variable PRICE measures the difference in the price level between hypermarkets; the variable SIZE measures the size of the supermarket for groceries in m^2; and the variable SITE captures the total size of the hypermarket's site, including the size of supermarkets, tenant stores, warehouses and offices. The variable TRDIS measures the driving time between the main road and tramline in Sarajevo and the hypermarket, and is used as a proxy for the accessibility of the hypermarket from the main transport connection.

Four variables on demographic data are included in the original model. The first one, EXPEN, measures average expenditures of customer per shopping trip. The variable MONB controls for the household's monthly income. The variable AGE controls for customers' age, the variable HHSIZE is for the household's size, CHILDDV controls for number of children in the household, and GENDER controls for the gender of the customer.

Distance between the customer and the hypermarket obtained from the answers to questions about the driving time spent on shopping is presented by the variable DRIVT. To control for advertising expenditures of hypermarkets, we use two variables, TVDV as a dummy for TV advertising during the previous two months, and FLYER for the number of flyers distributed by hypermarkets every month. The presence of tenant stores is controlled by the TSDV variable, and the level of competition the hypermarket is faced with is measured by Fotheringham's formula and presented by the variable COMPSQ.

[13] The explanation of the creation of all the variables is presented in Appendix 3

Test Statistics	LM Version		F Version	
	Computed value	Critical value for 5 % ls	Computed value	Critical F (1, 40) value for 5 % ls
A:Serial Correlation	0.85 E-3[0.977]	3.84146	0.61 E-3[.980]	4.08
B:Functional Form	0.0080[0.929]	3.84146	0.0057[.940]	4.08
C:Normality	0.9762[0.614]	5.99147	Not applicable	
D:Heteroscedasticity	3.7510[0.053]	3.84146	3.9103[.054	4.08

Table 1: Summary results of diagnostic tests

Dummy variables for store characteristics are included, in order to estimate differences in probability that arise from the particular characteristics of stores[14].

Values for all quantitative variables were transformed into logarithms after dividing them by their geometric means. We have changed the names of those variables by adding LN in front of the original names in order to indicate logarithmic transformation.

Before any regression estimation we decided to calculate the Pearson's correlation matrix of all variables we plan to include in the model, since we expect high collinearity among some of the variables mentioned. This matrix suggests high collinearity among some variables[15].

The easiest method of remedying the problem of collinearity among regressors is to exclude one of the regressors correlated to other. We believe this method is appropriate in our case, since we believe that variables left in the model still capture a sufficient part of the specific characteristic we would like to measure. Both results from the correlation matrix and from the VIF analysis suggest exclusion of the variables LNPRICE, LNSIZE, LNFLYER, LNTRDIS and all store dummies. Therefore, we have decided to exclude them. Exclusion of these variables is additionally justified by the "context dependency" nature of the analysis. It means that this analysis is dependent on the context of the Sarajevo trade area, where some store attributes are not significant because of insufficient variation between stores, and customers use other attributes to discriminate between these stores.

After the exclusion of variables due to the results of correlation indicators, we have estimated the first model, with 23 variables. The model has good diagnostics, but shows the insignificance of certain variables, whose exclusion might improve the model. Using stepwise backward regression we deleted regressors one at a time up to the point at which there was no more improvement in values of adjusted R^2 and the F statistic of joint significance. These variables were excluded in the following order: TSDV; TVDV; A5; A9; LNAGE; A1; GENDER; A3; MOTR; CHILDDV and A6. Thus we obtained the final, parsimonious model. There are more insignificant variables in the model but we have decided not to exclude them, because these coefficients have t-values higher than 1 and the exclusion of such regressors is not always recommended (Gujarati, 2003).

If we compare the signs and statistical significance of the same variables in the first and final models, we can see that all coefficients retain the same sign and improve their statistical significance from the first to the final model. This suggests that the results obtained by this regression analysis may be considered robust.

3.5. Results

The final model we estimated is as follows.

$$LNY = \beta_O + \beta_1 A2 + \beta_2 A4 + \beta_3 A7 + \beta_4 A8 + \beta_5 A10 + \beta_6 LNEXPEN + \beta_7 LNDRIVT + \beta_8 LNSITE + \beta_9 LNMONB + \beta_{10} LNHHSIZE + \beta_{11} COMPSQ + u_{ij}$$

The dependent variable in this case, after grouping of individual data, is not binary, but the proportion of customers from zone i patronising, or better, preferring hypermarket j.

The summary results of diagnostic testing of the residuals from the model are presented in the following table.

As we can see from the table, the computed χ^2 and F values for the LM test for serial correlation are well below their critical values at the 5% level of significance, which suggests that we cannot reject the null hypotheses of no serial correlation among the residuals.

Also, the result of Ramsey's RESET test shows that the model we have estimated is well specified as a linear model. Moreover, the computed χ^2 and F values for the Jarque–Berra test for normality are below their critical

[14] We have not included dummy variables for zones, since it is considered as alternative model to the one we used. With these dummies included in the model, it is not necessary to divide variables by their geometric mean (Cooper and Nakanishi, 1988).

[15] We have chosen the rule of thumb that the correlation coefficient above 0.7 suggests high multicollinearity.

Variable's name	Variable's description	Coefficient	Standard error	T-Ratio [prob.]
CON	Intercept term	-0.5116	0.3918	-1.305 [0.201]
A2	**Dummy for importance of the restaurant and café**	**-1.0288**	**0.3182**	**-3.232 [0.003]**
A4	**Dummy for importance of the assortment**	**0.7179**	**0.3538**	**2.029 [0.051]**
A7	Dummy for importance of lower prices	0.3867	0.3284	1.177 [0.248]
A8	**Dummy for importance of fresh products offer**	**1.0217**	**0.3243**	**3.150 [0.003]**
A10	**Dummy for importance of the queue in front of cashier**	**-1.3143**	**0.3870**	**-3.396 [0.002]**
LNEXPEN	**Variable for household's average expenditures per shopping trip**	**-1.2115**	**0.7057**	**-1.717 [0.095]**
LNDRIVT	**Variable for driving time for shopping trip**	**-0.9390**	**0.4035**	**-2.327 [0.026]**
LNSITE	**Variable for the size of the retail site (in m^2)**	**0.7148**	**0.2535**	**2.819 [0.008]**
LNMONB	**Variable for the household's monthly budget**	**1.1392**	**0.5043**	**2.259 [0.031]**
LNHHSIZE	**Variable for household's size**	**-1.2854**	**0.6242**	**-2.059 [0.047]**
LNCOMPSQ	**Variable for the level of competition each retailer faces**	**-0.4317**	**0.1424**	**-3.031 [0.005]**

Table 2: Estimated coefficients of the final model

values for a 5% level of significance, so we can conclude that our assumption of normal distribution of residuals holds. In turn, this suggests that our results are not distorted by outliers. Finally, our assumption of homoskedastic residuals is supported by the results of the Koenker-Bassett test for heteroskedasticity.

To conclude, we cannot reject the hypotheses that the residuals from our model do not indicate serial correlation, wrong functional form, non-normal distribution or heteroskedasticity of variances. Therefore, the values of t-statistics obtained from testing the hypotheses of statistical insignificance of estimated coefficients may be treated as valid.

The following values of coefficients, standard errors and t-statistics for the final model were obtained by OLS estimation and are presented in the table below.

Estimation of the model identified retail site size, distance between customer and store; customer expenditure per shopping trip, household size and monthly budget, presence of restaurant and café within the store, assortment of products, offer of fresh products, and the effectiveness of cashiers as the main discriminatory attributes of the stores[16]. Although we left the price variable in the model, it has shown its statistical significance, so we decided not to give any comment on it.

Probability of patronage increases with store size, but it decreases with the distance to the store. These observations are in line with the underlying theory (Reilly's law) and the logic of the gravity models.

Probability of patronage increases if stores offer a wider assortment of all products and especially of fresh products, since these stores' characteristics are very important to customers.

If customers believe that a store has a better restaurant, café and effective cashiers, such stores will have a lower probability of being patronised by customers, holding other influences unchanged. It may be explained by the fact that customers have assigned high importance only to some of the store's attributes presented as optional. It raises the possibility that customers who assigned high importance to assortment and lower prices to products at the same time consider the presence of restaurants and the effectiveness of cashiers as unimportant. Regardless, we must not conclude that stores would capture more customers if they made their restaurants worse or cashiers less effective.

[16] The level of significance we have used in this case is 10%.

The probability of patronage is higher for customers with a higher monthly budget, who spend less per shopping trip and live in a smaller household, which is as we expected.

The stronger presence of competing hypermarkets, measured by Foteringham's formula, affects the probability of patronage negatively.

The value of F statistics for testing the joint significance of variables from the model is higher than the critical F value, thus we can reject the hypothesis of joint insignificance of the variables at the 1 % level of significance. Regressors included in the final model explain around 61 % of all the variations in the dependent variable.

4. Conclusions and Implications

The location theories of oligopolistic competition are based on the unrealistic assumption that customers shop at the closest store. The empirical evidence presented in this dissertation does not support this assumption. It suggests that customers care not only about distance to the store, but also about other stores' attributes in making their patronage decision.

The main issue of this dissertation was to determine which store's attributes, other than distance, determine customers' patronage behaviour. The methodology used for this purpose was regression analysis of the Multiplicative Competitive Interaction model, with a range of attributes we assumed to be taken into consideration by customers in their patronisation decision–making process. The results have shown the significant influence of the six store attributes on customers' patronisation behaviour. Those attributes are the quality of the restaurant and café within the store, range of product lines offered in the store, offer of fresh products, effectiveness of the cashier, size of the store, and distance to the store. The significance of these store attributes show that customers, in their store choice behaviour, make a trade off between the distance to store and other store attributes. The regression analysis also identified four significant variables included in the regression as control variables. Those are customer's expenditure per shopping trip, household's size and monthly budget and presence of competitive stores close to the store patronized.

The analysis has also shown that there is a "reservation distance" beyond which customers are reluctant to travel for shopping. Hence, retail gravity models should incorporate this fact, by allowing for a different set of alternatives considered by customers from different zones.

4.1. Managerial Implications

As expected, distance showed significance for customers' patronage decisions, both by the results of the regression and of the descriptive analysis. Each hypermarket succeeded in attracting the majority of customers from the nearest area. Customers evaluate alternative outlets in their patronisation decision-making process up to a certain distance. Presence of competing outlets in the nearest areas around the store strongly influence the store's overall performance. Hence, the decision on the location of the retail outlet still remains the single most important decision facing decision makers in retail businesses in Sarajevo.

Nevertheless, the empirical evidence presented in this paper reveals the influence of certain store attributes that drive customers to shop at stores other than the closest one. Although these results reveal the preferences of an average customer toward an average hypermarket, they still show the existence of a variety of factors influencing customers' behaviour. Decision makers in retail companies should be aware of these factors and processes of store choice behaviour.

The range of products and offer of fresh products within the hypermarket increase the probability of patronisation of such a hypermarket. Hence, the choice of the products mix is very significant decision for retailers, since it should have a positive impact on the success of any hypermarket outlet. However, for further conclusions we should have more data about the list of products customers buy at a particular outlet.

The significance of several customer demographic variables, namely variables on household size, monthly budget and expenditures per shopping trip, along with the high correlation between store attributes considered important suggests that managers in retail companies should be well aware of both consumer characteristics and their preferences in order to create the most effective marketing program for their customers.

The descriptive analysis shows that all store attributes were assigned as the most important by a significant part of the sample, but the regression analysis suggested their insignificance. One of the explanations may be the existence of clearly distinguished market segments attracted by different stores, but regression analysis has

made this unclear by giving results for the average store. This may be an interesting direction for further research.

4.2. Limitations and Directions for Further Research

The main limitation of this research emerges from the limited sample size.

There are some additional limitations to be mentioned, which emerge from the nature of the gravity-type models. The model assumes that customers evaluate each store within the trade area, which is not always true. As the results from our analysis show, customers reject stores beyond a certain "reservation distance", and also may reject stores that do not satisfy a certain level of the attribute that plays the main role for the customer. Also, we have to take into account the "context dependency" nature of the model. The insignificance of any store's attribute in the regression analysis does not necessarily mean that the attribute is unimportant to customers, but it is possible that there is insufficient variation in the attributes between stores, and thus customers use other attributes to discriminate between stores in making their patronisation decision. This means that the results of this model for one trade area should not be simply applied to other trade areas.

The results that suggest a possible high level of inter-format competition suggest the need for further analysis of the determinants of the store choice behaviour of customers based on data that would include other retail formats. Particularly important for the gravity-based models would be the analysis of inter-format store choice behaviour that would include e-commerce as the new retail format, where distance is no longer the most important variable.

Also, the dependent variable is based upon revealed patronisation during one month, which may suggest the level of preference customers have to a particular store. Nevertheless, customers change their preferences due to various influences according to the stores' marketing activities, changes in the environment, and so forth. Hence, longitudinal analysis of the store choice behaviour of customers through time may reveal the level of loyalty customers have to particular stores, track their switching behaviour and determine the main factors that influence the degree of and changes in loyalty among customers.

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Appendix 1: Specification of the Original MCI Model

$$\ln p_{ij} = \frac{\beta_0 + \sum_k \ln \beta_1 S_{kj} + \ln \beta_2 d_{ij} + \ln \beta_3 C_j + \sum_k \ln \beta_4 A_{ki} + \ln \beta_5 P_j + \sum_k \ln \beta_6 CD_{ki} + \ln \beta_7 TSDV_j + \ln \beta_9 SDV_j + \varepsilon_{ij}}{\sum_j (\beta 0 + \sum_k \ln \beta_1 S_{kj} + \ln \beta_2 d_{ij} + \ln \beta_3 C_j + \sum_k \ln \beta_4 A_{ki} + \ln \beta_5 P_j + \sum_k \ln \beta_6 CD_{ki} + \ln \beta_7 TSDV_j + \ln \beta_9 SDV_j + \varepsilon_{ij}}$$

where:

$\ln p_{ij}$ – logarithm of probability that consumer from sub-area i will patronise hypermarket at site j
β_0 – intercept term
$\Sigma_k S_{kj}$ – k factor variables on store's attractiveness, k = 1, 2, … 10
d_{ij} – distance between sub-area i and hypermarket j,
i = 1, 2, … 9; j = 1, 2, … 5
C_j – level of competition for hypermarket j
$\Sigma_k A_{kj}$ – 2 variables for the hypermarket's level of advertising,
P_j – variable representing relative prices of hypermarkets,
$\Sigma_k CD_k$ – k variables on costumer's demographics, k = 1, 2, … 7
$TSDV_j$ – dummy variable for presence of tenant stores, 1 – hypermarket has tenant stores, 0 – otherwise,
$\Sigma_j SDV_j$ – j hypermarket dummies, capturing specific store ignorance
u_{ij} – error term

Appendix 2: Specification of the Log-Transformed MCI Model

$$\ln\frac{p_{ij}}{\widetilde{p}_{ij}} = \beta_0 + \sum_k \ln\beta_{1k}\frac{S_k}{\widetilde{S}_k} + \ln\beta_2\frac{d_{ij}}{\widetilde{d}_{ij}} + \ln\beta_3\frac{C_j}{\widetilde{C}_j} + \sum_k \ln\beta_{4k}\frac{A_{kj}}{\widetilde{A}_{kj}} + \ln\beta_5\frac{P_j}{\widetilde{P}_j} + \sum_k \ln\beta_6\frac{CD_{ki}}{CD_{ki}} + \ln\beta_7 TSDV_j + \ln\beta_8\sum_j SDV_j + u_{ij} \quad (15)$$

where:

$\widetilde{p}_{ij}$ – geometric mean of variable p_{ij}

$\sum_k \widetilde{S}_{kj}$ – geometric means of k variables of store's attractiveness for m shops evaluated by customers from zone i,

$\widetilde{d}_{ij}$ – geometric mean of variable d_{ij} to m shops from customers living in zone i,

$\widetilde{C}_j$ – geometric mean of variable C_j,

$\sum_k A_{kj}$ – geometric means of variables of advertising,

$\widetilde{P}_j$ – geometric mean of variable for relative price,

$\sum_k \widetilde{C}Dki$ – geometric means of k variables for customer's demographics,

$u_{ij} = \ln\left(\frac{\varepsilon_{ij}}{\widetilde{\varepsilon}_{ij}}\right)$

Appendix 3: Names and Descriptions of Variables

Variable's name	Variable' s description
LNY	Dependent variable. Values obtained from the answers to question 1 from the questionnaire. At the individual level, value of 1 assigned to the sub-area and store answered as being preferred, 0 otherwise, then proportions of customers preferring a particular store were calculated for each zone at the group level. These values were then divided by their geometric mean. Finally, the values were transformed into the logarithmic form.
CON	Intercept term.
A1 – A10	Variables for the importance of stores' attributes. Values obtained from answers to question 9 from the questionnaire. Dummy variable which, at individual level, takes value 1 if customer answered 4 or 5 on the scale, 0 otherwise. At the group level, it is calculated as the proportions of customers within each zone, giving high importance or not to the attribute.
LNEXPEN	Quantitative variable representing customer's expenditure per shopping trip. Values obtained from the answers to question 10 from the questionnaire. At the group level, average expenditures were calculated for each group of customers preferring particular stores within one zone. These values were then divided by their zone's geometric mean. Finally, the values were transformed into the logarithmic form.
LNMONB	Quantitative variable whose values were obtained from the answers to the question on the household's monthly budget from the questionnaire. At the group level, the average household's budget was calculated for each group of customers preferring a particular store within one zone. These values were then divided by their zone's geometric mean. Finally, the values were transformed into the logarithmic form.
MOTR	Dummy variable. Values obtained from the answers to question 5. At the individual level, takes value 1 if customers go shopping by car, 0 otherwise. At the group level, it is calculated as proportions of customers within each zone going shopping by car or otherwise.

Variable's name	Variable' s description
LNDRIVT	Quantitative variable obtained from answers to the questions 7 and 8. Takes mid values of the range offered (e.g. if customers travels to store in 5 to 10 minutes, value of 7.5 has been assigned). Then, averages were calculated at the group level for each group of customers preferring a particular store within one zone. These values were then divided by their geometric mean. Finally, the values were transformed into the logarithmic form.
LNSIZE	Quantitative variable for the size of the hypermarket's selling space. These values were then divided by their zone's geometric mean. Finally, the values were transformed into the logarithmic form.
LNSITE	Quantitative variable for the size of the site's space (including warehouses, offices, and parking). These values were then divided by their zone's geometric mean. Finally, the values were transformed into the logarithmic form.
TVDV	Dummy variable. Takes value 1 if hypermarket had any additional mass media advertising in recent two months, 0 otherwise.
TSDV	Dummy variable. Takes value 1 if hypermarket has tenant stores, 0 otherwise.
LNPRICE	Quantitative variable for the store's price level. Calculated as the sum of deviations of prices of 12 representative products in the store from the lowest prices of products between these stores.
LNFLYER	Quantitative variable for the number of promotional flyers and catalogues store prints distributed regularly every month.
LNTRDIS	Quantitative variable for the distance of store from the main transport artery. Calculated as the mean driving time from the road to the store.
CHILDDV	Dummy variable for the number of children in the household. Takes value 1 if household has 2 or more children, 0 if less then 2. At group level, it is calculated as proportions of customers having two or more children, or otherwise.
GENDER	Dummy variable taking value of 1 if customer is male, 0 if female. At group level, it is calculated as proportions of customers within each zone being males or females.
LNHHSIZE	Values obtained from the answers to question 1 from the questionnaire. At the individual level, a value of 1 assigned to the sub-area and store answered as being preferred, 0 otherwise, then average size of households preferring particular store were calculated for each zone at the group level. These values were then divided by their geometric mean. Finally, the values were transformed into the logarithmic form.
LNAGE	Values obtained from the answers to question 1 from the questionnaire. At the individual level, a value of 1 was assigned to the sub-area and store answered as being preferred, 0 otherwise, then the average age of customers preferring a particular store were calculated for each zone at the group level. These values were then divided by their geometric mean. Finally, the values were transformed into the logarithmic form.
LNCOMPSQ	Quantitative variable for the influence of competition. Calculated by Fotheringham's formula, by using driving time between stores as a measure for distance.
SDV4 - SDV7	Store dummy variables. Store numbered as 3 (VF Wisa – see Appendix 2) is the benchmark store.

Research and Development and Tax Incentives

Sabina Hodžić *

Abstract:

In many countries, tax incentives are a popular means to achieve political, economic and social objectives. Their aim is to reach and accelerate certain activities of public interest. Furthermore, one of the objectives is to accelerate the development of a certain industry and influence the growth of research and investment in foreign capital. Innovation is the key element that helps a company achieve competitive advantage. Global competition is forced to offer unique products with added values on the market. Tax incentives for research and development are an important factor of innovation. This paper aims to present the importance of research and development, as well as the role of tax incentives. States should use their fiscal policy to stimulate investment in research and development through various forms of tax relief. The Republic of Croatia applies tax incentives for research and development, but to a significantly less extent than other European Union countries.

Keywords: tax incentives, research and development, fiscal policy, direct measures

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1. Introduction

Since its aim is to achieve greater competitiveness than that of the United States of America and South Korea, the field of research and development is growing rapidly in the European Union. Many member states use fiscal incentives to invest in research and development. These represent a new means of investment in research-development activities in less developed countries. Globalization and new technologies have led the economy of the 21st century on to new challenges. Companies that perform their activities within the European Union must manage innovation activity in a high-quality and successful way. Successful management seeks educated staff and the fiscal incentives of the state. New system approaches and knowledge related to the innovation process encourage increased competitiveness. Research and development are one of the most significant processes of innovation. Innovation is a new and improved product or service presented on the market. A common characteristic of all innovation is that it must be implemented on the market. Market results show the profitability of a new product or service on the market. Innovation activities depend on the type and characteristic of a company introducing a new product or service. In most industrial companies in the European Union member states there are special departments for innovation activities. Several types of projects aiming to stimulate joint projects for research and development have been developed within the European Union. The European Commission has published the Horizon 2020 strategy, stating that investment in research and development should be increased to up to 3% of GDP. Horizon 2020 emphasizes the importance of international cooperation in science, technology and innovation. Research and innovation are

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at the centre of this strategy. The strategy supports three important areas - the EU's position as a world leader in science, making Europe a more attractive location to invest in research and innovation and social challenges such as health, demographic change and well-being, food security, secure, clean and efficient energy, smart, green and integrated transport, climate action and inclusive, innovative and secure societies The European Union member states use fiscal policy to encourage research and development in order to achieve objectives in growth, productivity and competitiveness. Higher investments in research and development bring a more important business position and competitiveness to companies and add to the higher economic growth of a country.

2. Literature Review

Research and development expenditures have long been an important concern for innovation analysts, who have used them as a proxy for innovation inputs and as a determinant of productivity growth (Moncada-Paterno-Castello, P. et al. 2010, p. 523). Governments try to reallocate or attract domestic and foreign capital using tax incentives that give more favourable tax treatment to certain economic activities (Klemm and Van Parys 2012, p. 394). The higher economic growth of a company demands more developed research-development cooperation between institutions. In addition to the positive sides of cooperation, there are a few negative ones as well. First, research and development cooperatives can collectively decide to cut research and development expenses if negative pecuniary externalities prevail. Second, an agreement to cooperate in research and development could facilitate collusion in other stages of the production process, a harmful reduction in competition which undoubtedly leads to a loss in net total surplus. Third, research and development cooperatives can act as s barrier to entry as they can, as a consortium of firms, set standards for future application (Hinloopen 2001, p. 314).

Firms need to complement their internal resources and capabilities with imported ideas from outside, interacting with a wide range of actors inside the innovation system (Sanchez-Gonzales and Herrera 2010, p. 338). According to this model, the advantages that firms obtain from internal research and development expenditures have decreased due to different factors, such as the increased mobility and availability of knowledge workers. It also emphasizes the interactive character of the innovation process, suggesting that firms need not and indeed should not rely exclusively on their own research and development (Sanchez-Gonzales and Herrera 2010, p. 338). Research and development activities must be tightly connected to national industry. Science and technology are the key components in the creation of a foundation for innovation, productivity and economic growth. The tax treatment of R&D is becoming more lenient and it is likely that countries will increasingly turn to the tax system and away from direct grants (Hall and Van Reenen 2000).

3. Importance of Tax Incentives for Research and Development

A large number of the European Union member states, as well as future members, offer companies tax incentives for research and development within their fiscal policies. Research and development and innovation are considered key for the productivity and profitability of a company. Without a good and innovative product a company won't be able to achieve its business plan. To encourage this activity, many countries produce different types of tax incentives for research and development. Various types lead to differences between incentives among the member states, and thus to significant discrepancies.

The paramount importance of tax incentives for research and development depends on the economic policy of a state. A state that encourages greater economic growth uses more resources. Resources for the stimulation of research and development include the cooperation of research centres and the private sector, and direct financing from budget and tax incentives. Using tax incentives for research and development, the state controls the strategic direction of a company and its objectives. Fiscal measures offer markets an opportunity to determine the degree and category of investment. Tax incentives can be especially important for the stimulation of small and medium-sized companies. Small and medium-sized companies could thus gain a greater opportunity to accelerate their growth and competitiveness on the market. The continuous and long-lasting survival of a company is achieved by creating new products and services, as well as added values. The new results of innovation, research and development show the successful development of companies and their competitiveness on the market. Research and

development should be a more continuous process and an attempt to cover a part of the costs of current earnings (Batty 1976).

Many countries have introduced tax incentives for research and development in the past two decades. Most OECD countries nowadays apply a combination of tax incentives and direct subventions for research and development. The European Commission has focused more on tax incentives for research and development than in previous years. By doing so, it is trying to increase the efficiency and coherence of tax incentives for research and development. More developed economies use both direct and indirect incentives for research and development.

The contribution of research and development depends on the growth of productivity, economic efficiency and achieving social justice. Different national factors determine countries' preferences with regard to tax incentives, subventions, preferential rights or other instruments to encourage research investments. The choice of tax incentives for research and development depends on the following (Hutschenreiter 2002):

1. Degree of innovation;
2. Perceived market irregularities in research and development;
3. Industrial structure;
4. Company's size; and
5. Nature of tax system within company and respective country.

The efficiency of the tax incentives for research and development depends on the types of tax measures associated with the political objectives of a country. Member states encourage investment in business research and development because research and development has an important role in long-run economic growth. Furthermore, in times of crisis it maintains jobs, encourages national competitiveness and produces public goods. Today more than 20 OECD governments provide fiscal incentives for research and development, up from 12 in 1995 and 18 in 2004.

3.1. Types of Research and Development

In the European Union, as well as in the Republic of Croatia, there are several definitions and types of research and development that are being applied. The types of research and development include (Frascati Manual 2002):

1. *Basic research* –theoretical or experimental work carried out primarily to acquire new knowledge on the basics of occurrences and facts without concrete practical application.
2. *Applied research* –theoretical or experimental work performed to acquire new knowledge, primarily focused on achieving practical objectives.
3. *Developmental research* – work based on the results of scientific research and practical experience, focused on creating new materials, products and systems and the introduction of new processes, systems and roles or improvement of existing ones.

These types of research are conducted in several sector types: the business sector, government sector, non-profit sector and higher education sector.

According to Frascati (2002), several basic concepts related to research and development should be distinguished:

Gross Domestic Expenditures on Research & Development (GERD) are the total internal expenditures for research and development in a country during the observed calendar year, comprising current and investment expenditures in gross amounts.

Business Enterprise Sector (BERD) comprises enterprises/companies and organizations whose main activity is the production of goods and services for the market at the economic price.

Government Sector (GOVERD) relates to institutions and other entities providing the community with such common services (except higher education) that otherwise, with market conditions, could not be provided, and they are a form of the community's economic and social policy.

Government budget appropriations or outlays (GBAORD) comprise all expenditures of the central government's budget.

Share of gross domestic expenditures for research and development show the expectations of a country for the creation of newer knowledge and technology, as well as simultaneous application of existing knowledge in the private and public sectors. Tax incentives for research and development usually occur in one of the following three forms (Kesner-Škreb 2001):

1. Tax deferrals – relief with respect to deferred tax payment;
2. Tax allowances – the possibility of tax allowance for the value added tax for the amount exceeding actual investments in research and development;

3. Tax credits –amount deducted from tax liability, i.e. the possibility to reduce tax liability for a part of the expenditures for research and development.

Some countries, like Italy, the Netherlands and Spain, prefer tax credits over tax allowances. Tax policy has an important role in stimulating research and development as a response to high levels of risk associated with this category of investment (Tassey, 2007).

3.2. Principles for the Creation of Tax Incentives for Research and Development

When creating tax incentives for research and development, countries give priority to forms that include elements of simplicity, costs of compliance, reliability and stability. To maximize research and development activities in enterprises, tax incentives need to be transparent and easily accessible. In addition, tax incentives should be designed for longer time periods, efficient and have simple application rules in order to create a reliable and stable framework for enterprises. The basis of tax incentives for research and development shouldn't be frequently changed in order to ensure a higher corporate quality plan for research and development investment activities.

The European Commission has prescribed several principles for the main possibilities, features and relevant factors of tax incentives. Such principles define that tax incentives must (European Commission, COM (2006) 728 final):

1. Affect several enterprises with as high an increase of expenditures for research and development in the business sector as possible
2. Include all current expenditures and take into account certain types of capital expenditures for research and development
3. Focus on identifying the immediate additionality of tax incentives and their additionality with regard to behaviour
4. Consider criteria for evaluation and data from the creation phase
5. Examine whether tax incentives meet their respective objectives, their mechanism's management efficiency and wider influences on society.

Most tax incentives whose aim is to increase research and development are general. Such incentives include all types of enterprises, sectors or technologies. Half of the existing implemented tax incentives for research and development limit the general availability with the upper limit of the amount of the available tax burden. The upper limit presents a relative advantage for small and medium-sized enterprises. Advantage is achieved because their level of expenditures isn't covered within the upper limit. The dominant model of tax incentives for research and development aims at lowering the tax paid by enterprises for research costs. The usefulness of such incentives is proportional to the effective rates of corporate tax and can be in the form of relief. In achieving research and development objectives, fiscal policy has to ensure a general tax system that favours technological development. The level of tax incentives varies depending on the specific state conditions, existing industrial structure, level of corporate research and development, macroeconomic situation and tax environment. Public funds for basic research and development performed by universities are increasing and linked via additional stimulation for technology transfer to corporate research and development activities (Elschner et al. 2011). Each member state chooses a specific combination of tax incentives for research and development. Well-designed tax incentives can support business research and innovation in a simpler and more predictable way than grants (European Commission 2005).

4. Tax Incentives for Research and Development

The European economy has the task of achieving 3% of GDP in research and development. By reaching 3% of GDP by 2020, the European Union will ensure 3.7 million workplaces and an increase in its annual gross domestic product of nearly 800 billion Euros by 2025. Table 1 and Figure 1 present gross domestic expenditure on R&D (GERD).

With its 27 member states, the European Union's average investment in research and development was 1.98% for the 2008-2010 period. In the same 2008-2010 period, Finland invested 3.83% of its GDP on average, while Sweden invested 3.58%. Cyprus invested the least – 0.47% – of its GDP. Keeping in mind that the European Union's average result, with its 27 member states, is low, additional efforts and financial means have to be invested in order to reach the United States of America with its 2.79% average in 2008.

At the national level, the highest R&D intensity in 2010 was recorded in Finland (3.87%), Sweden (3.42%) and

Denmark (3.06%). Some member states reported R&D expenditure accounting for less than 1% of their GDP in 2010 (for example, Romania below 0.50%). The regions with the lowest R&D intensity were generally in Southern and Eastern Europe.

The most important factors for companies when deciding on research-development activities are: their approach to the market, the flexible disposition of researchers and their country's macroeconomic and political stability. A company usually chooses a country for its registered seat that has a regulated fiscal system and a policy to perform research and development. Research and development activities in a company result in new products that are the basis of sustainable growth and economy. The diversity of investment in research and development depends on the sector's type. Table 2 shows gross domestic expenditure on R&D by sector.

Table 2 shows that the share of research and development in the business enterprise sector was equivalent to 1.23% of the EU-27 GDP in 2010, compared with 2.70% in Japan and 2.02 % in the United States. Germany, with 0.41% of its GDP, and Slovenia, with 0.38% of its GDP, recorded the most expenditures in the government sector. Sweden and Denmark recorded the highest expenditures in the higher education sector, with 0.90% of their GDP. Given the structure of financing resources in the European Union, efforts are being made to increase the business enterprise sector's share, which would then dominate, comprising two thirds of investment in research and development. High research and development intensity is found to have a positive impact on firm efficiency, no matter whether low, medium or high-tech industries are considered (Kumbhakar et al. 2010).

4.1. The Structure of Tax Incentives for Research and Development in The Republic Of Croatia

Investment in research and development enables the Republic of Croatia to create a national research market as a part of both European and global research areas. Such a market is characterized by a high level of competition, mobility and research excellence. The country's economic development is slowed down due to a business enterprise sector that has been outdone with respect to research and development. The problems of transition and privatization have been present in Croatia for many years. Some of the key reasons behind the state of the business enterprise sector include (Bečić and Dabić 2008, p. 71):

1. *Insufficient allocation for research and development in the private sector,*
2. *Unclear role of industrial policy in economic development strategies,*
3. *Weak relationship between the scientific sector and enterprises,*
4. *Existing industrial structure of economy,*
5. *Existing structure of funding source for research and development,*
6. *Low rate of investment in higher education,*
7. *Weak relationship between technology and science*.

The nature of research and development is such that at the time when the cost of research and development occurs, it is impossible to measure with certainty the future economic benefits. It can only be assumed that long-term economic benefits are precisely the result of research and development costs. Small and start-up firms in research and development intensive industries face a higher cost of capital than their larger competitors and firms in other industries (Hall, 2002).

Upon accession to the European Union, government budget resources for research and development in the Republic of Croatia will become a constituent part of the European budget for research and development. Share of the government budget sources for research and development in the gross domestic product was 0.69% in 2009, while in 2010 it amounted to 0.71%. In 2009 the most resources, 62.5%, were given to higher education, followed by 34.4% for the government sector, while the amounts in 2010 were 70.08% for higher education and 25.78% for the government sector.

Figure 2 presents funding resources for research and development in the Republic of Croatia in 2010 in thousands of Kunas (%).

The main sources of resources for the business enterprise sector are own resources, comprising 68.7% of resources, and for the government sector state and local administration 80.1%. This leads to a great discrepancy since most of the government sector's resource sources come from the state and local administration's budget, while business enterprise sector is self-financing.

Until 2003, Croatia offered tax relief for tax payers depending on place of business, amount of investment, as well as tax benefits in the form of tax payment deferrals. In order to encourage investment in research and development, that same year saw the introduction of

relief for tax payers investing precisely in mentioned activities. The idea was to encourage research and development aimed at producing new products and procedures, the improvement of the existing and development of own know-how, and stimulation of the economic sector to invest more in research and development (Bratić and Urban, 2006). Tax incentives for research and development existed at the beginning of 2006 within the Value Added Tax Act. However, in May 2006, incentives were withdrawn and do not apply as of 1 January 2007. They have been since reintroduced and implemented in the Scientific Activity and Higher Education Act.

Tax incentives in Croatia can be grouped into six categories (Švaljek 2007, p. 71):

1. Tax incentives for business expenditures for research and development (business credits or deductions) – a tax credit is a tax incentive in the form of the possibility of the reduction of tax liability for part of the expenditures for research and development, while tax deduction presents a possibility of decreasing the value added tax basis for the amount that exceeds investment in research and development;
2. Tax incentives for capital expenditures for research and development (one-time or accelerated depreciation);
3. Tax incentives for contracts with researchers (incentives in terms of the deduction of the income tax of employees or income tax when engaging experts);
4. Tax incentives for the transfer of technology (incentives that support the procurement of new technology or tax incentives for those who develop new technologies for the transfer of their know-how);
5. Tax incentives for the cooperation of companies and research institutes, i.e. universities (tax incentives for collaborative projects);
6. Tax incentives for the creation of new firms (tax incentives for spin-off or spin-out).

The Republic of Croatia didn't have a tax credit or base deduction until 2003. That same year base deductions for research and development were introduced, as well as for employees' education and professional education. Deductions referred to all types of investments in research and development, such as fixed assets, current costs and wages. Legislative changes in 2005 introduced exemptions for tax payers performing only research and development activities. Table 3 presents government budget appropriations for research and development by socio-economic objectives in the Republic of Croatia.

According to the socio-economic objectives, most of the government budget appropriations for research and development in 2010 were invested for the objective of the general advancement of knowledge through research and development financed from general university funds (55.4%) The general advancement of knowledge through research and development financed from other sources follows with 34.22%, and the least amount of state budget resources, 0.13%, was invested in defence. In 2011 most was invested in the objective of the general advancement of knowledge through research and development financed from general university funds (54.62%) and least for the objective of the exploration and exploitation of space. The biggest increase of 58% from 2010 was noted in transport, telecommunication and other infrastructure. Compared to 2010, the total state budget funds for research and development of the socio-economic objectives in the Republic of Croatia decreased by 4%. The reduced resources are the result of the economic crisis, which did not bypass Croatia. Apart from the economic crisis, there are a number of structural problems that limit the further development of research and development in Croatia.

5. The Choice between Tax Incentives and Direct Measures

Tax incentives for research and development are a policy instrument because the state uses them to direct the development of a company or economy. In addition, they also encourage the business environment in attracting new investment. Every country meets the problem of the implementation of political instruments of the highest quality to stimulate enterprises to invest in the activities of research and development. To solve the problem, the state oriented political instruments towards the market. Such a possibility allows an enterprise to choose how to strive towards research and development. The state can stimulate investment in research and development through direct measures such as subventions, loans and grants and indirect measures such as tax incentives and tax credits. Tax incentives for the stimulation of the business sector to invest in research

	TAX INCENTIVES	DIRECT MEASURES
ADVANTAGES	-incentive to increase research and development through every area of the company -private sector's decision in choosing the most productive manner of investment -lower risk of government mistake in choosing the wrong research-development project -encouraging companies to report on income more often -lower administrative costs of planning, allocation and management -the easiest manner to increase business sector participation in research and development	-better budget control -encouraging cooperation and technology transfers -possibility of using specific technological and scientific fields as an objective in overcoming circular or sectoral slowing down -contest between companies ensures that public resources belong directly to the best research-development projects -best for high-risk projects -adequate for achieving research-development activities with the greatest disagreement between social and private returns
DISADVANTAGES	-weak budget control -higher risk of loss -minor amendments in case of large companies -company's risk that other activities will be renamed research and development activities -private companies will choose research-development project with the highest return rate -risk that globalization of research and development might reduce overflow of local research and development for society	-high administration costs -administratively not adjustable to large number of applications -companies won't commit to research-development program that does not allow for public financing

Source: Adjusted by the author according to CEFAGUE-UE Working Paper 2011/4.
Table 4: Advantages and disadvantages of tax incentives and direct measures

and development are the most important instruments in the fiscal policies of European Union member states.

The European Commission encourages member states to equally use both types of measures. Each of these types has some advantages, as well as disadvantages. Table 4 gives an overview of the advantages and disadvantages of tax incentives and direct measures.
Source: adjusted by the author according to CEFAGUE-UE Working Paper 2011/4.

Each measure, whether direct or indirect, depends on the political objectives of the state. According to the strategic level of the state, tax incentives are more appropriate for international investment in research and development. If the objective of research and development policy is to encourage a large number of enterprises and increase the amount of the business sector's investment in research and development, tax incentives should be applied. Direct measures are more often used as state support for research and development. Direct R&D subsidies or government spending on basic research activities should not be expected to displace private real R&D investment (David, Hall, and Toole 2000). Investment in research and development decreases inequality among the European Union member states, as well as among the countries outside the EU's borders. The tax treatment of R&D is becoming more lenient and it is likely that countries will increasingly turn to the tax system and away from direct grants (Hall and Van Reenen 2000, p. 466). Investors will also need to be able to rely on a certain stability of the tax incentives granted, before engaging in a major investment (Klemm 2010, p. 323).

6. Conclusion

The activity of research and development is an important factor when it comes to the increase of productivity, economic efficiency and achievement of long-term economic growth. Each country has a right to independently choose whether to finance incentives for research and development directly or indirectly through tax incentives.

The introduction of tax incentives for research and development presents a foundation for an increase in national and international investments. The types of tax incentives for research and development also depend on the type of fiscal system and certain political objectives. The introduction of tax incentives for research and development is an attempt to support certain activities. They enable the reduction of imperfections in certain

sections of the fiscal structure and encourage the private sector to participate in economic and social programs. For countries, such as Croatia, that face the problem of transition and privatization and are about to join the European Union, it is highly important to invest in research and development. It enables them to create a national research market characterized by high levels of competitiveness and research excellence. In comparison to certain members of the European Union, Croatia still recognizes the trend of lagging behind in investment in research and development. On one hand, this is the consequence of the insufficient investment of the business sector in research and development and the unclear role of industrial policy in economic growth strategies, and, on the other, of the weak connection between the scientific sector and enterprises and the low rate of investment in higher education.

The European Union faces the problem of the dispersion of the actual effects for research and development. Most scientific researchers are conducted on the national level, mostly within national and regional research programs financed by the European Union. Compared to the United States of America, it is thought that the European Union does not invest sufficient resources in research and development in order to encourage economic growth. Therefore, in order to become competitive on a global level, the European Union has set the strengthening of the scientific and technological foundations of industry based upon increasing investment in research and development to 3% of GDP as one of its fundamental objectives, in line with the Horizon 2020 strategy. Joint investment of the European Union and Croatia in the field of research and development is useful in order to accumulate knowledge that can significantly increase factor production, innovative processes and the effects of knowledge overflow to all economic entities, thus influencing total economic growth and employment. The Republic of Croatia needs to invest additional efforts in order to reach certain members of the European Union in the area of tax incentives for research and development.

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Appendix: Tables and Figures

	2008	2009	2010	AVERAGE
Belgium	1,97	2,03	1,99	2,00
Bulgaria	0,47	0,53	0,60	0,53
Czech Republic	1,41	1,48	1,56	1,48
Denmark	2,85	3,06	3,06	2,99
Germany	2,69	2,82	2,82	2,78
Estonia	1,28	1,43	1,62	1,44
Ireland	1,45	1,74	1,79	1,66
Greece	—	—	—	—
Spain	1,35	1,39	1,39	1,38
France	2,12	2,26	2,26	2,21
Italy	1,21	1,26	1,26	1,24
Cyprus	0,43	0,49	0,50	0,47
Latvia	0,62	0,46	0,60	0,56
Lithuania	0,79	0,83	0,79	0,80
Luxembourg	1,57	1,66	1,63	1,62
Hungary	1,00	1,17	1,16	1,11
Malta	0,56	0,54	0,63	0,58
Netherlands	1,77	1,82	1,83	1,81
Austria	2,67	2,72	2,76	2,72
Poland	0,60	0,68	0,74	0,67
Portugal	1,50	1,64	1,59	1,58
Romania	0,58	0,47	0,47	0,51
Slovenia	1,65	1,86	2,11	1,87
Slovakia	0,47	0,48	0,63	0,53
Finland	3,70	3,92	3,87	3,83
Sweden	3,70	3,61	3,42	3,58
United Kingdom	1,79	1,86	1,77	1,81
Iceland	2,64	3,11	—	2,88
Norway	1,61	1,80	1,71	1,71
Switzerland	2,99	—	—	2,99
Croatia	0,89	0,83	0,73	0,82
Turkey	0,73	0,85	—	0,79
EU- 27	1,92	2,01	2,00	1,98

Source: Eurostat. 2011. Research and development: annual statistics. Bruxelles.
Table 1: Gross domestic expenditure on R&D (GERD) (% share of GDP)

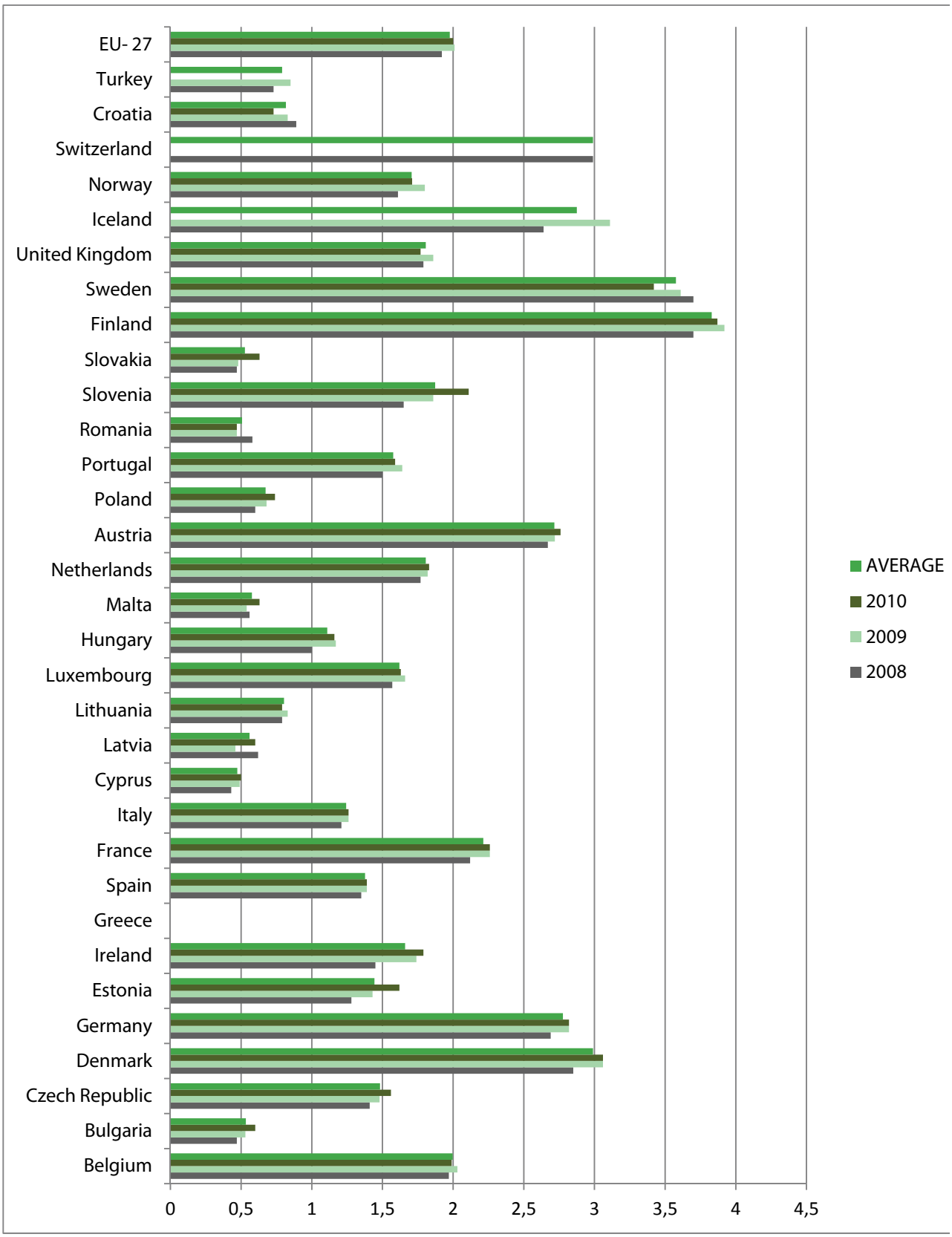
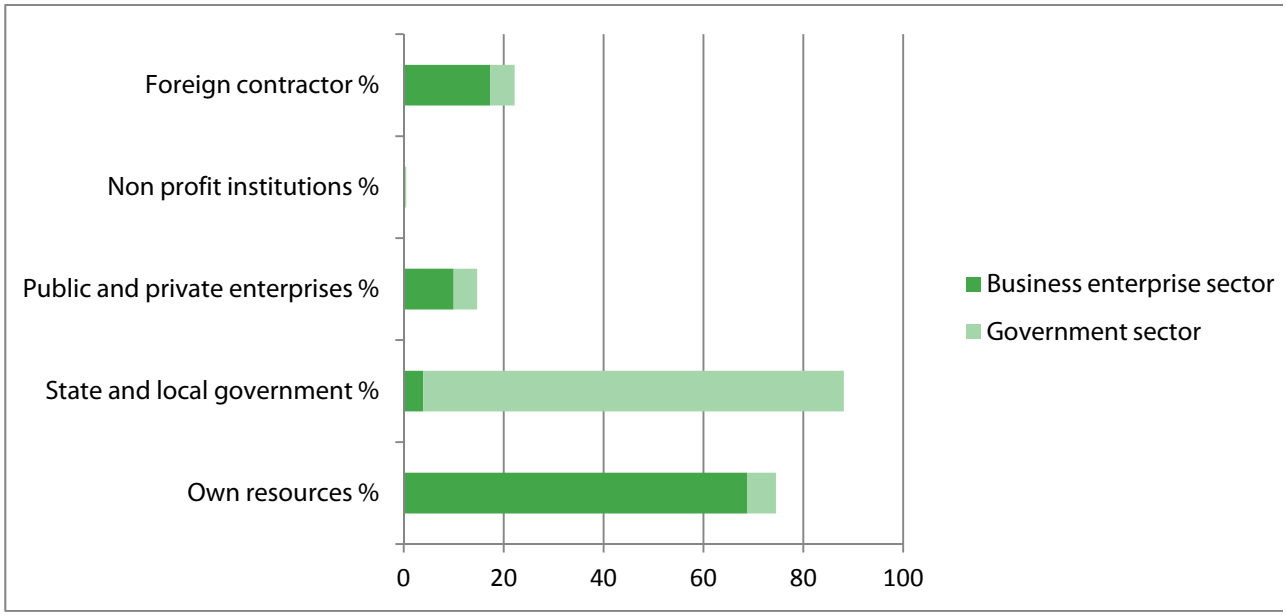


Figure 1: Gross domestic expenditure on R&D (GERD) (% share of GDP)

	Business enterprise sector		Government sector		Higher education sector	
	2005	2010	2005	2010	2005	2010
EU-27	1,15	1,23	0,25	0,27	0,41	0,49
Belgium	1,24	1,32	0,15	0,19	0,41	0,46
Bulgaria	0,10	0,30	0,31	0,22	0,05	0,07
Czech Republic	0,86	0,97	0,27	0,30	0,22	0,28
Denmark	1,68	2,08	0,16	0,06	0,60	0,90
Germany	1,74	1,90	0,35	0,41	0,41	0,51
Estonia	0,42	0,81	0,11	0,17	0,39	0,62
Ireland	0,81	1,22	0,09	0,06	0,34	0,51
Greece	0,19	—	0,12	—	0,28	—
Spain	0,60	0,71	0,19	0,28	0,33	0,39
France	1,31	1,38	0,37	0,37	0,40	0,48
Italy	0,55	0,67	0,19	0,18	0,33	0,36
Cyprus	0,09	0,09	0,13	0,10	0,16	0,25
Latvia	0,23	0,22	0,11	0,14	0,23	0,24
Lithuania	0,15	0,23	0,19	0,14	0,41	0,42
Luxembourg	1,35	1,16	0,19	0,29	0,02	0,19
Hungary	0,41	0,69	0,26	0,21	0,24	0,23
Malta	0,38	0,37	0,03	0,02	0,16	0,23
Netherlands	1,01	0,87	0,24	0,22	0,66	0,75
Austria	1,72	1,88	0,13	0,15	0,61	0,72
Poland	0,18	0,20	0,21	0,26	0,18	0,27
Portugal	0,30	0,72	0,11	0,11	0,28	0,59
Romania	0,20	0,18	0,14	0,17	0,06	0,12
Slovenia	0,85	1,43	0,35	0,38	0,24	0,29
Slovakia	0,25	0,27	0,15	0,19	0,10	0,17
Finland	2,46	2,69	0,33	0,36	0,66	0,79
Sweden	2,59	2,35	0,18	0,17	0,78	0,90
United Kingdom	1,06	1,08	0,18	0,17	0,44	0,48
Iceland	1,43	—	0,65	—	0,61	—
Norway	0,81	0,88	0,24	0,28	0,47	0,55
Switzerland	—	—	—	—	—	—
Croatia	0,36	0,32	0,21	0,20	0,30	0,21
Turkey	0,20	—	0,07	—	0,32	—
Japan	2,54	2,70	0,28	0,29	0,45	0,40
United States	1,79	2,02	0,31	0,30	0,36	0,36

Source: Eurostat. 2011. Research and development: annual statistics. Bruxelles.
Table 2: Gross domestic expenditure on R&D by sector (% share of GDP)



Source: Central Bureau of Statistics of the Republic of Croatia. 2010. Note 8.2.1.
Figure 2: Funding resources for the research and development in the Republic of Croatia in 2010 in thousands of Kunas (%)

Thousand Kunas

	2010	2011
Exploration and exploitation of the Earth	24 524	25 467
Environment	10 773	12 754
Exploration and exploitation of space	3 605	1 117
Transport, telecommunication and other infrastructures	33 406	52 930
Energy	8 397	5 924
Industrial production and technology	39 929	25 177
Health	37 683	37 156
Agriculture	18 337	20 813
Education	9 606	6 309
Culture, recreation, religion and mass media	29 436	24 772
Political and social system, structures and processes	25 775	33 264
General advancement of knowledge: R&D financed from general university funds	1 311 855	1 2452 08
General advancement of knowledge: R&D financed from other sources than general university funds	809 753	786 563
Defence	2 988	2 487
TOTAL	2 366 067	2 279 941

Source: Central Bureau of Statistics of the Republic of Croatia. 2012. Note 8.2.3.
Table 3: Government budget appropriations for research and development by socio-economic objectives in 2010-2011 in Croatia

Two Decades of Croatian Transition: A Retrospective Analysis

Nebojsa Stojcic*

Abstract:

Over the past two decades many Central and South East European countries underwent the process of transition from a centrally-planned towards a market economy. Among them, the case of Croatia stands out as particularly interesting. Owing to a number of reasons Croatia had the potential to be among the forerunners of transition. However, in realising this potential the country was constrained by numerous political and social turbulences which made its transition path somewhat unique. The objective of this paper is to explore to what extent the favourable initial conditions of Croatian transition have been exploited over the past two decades. The focus of the analysis is on four dimensions of transition: institutional reforms, macroeconomic performance, changes in economic structure and international trade. The general message yielded by the analysis is that much of Croatia's initial advantage was lost over the past two decades because of war, the unfavourable political climate in the 1990s, late integration into regional, European and global economic institutions and the slow restructuring of enterprises..

Keywords: Croatia, institutional reforms, restructuring, international trade, macroeconomic performance

JEL: P30, P52 **DOI:** 10.2478/v10033-012-0015-5

1. Introduction

The past two decades for Central and South East European countries (CEECs and SEECs) have been marked by their transition from centrally-planned towards market economies. Among them, the case of Croatia stands out as particularly interesting. Prior to transition, economic activity in Croatia was organised through a system which combined planning with market instruments. There were also differences in the structure of the economy, where the manufacturing sector was accompanied by a relatively large service sector. Finally, Croatia traded with both centrally-planned and market economies, the latter accounting for more than half of its overall international trade. These favourable initial conditions indicate that Croatia had the potential to be amongst the forerunners of transition.

In practice, Croatia embarked on transition in an environment characterised by political and social turbulences. With the exception of Bosnia and Herzegovina, it was the only country that had to deal with transformational recession and to pursue institutional reforms in a war environment. In the post-war period, a set of specific political factors impeded its integration into the EU and other European and international trade organisations. Together with the shortcomings of its privatisation process, these developments delayed the restructuring of Croatian enterprises and eroded their competitiveness in both domestic and foreign markets. In the advanced stage of transition, negative trends were partially reversed as Croatia approached regional, European and global economic associations with higher intensity.

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Period	GDP growth (%)	GDP per capita growth (%)	GDP/ Employment growth	Inflation (%)	Export/ Import ratio
1952-1989	5.19	4.67	1.74	59.72	0.75
1952-1971	7.63	6.93	3.47	9.73	0.81
1972-1979	5.41	5.00	1.52	19.70	0.61
1980-1989	-0.75	-1.12	-1.80	244.32	0.77

Table 1: Main macroeconomic aggregates: Croatia 1952-1989
Source: Own calculations based on data from the Croatian Statistical Office (DZS) and Druzic (2006).

The objective of this paper is to explore to what extent the favourable initial conditions of Croatian transition have been exploited over past two decades. The analysis focuses on four dimensions of transition: institutional reforms, macroeconomic performance, changes in economic structure and international trade. To this end, Section 2 explains why Croatia was expected to be amongst the forerunners of transition. Section 3 will then investigate the major changes that took place in the previously mentioned dimensions during the transition period and compare the Croatian experience with that of other transition economies. Finally, a summary of findings will be presented in Section 4.

2. The Croatian Economy before Transition

Before transition, Croatia had a number of distinctive characteristics compared to other centrally-planned economies. The country followed a 'liberal' model of central-planning, known as self-managed socialism, which combined instruments of both planning and the market. In general, and by many criteria, the country was closer to the standards of industrialised market economies than any other socialist country. In this context, it is possible to track the main features of the Croatian economy before transition along four main areas: the characteristics of its institutional framework, macroeconomic performance, the structure of its economy and international trade.

2.1. Institutional Setting

As part of the former Yugoslavia, Croatia practised a liberal model of socialism known as 'socialist self-management'. Formally, economic activity was coordinated through plans but these plans were more of an indicative than of a binding nature and enterprises had to rely, by and large, on market forces when making decisions about their activities (Gros and Steinherr, 1995). The ownership rights over the means of production were vested in all citizens but the management over such social property and responsibility for the performance of enterprises were delegated to workers. In such a setting, the managers of enterprises had the opportunity and incentive to show initiative and to respond to market stimulus. All in all, the market forces were present to a much higher extent than in any other centrally-planned economy until the fall of the system. This is particularly true for the period between 1952 and 1972, which was characterised with decentralisation of decision-making and price and trade liberalisation which enhanced managerial initiatives (Lyndall, 1984; Druzic, 2006). In that respect it can be argued that Croatia's transition to a market economy has been underway since the 1950s.

2.2. Macroeconomic Performance

From 1952, the year with the first available post-WW2 statistical data on Croatian macroeconomic performance until 1989, when the socialist period came to an end and the transition period started, the Croatian economy was growing at an average annual rate of 5.2% (Table 1). For comparison, the average rate of growth in OECD countries between 1960 and 1989 was 3.93%. The productivity of labour in that period was growing at a rate of 1.7% per year while the export/import ratio averaged around 75%. The only exception to this positive picture was inflation, which had an average annual rate of 60%. However, averaging over such a long period may hide the actual variations in macroeconomic aggregates in particular sub-periods. To this end, the post-war period may be divided into three distinguishable periods; the liberalisation (1952-1971), the retreat from the market (1972-1979) and finally the period of economic decline (1980-1989) (Druzic, 2006).

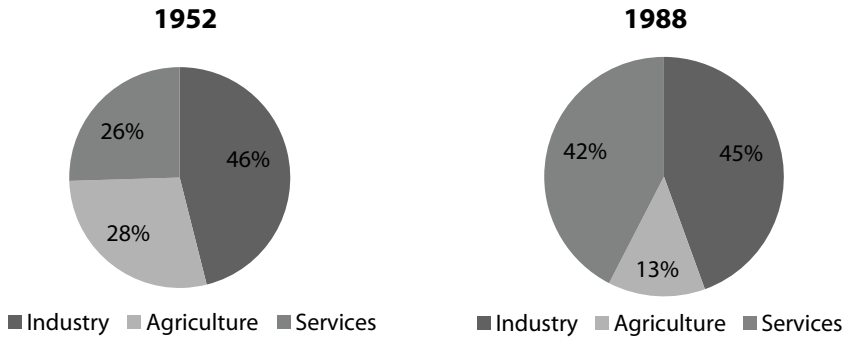

Figure 1: The structure of the Croatian economy, 1952-1988
Source: Federal Statistics Bureau of Yugoslavia, (SZS) 1989 and DZS, 1990 Industry includes mining and construction

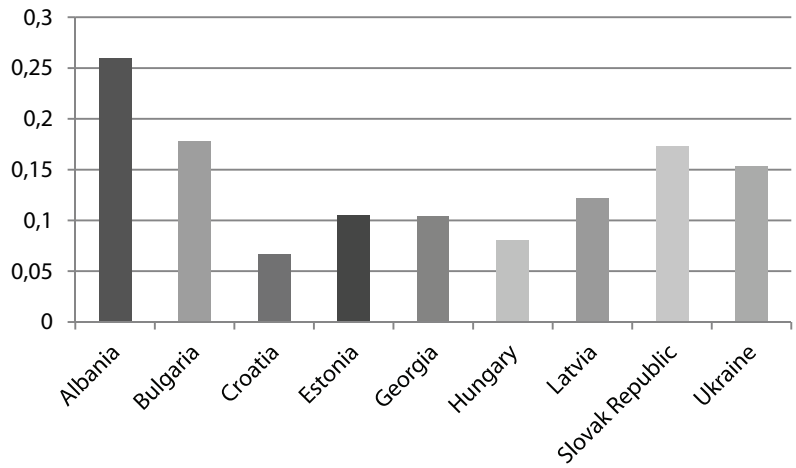

Figure 2: Structural similarity of selected centrally-planned economies and EU15 in 1988
Source: Own calculations based on data from DZS (1990) and WDI World Bank (2010)

The highest rates of growth were recorded in the years of liberalisation (1952-1971) and they were accompanied by rising labour productivity (Table 1). The years that followed (1972-1979) were characterised by a slowdown which turned into a decline in the 1980s. The coverage of exports with imports was throughout this entire period above 60%, and particularly high in the years of the institutional reforms (1960s) and in the second half of 1980s due to the combination of increased exports and administrative control over imports. However, an acute problem of the Croatian economy was inflation. The rise of prices started after 1960 due to the fact that price and trade liberalisation increased the prices of raw materials and agricultural products. High rates of inflation were also recorded in the years of oil shocks (1973-74 and 1979), suggesting that Croatia, as other centrally-planned economies, was sensitive to changes in the prices of energy and raw materials. However, the highest rates of inflation were recorded in the last years of the socialist era.[i] This was caused by a combination of factors of which the most important were structural disproportions, the high share of foreign debt and oil shocks (Gros and Steinherr, 1995).

2.3. Economic Structure

Croatia entered central planning as a predominantly industrial and agricultural economy with these sectors accounting for 46% and 28% of overall output, respectively (Figure 1). In the years that followed, the industrialisation of the economy continued and in 1988 industry accounted for 45% of the overall output. By this time, the services had become the second largest sector, with their share increasing to 42% (Figure 1).

The comparison of the economic structure of Croatia and several other centrally-planned economies (for which

data were available) with that of the EU15 in 1988 using the index of structural convergence developed by Thiessen and Gregory (2007) shows that in structural terms Croatia was closer to EU15 countries than any other centrally planned economy (Figure 2).[ii] It can be concluded that favourable economic policies and institutional circumstances had facilitated the gradual emergence of an economic structure typical of market economies.

2.4. International Trade

The distinctive feature of the Croatian trade pattern in comparison to other centrally-planned economies was its much stronger orientation to West European markets. In 1989, more than half of both Croatian exports and imports were accounted for by trade with market economies, mainly West European (Table 2). Croatia's main trading partners at the time were Italy, Germany (Federal Republic) and the Soviet Union (DZS, 1990). Together, these three countries accounted for one third of Croatian imports and absorbed nearly half of its exports.

Destination	Flow: Export	Flow: Import
Market Economies (MEs)	*0.54*	*0.53*
Western Europe	0.46	0.43
Other ME	0.08	0.10
Centrally-Planned Economies (CPEs)	*0.29*	*0.25*
East European CPE	0.29	0.25
Other CPE	0.01	0.01
Developing Countries	*0.16*	*0.22*

Table 2: Distribution of Croatian international trade in 1989
Source: DZS, 1990

Table 3 shows the sectoral distribution of the international trade of Croatia and the EU15 countries with the rest of the world in 1988.[iii] At that time, over 53% of Croatia's exports were concentrated in two sectors (6 and 7 – 'manufactured goods' and 'machinery and equipment'). These two sectors also accounted for the largest share of EU15's exports (almost 53%). Two sectors (3 and 7 = 'energy and raw materials' and 'machinery and equipment') accounted for the bulk of Croatia's imports (nearly 47%). Given that 70-75% of Croatia's trade was conducted with Western Europe and non-socialist countries (Table 2), the sectoral distribution of its exports and its similarity with the market economies of EU15 indicates that Croatian industries were influenced by, and responded to, international market trends.

Sector	Croatia Export	Croatia Import	EU15 Export	EU15 Import
0	11.4	9.1	10.3	9.3
1	0.6	0.1	1.8	1.0
2	5.8	9.3	5.5	5.9
3	3.6	26.3	3.2	7.4
4	0.1	0.3	0.5	0.4
5	10.4	18.8	10.4	10.8
6	21.5	11.6	22.6	18.1
7	31.9	20.3	30.2	33.5
8	14.6	4.3	14.3	11.9
9	0.1	0.0	1.4	1.6

Table 3: Sectoral distribution of exports and imports of Croatia and EU15 in 1988 (%)
Source: Own calculations based on UN Comext database and SZS (1989)

Bringing all the findings from this section together, several reasons can be identified as to why Croatia was expected to be among the forerunners of transition. First, even before transition Croatia was a semi-market economy with many functioning market instruments which had yet to be introduced in other centrally-planned economies. Second, in structural terms, Croatia was closer to European market economies than most of the other centrally planned economies. Third, Croatian producers have been predominantly oriented towards international trade on West European markets and their export was in line with import demand of that market.

3. Croatian Economy in Transition

The transition in Croatia formally started in 1989 with the introduction of several laws that permitted the creation of new private businesses and the full transfer of ownership over socially owned means of production to employees and outside owners. As the EBRD indices of institutional reforms (Figure 3) show, some degree of price and trade liberalisation and small entrepreneurship existed even in 1989 before the break-up of Yugoslavia. However, these favourable initial conditions were offset by the political and social turmoil, including the war that followed Croatia's declaration of independence from Yugoslavia and the subsequent dissolution of this country. The initial transformation policies aimed at facilitating Croatia's transition to a market economy were

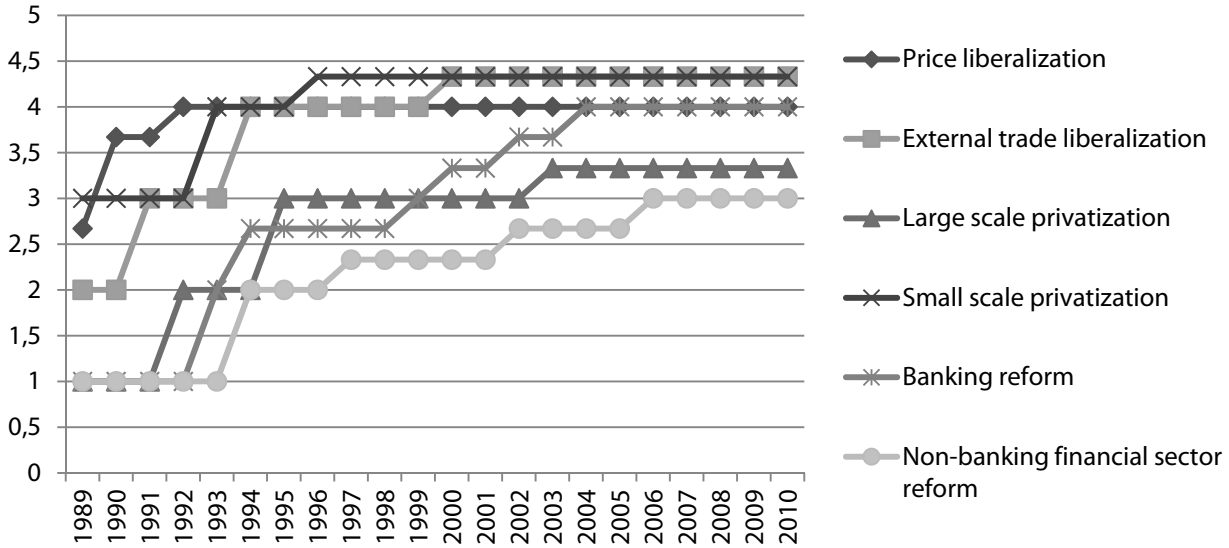

Figure 3: Indices of the progress in institutional reforms in Croatia, 1989-2007
Source: EBRD Transition report (various years)

undertaken under conditions of war, with an inflow of refugees and consequent economic, social and political problems (Bartlett, 2003). In addition to war, specific political circumstances during the second half of the 1990s impeded Croatia's EU accession as well as integration into international economic and political associations such as the Central European Free Trade Agreement (CEFTA), World Trade Organisation (WTO), etc. These factors did not facilitate the restructuring of enterprises whose competitiveness declined in this period (Nikic, 2003).

3.1. Institutional Framework

As a semi-market economy Croatia had the advantage that the extent of institutional reforms that needed to be undertaken was less than in other transition countries. The institutional reforms in the transition period were the continuation of reform processes which started in the 1960s and continued in the second half of the 1980s. The most important reforms were undertaken in the first half of the 1990s. By 1992, price controls were restricted to natural monopolies, highly concentrated industries and some sectors such as agriculture and shipbuilding.[iv] Full current account convertibility and internal convertibility were established in 1993 thus enabling the free purchase of foreign currencies by legal and private subjects. Trade liberalisation was gradual and, by 1996, import quotas and non-tariff instruments were replaced by a set of tariffs typical of market economies (Skreb, 1995; Bartlett, 2003). The capital account was liberalized only in 2007, in which respect Croatia was more conservative than other CEECs (Babic, 2002). Croatia experimented with several exchange rate mechanisms from the real exchange rate regime (REER) inherited from Yugoslavia to the fixed exchange rate regime in 1991, to the floating regime in 1992 and to a crawling peg exchange rate regime introduced in 1993, pegging the domestic currency first to the Deutschmark (DEM) and then to the Euro (Payne, 2000). Figure 3 shows the progress of institutional reforms in the post-transition period.

In the first years of the transition Croatia benefited from preferential trade agreements signed between the EU and Yugoslavia in the 1980s. However, due to various political obstacles, the integration in international trade flows in later years was slower than in other CEECs. Membership in the World Trade Organization (WTO) was achieved in 2000 while the Association Agreement with EU which enabled CEECs to export their products to the EU market under preferential terms was signed in 2001.[v] Finally, given that Croatia was not part of the Central European Free Trade Agreement (CEFTA) until 2003, her access to markets of other CEECs was impeded. From 2000, preferential trade agreements were signed with almost all CEEC members and according to Skuflic (2005), 95% of Croatia's trade in 2005 was covered with bilateral trade agreements.

In addition to the previously mentioned laws from 1989 that allowed the creation of private and the privatisation of socially owned enterprises, the law on the

Transformation of Socially Owned Assets was passed in 1991, which further facilitated the replacement of social ownership by private ownership. In the next two years the bulk of companies were privatised through direct sales to employees, Croatian citizens and Croatian and foreign legal entities. The remaining shares from this round were sold from 1994 to 1997 on the basis of contractual sales or they were distributed to selected institutions and groups such as health and pension funds, war veterans, etc. By 1998, 96% of total capital earmarked for privatisation was privatized in this manner (Druzic, 2006). Between 1998 and 2000 half of the remaining shares were then distributed through voucher privatization to selected social categories. Finally, in the fourth stage, after 2000, the shares in the remaining non-privatized companies and some strategic companies, mainly public utilities which were left out of the earlier stages of privatization, were offered either through the stock-exchange or directly to strategic partners.

Although ownership was transferred formally to the private sector, the state continued to remain in control of the economy through several indirect channels such as state companies or state-owned banks (Bartlett, 2003). Furthermore, the privatization often lacked transparency and the ownership of some of the most profitable enterprises was transferred to individuals who had close ties to the governing party in contravention of the law (Bartlett, 2003). Also, 100 of the most important large companies were left to be privatized in later periods. The new owners of privatised companies often lacked the vision, knowledge and capital to transform enterprises into efficient companies capable of competing in a market economy. As a consequence, many profitable and potentially profitable enterprises were eventually returned to the Croatian Privatization Fund (CPF) as loss-making companies ready for liquidation. An audit of the privatization programme by the State Audit Office in 2004 found that 64% of privatized companies failed to achieve goals stated before privatization (State Audit Office, 2004). In addition, the discounted sale of shares to employees proved to be unsuccessful as in many cases employees were not able to pay for their shares. According to Gregurek (2001), by 1999 only 26% of shares purchased by employees were paid for and about 60% of contracts between CPF and employees had to be terminated.

The reforms in the banking sector started in 1991 with measures aimed at freeing banks from accumulated bad loans. From 1993, the Croatian National Bank (HNB) was given autonomy and it was vested with the duty to maintain the stability and liquidity of the financial system. Its supervisory powers were further increased with the new banking law in 1999. Furthermore, ceilings were introduced on the credit activities of business banks and government borrowing from the central bank. The reforms of the banking sector continued in two waves, first in 1995 when four major loss-making banks were rehabilitated and in 1999 when the new banking law initiating the bankruptcy of some banks and the privatization of others was passed (Bartlett, 2003).

During the transition period, changes have also taken place in the number of banks and in the ownership structure of the banking sector. In 1993, the Croatian banking sector consisted of 25 state-owned banks and 18 banks under private domestic ownership (HNB, 2010). The number of banks rose until 1998, when the total reached 60 banks, of which 42 were under domestic private ownership, 10 were under foreign ownership and 8 were owned by the state. Since then, the number of banks has been falling and by 2007, the total had fallen to 33 banks, 2 owned by the state, 16 by foreign owners and 15 by domestic private owners. After 2000, the share of the state in the assets of the banking sector was reduced to 5%, and has varied between 4% and 5% ever since. Among private banks, the share of foreign owners in the assets of the banking sector has been rising and, since 2002, over 90% of the Croatian banking sector was under foreign ownership (HNB, 2010).

The stock-exchange was established as early as 1991, but the stock market started to gain importance from 1998 after voucher privatization, when newly established Privatization Investment Funds (PIFs) entered the market and began trading with shares of privatized enterprises. The number of funds and their diversity increased over the years and at the end of 2007 there were 100 open-end and 9 closed-end investment funds. After 2000, the insurance sector was also liberalized and in 2007 there were 27 insurance companies in Croatia. Finally, the reform of pension funds was undertaken between 1999 and 2002 when the former retirement fund was substituted by the three pillar pension model consisting of mandatory personal retirement accounts, mandatory private retirement schemes, and optional private savings for the purpose of retirement.

To sum up, two sub-periods can be distinguished in Croatia's institutional development during transition. Between 1991 and 1999 Croatia introduced all major mechanisms required for the establishment of a

Period	GDP growth (%)	GDP per capita growth (%)	Employment growth rate (%)	GDP/ Employment growth	Inflation (%)	Export/ Import ratio
1989-1993	-10.21	-10.58	-5.18	-5.43	807.46	0.87
1994-1999	4.5	5.38	-1.06	5.19	43.16	0.59
2000-2010	2.9	3.15	0.48	2.15	2.26	0.49

Table 4: Croatia's main macroeconomic aggregates: Annual averages, 1989-2010
Source: DZS and HNB

functioning market economy. However, due to the specific nature of the Croatian transition the success of these reforms was only partial and in many aspects Croatia fell behind other CEECs. In the second period, after 2000, Croatia made significant progress to regain its position in the group of advanced CEECs. This primarily relates to the process of integration in international and regional trade arrangements and developments in the financial sector. In this context it can be stated that the institutional framework of a market economy was fully created at an advanced stage of transition.

3.2. Macroeconomic Performance

At the beginning of the transition, the Croatian economy demonstrated behaviour typical of transition economies. The decline in output was accompanied by a decline in employment and rising inflation. However, the transformational recession was amplified with the war and the break-up of linkages with the markets of the former Yugoslavia. Between 1989 and 1993 the GDP fell at an average annual rate of 10% and in 1993 it was at 60% of its pre-transition level (Table 4). Such output decline is comparable only to that of some CIS and Baltic countries (Fischer et al., 1996). Due to a transformational recession and the destruction of many industrial capacities in the first years of the war, the number of employed persons fell from 1.6 million to 1.23 million, i.e. a decline of almost 25% (Druzic, 2006). The only aspect of macroeconomic performance that developed in a favourable direction in this period was the export/import ratio, which was sustained at a level of nearly 90%. However, these developments should be interpreted with caution as at the time Croatia was under unofficial sanctions which artificially decreased imports. Moreover, imports in this period included a considerable amount of military equipment which was not registered in the official import statistics (Druzic, 2006).

Inflation, inherited from the 1980s, reached its peak between 1989 and 1993 when the average annual rate of inflation was over 800% (Table 4), substantially above the inflation rates in CEECs and in line with CIS, Macedonia and some Baltic countries. The first attempts to curb inflation were made in 1989 when the annual rate of inflation was running at 1200%, but these measures yielded only temporary success and inflation again started to rise after the disintegration of Yugoslavia and the onslaught of the war. By this time, inflation was further fuelled by the attempts of monetary authorities to build foreign currency reserves (Bartlett, 2003).[vi] As a consequence, inflation reached its peak in October 1993 when its annual level amounted to over 1400%.

The recovery of the economy started in the second half of 1993 when the government introduced a stabilisation plan which had four main objectives: to curb inflation, to initiate restructuring of the real sector and to rehabilitate the financial sector, and to create foundations for sustainable growth of the economy in the long run. In 1994 the rate of inflation fell to 107% and in the following five years it was brought down to an average of 4.46% per annum. On a wave of post-war recovery and stabilization, the Croatian economy started to grow and the average annual rate of growth of GDP and GDP per capita reached 4.5% and 5.38% respectively, which was in line with other CEECs. As employment continued to fall at about 1% annually, overall labour productivity increased at a rate of 5% per year (Table 4).

The success of macroeconomic stabilization, however, was not followed by another element of the stabilization package, namely enterprise restructuring. The failures of privatization, the weak discipline in the banking sector and the specific political environment of the 1990s impeded the restructuring process which eventually eroded the competitiveness of domestic enterprises (Nikic, 2003). This was particularly visible in international trade where the ratio of export to import fell to 60% (Table 4). The expansion of the economy and the post-

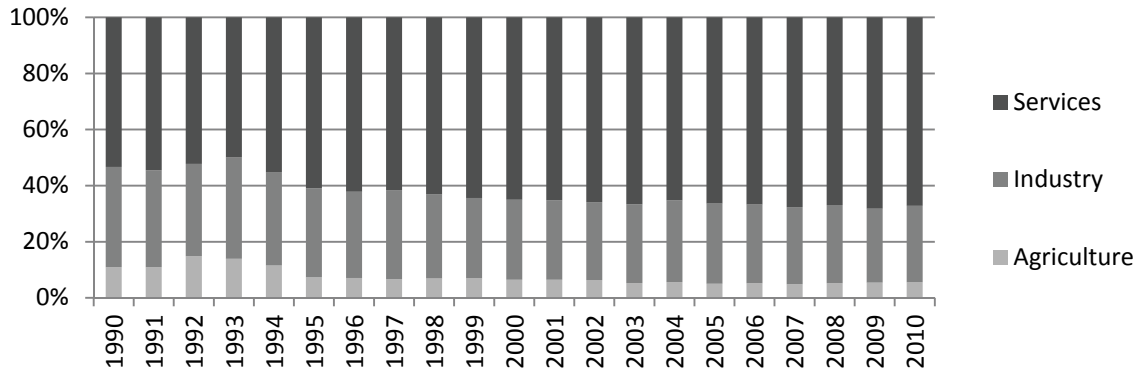

Figure 4: The structure of the Croatian economy (% of GDP), 1990-2010
Source: WDI, World Bank, 2012

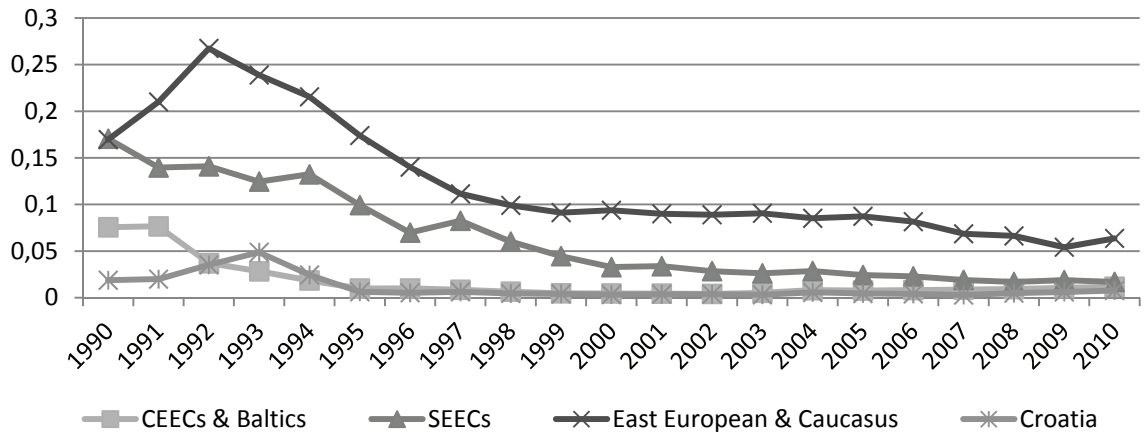

Figure 5: Structural convergence of transition economies, 1990-2010
Source: Own calculations based on WDI World Bank (2012)

war recovery were accompanied by a rise in imports for both consumption and investment purposes. As domestic export stagnated, Croatia was eventually transformed into an import led economy (Bartlett, 2003).

Between 2000 and 2010, all main macroeconomic aggregates recorded positive trends. Growth of GDP and GDP per capita was somewhat lower than in other CEECs but Croatia reached its pre-transition level of output in 2003 (EBRD, 2007). The growth of output was accompanied by growth in employment (0.48%) which was higher than in other CEECs (0.38%) and by a growth of labour productivity (2.15%). Also, through the entire period, inflation remained at around 3%, below the rate of inflation in other CEECs (4.8%) (EBRD, 2011). However, the export/import ratio fell to an average of about 50% (Table 4).

To sum up, the transformational recession in Croatia was particularly strong, with a decline in output and high inflation that were more comparable with the experiences of CIS countries than with those of CEECs. In the years after the introduction of the stabilization programme, Croatia managed to restore macroeconomic stability and achieve rates of growth typical for CEECs. However, the stabilization and expansion of the economy were not accompanied by the restructuring of enterprises which eroded the competitiveness of Croatian exports and eventually transformed Croatia into an import-led economy.

3.3. Structural Changes

Before transition, economic activity in Croatia was concentrated in the manufacturing and service sectors. During the period of transformational recession, the service sector suffered from a particularly large contraction, mainly due to the decline in tourism. In 1991, the fall in the number of tourist arrivals was estimated at 85% (Bartlett, 2003). However, as transformational

Industry Code	Industry Name	1995	2005	2005/1995 (p.p.)
15	Food products and beverages	19.3%	20.2%	5.1
16	Tobacco products	2.4%	2.5%	3.0
17	Textiles	2.8%	1.7%	-39.7
18	Wearing apparel; Dressing and dyeing of fur	5.6%	3.8%	-32.3
19	Tanning and dressing of leather; luggage, handbags, saddler, harness, footwear	2.2%	1.3%	-40.4
20	Products of wood and cork, except furniture; articles of straw and plaiting	2.8%	2.9%	3.1
21	Pulp, paper and paper products	2.7%	2.0%	-23.6
22	Publishing, printing and reproduction of recorded media	6.6%	5.8%	-12.4
23	Coke, refined petroleum products and nuclear fuel	10.3%	10.9%	5.8
24	Chemicals and chemical products	11.8%	8.1%	-32.0
25	Rubber and plastic products	2.4%	2.4%	1.2
26	Other non-metallic mineral products	4.4%	7.2%	61.8
27	Basic metals	1.9%	1.7%	-15.4
28	Fabricated metal products, except machinery and equipment	5.9%	7.5%	27.2
29	Machinery and equipment n.e.c.	3.4%	3.4%	0.9
30	Office machinery and computers	0.9%	1.0%	23.2
31	Electrical machinery and apparatus n.e.c.	3.9%	4.2%	7.4
32	Radio, television and communication equipment and apparatus	2.2%	2.3%	3.8
33	Medical, precision and optical instruments, watches and clocks	0.9%	0.8%	-15.2
34	Motor vehicles, trailers and semi-trailers	0.8%	1.1%	30.7
35	Other transport equipment	2.9%	5.4%	83.1
36	Furniture; manufacturing n.e.c.	3.2%	2.9%	-6.4
37	Recycling	0.6%	0.8%	43.3

Table 5: Industry value added as % of manufacturing in Croatia, 1995-2005
Source: DZS, 1997 and 2008

recession and the war had affected the entire economy, the contraction of services did not produce major changes in its structure. In 1993, the year when output fall reached its bottom, the service sector accounted for nearly 50% of the entire value added in the Croatian economy, compared with 54% in 1990. It was followed by industry (36%), whose share slightly increased from 35% in 1990, and agriculture whose share increased from 10% in 1990 to 14% in 1993. Figure 4 shows the change in the structure of the economy throughout the transition period.

In the years after the introduction of the stabilization programme and during the post-war recovery (1994-1995), the share of the service sector in the economy increased to 64% in 1999 and by another 5% by 2010 (Figure 4). The share of industry was reduced to 28%, while the share of agriculture fell to 6% by 2010. The structure of the Croatian economy in this period was shaped by the end of the war and regional conflict, which boosted domestic tourism and increased the share of services to levels higher than pre-transition levels. However, it is also likely that the combination of privatization failures, the difficulties of access to the markets of the EU and CEECs, and the penetration of imports eroded the competitiveness of the Croatian manufacturing sector and reduced its share in the overall economy. A comparison of the structural similarity between transition economies and Croatia on the one hand and the EU15 economies on the other indicates that Croatia soon assumed a pattern which was much closer to that of market economies than to its centrally-planned counterparts (Figure 5). In that respect Croatia was closer to the EU15 countries than the group of advanced CEECs.

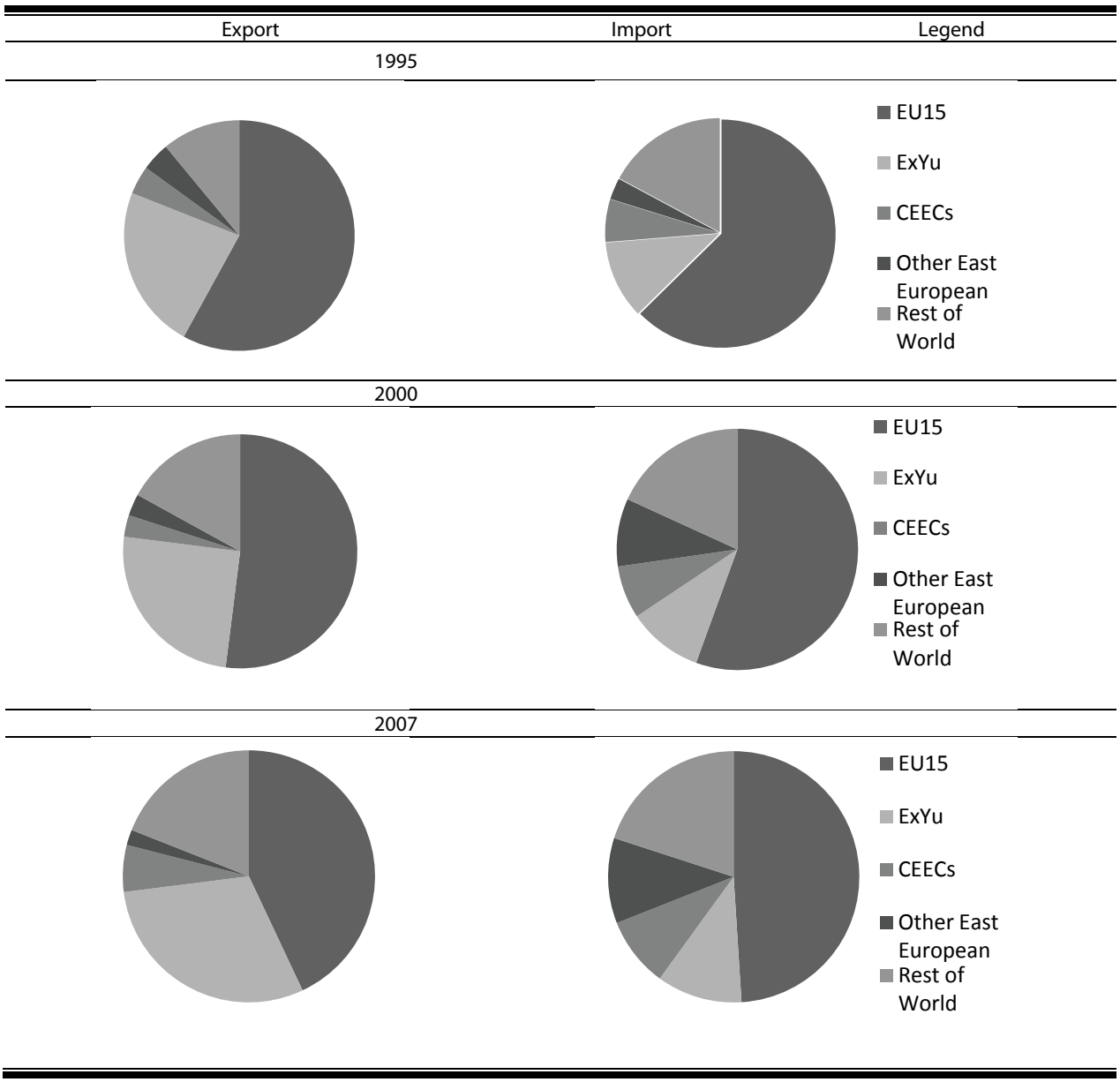

Figure.6: % of Croatian trade by main trading partners, 1995-2007
Source: IMF DOTS Database
ExYu group includes Slovenia, Bosnia and Herzegovina, Serbia, Montenegro and Macedonia
CEECs group includes Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovak Republic, Estonia, Latvia and Lithuania
Other East European group includes CIS countries, Moldova, Albania and Georgia

A closer look at the components of the manufacturing sector, presented in Table 5, indicates that between 1995 and 2005 the food industry, the manufacture of coke, petroleum and nuclear fuels and the chemical industry accounted for more than 40% of the value added in this sector. The industries that have enjoyed the highest rate of growth in this period were the manufacture of transport equipment (83 p.p.), the manufacture of other non-metallic mineral products (61 p.p.) and recycling (43.32 p.p.). However, together these three industries accounted for only 13% of the total value added in manufacturing. On the other hand, the fastest declining industries in the period of transition were the manufacture of leather and leather products (-40.35 p.p.), manufacture of textiles (-40 p.p.), manufacture of apparel, the dressing and dyeing of fur (-32 p.p.) and the chemical industry (-32 p.p.). In 1995 these four industries together accounted for 22% of the total value added in manufacturing whereas by 2005 their share had fallen to 14%.

The division of industries from Table 5 by their technological intensity into low, medium-low, medium-high and high technology intensive industries (OECD, 2007) reveals that the industries with the largest share in the Croatian manufacturing come from low (food industry), medium-low (coke-petroleum and nuclear fuels) and medium-high (chemical industry) technology-intensive industries. Such a dispersed pattern may imply either a lack of specialization or it may also signal that, even in an advanced stage of transition, the manufacturing sector was still undergoing structural changes. The latter explanation seems more plausible if we note that the three largest losers (in terms of their shares in value added of the manufacturing sector) were low-technology intensive industries, while the five biggest gainers in transition four were from the medium-low and medium-high technology intensive industries.

Summing all of these findings it can be concluded that during the transition period Croatia has gradually approached the structure of a market-style economy. After the war and the initial transformational recession, the share of the service sector increased to above its pre-transition levels and Croatia became closer to the structural pattern of EU15 countries than any of the three major groups of transition countries. However, it needs to be underlined that within the manufacturing sector, the low-technology intensive industries retained the largest share. Moreover, the restructuring of Croatian enterprises in the early transition period took place in a more hostile institutional environment than in other CEECs.

3.4. International Trade

As has been already explained in Section 2, in the first years of transition Croatia benefited from a Trade and Cooperation Agreement signed between the EU and Yugoslavia in the 1980s. In later years the lack of the Association Agreement deprived Croatia of preferential access to EU markets that was offered to many other transition countries. The exporters from transition economies which had an Association Agreement with EU were discouraged to source their inputs in Croatia, as these agreements required that their exports to the EU market must contain minimum levels of input originating either in the EU, or in Association Agreement countries. Similarly, the late signing of the CEFTA agreement impeded access by Croatian producers to CEECs' markets (Bartlett, 2003). In addition, the almost fixed level of exchange rate set by the stabilization plan in 1993 (which effectively implied currency appreciation) eroded the international competitiveness of Croatian producers and facilitated large increases in imports (Nikic, 2003).

Figure 6 shows the share of the main trading partners in Croatia's international trade during the transition period. It is evident that despite previously mentioned impediments, the EU15 countries remained the most important trading partners of Croatia during the entire transition period. The share of the EU15 in Croatian import and export was highest in the first years of transition when Croatia was confronted with the loss of markets in other parts of the former Yugoslavia and Eastern Europe. Within the EU15, the major trading partners were Germany and Italy, the same countries as before the transition (Table A1 in Appendix). In addition, the countries of the former Yugoslavia accounted for about 25% of Croatian exports and about 10% of its imports. The bulk of this trade took place with Slovenia and Bosnia and Herzegovina, who absorbed over 80% of Croatian trade with the region (Table A1 in Appendix). Other transition countries did not have a significant share in Croatian international trade.

The low share of CEECs in Figure 6 probably reflects the impediments to trade with these countries that were mentioned earlier. Trade with other economies from Eastern Europe was also modest and these countries accounted for less than 5% of Croatian exports and less than 10% of its imports over the entire period. To some extent these developments can be interpreted as an indicator of Croatia's strong orientation towards EU, but also they may indicate that Croatia did not succeed in regaining its position in these markets. Finally, trade with the rest of the world formed about one fifth of Croatian exports and imports.

During transition, exports from Croatia and CEECs to the rest of the world were mainly concentrated in three sectors, machinery and transport equipment, manufacturing products classified by material and miscellaneous manufactured articles (Table 6). These sectors accounted for 75% of CEECs export to the rest of the world. On the import side, the three most important import sectors in both CEECs and Croatia were the manufacturing of machinery and transport equipment, the manufacturing of products classified by material and the chemical industry.

During the transition the EU15 countries mainly imported products from the rest of the world from the three industries which were identified as the most important in the overall exports of Croatia and CEECs

SITC Rev 3 Code	Description	Export		Import	
		Croatia	CEECs	Croatia	CEECs
0	Food and live animals	8.2	6.4	7.8	5.5
1	Beverages and Tobacco	2.3	0.7	0.8	0.8
2	Crude materials, inedible, except fuels	5.7	3.9	2.5	3.6
3	Mineral fuels, lubricants and related materials	10.2	4.9	12.0	10.5
4	Animal and vegetable oils, fats and waxes	0.2	0.2	0.3	0.3
5	Chemicals and related products, n.e.c.	11.8	7.7	11.3	11.9
6	Manufactured goods classified chiefly by material	14.3	22.2	19.0	19.6
7	Machinery and transport equipment	25.4	36.5	31.9	36.8
8	Miscellaneous manufactured articles	21.8	16.4	12.8	9.7
9	Commodities and transactions n.e.c.	0.04	1.0	1.5	1.3

Table 6: Sectoral distribution of international trade of Croatia and CEECs with rest of world, 1993-2007 (%)
Source: Own calculations based on UN Comext database

SITC Rev3 Code	Description	Export to EU15		Import from EU15	
		Croatia	CEECs	Croatia	CEECs
0	Food and live animals	4.1	4.6	6.7	4.5
1	Beverages and Tobacco	0.4	0.3	0.6	0.6
2	Crude materials, inedible, except fuels	7.9	4.3	1.7	2.1
3	Mineral fuels, lubricants and related materials	5.5	3.6	2.8	2.2
4	Animal and vegetable oils, fats and waxes	0.1	0.1	0.3	0.4
5	Chemicals and related products, n.e.c.	9.9	4.8	12.6	13.9
6	Manufactured goods classified chiefly by material	14.6	21.2	19.2	22.9
7	Machinery and transport equipment	23.7	40.1	39.3	41.9
8	Miscellaneous manufactured articles	33.8	20.0	14.8	10.5
9	Commodities and transactions n.e.c.	0.04	0.6	2.1	0.6

Table 7: International trade of Croatia and CEECs with EU15, 1993-2007 (%)
Source: Own calculations based on UN Comext database

(Table 7). About a third of Croatian exports to the EU15 came from miscellaneous manufactured articles. On the other hand, the most important exporting sector of the CEECs was machinery and transport equipment (40%) Finally, the imports of these countries from the EU15 did not significantly differ from their imports from the rest of the world. It was concentrated in a few sectors, the most important being machinery and transport equipment. On the one hand, these figures can be interpreted in light of findings about the outsourcing of activities from EU15 to transition economies. However, they may also signal that intra-industry trade has an important role in the exchanges of CEECs and Croatia with the rest of the world.

Summarizing these findings it is evident that over the past two decades Croatia lost most of its initial advantage over other transition economies. Broadly speaking, it is possible to distinguish between two periods of Croatian transition: the first is characterised by the eroding competitiveness of its firms and industries (during the 1990s) and second (after 2000) when many negative trends from the previous period came to an end and the competitiveness of Croatian firms, industries and the economy as a whole started to improve. However, while it is well established and taken as stylised fact that the key role in explaining the first part of the Croatian transition belonged to the specific nature of the Croatian transition, which at that time was characterised by war, privatisation

failures and unfavourable institutional developments, it remains unknown whether improvements in the competitiveness of Croatian firms and industries have come as a consequence of favourable developments in their environment or whether they were the results of changes in the behaviour of the firms themselves.

4. Conclusion

This paper reviewed the development of some important features of the Croatian economy in the course of its transition to a market economy. The investigation showed that before transition Croatia had some distinctive features in relation to other centrally-planned economies. The Croatian economic system was organized as a semi-market economy and its enterprises enjoyed a higher freedom of decision-making than their counterparts in other socialist economies. In addition, the Croatian international trade was equally balanced between East European centrally-planned economies and West European market-style economies, implying that Croatian enterprises had the experience of competing in a market oriented environment and the structure of the economy was more similar to EU15 countries than to the socialist world. However, it was also shown that in the last years of the socialist regime, Croatia struggled with hyperinflation, which suggests that Croatia was not free from the common weaknesses of centrally-planned economies despite its more liberal institutional framework and openness in trade with West European market economies. On the whole, it can be concluded that at the beginning of transition Croatia had the potential to be amongst the forerunners of transition.

The transformation of Croatia into a market-style economy started in an environment characterized by political turbulences and war, which pushed transformational recession to levels below those in most of the other transition economies, destroying a large part of its domestic economic capacities and infrastructure. Although all major reforms were pushed through at the same time as in advanced transition economies and macroeconomic stability was achieved relatively early, Croatia developed its relationships with the EU and other major international trade organisations slower than other CEECs. This, and the poor political environment, put Croatian enterprises in an unfavourable position in their traditional markets with EU15 and CEECs. As a consequence, Croatian producers turned to the markets of less developed transition economies and other countries of the world. However, the institutional framework in Croatia underwent major changes in the advanced stage of transition, characterized by a faster approach to EU and accession and membership in regional and global trade associations.

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Appendix

Exports				Imports			
Country	1995	2000	2007	Country	1995	2000	2007
Italy	23,71	22.34	18.78	Italy	18.19	16.61	16.05
Bosnia and Herzegovina	8.27	11.17	14.19	Germany	20.09	16.44	14.40
Germany	21.52	14.26	9.84	Russian Federation	2.09	8.52	10.16
Slovenia	13.12	10.83	8.13	Slovenia	10.72	7.94	5.94
Austria	4.32	6.60	6.02	Austria	7.65	6.70	5.29
Serbia	n/a	2.42[a]	5.29	France	2.51	5.53	3.61
France	2.42	2.84	2.19	Hungary	2.10	2.33	2.93
Hungary	1.53	1.35	2.15	Bosnia and Herzegovina	0.12	1.03	2.84
United Kingdom	1.24	1.72	1.91	Czech Republic	1.96	2.27	2.16
Russian Federation	3.28	1.28	1.25	Poland	0.60	1.19	1.96

Table A1: Main trading partners of Croatia 1995-2007 (in % according to 2007 rankings)
Source: IMF DOTS Database
[a]Data for Serbia for 2000 refer to Serbia and Montenegro

Endnotes

[i] The average rate of inflation between 1985 and 1989 was 336.8% reaching its peak in 1989 (1198.6%).

[ii] The index is calculated as $D_k = \sum_i (S_{TEi} - S_{EU15i})^2$ where S_{TEi} stands for share of sector *i* in transition economy and S_{EU15i} for the average share of sector *i* in EU15. Lower values of the index indicate structural convergence between two economic entities.

[iii] The data are classified by SITC rev 3 classification.

[iv] In these sectors subsidies were justified as temporary assistance in the course of restructuring.

[v] This agreement granted Croatia unrestricted access to the EU market in all goods except fish, wine, sugar and calf-beef. In return, Croatia was expected to open its market for EU producers by the 1st of January 2008.

[vi] As after the declaration of independence Croatia had no reserves of its own, the Central bank started to buy foreign currency from enterprises and private persons in exchange for domestic currency.

Impacts of Location on Bank Call Center Services: The Case of Turkey

Ahmet Hakan Özkan*

Abstract:

Purpose – The CRM sector represents the quality of a company. The quality of a company might be evaluated by taking the services of a call center as a measure by the customers, because CRM is the most interactive point of the operations of all companies. Call centers represent companies with 24/7 service. Companies have to search for ways to increase the quality of their service and CRM. Call center companies started to move to Anatolia in response to government incentives. The purpose of this study was to examine the results of this change.
Design/methodology/approach – Bank call centers in large cities and Anatolian bank call centers are compared. SERVQUAL is used to compare the service quality of the call centers. 100 questionnaires are used to evaluate the services of the bank call centers and 100 customers are interviewed. The banks with Anatolian call centers and the banks without Anatolian call centers are compared to each other by using the results of the interviews and questionnaires.
Findings – The service quality of the call center of the banks with Anatolian call centers seems to be higher than those without them.
Practical implications – The reason for the better performance of Anatolian bank call centers can be explained by using some observations. These reasons can be taken into account by CRM companies to provide better service.
Originality/value – This paper is proof of that CRM agents are affected by stress factors and their environment. Therefore, stress levels have to be decreased for employees for better service. Selecting a good location is the most important step in diminishing stress levels.

Keywords: CRM sector, Turkey, Anatolian bank call centers.

JEL: J24, R11, R23

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1. Introduction

The factors that affect success are different than those of other sectors in the customer relationship management sector. Employees are the main components of CRM. Thus the factors that affect the success of the employees are the main factors of CRM.

The success of CRM is strictly related with the success of the human resources department. Employing the right employees is the key factor for success. Therefore, the criteria for choosing the right employees need to be determined carefully. Some regions may not be appropriate for the selection of customer representatives. Therefore, choosing the right region to locate a call center is another important event in providing customer satisfaction.

We would expect each call center to operate under an almost unique set of circumstances, so that the levels of performance achieved by the call centers can be expected to vary (Betts, Meadows and Walley, 2000). The stability of high performance and high quality are inevitable to keep the reputation of corporations. Qualified employees can add value to a corporation and provide stability for its performance.

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Choosing the most suitable region to establish a call center to employ the right agents plays a key role in achieving the best performance for a call center. In Turkey, the call centers started to move to Anatolia, from large cities. Bank call centers in particular moved to Anatolia.

Anatolian bank call centers are expected to provide worse service and the attraction of investing in Anatolia is expected to be the advantage of cost. Some banks did not establish a location in Anatolia to keep the reputation of their brands. On the other hand there was no proof of worse service among Anatolian bank call centers.

2. Criteria for Better CRM

Compensations, especially salaries, seem like an important criterion. On the other hand, call center industry salaries have consistently been low when compared to other industries within Ireland; although they speak more languages, non-Irish-born call center employees make less than Irish-born employees; and having a bachelor's or master's degree does not considerably increase salary levels within the Irish call center industry (Jobs, Burris and Butler, 2007). It is obvious that level of education is not an important factor for better service in the CRM sector. Education level might only increase expectation levels and reduce employee loyalty.

The behavioral dimensions of CRM effectiveness identify the need for a tool that focuses on the behavioral dimensions for measuring CRM effectiveness (Jain, Jain and Dhar, 2003). Therefore, the behaviours of employees are very important for CRM. Brand loyalty can be maintained by employees.

Application of the technologies involved in call center operations can play a key role in accessing more customers, and in providing better quality services, especially where additional or extended services become available (Walker and Craig-Lees, 1998). Generally, customers expect the service to work properly and they can become angry with technological problems (Bennington, Cummane and Conn, 2000). During these kind of problems, the customer representatives can interact with the customers to truly preserve the satisfaction of customers or to convince the customer to call later. But as it is defined in agency theory, it is not possible to monitor agents all the time. As a result, the ability and the intentions of the agents also play a key role, not only in customer satisfaction, but also in using new technologies.

Technologies are not useful unless they are used efficiently by the agents. Therefore, behavioral dimensions are the most important. High salaries may not always be the right compensations to increase the motivations of employees. Sometimes there is no compensation to meet the expectations of employees.

3. Behavioral Dimensions

Behavioral dimensions are defined by ten factors that include: attitude, understanding of expectations, quality perceptions, reliability, communication, customization, recognition, keeping promises, satisfaction audit and retention (Oztaysi, Sezgin and Ozok, 2011). The performance of employees is strictly correlated with these ten factors. The additional value which is created by the employees is very important for the sectors which almost have no chance to differentiate their products, just as in the banking sector.

Besides these factors, the absorptive capability for a firm's learning and innovation is important for the development of corporations (Cohen and Levinthal, 1990). Absorptive capacity is of critical importance to innovative capabilities and knowledge absorption and can be a source of competitive advantage (Liao *et al*, 2009). The idea of a balanced score card takes this factor as learning and growth (Kaplan & Norton, 1992). The knowledge absorption capability of employees can also be counted among the behavioral dimensions.

A firm's combinative capabilities involve the synthesis and application of current and acquired knowledge (Kogut and Zander, 1992). Application capabilities especially determine the level of the firm's knowledge and absorptive capacity (Van den Bosch, Volberda and De Boer, 1999). The application of exploring and acquiring knowledge is as critical as the application of using existing knowledge. At this point, the capabilities and the loyalty of employees carry great importance.

Behavioral dimensions can be affected by the trials of increasing motivation. Compensations can be used to increase motivation, but the loyalty of agents cannot be created easily. Under high stress, ignorance will appear among agents who are not loyal. The opinions of employees are affected by their external environment. For example, if the call center is located in a region where the call centers are accepted as a temporary working place, then the customer representatives will not be loyal

due to the prejudices of the community of the region. On the other hand, call centers which are located in regions where the call centers are accepted as reputable corporations will be able to find loyal employees easily. The management of the behaviours of employees will not be difficult for these call centers because of the positive expectations of the employees.

4. Selecting a Location

Since organization culture is commonly cited as a major obstacle to knowledge sharing, efforts should be made to explore the contingency factors that influence the design of a firm's organizational mechanisms in order to identify how the practices and factors in developing these mechanisms differ across companies and might be considered contingency factors (Hall, 2007). Contingency factors that influence the firm's organizational mechanisms have been underemphasized (Chou, 2011). The organization culture must be appropriate for the culture of the region where the call center is located.

The location of the call centers have a great impact on the capabilities of the call centers. The natives of the region should be open to learning and should be loyal to the company. The daily life of the natives of the region is very important for location selection, because stress is the main factor that affects the performance of employees in a call center. Regions with less stress in daily life should be preferred by call center companies.

Call center companies started to locate in Anatolian cities instead of large cities. Large cities have issues like traffic jams, high prices and high criminal rates, which increase the stress levels of the people living in these cities. On the other hand, Anatolian cities have better conditions. The people living in these cities are more indulgent. They can spend more time on learning as they spend less time in traffic.

Government incentives have encouraged corporations to locate their call centers in Anatolian cities. At the same time, these new locations provided better CRM service to customers. The employees are more loyal to the company and try to increase the reputations of their corporations.

5. Comparison Methodolody

SERVQUAL was used to prepare the questionnaires and the five components were determined as tangibles, assurance, relability, responsiveness and empathy (Parasuraman and Zeithaml, 1988). Four questions were used to measure tangibility, 3 questions were used to measure assurance, 6 questions were used to measure reliability, 4 questions were used to measure reponsiveness and 9 questions were used to measure empathy.

One hundred questionnaires were used to learn the opinions of the consumers. Fifty-six of these questionanires were answered by the customers of the banks without Anatolian call centers and 44 of these questionnaires were answered by the customers of the other Turkish banks.

The evaluations of the participants were done by using 39 questions. After factor analysis, 13 of these questions were removed to keep 5 components. The banks with Anatolian call centers show better performance in each component.

The Cronbach's Alpha value of the results is 0,960 and the KMO value is 0,894. The results are compared by using an independent sample t test and it was seen that the service of the banks with Anatolian call centers is better than that of the others. The means of the answers of the customers of banks with Anatolian call centers range between 3,36 and 4,09. On the other hand, the means of the answers of the other bank customers range between 2,80 and 3,29. As the results of the banks with Anatolian call centers were better on each question, no more tests were necessary.

6. Observation Methodology

Simple questionnaires were used to observe the reasons for the better service of Anatolian bank call centers. One hundred and four semi-structured interviews were used for evaluation. Fifty of the participants are employees of Anatolian bank call centers and 54 of the participants are the employees of bank call centers which are located in big cities.

The education level of the employees are almost the same, with two more bachelor's degree holders in Anatolian bank call centers, 13 to 11. Forty-seven people live with their families, and nine are married in the Anatolian bank call center group. None are considering changing his/her home. On the other hand, 32 people live with their families and 3 are married in the other group. Twenty-eight of these people want to leave home for better conditions or a better house.

The results on amount of time spent in traffic are astonishing. Ten people claim that they walk home, 23

people claim that they spend less than 1 hour in traffic daily, while the rest claim that they stay in traffic between 1-2 hours within the Anatolian bank call center group. No one stays more than 2 hours in traffic. The other group has no-one who is able to reach home by walking and able to reach home in less than 1 hour. Only 4 people can reach home in 2 hours, and 34 people can reach home in 2-3 hours, 10 people can reach home in 3-4 hours, 4 people can reach in 4-5 hours and 2 people announced that they spend more than 5 hours in traffic jams daily.

At the Anatolian bank call centers, 45 people are satisfied with their job, 44 people are happy with their colleagues, 45 people are happy with their managers, none want to change their company, while only 8 want to change their jobs. At the other bank call centers 20 people are satisfied with their jobs, 6 people are happy with their colleagues, 24 people are happy with their managers, 41 want to change their companies and 52 want to change their jobs.

7. Findings

With the help of semi-structured interviews, the comments of the participants are also used for more observations. The first set of information given by the Anatolian bank call center employees was about the culture of the region. The behavioral patterns of the Anatolian people have a basis in traditional respect. The culture of the Anatolian people is mostly based on respect. As a result of this mentality, disrespect of anyone can be punished. The fear of getting punished, together with respectful behaviours toward other people arise a regular and more secure daily life.

The second set of information given by the Anatolian bank call center employees is loyalty to the company. The concept of "respect for one's employer" also provides stronger employee loyalty. They use the Turkish idiom of "ekmek vermek" which can be translated as "giving bread" when they talk about their company. In Turkey, it is customary to say instead of "the company has 40 employees" that "the company is giving bread to 40 people". The employees mostly use the same phrase: "our company is giving bread to us". Employing somebody is accepted as a holy thing, because the employee might be able to look after his or her family with the salary and compensations.

Humble Anatolian culture also reduces expectations. The employees of Anatolian call centers have low expectations. They expect to get a low salary, getting promoted is not a must and premiums related to performance is like a special gift to them. Some of them do not have lunch for 8 hours and use only about 10 minutes of breaks for toilet needs. These people spend the remaining 25 minutes necessary to reach the minimum level of 35 minutes by sitting in front of their computer and checking their transactions.

The poor job opportunities in Anatolia increases the motivation of employees in Anatolia. For example, in Sivas, where the call center of the Garanti Bank is located, there is no other company and job opportunity. The only opportunity might be the Sivas Cumhuriyet University, which provides very few job opportunities due to its very low turnover rates. The expectations of the employees are also affected by poor job opportunities and high employee loyalty in Anatolia.

The brands of banks are reputable anywhere in Turkey, but employees can think of getting transferred to another bank in a large city. In Anatolia this chance does not exist, but they do think of getting transferred to a branch. On the other hand, working in a reputable company is a non-financial compensation for the employees of Anatolian call centers. The employees of the large city call centers are mostly seeking a better company to apply to and the brand of their bank is not compensation for them.

The employees at large city call centers are more arrogant and less satisfied. They mostly think that they deserve a better job, even though they are not qualified. Increases in salary or premiums do not work; instead these kind of increases seem to increase the expectations of the employees. Getting promoted is the main concern at large city call center employees.

The large city bank call center employees lodge complaints about mobbing. Their social relations are weak and the relationships between the employees are very limited. No one goes for a dinner or a visit to the house of a colleague and only two people have gone out for a drink. Mobbing can be anticipated if the loneliness of the employees are observed for these reasons. An employee has explained that the reason for his loneliness was the common behaviours of his team. He had the best performance on his team and his team was not speaking to him. Some members of the team were even yelling at him whenever they found a reason.

Mobbing is unknown at the Anatolian call centers. The employees already know each other and their families also know each other. Their relationships are friendlier and more than half of the participants have connections

with their colleagues and their families. Visiting each other to drink tea is something usual for them. The employees are also happier with their managers in the bank call centers of Anatolia.

The stress levels of the employees are not only affected by social factors but also by the life style. The employees which live with their families have fewer problems with their homes and have more social satisfaction. They share the issues which bothered them at work with their families and they relax with the help of this sharing. They say that every family member shares something different and it is easier to focus on something different and to forget your own problems.

Family life is also more social in Anatolia, because family members spend less time in traffic and can create more time for chatting. Therefore, the employees of Anatolian bank call centers have more social advantages. On the other hand, traffic jams not only cause a social disadvantages: employees who spend more time in traffic are more tired than others and cannot find time to improve themselves. Spending time in traffic also increases stress levels.

The labor is qualified enough in Anatolia due to the university policy of Turkey. With newly established universities in recent years, every city in Turkey now has a university. Together with other reasons, employees of Anatolian call centers provide better service and demonstrate better performance.

Anatolian call centers are able to use non-financial compensations like brand reputation. In addition,the fear of losing their jobs is also a strong motivation device due to poor job opportunities. The cost of employees is lower, while motivation is higher at Anatolian bank call centers.

8. Conclusions

The CRM sector needs to focus on its employees for better service. Employees who are capable of satisfying customers even without solutions will increase the reputability of the company and the success of the CRM. Not only the mood of the employees, but also their ability to use technology, is also important for better service.

Bank call centers, which began to be located in Anatolia to enjoy the advantages of government incentives, have succeeded more than expected. Their service quality is high enough to compete with other bank call centers. Our sample has proved that the service of these bank call centers have adequate abilities to carry on these operations in Anatolia, even with more contributions. The service quality of the banks with Anatolian call centers seems to be better than those without them.

The main reason of the success of the Anatolian call centers is the low stress level in Anatolia. Daily life is less complicated and more indulgent than in big cities. Other reasons for this success can be counted among better family relations, a better social life and less time spent in traffic. Families are close to each other in Anatolia and they visit each other often. Some families come together to form a village or a part of a village or town.

In large cities, people may spend 2 to 6 hours a day reaching their offices. Transportation is easier in Anatolian cities, as there are no traffic jams and the distances are short. Therefore the employees at Anatolian call centers can create more time to improve their abilities to use technology.

The Anatolian bank call centers are seen as a reputable employer in Anatolia. Their facilities serve social opportunities and trainings for their employees. The conditions of these employees are better than the employees living in the large cities of Turkey. They improve their capabilities, which can assist the company in reaching its objectives willingly because they appreciate their company.

The policies of companies and governments in emerging markets are elaborated by some studies and the necessary modifications are attempted in order to determine them (Nkamnebe, 2010). It is not possible to make any modifications without taking various factors into account. But information about Anatolian bank call centers gained with this study can be a tool for any strategy in Anatolian emerging markets.

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Appendix

The questionnaire used for collection/for the customers

Soruları değerlendirirken lütfen aşağıdaki ölçeği kullanın

Kesinlikle katılmıyorum		Kararsızım		Kesinlikle katılıyorum
1	2	3	4	5

Bankamın çağrı merkezi.

H1	Müşteri temsilcisi vaad edilen şekilde bir hizmet kalitesi sunmaktadır.	1	2	3	4	5
H2	Müşteri temsilcisi sorunların çözümü için samimiyetle çaba göstermektedir	1	2	3	4	5
H3	Müşteri temsilcisi hizmeti eksiksiz ve doğru olarak gerçekleştirmektedir	1	2	3	4	5
H4	Müşteri temsilcisi vaad ettiği şekilde zamanı etkin olarak kullanmaktadır.	1	2	3	4	5
H5	Müşteri hizmetlerinin paylaştığı bilgi hatasız ve eksiksizdir	1	2	3	4	5
H6	Müşteri temsilcisi her zaman sorunlarıma çözüm üretiyor ve sorunun çözümü için yardımcı oluyor.	1	2	3	4	5
H7	Müşteri temsilcisi tarafından zamanında hizmet veriliyor	1	2	3	4	5
H8	Müşteri temsilcisi gereken yardımı gösteriyor.	1	2	3	4	5
H9	Müşteri temsilcisi isteklerime cevap vermektedir.	1	2	3	4	5
H10	Müşteri temsilcisi konuşmasıyla güven aşılamaktadır.	1	2	3	4	5
H11	Müşteri temsilcisiyle her zaman rahat bir iletişim kurarım.	1	2	3	4	5
H12	Müşteri temsilcisi bana karşı gayet nazik konuşur.	1	2	3	4	5
H13	Müşteri temsilcisi sorulara cevap verebilecek bilgiye sahiptir	1	2	3	4	5
H14	Müşteri temsilcisi alanında profesyonel ve etkileyici bir ses tonuna sahiptir.	1	2	3	4	5
H15	Müşteri temsilcisinin kullanmış oldugu teknolojide bilgilere erişim hızlıdır.	1	2	3	4	5
H16	Müşteri temsilcisinin diksiyonu düzgündür	1	2	3	4	5
H17	Müşteri temsilcisi mesleki bilgiye sahiptir	1	2	3	4	5
H18	7/24 hizmet vermesinden dolayı memnunum.	1	2	3	4	5
H19	Müşteri temsilcisi bilgi paylaşma konusunda titiz davranmakta, bilgi güvenliğine önem vermektedir	1	2	3	4	5
H20	Sorunum çözülmediği taktirde yetkililere rahatlıkla ulaşabilmekteyim.	1	2	3	4	5
H21	Banka tarafından sunulan hizmetler beklenilen kalitededir	1	2	3	4	5
H22	Bankamın teknolojik kapasitesi yeterlidir	1	2	3	4	5
H23	Bankam dünya standartlarında hizmet vermektedir.	1	2	3	4	5
H24	Sesli sistemde ihtiyacım olan bilgiye hızlı ve kolayca ulaşılabilmektedir	1	2	3	4	5
H25	Bankam yeterli teknolojik gelişmelerden haberdardır ve beni de gelişmelerden haberdar etmektedir.	1	2	3	4	5
H26	Diğer bankalar benim için avantajlı kampanyalar yapmış olsa da bankamı değiştirmem.	1	2	3	4	5
H27	Müşteri temsilcisi abonesine önemli olduğu hissi vermektedir	1	2	3	4	5
H28	Müşterilerin abonelerin beklentileri en iyi şekilde karşılanmaktadır	1	2	3	4	5
H29	Müşterilerin arzu ve ihtiyaçları müşteri temsilcisi tarafından çok iyi anlaşılmaktadır	1	2	3	4	5

Müşteri temsilcisinin performanslarını değerlendiriniz

Oldukça az		Kararsızım		Oldukça çok
1	2	3	4	5

H30	Müşteri temsilcisinin sorunu çözme hızı	1	2	3	4	5
H31	Müşteri isteklerinin hemen yerine getirilmesi	1	2	3	4	5
H32	Müşteri temsilcisinin davranışının oluşturduğu güven	1	2	3	4	5
H33	Müşteri temsilcilerinin verdiği hizmet esnasında herseyin tam olarak gerceklestiği konusunda verdiği güven	1	2	3	4	5
H34	Müşteri temsilcisinin sorduğum sorulara cevap verebilme yeteneği	1	2	3	4	5
H35	Müşteri temsilcisinin içten gelen samimi hizmet kalitesi	1	2	3	4	5
H36	Müşteri temsilcisinin gösteridiği dikkat	1	2	3	4	5
H37	Müşteri temsilcisinin kişisel ilgi ve alakası	1	2	3	4	5
H38	Müşteri temsilcisinin özel şikayetlerimi anlama becerisi ve yetenegi	1	2	3	4	5
H39	Müşteri temsilcisinin bende uyandırdıgı intiba	1	2	3	4	5

Yaş:……..
Cinsiyet: a)Erkek b)Bayan
Eğitim durumu: a)İlkokul/orta okul b)Lise c)Üniversite d)lisansüstü/doktora
Bankanızla ne kadar zamandır çalışıyorsunuz?...

The English Translation of the Questionnaire

Please use the metrics below

I strongly disagree	I disagree	I am not sure	I agree	I strongly agree
1	2	3	4	5

The call center of my bank…

H1	The customer representative provides service at the offered quality.	1	2	3	4	5
H2	The customer representative frankly strives to solve my problems	1	2	3	4	5
H3	The customer representative provides complete and genuine service.	1	2	3	4	5
H4	The customer representative uses the time effectively as promised..	1	2	3	4	5
H5	The customer representative shares complete and true information.	1	2	3	4	5
H6	The customer representative creates a solution to my problems and assists me in solving my problem.	1	2	3	4	5
H7	The customer representative provides service on time.	1	2	3	4	5
H8	The customer representative provides adequate assistance.	1	2	3	4	5
H9	The customer representative meets my requirements.	1	2	3	4	5
H10	The customer representative gains my confidence with his/her speech.	1	2	3	4	5
H11	The customer representative is easy to communicate with.	1	2	3	4	5
H12	The customer representative speaks kindly to me.	1	2	3	4	5
H13	The customer representative has the information to answer my questions.	1	2	3	4	5
H14	The customer representative is professional in a relevant field and has a charming voice.	1	2	3	4	5
H15	The customer representative uses a technology which accesses information quickly.	1	2	3	4	5
H16	The customer representative has clear diction.	1	2	3	4	5
H17	The customer representative has occupational information.	1	2	3	4	5
H18	7/24 service ability satisfies me.	1	2	3	4	5
H19	The customer representative shares information delicately and pays attention to information security.	1	2	3	4	5
H20	I can reach the authorized people if my problem is not solved.	1	2	3	4	5
H21	The quality of the services of my bank is at the expected level.	1	2	3	4	5
H22	The technological capacity of my bank is adequate.	1	2	3	4	5
H23	The service of my bank meets world standards.	1	2	3	4	5

H24	I can reach the necessary information at IVR easily.	1	2	3	4	5
H25	My bank is aware of the technological improvements and informs me about these improvements.	1	2	3	4	5
H26	Even if the other banks offer advantegous campaigns, I would not prefer to change my bank.	1	2	3	4	5
H27	The customer representative imparts the feeling of being important to the subscribers.	1	2	3	4	5
H28	The expectations of the subscribers are met in the best way.	1	2	3	4	5
H29	The desires and the needs of the subscribers are well-understood by the customer representative.	1	2	3	4	5

Please evaluate the performance of the customer representative

H30	Customer representative is fast in solving the problem	1	2	3	4	5
H31	Customer representative is fast in meeting requirements	1	2	3	4	5
H32	Customer representative's behaviours create confidence.	1	2	3	4	5
H33	Customer representative assures the customer that everything is done completely during the service.	1	2	3	4	5
H34	Customer representative is capable of answering my questions.	1	2	3	4	5
H35	Customer representative serves frankly	1	2	3	4	5
H36	Customer representative pays attention	1	2	3	4	5
H37	Customer representative has personal care.	1	2	3	4	5
H38	Customer representative has the ability to understand my complaints.	1	2	3	4	5
H39	Customer representative made a good impression on me.	1	2	3	4	5

Age:……..
Gender: a)Male b)Female
Education: a)High school b)College c)Bachelor's d)Master e)Doctorate
How long have you been working with your bank?.....

Questions of
Empathy: h36, h39, h37, h33, h35, h31, h34, h32, h30
Reliability: h12, h9, h10, h8, h19, h13
Responsiveness. H3, h4, h5, h17
Tangibility: h22, h21, h16, h25
Assurance: h1, h2, h6

The eliminated questions: h7, h11, h14, h15, h18, h20, h23, h24, h26, h27, h28, h29, h38

Group Statistics

	Bank	N	Mean	Std. Deviation	Std. Error Mean
h1	Banks with Anatolian call centers	44	3,77	1,075	,162
	Banks without Anatolian call centers	56	3,09	1,195	,160
h2	Banks with Anatolian call centers	44	3,73	,872	,132
	Banks without Anatolian call centers	56	2,96	1,061	,142
h3	Banks with Anatolian call centers	44	3,80	1,025	,154
	Banks without Anatolian call centers	56	2,93	,892	,119
h4	Banks with Anatolian call centers	44	3,64	,990	,149
	Banks without Anatolian call centers	56	2,82	,917	,122
h5	Banks with Anatolian call centers	44	3,55	1,022	,154
	Banks without Anatolian call centers	56	2,80	,942	,126
h6	Banks with Anatolian call centers	44	3,57	,900	,136
	Banks without Anatolian call centers	56	2,84	,987	,132
h8	Banks with Anatolian call centers	44	3,84	,805	,121
	Banks without Anatolian call centers	56	3,00	1,044	,140
h9	Banks with Anatolian call centers	44	3,95	,914	,138
	Banks without Anatolian call centers	56	2,86	,962	,128
h10	Banks with Anatolian call centers	44	3,64	,917	,138
	Banks without Anatolian call centers	56	2,89	,985	,132
h12	Banks with Anatolian call centers	44	4,09	,772	,116
	Banks without Anatolian call centers	56	3,29	,929	,124
h13	Banks with Anatolian call centers	44	3,82	,815	,123
	Banks without Anatolian call centers	56	2,93	1,006	,134
h16	Banks with Anatolian call centers	44	3,70	1,047	,158
	Banks without Anatolian call centers	56	3,14	1,052	,141
h17	Banks with Anatolian call centers	44	3,86	,878	,132
	Banks without Anatolian call centers	56	3,13	1,010	,135
h19	Banks with Anatolian call centers	44	3,89	,945	,143
	Banks without Anatolian call centers	56	3,13	,992	,133
h21	Banks with Anatolian call centers	44	3,36	1,080	,163
	Banks without Anatolian call centers	56	3,07	,970	,130
h22	Banks with Anatolian call centers	44	3,77	,886	,134
	Banks without Anatolian call centers	56	3,21	,929	,124
h25	Banks with Anatolian call centers	44	3,57	1,043	,157
	Banks without Anatolian call centers	56	3,14	1,069	,143
h30	Banks with Anatolian call centers	44	3,52	,849	,128
	Banks without Anatolian call centers	56	2,95	,862	,115
h31	Banks with Anatolian call centers	44	3,77	,677	,102
	Banks without Anatolian call centers	56	2,95	,903	,121
h32	Banks with Anatolian call centers	44	3,70	,954	,144
	Banks without Anatolian call centers	56	3,09	,880	,118
h33	Banks with Anatolian call centers	44	3,77	,859	,129
	Banks without Anatolian call centers	56	2,96	,934	,125
h34	Banks with Anatolian call centers	44	3,82	,922	,139
	Banks without Anatolian call centers	56	2,89	,888	,119
h35	Banks with Anatolian call centers	44	3,64	1,014	,153
	Banks without Anatolian call centers	56	2,93	,988	,132
h36	Banks with Anatolian call centers	44	3,86	1,002	,151
	Banks without Anatolian call centers	56	3,02	,963	,129
h37	Banks with Anatolian call centers	44	3,86	,905	,136
	Banks without Anatolian call centers	56	3,02	1,036	,138
h39	Banks with Anatolian call centers	44	3,86	,930	,140
	Banks without Anatolian call centers	56	2,88	,935	,125

Independent Samples Test			
		Levene's Test for Equality of Variances	
		F	Sig.
		Lower	Upper
h1	Equal variances assumed	1,213798518	0,273279625
	Equal variances not assumed		
h2	Equal variances assumed	0,281965748	0,596617084
	Equal variances not assumed		
h3	Equal variances assumed	1,457445277	0,230242794
	Equal variances not assumed		
h4	Equal variances assumed	0,544147208	0,462481685
	Equal variances not assumed		
h5	Equal variances assumed	0,802648494	0,37249807
	Equal variances not assumed		
h6	Equal variances assumed	0,001357302	0,970686258
	Equal variances not assumed		
h8	Equal variances assumed	1,706952758	0,194439099
	Equal variances not assumed		
h9	Equal variances assumed	0,024016167	0,877162517
	Equal variances not assumed		
h10	Equal variances assumed	0,108501153	0,742560016
	Equal variances not assumed		
h12	Equal variances assumed	1,999320283	0,160538738
	Equal variances not assumed		
h13	Equal variances assumed	0,535539448	0,466033635
	Equal variances not assumed		
h16	Equal variances assumed	0,061843249	0,804126385
	Equal variances not assumed		
h17	Equal variances assumed	1,02971566	0,31272423
	Equal variances not assumed		
h19	Equal variances assumed	0,068948215	0,793425578
	Equal variances not assumed		
h21	Equal variances assumed	1,368642707	0,244882546
	Equal variances not assumed		
h22	Equal variances assumed	0,279443006	0,598261697
	Equal variances not assumed		
h25	Equal variances assumed	0,035317697	0,851320079
	Equal variances not assumed		
h30	Equal variances assumed	1,122419479	0,29200232
	Equal variances not assumed		
h31	Equal variances assumed	1,302074244	0,256615443
	Equal variances not assumed		

Independent Samples Test			
		Levene's Test for Equality of Variances	
		F	Sig.
		Lower	Upper
h32	Equal variances assumed	0,728351629	0,395499196
	Equal variances not assumed		
h33	Equal variances assumed	0,129220274	0,720015282
	Equal variances not assumed		
h34	Equal variances assumed	0,612828443	0,435612464
	Equal variances not assumed		
h35	Equal variances assumed	1,415499394	0,237020016
	Equal variances not assumed		
h36	Equal variances assumed	6,56812E-05	0,993550176
	Equal variances not assumed		
h37	Equal variances assumed	0,132829517	0,716301385
	Equal variances not assumed		
h39	Equal variances assumed	0,000430657	0,983485461
	Equal variances not assumed		

The questionnaire used for collection/for the employees

Yaş:……..
Cinsiyet: a)Erkek b)Bayan
Eğitim durumu: a)İlkokul/orta okul b)Lise c)Üniversite d)lisansüstü/doktora
Bu çağrı merkezinde ne kadar zamandır çalışıyorsunuz?...

Sorular

1. Ailenizle beraber mi yaşıyorsunuz?
   Evet/hayır
2. Yaşadığınız evi değiştirmek ister miydiniz?
   Evet/hayır
3. Günde ne kadar saatiniz yolda geçiyor?
   1 saatten az/1-2 saat/2-3 saat/3-4 saat/4-5 saat
4. Şirketinizden memnun musunuz?
   Evet/hayır
5. Evinizden memnun musunuz?
   Evet/hayır
6. Beraber çalıştığınız kişilerden memnun musunuz?
   Evet/hayır
7. Yöneticilerinizden memnun musunuz?
   Evet/hayır
8. İşinizi değiştirmek ister miydiniz?
   Evet/hayır
9. Çalıştığınız yeri değiştirmek ister miydiniz?
   Evet/hayır
10. Kendinizi geliştirmeye zaman ayırabiliyor musunuz?
    Evet/hayır

The English Translation of the Questionnaire

Age:……..
Gender: a)Male b)Female
Education: a)High school b)College c)Bachelor's d)Master e)Doctorate
How long have you been working in this bank call center?.....

Questions

1. Are you living with your family?
   Yes/No
2. Would you like to change your home?
   Yes/No
3. How many hours do you spend in traffic?
   Less than 1 hour/1-2 hours/2-3 hours/3-4 hours/4-5 hours
4. Are you satisfied with your company?
   Yes/No
5. Are you satisfied with your job?
   Yes/No
6. Are you happy to work with your colleagues?
   Yes/No
7. Are you happy to work with your managers?
   Yes/No
8. Would you like to change your job?
   Yes/No
9. Would you like to change your company?
   Yes/No
10. Can you find time to improve yourself?
    Yes/No

Predicting Macroeconomic Indicators in the Czech Republic Using Econometric Models and Exponential Smoothing Techniques

Bratu Mihaela Simionescu *

Abstract:

Econometric modeling and exponential smoothing techniques are two quantitative forecasting methods with good results in practice, but the objective of the research was to find out which of the two techniques are better for short run predictions. Therefore, for inflation, unemployment and interest rate in the Czech Republic various accuracy indicators were calculated for the predictions based on these methods. Short run forecasts on a horizon of 3 months were made for December 2011-February 2012, the econometric models being updated. For the Czech Republic, the exponential smoothing techniques provided more accurate forecasts than the econometric models (VAR(2) models, ARMA procedure and models with lagged variables). One explication for the better performance of smoothing techniques would be that in the chosen countries the short run predictions were more influenced by the recent evolution of the indicators.

Keywords: accuracy, econometric models, forecasts, forecasting methods, smoothing exponential techniques

JEL: E21, E27,C51, C53 **DOI:** 10.2478/v10033-012-0017-3

1. Introduction

In establishing monetary policy, decision-makers must take into account the possible future evolution of important macroeconomic variables such as the inflation rate, unemployment rate or interest rate. This fact implies knowledge of the predictions of these indicators. In econometrics we can build forecasts starting from a valid model. The real problem appears when we use two or more different forecasting methods and we must choose the one which generated forecasts with the higher degree of accuracy.

In this article, we modeled the three selected variables and made predictions for them. Using indicators of accuracy we demonstrated that the smoothing exponential techniques generated better forecasts than simple econometric models in the Czech Republic.

2. Literature

To assess the accuracy of forecasts, as well as their ordering, statisticians have developed several measures of accuracy. For comparisons between the MSE indicators of forecasts, Granger and Jeon (2003) proposed a statistical measure. Another statistical measure is presented by Diebold and Mariano (1995) for the comparison of other quantitative measures of errors. Diebold and Marianot proposed in 1995 a test to compare the accuracy of two forecasts under a null hypothesis that assumes no differences in accuracy. The test proposed by them was later improved by Ashley (2003), who developed a new statistical measure based on a bootstrap inference. Subsequently, Diebold and Christoffersen (1998) have developed a new way of measuring the accuracy while preserving the cointegrating relation between variables.

Armstrong and Fildes (1995) showed that the purpose

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of measuring an error of prediction is to provide information about the distribution of errors form and proposed assessing the prediction error using a loss function. They showed that it is not sufficient to use a single measure of accuracy.

Since the normal distribution is a poor approximation of the distribution of a low-volume data series, Harvey, Leybourne, and Newbold (2003) improved the properties of the small length data series, applying some corrections: the change of DM statistics to eliminate the bias and the comparison of this statistical measure not with normal distribution, but with a T-Student distribution. Clark (2006) evaluated the power of equality forecast accuracy tests, such as modified versions of the DM test or those based on a Bartlett core and a determined length of data series.

In the literature, there are several traditional ways of measurement, which can be ranked according to the dependence or independence of their measurement scale. A complete classification is made by Hyndman and Koehler (2005) in their reference study in the field, "Another Look at Measures of Forecast Accuracy":

- Scale-dependent measures

The most used measures of scale dependent accuracy are:

-> Mean-Square Error (MSE) = average (e_t^2)

-> Root Mean Square Error (RMSE) = $\sqrt{MSE}$

-> Mean Absolute Error (MAE) = average ($|e_t|$)

-> Median Absolute Error (MdAE) = median ($|e_t|$)

RMSE and MSE are commonly used in statistical modeling, although they are affected by outliers more than other measures.

- Scale-independent errors:

-> *Measures based on percentage errors*

The percentage error is given by: $p_t = \frac{e_t}{X_t} \cdot 100$

The most common measures based on percentage errors are:

* Mean Absolute Percentage Error (MAPE) = average ($|p_t|$)

* Median Absolute Percentage Error (MdAPE) = median ($|p_t|$)

* Root Mean Square Percentage Error (RMSPE) = geometric mean (p_t^2)

* Root Median Square Percentage Error (RMdSPE) = median (p_t^2)

When X_t takes the value 0, the percentage error becomes infinite or is not defined and the measure distribution is highly skewed, which is a major disadvantage. Makridakis (1984) introduced symmetrical measures in order to avoid another disadvantage of MAPE and MdAPE. For example, excessively large penalizing made positive errors in comparison with negative ones.

* Mean Absolute Percentage Error (sMAPE) = average ($\frac{|X_t - F_t|}{X_t + F} \cdot 200$)

* Symmetric Median Absolute Percentage Error (sMdAPE) = median ($\frac{|X_t - F_t|}{X_t + F} \cdot 200$),where F_t - forecast of X_t .

-> *Measures based on relative errors*

It is considered that $r_t = \frac{e_t}{e_t^*}$, where e_t^* is the forecast error for the reference model.

* Mean Relative Absolute Error (MRAE) = average ($|r_t|$)

* Median Relative Absolute Error (MdRAE) = median ($|r_t|$)

* Geometric Mean Relative Absolute Error (GMRAE) = geometric mean ($|r_t|$)

A major disadvantage is a too-low value for the error of the benchmark forecast.

->*Relative measures*

For example, the relative RMSE is calculated: $rel\_RMSE = \frac{RMSE}{RMSE_b}$, *where* $RMSE_b$ is the RMSE of "benchmark model"

Relative measures can be defined for MFA MdAE, MAPE. When the benchmark model is a random walk, rel_RMSE is used, which is actually Theil's U statistic. Random walk or the naive model is used the most, but it may be replaced with the naive2 method, in which the forecasts are based on the latest seasonally adjusted values according to Makridakis, Wheelwright and Hyndman (1998).

- Free-scale error metrics (resulting from dividing each error at the average error)

Hyndman and Koehler (2005) introduce in this class of errors "Mean Absolute Scaled Error" (MASE) in order to compare the accuracy of forecasts of more time series.

In practice, the most used measures of forecast error are:

- Root Mean Squared Error (RMSE)

$$RMSE = \sqrt{\frac{1}{n}\sum_{j=1}^{n} e_X^2(T_0 + j, k)}$$

- Mean error (ME)

$$ME = \frac{1}{n}\sum_{j=1}^{n} e_X(T_0 + j, k)$$

The sign of the indicator value provides important information: if it has a positive value, then the current value of the variable was underestimated, which means the expected average values are too small. A negative value for the indicator shows that the expected values are too high on average.

- Mean absolute error (MAE)

$$MAE = \frac{1}{n}\sum_{j=1}^{n} \left| e_X(T_0 + j, k) \right|$$

These measures of accuracy have some disadvantages. For example, RMSE is affected by outliers. Armstrong and Collopy (2000) stress that these measures are not independent of the unit of measurement unless they are expressed as percentages. These measures include average errors with different degrees of variability. The purpose of using these indicators is related to the characterization of distribution errors. Clements and Hendry (1995) have proposed a generalized version of the RMSE based on error intercorrelation, when at least two series of macroeconomic data are used. If we have two forecasts with the same mean absolute error, RMSE penalizes the one with the biggest errors.

U Theil's statistic is calculated in two variants by the Australian Treasury in order to evaluate forecast accuracy.

The following notations are used:

a- the registered results

p- the predicted results

t- reference time

e- the error (e=a-p)

n- number of time periods

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

If U_1 is closer to one, the forecast accuracy is higher.

$$U_2 = \sqrt{\frac{\sum_{t=1}^{n-1}\left(\frac{p_{t+1} - a_{t+1}}{a_t}\right)^2}{\sum_{t=1}^{n-1}\left(\frac{a_{t+1} - a_t}{a_t}\right)^2}}$$

If U_2 =1=> there are no differences in the terms of accuracy between the two forecasts to compare

If U_2 <1=> the forecast compared has a higher degree of accuracy than the naive one

If U_2 >1=> the forecast compared has a lower degree of accuracy than the naive one

Other authors, like Fildes R. and Steckler H. (2000) use another criterion to classify accuracy measures. If we consider $\hat{X}_t(k)$ the predicted value after k periods from the origin time t, then the error at future time (t+k) is: $e_t(t+k)$. Indicators used to evaluate forecast accuracy can be classified according to their usage. Thus, the forecast accuracy measurement can be done independently or by comparison with another forecast.

Clements and Hendry (2010) presented the most used accuracy measures in the literature, which are described below.

1. The specific loss function

Diebold, Gunther and Tay (1998) started from a loss function $L(a_t, x_{t+1})$, where:

a_t -specific action

$x_{t+1} \to f(x_{t+1})$- the future value of a random variable whose distribution is known

f (.)-density forecast

The optimal condition involves minimizing the loss function when the density forecast is $p_{t,1}(x_{t+1})$:

$$a_{t,1}^* = \arg\min_{a_{t,1} \in A} \int L(a_{t,1}, x_{t+1}) p_{t,1}(x_{t+1}) dx_{t+1}$$

The expected value of the loss function is:

$$E[L(a_{t,1}^*, x_{t+1})] = \int L(a_{t,1}^*, x_{t+1}) f(x_{t+1}) dx_{t+1}$$

The density forecast will be preferred above any other density for a given loss function if the following condition is accomplished:

$$E[L(a_{t,1}^*(p_{t,1}(x_{t+1})), x_{t+1})] < E[L(a_{t,2}^*(p_{t,2}(x_{t+1})), x_{t+1})]$$

where $a_{t,i}^*$ – the optimal action for the following forecast: $p_{t,i}(x)$.

Making decisions based on forecast accuracy evaluation is important in macroeconomics, but few studies have focused on this. Notable achievements on forecast performance evaluation were made in practical applications in finance and in metrology. Recent improvements refer to the inclusion of disutility, which is presented in actions in future states and takes into account the entire distribution of the forecast. Since an objective assessment of prediction errors cost cannot be made, only the general absolute loss functions loss or loss of error squares can be used.

2. Mean square forecast error (MSFE) and the second error of the generalized forecast (GFESM)

The most used measure to assess forecast accuracy is the mean square forecast error (MSFE). In case of a vector of variables, a MSFE matrix will be built: $V_h \equiv E[e_{T+h} e_{T+h}^{'}] = V[e_{T+h}] + E[e_{T+h}] E[e_{T+h}^{'}]$,

where e_{T+h} - vector of errors with an h steps- ahead-forecast

The trace and the determinant of the mean square errors matrix are classical measures of forecast accuracy.

Generalized forecast error second moment (GFESM) is calculated according to Clements and Hendry (1993) as a determinant of the expected value of the forecast errors vector for future moments up to the horizon of interest. If forecasts up to a horizon of h quarters present interest, this indicator is calculated as:

$$GFESM = \left| E \begin{pmatrix} e_{t+1} \\ e_{t+2} \\ \dots \\ e_{t+h} \end{pmatrix} \cdot \begin{pmatrix} e_{t+1} \\ e_{t+2} \\ \dots \\ e_{t+h} \end{pmatrix}^T \right| .$$

e_{t+h} -n-dimensional forecast error of n variables model on horizon h

GFESM is considered a better measure of accuracy because it is invariant to elementary operations with variables, unlike the MSFE trace, and it is also a measure that is invariant to basic operations of the same variables on different horizons of prediction, in contrast with the MSFE matrix trace and determinant.

Clements and Hendry (1993) showed that the MSFE disadvantages related to invariance models are determined by the lack of invariance indicator non singular linear transformations, which preserves the scale. MSFE comparisons determined inconsistent ranks of forecast performance of different models with several steps along the variable transformations.

3. Measures of relative accuracy

A relative measure for assessing forecast accuracy supposes the comparison of a forecast with a reference, which is called a “benchmark forecast” or “naïve forecast" in the literature. However, this remains a subjective approach in terms of the choice of forecast used for comparison. Problems that may arise in this case are related to: the existence of outliers or the inappropriate choice of models on which the forecasts are developed, and the emergence of shocks. A first measure of relative accuracy is Theil's U statistic, for which the reference forecast is the last observed value recorded in the data series. Collopy and Armstrong proposed a new indicator instead of the U statistics similar (RAE). Thompson improved the MSE indicator, proposing a statistically determined MSE (mean squared error log ratio).

Relative accuracy can also be measured by comparing predicted values with those based on a model built using data from the past. The tests of forecast accuracy compare an estimate of forecast error variance derived from the past residue and the current MSFE.

To check whether the differences between mean square errors corresponding to the two alternative forecasts are statistically significant the tests proposed by Diebold and Mariano, West, Clark and McCracken, Corradi and Swanson, Giacomini and White are used.

Starting from a general loss function based on predictive ability tests, the accuracy of the two alternative forecasts for the same variable is compared. The first results obtained by Diebold and Mariano were formalized, as showed by Giacomini and White (2006), West, McCracken, Clark and McCracken, Corradi, Swanson and Olivetti, Chao, Corradi and Swanson. Other researchers started from the particular loss function (Granger and Newbold, Leitch and Tanner, West, Edison and Cho, Harvey, Leybourne and Newbold).

Recent studies target accuracy analysis using as comparison criterion different models used in making predictions or the analysis of forecasted values for the same macroeconomic indicators registered in several countries.

Ericsson (1992) shows that parameter stability and the mean square error of prediction are two key measures in the evaluation of forecast accuracy. However, they are not sufficient and it is necessary to introduce a new statistical test.

Granger and Jeon (2003) consider four models for U.S. inflation: a univariate model, a model based on an indicator used to measure inflation, a univariate model based on the two previous models and a bivariate model. Applying the mean square error criterion, the best prediction made is one based on an autoregressive model of order 1 (AR (1)). Applying a distance-time method, the best model is the one based on an indicator used to measure inflation.

Ledolter (2006) compares the mean square error of ex-post and ex-ante forecasts of regression models with a transfer function with the mean square error of univariate models that ignore the covariance and show the superiority of predictions based on transfer functions.

Teräsvirta et al. (2005) examine the accuracy of forecasts based on linear autoregressive models, autoregressive with smooth transition (STAR) and neural network (neural network-NN) time series for 47 months of the macroeconomic variables of G7 economies. For each model a dynamic specification is used and it is shown that STAR models generate better forecasts than linear autoregressive ones. Neural networks over long a horizon forecast generated better predictions than models using an approach from private to general.

Heilemann and Stekler (2007) explain why macroeconomic forecast accuracy in the last 50 years for the G7 has not improved. The first explanation refers to the critique of macroeconomic models and to forecasting models, and the second is related to the unrealistic expectations of forecast accuracy. Problems related to forecast bias, data quality, the forecast process, predicted indicators, and the relationship between forecast accuracy and forecast horizon are analyzed.

Ruth (2008), using empirical studies, obtains forecasts with a higher degree of accuracy for European macroeconomic variables by combining specific sub-group predictions in comparison with forecasts based on a single model for the whole Union.

Gorr (2009) shows that the univariate method of prediction is suitable for normal conditions of forecasting while using conventional measures for accuracy, yet multivariate models are recommended for predicting exceptional conditions when an ROC curve is used to measure accuracy.

Dovern and Weisser (2011) use a broad set of individual forecasts to analyze four macroeconomic variables in G7 countries. Analyzing accuracy, bias and forecast efficiency resulted in large discrepancies between countries, as well as within the same country for different variables. In general, the forecasts are biased and only a fraction of GDP forecasts are closer to the results registered in reality.

In the Netherlands, experts make predictions starting from a macroeconomic model used by the Netherlands Bureau for Economic Policy Analysis (CPB). For the period 1997-2008 the model of the expert macroeconomic variables evolution was reconstructed and compared with the base model. The conclusions of Franses, Kranendonk and Lanser (2011) are that the CPB model forecasts are in general biased and have a higher degree of accuracy.

3. The Models Used to Make Macroeconomic Forecasts

The variables used in models are: the inflation rate calculated starting from the harmonized index of consumer prices, the unemployment rate and the interest

Inflation rate	**Models used to build the forecasts**		
Indicators of accuracy	**VAR(2)**	**ARMA**	**Models with lag**
RMSE	0,17051339	0,8532325	3,6277209
ME	-0,6694	0,0955	-3,9449
MAE	1,3694	0,6045	4,6449
MPE	-0,0650	-0,0336	-0,2550
U1	0,051257	0,017019	0,151515
U2	1,388935	0,981571	2,980709
Unemployment rate	Models used to build the forecasts		
Indicators of accuracy	VAR(2)	ARMA	
RMSE	0,57231311	2,0922862	
ME	-0,51277	-2,09223	
MAE	0,512767	2,092233	
MPE	-0,07696	-0,31383	
U1	0,040086	0,186124	
U2	3,914625	15,89517	
Interest rate	**VAR(2)**	**ARMA**	
RMSE	0,03663478	0,3635292	
ME	0,0052	-0,3693	
MAE	0,0164	0,3693	
MPE	0,0100	-0,5302	
U1	0,014359	0,36058	
U2	0,761926	14,99092	

Table 1: Indicators of forecasts accuracy for the inflation, unemployment and interest rate (the Czech Republic)
Source: own calculations using Excel.

rate in the short term. The last indicator is calculated as the average of daily values of interest rates on the market. The data series are monthly and are taken from the Eurostat website for the period from February 1999 to October 2011 for the Czech Republic. The indicators are expressed in comparable prices, the reference base being values from January 1999. We eliminated the influence of seasonal factors for the inflation rate using the Census X11 (historical) method.

In the Czech Republic only the data series for inflation and unemployment rate were transformed to become stationary.

Taking into account that our objective is the achievement of one-month-ahead forecasts for December 2011, January and February 2012, we considered it necessary to update the models. We used three types of models: a VAR(2) model, an ARMA and a model in which the inflation and interest rates are explained using variables with lag. The econometric models used for the Czech Republic are specified in **Appendix 1**.

We developed one-month-ahead forecasts starting from these models and then evaluated their accuracy. The one-step-ahead forecasts for the 3 months were presented in **Appendix 2**.

4. The Assessment of Accuracy for Predictions Based on Econometric Models

A generalization of the Diebold-Mariano test (DM) is used to determine whether the MSFE matrix trace of the model with aggregation variables is significantly lower than that of the model in which the aggregation of forecasts is done. If the MSFE determinant is used, according to Athanasopoulos and Vahid (2005), the DM test can not be used in this version, because the difference between the two models' MSFE determinants cannot be written as an average. In this case, a test that uses a bootstrap method is recommended.

The DM statistic is calculated as:

$$DM_t = \frac{\sqrt{T}\cdot[tr(MSFE_{VAR(2)\ \mathrm{mod}el})_h - tr(MSFE_{ARMA\,\mathrm{mod}el})_h]}{s} = \frac{1}{s}\cdot\sqrt{T}\cdot[\frac{1}{T}\sum_{t=1}^{T}(em_{1,1,t}^2 + em_{2,1,t}^2 + em_{3,1,t}^2 - er_{1,1,t}^2 - er_{2,1,t}^2 - er_{3,1,t}^2)] \quad (1)$$

T-number of months for which forecasts are developed

$em_{i,h,t}$ – the h-steps-ahead forecast error of variable i at time t for the VAR(2) model

$er_{i,h,t}$ – the h-steps-ahead forecast error of variable i at time t for the ARMA

s- the square root of a consistent estimator of the limiting variance of the numerator

The null hypothesis of the test refers to the same accuracy of forecasts. Under this assumption and taking into account the usual conditions of the central limit theorem for weakly correlated processes, the DM statistic follows a standard normal asymptotic distribution. For variance the Newey-West estimator with the corresponding lag-truncation parameter set to $h - 1$ is used.

We compared 3 months in terms of the accuracy of the predictions for all three variables, and predictions made starting from the VAR(2) models and ARMA models. The DM statistics for the accuracy of forecasts based on VAR models is higher than that based on ARMA models for all chosen countries.

In **Table 1** the accuracy indicators for the predictions are displayed.

In the Czech Republic, when an econometric models was used to make forecasts, the ARMA procedure was the most suitable for the inflation rate, while the best results were given by VAR(2) models for the unemployment and interest rates. However, only the predictions based on the ARMA models for the inflation rate and on VAR for the interest rate are better than those that used the naïve model.

For the Czech Republic only the VAR and ARMA models could be built to explain the evolution of the interest rate. Best results for the interest rate in the Czech Republic are given also by the VAR models.

5. The Assessment of Accuracy for Predictions Based On Exponential Smoothing Techniques

Like econometric modeling, exponential smoothing is a technique used to make forecasts. It is a simple method that takes into account more recent data. In other words, recent observations in the data series are given more weight in the prediction than older values. Exponential smoothing considers exponentially decreasing weights over time.

4. Simple exponential smoothing method (M1)

The technique can be applied for stationary data to make short run forecasts. Starting from the formula of each rate $R_n = a + u_n$, where a is a constant and u_t – resid, s- seasonal frequency, the prediction for the next period is:

$$\hat{R}'_{n+1} = \alpha \times R'_n + (1-\alpha) \times \hat{R}'_n, n = 1,2,...,t+k \quad (2)$$

α is a smoothing factor, with values between 0 and 1, being determined by minimizing the sum of squared prediction errors.

$$\min \frac{1}{n} \sum_{i=0}^{n-1} (R'_{n+1} - \hat{R}'_{n+1})^2 = \min \frac{1}{n} \sum_{i=0}^{n-1} e_{n+1}^2 \quad (3)$$

Each future smoothed value is calculated as a weighted average of the n past observations, resulting in:

$$\hat{R}'_{n+1} = \alpha \times \sum_{i=1}^{n} (1-\alpha)^i \times \hat{R}'_{n+1-s} \ . \quad (4)$$

5. Holt-Winters Simple exponential smoothing method (M2)

The method is recommended for data series with linear trends and without seasonal variations, the forecast being determined as: $R_{n+k} = a + b \times k$. (5)

$$a_n = \alpha \times R_n + (1-\alpha) \times (a_{n-1} + b_{n-1}) \quad (6)$$
$$b_n = \beta \cdot (a_n - a_{n-1}) + (1-\beta) \cdot b_{n-1}$$

Finally, the prediction value on horizon k is:

$$\hat{R}_{n+k} = \hat{a}_n + \hat{b}_n \times k \quad (7)$$

6. Holt-Winters multiplicative exponential smoothing method (M3)

This technique is used when the trend is linear and the seasonal variation follows a multiplicative model. The smoothed data series is: $\hat{R}'_{n+k} = (a_n + b_n \times k) \times c_{n+k}$ (8), where a-intercept, b- trend, c- multiplicative seasonal factor

$$a_n = \alpha \times \frac{R'_n}{c_{n-s}} + (1-\alpha) \times (a_{n-1} + b_{n-1})$$
$$b_n = \beta \times (a_n - a_{n-1}) + (1-\beta) \times b_{n-1} \quad (9)$$
$$c_n = \gamma \times \frac{R'}{a_n} + (1-\gamma) \times c_{n-s}$$

The prediction is:

$$\hat{R}'_{n+k} = (\hat{a}_n + \hat{b}_n \times k) \times \hat{c}_{n+k} \ . \quad (10)$$

Inflation rate- Czech Republic	RMSE	ME	MAE	MPE	U1	U2
M1	0,288386455	-1,73383	1,800501	-0,08296	0,056005	1,545809
M2	1,119007113	-1,50076	1,567428	-0,08027	0,049381	0,189913
M3	-	-	-	-	-	-
M4	0,859249004	-0,53664	0,603307	-0,03108	0,01775	0,947732
M5	1,039570357	-1,45292	1,519589	-0,0779	0,0475	0,228745
Unemployment rate- Czech Republic						
M1	0,081731	-0,03343	0,033433	-0,00499	0,004345	0,43671
M2	0,058351	0,049443	0,049443	0,007421	0,00436	0,44044
M3	0,111016	-0,07804	0,09456	-0,01163	0,008375	0,836498
M4	0,116203	-0,0839	0,100421	-0,0125	0,00877	0,87466
M5	0,048776	0,01744	0,044912	0,002621	0,003653	0,365749
Interest rate- Czech Republic						
M1	0,033121	-0,01294	0,022964	-0,01635	0,021484	1,125963
M2	0,045165	-0,01788	0,030232	-0,02586	0,02999	2,013734
M3	0,098583	-0,09484	0,094845	-0,13656	0,075181	4,417344
M4	0,076148	0,014587	0,094149	0,022764	0,068091	3,35745
M5	0,03487	-0,01772	0,023895	-0,02554	0,0225	1,657338

Table 2: Measures of accuracy for forecasts based on exponential smoothing techniques for the inflation, unemployment and interest rate (the Czech Republic)
Source: own computations using Excel

6. Holt-Winters additive exponential smoothing method (M4)

This technique is used when the trend is linear and the seasonal variation follows a multiplicative model. The smoothed data series is (14): $\hat{R}'_{n+k} = a_n + b_n \times k + c_{n+k}$

a- intercept, b- trend, c- additive seasonal factor

$$a_n = \alpha \times (R'_n - c_{n-s}) + (1-\alpha) \times (a_{n-1} + b_{n-1})$$
$$b_n = \beta \times (a_n - a_{n-1}) + (1-\beta) \times b_{n-1} \quad (11)$$
$$c_n = \gamma \times (R'_n - a_n) + (1-\gamma) \times c_{n-s}$$

The prediction is:

$$\hat{R}'_{n+k} = \hat{a}_n + \hat{b}_n \times k + \hat{c}_{n+k}. \quad (12)$$

7. Double exponential smoothing method (M5)

This technique is recommended when the trend is linear, two recursive equations being used:

$$S_n = \alpha \times R_n + (1-\alpha) \times S_{n-1} \quad (13)$$

$D_n = \alpha \times S_n + (1-\alpha) \times D_{n-1}$ where S and D are simple, respectively double smoothed series.

In **Table 2** the accuracy indicators for predictions based on exponential smoothing techniques are presented for all three countries. Analyzing the values of these indicators, the smoothing method is better than the econometric models for the aforementioned countries.

Indeed, the exponential smoothing techniques provided the most accurate predictions for all indicators in the Czech Republic. For the inflation rate the best method to be applied was the additive exponential smoothing technique, while for unemployment and interest rates the simple exponential smoothing technique generated the best results due to a value of U1 very closed to zero. All of the predictions for the unemployment rate based on the exponential smoothing techniques are more accurate than those based on the naïve model. All forecasts are overestimated on the chosen horizon, excepting the unemployment rate in the case of Holt-Winters and the double smoothing method, and the interest rate when the additive technique is used. The low values for RMSE imply low variability in the data series.

6. Conclusions

In our research we proposed to check if exponential smoothing techniques generate better short run predictions than simple econometric models.

According to recent research, simple econometric models are recommended for forecasts due to their high degree of accuracy in predictions. For the prognosis made for the Czech Republic from December 2011-February 2012 this hypothesis was not supported.

In the Czech Republic the recent values in the data series used for predictions have the greatest importance. Therefore, exponential smoothing methods determined the best results in terms of forecasts accuracy. Simple and additive exponential smoothing techniques are recommended for the Czech Republic.

To improve policy we can use monthly forecasts based on the better method for this country. Policy is improved by choosing the most accurate forecast, which helps the government or banks in making the best decisions. In our study we analyzed the results of only two quantitative methods, but the research could be extended by adding other quantitative forecasting methods or by using qualitative methods or predictions based on combinations of the two types of methods.

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Appendices

Appendix 1: Models used for one-month-ahead forecasts (Czech Republic)

Reference period of data series	VAR(2)
February 1999-November 2011	INTEREST_CR = 1.032955367*INTEREST_CR(-1) - 0.07435234854*INTEREST_CR(-2) + 0.01622901437*RI_CR(-1) - 0.02073687184*RI_CR(-2) - 0.2030556239*UR_CR(-1) + 0.1918379768*UR_CR(-2) + 0.1620812519 RI_CR = 0.07613664735*INTEREST_CR(-1) - 0.08479586276*INTEREST_CR(-2) + 1.091002306*RI_CR(-1) - 0.1006512028*RI_CR(-2) - 0.1904207202*UR_CR(-1) + 0.1284548155*UR_CR(-2) + 0.6752498405 UR_CR = - 0.1503567547*INTEREST_CR(-1) + 0.1438367589*INTEREST_CR(-2) - 0.01694177212*RI_CR(-1) + 0.0156354488*RI_CR(-2) + 1.616200903*UR_CR(-1) - 0.633750514*UR_CR(-2) + 0.1397074831
February 1999-December 2011	INTEREST_CR = 1.03212544*INTEREST_CR(-1) - 0.07367847639*INTEREST_CR(-2) + 0.01566704719*RI_CR1(-1) - 0.02030389812*RI_CR1(-2) - 0.2054864774*UR_CR1(-1) + 0.1938526614*UR_CR1(-2) + 0.1654661173 RI_CR1 = 0.08149977622*INTEREST_CR(-1) - 0.08915054128*INTEREST_CR(-2) + 1.094633835*RI_CR1(-1) - 0.103449154*RI_CR1(-2) - 0.1747121244*UR_CR1(-1) + 0.1154355747*UR_CR1(-2) + 0.6533762543 UR_CR1 = - 0.1495715212*INTEREST_CR(-1) + 0.143199176*INTEREST_CR(-2) - 0.01641006788*RI_CR1(-1) + 0.01522579148*RI_CR1(-2) + 1.61850085*UR_CR1(-1) - 0.6356567043*UR_CR1(-2) + 0.1365048988
February 1999-January 2011	INTEREST_CR = 1.031008851*INTEREST_CR(-1) - 0.07233575969*INTEREST_CR(-2) + 0.01671004085*RI_CR1(-1) - 0.02111360193*RI_CR1(-2) - 0.2024762562*UR_CR1(-1) + 0.1916516303*UR_CR1(-2) + 0.1588725354 RI_CR1 = 0.05833066638*INTEREST_CR(-1) - 0.06128930788*INTEREST_CR(-2) + 1.116275846*RI_CR1(-1) - 0.1202504248*RI_CR1(-2) - 0.112250345*UR_CR1(-1) + 0.06976440581*UR_CR1(-2) + 0.5165601085 UR_CR1 = - 0.1488160438*INTEREST_CR(-1) + 0.1422907021*INTEREST_CR(-2) - 0.01711575102*RI_CR1(-1) + 0.01577363214*RI_CR1(-2) + 1.616464153*UR_CR1(-1) - 0.6341675*UR_CR1(-2) + 0.140966076

Reference period of data series	ARMA
February 1999-November 2011	$ri\_cr_t = 0{,}152 + 0{,}985 \cdot ri\_cr_{t-1} - 0{,}972 \cdot \varepsilon_{t-3} + \varepsilon_t$ $ur\_cr_t = -0{,}012 + 0{,}688 \cdot ur\_cr_{t-1} + \varepsilon_t$ $\text{int}\,erest\_cr_t = 1{,}662 + 0{,}958 \cdot \text{int}\,erest_{t-1} + \varepsilon_t$
February 1999-December 2011	$ri\_cr_t = 0{,}152 + 0{,}987 \cdot ri\_cr_{t-1} - 0{,}972 \cdot \varepsilon_{t-3} + \varepsilon_t$ $ur\_cr_t = -0{,}0127 + 0{,}689 \cdot ur\_cr_{t-1} + \varepsilon_t$ $\text{int}\,erest\_cr_t = 1{,}667 + 0{,}959 \cdot \text{int}\,erest_{t-1} + \varepsilon_t$
February 1999-January 2011	$ri\_cr_t = 0{,}153 + 0{,}988 \cdot ri\_cr_{t-1} - 0{,}973 \cdot \varepsilon_{t-3} + \varepsilon_t$ $ur\_cr_t = -0{,}013 + 0{,}689 \cdot ur\_cr_{t-1} + \varepsilon_t$ $\text{int}\,erest\_cr_t = 1{,}667 + 0{,}96 \cdot \text{int}\,erest_{t-1} + \varepsilon_t$

Reference period of data series	Models having variables with lags
February 1999-November 2011	$ri\_cr_t = 0{,}197 - 0{,}546 \cdot ur_{t-2} + \varepsilon_t$
February 1999-December 2011	$ri\_cr_t = 0{,}198 - 0{,}546 \cdot ur_{t-2} + \varepsilon_t$
February 1999-January 2011	$ri\_cr_t = 0{,}198 - 0{,}5463 \cdot ur_{t-2} + \varepsilon_t$

Appendix 2: One-month-ahead forecasts based on econometric models (Czech Republic)

Inflation rate	VAR(2) models	ARMA models	Models with lags
December 2011	16,6238	16,411	13,2974
January 2012	16,7299	16,9035	13,4066
February 2012	16,638	18,972	13,4612

Unemployment rate	VAR(2) models	ARMA models
December 2011	6,0388	4,5288
January 2012	6,2199	4,5969
February 2012	6,203	4,5976

Interest rate	VAR(2) models	ARMA models
December 2011	0,70482	0,34218
January 2012	0,67838	0,32302
February 2012	0,72238	0,31685

Source: own calculations using Excel.

Multi-Level Analysis of Authentic Leadership from a Turkish Consruction Engineers Perspective

Semra Özkan, Adnan Ceylan *

Abstract:

Authentic leaders are leaders who when called upon by the hand of fate, will be the ones who take a stand that changes the course of history for others, be they organizations, departments or just other individuals (May, Chan, Hodges & Avolio, 2003). That's the answer of why authentic leadership? In this study we explore authentic leadership in Turkey from a multilevel perspective. We used the authentic leadership measure developed by Walumbwa, Avolio, Gardner, Wernsing and Peterson in 2008. We also tested the generalizability and validity of the AL measure in a different cultural context.

Keywords: Authentic leadership, affective organizational commitment, multi-level analysis, HLM

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1. Introduction

"When leaders are dedicated stewards and lead in an authentic manner, they build enduring organizations that do great good for people and make an enormous difference in the world" (George, 2003). But what is authenticity? Harter (2002) defines authenticity as "to thine own self be true". The meaning of the word authentic is original, genuine, principal, reliable, trustworthy. The authentic person is one acting on his/her own authority, in other words doing the right thing as a choice of one´s own, not beceause of social pressures. Kernis and Goldman (2005) defined authenticity as "the unimpeded operation of one's true or core self in one's daily interactions with others". So it requires acting in a way compatible with one's values and needs.

Authenticity takes place both in philosophy and psychology. In existentialist philosophy, authenticity is the degree to which one is true to one's own personality, spirit, or character, despite external forces, pressures and influences. So it cannot be said that someone is authentic or not authentic because it is a matter of degree. Everyone is more or less authentic, according to the person. On the other hand, in psychology authenticity refers to the attempt to live one's life according to the needs of one's inner being, rather than the demands of society or one's early conditioning. However, the meaning of the "needs of one's inner being" is subjective and culture bound. In the emerging field of positive psychology (Seligman, 2002), authenticity can be defined as "owning one's personal experiences (thoughts, emotions, needs, wants, preferences, or beliefs) and acting in accord with the true self (behaving and expressing what you really think and believe)" (Harter, 2002).

Kernis (2003) proposed that achieving authenticity brings "optimal" levels of self-esteem. When individuals know and accept themselves, their strengths and weaknesses, they display high levels of stable self-esteem. Such individuals can build transparent, open and close

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relationships with others. Furthermore, they display authentic behavior that reflects consistency between their values, beliefs, and actions. Similarly, Ryan and Deci (2003) asserted that authenticity is achieved when individuals' behaviors are guided by internal values as opposed to external threats, inducements, or social expectations and rewards.

1.1. Authentic Leadership

Luthans and Avolio (2003) integrated the fields of positive organizational behavior, transformational and moral/ethical leadership into a broader framework of authentic leadership. They proposed that the confluence and synergy of all three approaches through authentic leadership may best meet what most informed observers agree is a turning point, a paradigm shift, in the way societies and organizations must be led in order to survive, let alone thrive and gain competitive advantage.

Luthans (2002) defined positive organizational behavior (POB) as "the study and application of positively oriented human resource strengths and psychological capacities that can be measured, developed, and effectively managed for performance improvement". The concept was built on the work of Seligman (1998) on positive psychology which focuses on the propagation and nurturing of positive feelings opposed to traditional clinical psychology, focusing on the repair of unhappy states and pathologies. Positive psychology is interested in what is right with people and their strengths. Luthans proposes POB as focusing on positive feelings, in general, and on the sub-concepts of confidence/self-efficacy, hope, optimism, subjective well-being/ happiness, and emotional intelligence, in particular (Yammarino, Dionne, Schriesheim & Dansereau, 2008). As is the case in POB, authentic leaders approve his/her followers' diferences and focus on strengthen their capabilities (Luthans and Avolio, 2003).

Authentic leadership is a process that draws from both positive psychological capacities and a highly developed organizational context, which results in both greater self-awareness and self-regulated positive behaviors on the part of leaders and associates, fostering positive self-development (Luthans & Avolio, 2003). Avolio, Luthans & Walumbwa (2004b) defined authentic leaders as "those who are deeply aware of how they think and behave and are perceived by others as being aware of their own and others' values/moral perspectives, knowledge, and strengths; aware of the context in which they operate; and who are confident, hopeful, optimistic, resilient, and of high moral character" (as cited in Avolio, Gardner, Walumbwa, Luthans & May, 2004a).

1.2. The Components of Authentic Leadership

The authentic leadership models proposed by Ilies, Morgeson & Nahrgang (2005) and Gardner, Avolio, Luthans, May & Walumbwa (2005) are heavily influenced by Kernis's (2003) authenticity conception and Deci and Ryan's (2000) self-determination theory. Furthermore, Avolio and Gardner (2005), Luthans and Avolio (2003), and May et al. (2003) have argued that authentic leadership includes a positive moral perspective. Building on these previous studies Walumbwa et al. (2008) conceptualized authentic leadership as being composed of five distinct but related components: self-awareness, relational transparency, balanced processing of information and internalized moral perspective. Self-awareness refers to knowing and accepting one's strengths and weaknesses and being aware of one's impact on other people. Relational transparency refers to presenting one's real self to others, openly sharing information and one's true thoughts and feelings. Balanced processing refers to analyzing all relevant data objectively before coming to a decision. Internalized moral perspective refers to achieving behavioral integrity (consistency between values and actions) which is guided by internal moral standards and values versus societal pressures.

To include the dimensions of the construct, Walumbwa et al. (2008) updated Luthans and Avolio's (2003) definition as "a pattern of leader behavior that draws upon and promotes both positive psychological capacities and a positive ethical climate, to foster greater self-awareness, an internalized moral perspective, balanced processing of information, and relational transparency on the part of leaders working with followers, fostering positive self-development".

1.3. Authentic Leadership from a Multi-level Perspective

In social sciences hierarchical data structure is very common. It means the units observed are nested in a hierarchical structure, for example employees are nested in groups, groups in departments, departments in organizations. The problem with a hierarchical dataset is that observations from the same hierarchical unit can not

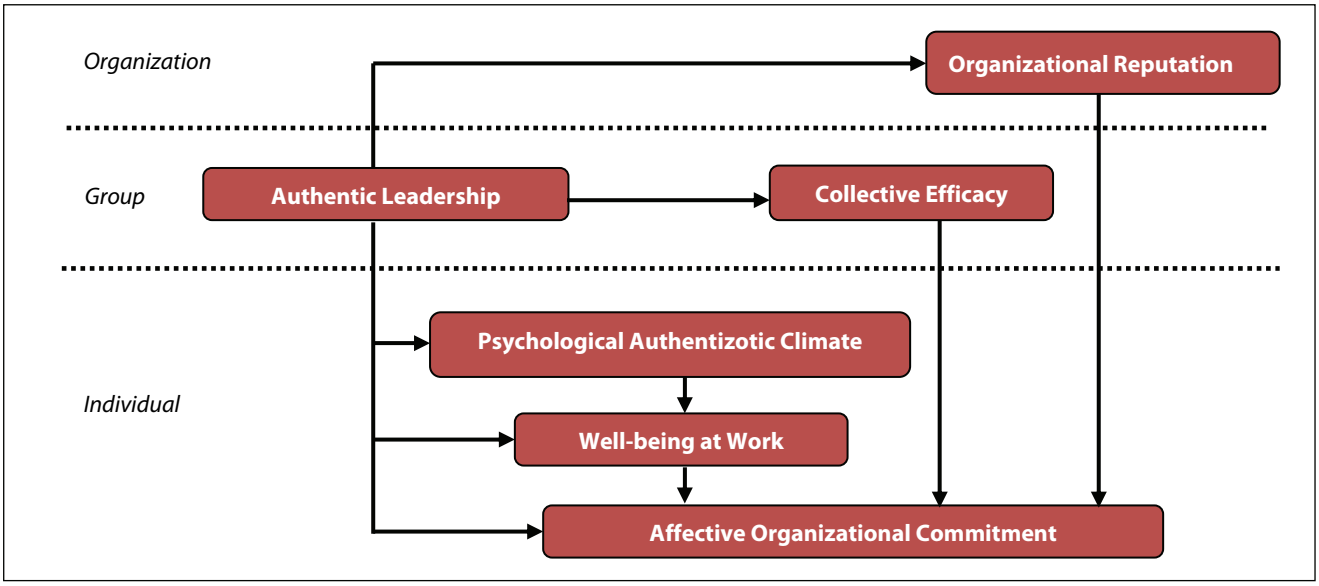

Figure 1: Hypothesized Model

be decsribed as independent, because observations in the same hierarchical unit will have similar characteristics. Suppose that we conduct a survey measuring satisfaction with a supervisor. The employees of the same department who are the direct reports of the same supervisor will answer the questions similarly, because they all assess the same supervisor, so we can not say that the observations are fully independent. In contrast with this situation, the most important assumption in statistical analysis procedures is the independence of observations, so we must use another pocedure, namely hierarchical linear modeling, with our hierarchical dataset.

Most statistical inference is based on replicated observations of units of analysis of one type (e.g., a sample of individuals, countries, or schools). However, the complexity of social reality and social science theories often calls for more complex data sets, which include units of analysis of more than one type. Multilevel analysis is a general term referring to statistical methods appropriate for the analysis of data sets comprising several types of unit of analysis (Snijders, 2003). In this study, we analyze individuals, groups and organizations as units of analysis. Those units of analysis are hierarchically nested; individuals in groups, groups in organizations. Individuals form level 1, the most detailed level, groups level 2 and organizations level 3 of the analysis.

Dansereau, Alutto & Yammarino (1984); Klein, Dansereau & Hall (1994); Dansereau & Yammarino (2000); Dionne, Randel, Jaussi & Chun (2004) put forth the guidelines of theoretical formulation and empirical testing for multiple levels of analysis. The most important methods of multilevel analysis are variants of regression analysis designed for hierarchically nested data sets. The main model is the hierarchical linear model (HLM), an extension of the general linear model in which the probability model for the errors, or residuals, has a structure reflecting the hierarchical structure of the data. For this reason, multilevel analysis is often called hierarchical linear modeling. The dependent variable in the HLM always is a variable defined at the lowest (i.e., most detailed) level of the hierarchy. An important feature of the HLM is that the independent, or explanatory, variables can be defined at any of the levels of analysis (Snijders, 2003). In accordance with that rule our dependent variable is affective organizational commitment defined at level 1. The independent variables are psychological authentizotic climate, well-being at work, authentic leadership, collective efficacy, and organizational reputation defined at levels 1, 2 and 3.

In this study we explore authentic leadership theory from a multi-level perspective. We propose that an authentic leader (1) enhances the psychological authentizotic climate of his/her followers, supports their well-being at work and finally provides affective organizational commitment of his/her followers on an individual level; (2) heightens collective efficacy among the group members in group levels that in turn deepens the affective organizational commitment of followers and (3) improves organizational reputation at the organizational level that in turn deepens the affective organizational commitment of followers. We

strengthen our proposals with related literature as shown below and try to support them with empirical evidence. Figure 1 illustrates the hypothesized model.

2. Theory and Hypotheses

2.1. Authentic Leadership and Affective Organizational Commitment

Meyer and Allen (1987), conceptualized organizational commitment as the integration of three related but distinguishable components. The affective component of organizational commitment refers to employees' emotional attachment to, identification with, and involvement in the organization. The continuance component refers to commitment based on the costs that employees associate with leaving the organization. The normative component refers to employees' feelings of obligation to remain with the organization. Employees with strong affective commitment remain because they want to, those with strong continuance commitment because they need to, and those with strong normative commitment because they feel they ought to do so (Allen and Meyer, 1990).

In this study we focused on the affective component of organizational commitment because as Allen and Meyer (1990) empirically proved in their study, employees who feel comfortable in their roles and who feel competent in their jobs express greater affective attachment to the organization. We propose that through empowering his/her followers authentic leaders make them feel competent in their work; through transparent relationships, ethical role modeling and strengthening them for behaving compatible with their inner/core beliefs, authentic leaders make them feel comfortable in their roles and so enhance their affective organizational commitment. Walumbwa et al. (2008) also proved the positive relation of authentic leadership to organizational commitment empirically with samples obtained from China. Moreover, Avolio and Gardner (2005) asserted that "leadership can make a fundamental difference in organizations by helping people find meaning and connection at work through greater self-awareness; by restoring and building optimism, confidence and hope; by promoting transparent relationships and decision making that build trust and commitment among followers; and by fostering inclusive structures and positive ethical climates."

H_1 : Authentic leadership is positively related with affective organizational commitment.

2.2. Authentic Leadership and a Psychological Authentizotic Climate

Kets de Vries' (2001) advanced the concept "authentizotic organization" to describe an organization that is trustful and reliant, and vital to life. The authentizotic theory suggests that organizations can enhance psychological well being, sustain developing positive self-esteem and self-determination. From this perspective it is very similar to authentic leadership because both of them are positive theories and focus on strengths while improving weaknesses.

The instrument developed by Rego and Souto (2005) for measuring authentizotic psychological climates was intended to measure employees' perceptions of workplace characteristics, not real workplace characteristics. Psychological climates are the "individual's psychologically meaningful representations of proximal organizational structures, processes, and events" (Parker et al., 2003). The instrument is composed of six factors: spirit of camaraderie, trust/credibility of the leader, open and frank communication with the leader, opportunities for learning and personal development, fairness and work–family conciliation. Except for the work–family conciliation factor, other factors concur with authentic leadership components. Authentic leaders build transparent relationships based on trust, truth and intimacy, treat followers similarly, fairly, empower followers and support developing their self-determination.

The construct of psychological climate influences important individual-level outcomes (e.g., motivation, commitment, satisfaction and performance) (Rego and Cunha, 2008). Martin, Jones and Callan (2005) also observed that "employees whose perceptions of the organization and environment in which they were working (…) were more positive, were more likely to appraise change favorably and report better adjustment in terms of higher job satisfaction, psychological well being, and organizational commitment, and lower absenteeism and turnover intentions". Similarly Parker et al. (2003) suggested that psychological climates "do have reliable relationships with employees' work attitudes, psychological well being, motivation and performance".

Rego and Cunha (2008)'s empirical research on authentizotic psychological climates displayed that psychological climates explain unique variance of stress, well being at work and performance. They especially underline that it is important to take into account the perceptions of followers while searching for well being, because often followers' subjective perceptions and evaluations are more significant and determinant for their well being than the actual situation. So while searching for well being, it is more proper to use pyschological climate than organizational climate. Compatible with previous studies' results we propose that followers who perceive their leaders as authentic, perceive their organizations as more authentizotic and feel greater well-being at work.

H_2 : Authentic leadership is positively related with authentizotic psychological climates.

2.3. Authentic Leadership and Well-Being At Work

Affective well-being is based on theories of happiness and defined as the balance of pleasure and displeasure in people's lives (Sumner, 1996). Positive organizational studies focus on developing people's strengths to help people achieve happiness. When we think that an average person spends nine hours at work each weekday the workplace must have an important role in his/her well-being. Gavin and Mason (2004) asserted that "It seems clear that if there is any hope for people to find general happiness in their lives today, they must be happy at work. Work by itself, of course, cannot make a person happy, but a person cannot be genuinely happy if he or she is unhappy at work". So we can say that if a leader makes his/her followers feel happy at work, he can heighten their performance and easily motivate them for organizational goals. Because positive emotions play a crucial role in coping with stress, happiness will improve employees' productivity and engagement. Authentic leadership is closely related to positive organizational behavior, hence positive pyschology, we suggest, is also strictly related with follower happiness. We propose that an authentic leader will promote his employees' happiness and positive emotions through transparent relationships, behavioral integrity, high moral standards and honesty. Trust and credibility in leaders, as well as open and frank communication with them, may strengthen the employees' feelings of emotional support, improving their well being (Aycan and Eskin, 2005; Kramer and Tyler, 1996).

Avolio et. al. (2004) assert that "authentic leaders act in accordance with deep personal values and convictions, to build credibility and win the respect and trust of followers by encouraging diverse viewpoints and building networks of collaborative relationships with followers, and thereby lead in a manner that followers recognize as authentic. As this process cascades to followers, they may also operate in a similar manner, portraying to leaders, colleagues, customers and other interested stakeholders their authenticity, which over time may become a basis for the organization's culture". On the other hand, Luthans and Avolio (2003) described the characteristics of an authentic leader as confident, hopeful, optimistic, resilient, transparent, moral/ethical, future-oriented, and associate building (gives priority to developing associates to be leaders). So we think that as this process cascades to followers, they also be as confident, hopeful, optimistic, resilient, moral/ethical and future-oriented as their leader. We propose that this cascading authenticity enhances followers' well-being at work. In accordance with our purposes Avolio and Gardner (2005) suggested that "through increased self-awareness, self-regulation, and positive modeling, authentic leaders foster the development of authenticity in followers. In turn, followers' authenticity contributes to their well-being and the attainment of sustainable and veritable performance." Ilies et al. (2005) argued that "when leaders display unbiased processing of self-relevant information, personal integrity, and an authentic relational orientation, leader–follower relationships will be characterized by high levels of respect, positive affect, and trust. High quality and close relationships will in turn foster greater value congruence and follower reciprocation in the form of behavior that is consistent with the leader's values. Such reciprocity is posited to result in greater authenticity, and well-being among followers" (as cited in Avolio and Gardner, 2005).

H_3 : Authentic leadership is positively related with a follower's well-being at work.

In this study we also explore if authentizotic psychological climates and well-being at work mediate the positive relationship between authentic leadership and affective organizational commitment.

H_4 : Authentizotic psychological climates and well-being at work mediate the positive relationship between authentic leadership and affective organizational commitment.

2.4. Authentic Leadership and Collective Efficacy

Bandura (1997) defined collective efficacy as "a group's shared belief in their conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments". Another definition of the concept is "a sense of collective competence shared among members when allocating, coordinating, and integrating their resources as a successful, concerted response to specific situational demands" (Zaccaro, Blair, Peterson & Zazanis, 1995). When coping with obstacles, people who have high collective efficacy are more likely to insist on finding solutions. Studies on collective efficacy have shown that it positively predicts group motivation and performance and acts as a buffer of stressor–strain relations. Thus, efficacy beliefs at both the individual level (self-efficacy) and group level (collective efficacy) are related to important individual and organizational outcomes (Chen and Bliese, 2002).

Sosik, Avolio & Kahai (1997), found empirical support for the importance of leadership behaviors as one of important antecedents of collective efficacy in laboratory studies. Walumbwa, Wang & Lawler (2003) investigated the direct and indirect effects transformational leadership has on followers' attitudes, such as organizational commitment and job satisfaction, mediated through collective efficacy. They found that collective efficacy mediated the relationship between transformational leadership and work-related attitudes, so transformational leadership is a possible mechanism through which collective efficacy may be enhanced, which in turn, enhances followers' commitment and satisfaction. Individuals, perceive high collective efficacy, are more likely to appreciate their membership, and to feel committed to their organizations.

An authentic leader enhances followers' social identification by creating a deeper sense of high moral values and expressing high levels of honesty and integrity in their dealings with followers (Avolio et al., 2004). Social identification is a process through which individuals identify with a group, take pride in belonging, and see group membership as an important part of their identity (Kark & Shamir, 2002). The perceptions of trustful behaviors of leaders also favor more cooperative behavior among colleagues, which can further lead to pleasant affects (Herrbach and Mignonac, 2004). Alternatively, while authentic leadership comprises transformational leadership, authentic leadership can also be a possible mechanism through which collective efficacy may be enhanced, which in turn, enhances followers' commitment and satisfaction.

H_5 :Authentic leadership is positively related with collective efficacy.

H_6 :Collective efficacy mediates the positive relationship between authentic leadership and affective organizational commitment.

2.5. Authentic Leadership and Organizational Reputation

Hall (1992) suggests that a company's reputation consists of the knowledge and the emotions held by individuals. Fombrun and Van Riel (2003) characterize corporate reputation as a magnet that magnetizes the stakeholders and positive consequences. They suggested that corporate reputation brings in well-qualified employees, and supports employees' motivations and affective commitment. Fombrun, Shanley (1990) propose that institutional signals depicting firms as more or less visible, attractive and socially responsive are related to the assessment of a firm's reputation. "Managers presume that social responsiveness generates goodwill from employees, consumers and other publics that enhances the long-run profitability and viability of firms and protects their own employment. Managers can signal their firms' social concern by contributing to charitable causes, developing nonpolluting products, achieving equal opportunity employment, creating foundations, placing women and minority members on boards (Lydenberg, Marlin & Strub,1986; Ryan, Swanson & Buchholz, 1987)" (as cited in Fombrun and Shanley, 1990).

Lewis (2003) defined the six factors that comprise corporate reputation as leadership, social responsiveness, environmental responsiveness, product and service quality, financial performance and employee training. In light of previous studies, we can see that leadership and social responsiveness are two important factors of corporate reputation. Ethical leaders care about people and society in their decisions (Brown & Trevino, 2006); they display actions indicating they seek to do the right thing personally and professionally and have the

attributes of honesty, fairness, integrity, and openness. They are self-disciplined and consistent in their pursuit of clear ethical standards, which they refuse to compromise even in the face of uncertainty or pressure (Brown, Trevino & Harrison, 2005). Because authentic leadership involves ethical leadership, we suggest that authentic leaders will also exhibit similar characteristics. Moreover, we know that an authentic leader achieves equal opportunity employment so we propose that

H_7 : Authentic leadership is positively related with corporate reputation.

H_8 : Corporate reputation mediates the positive relationship between authentic leadership and affective organizational commitment.

3. Research

3.1. Sample and Procedure

Our sample was composed of 304 construction engineer employed full-time who were members of the "Chamber of Construction Engineers". All of the respondents were male and with respect to education, had at least a university degree. We collected data through face-to-face surveys. The 304 respondents were employed in 115 different construction firms and had 154 immediate supervisors.

3.2. Measures

Authentic leadership was measured using the 16 item Authentic Leadership Questionnaire, developed by Walumbwa et. al. (2008), with a 5-point response scale from 1 (Not at all) to 5 (Frequently, if not always). The scale has four dimensions including balanced processing (3 items), internalized moral perspective (4 items), relational transparency (5 items) and self-awareness (4 items). Sample items included "Solicits views that challenge his or her deeply held positions" (balanced processing), "Makes decisions based on his/her core beliefs" (internalized moral perspective), "Is willing to admit mistakes when they are made" (relational transparency) and "Seeks feedback to improve interactions with others" (self-awareness).

We obtained the ALQ's Turkish translation through Mind Garden (Users should request the instrument from Mind Garden, 1690 Woodside Road, Suite 202, Redwood City, CA 94061). Avolio, Gardner and Walumbwa addressed the following questions through ALQ:

Self Awareness: To what degree is the leader aware of his or her strengths, limitations, how others see him or her and how the leader impacts others?

Transparency: To what degree does the leader reinforce a level of openness with others that provides them with an opportunity to be forthcoming with their ideas, challenges and opinions?

Ethical/Moral: To what degree does the leader set a high standard for moral and ethical conduct?

Balanced Processing: To what degree does the leader solicit sufficient opinions and viewpoints prior to making important decisions?

Leadership has strong theoretical and empirical bases to be conceptualized at multiple levels of analysis (Yammarino, Dionne, Chun & Dansereau, 2005). So we defined authentic leadership at the group level of analysis in this study.

Psychological authentizotic climate was measured using an instrument comprising 21 items and measuring six authentizotic dimensions, developed by Rego and Cunha (2008), with a 5-point response scale from 1 (Strongly disagree) to 5 (Strongly agree). We used 10 items of the scale that measure three dimensions which we suppose are strictly related to authentic leadership theory, spirit of camaraderie (4 items), trust/credibility of the leader (3 items), and open and frank communication with the leader (3 items). Sample items are in turn, "A sense of family exists among the employees", "People trust in their leaders", "People feel free to communicate frankly and openly with the leaders".

Well-being at work was measured using a scale comprising 12 items and two dimensions which was developed by Warr (1990). The dimensions are anxiety-contentment and depression-enthusiasm, all consisting of six items. The adjectives in anxiety-contentment dimension are contented, calm, relaxed, tense, uneasy, and worried. Those in depression-enthusiasm dimension are enthusiastic, optimistic, cheerful, depressed, gloomy, and miserable. Items 4, 5, 6, 10, 11, and 12 are reverse coded. Sample items are "cheerful", "optimistic" and "worried". Respondents are asked to think about the frequency they feel those 12 sensations in their organizations and mark the response scale from 0 (never) to 4 (always).

Affective organizational commitment was measured using the scale developed by Allen and Meyer (1990) with a 5-point response scale from 1 (Strongly

1. factor % of variance explained: 45,249	2. factor % of variance explained: 8,386	3. factor % of variance explained: 6,838
self-awareness	relational transparency	internalized moral perspective
self-awareness	relational transparency	internalized moral perspective
self-awareness	relational transparency	internalized moral perspective
self-awareness	relational transparency	
balanced processing	internalized moral perspective	
balanced processing		
balanced processing		
relational transparency		

Table 1: The Composition of Items among Factors

Variable	% of Total Variance Explained in the Items	Internal Consistency (coefficient α)
Authentizotic Psychological Climate	74,640	0.935
Well-being at Work	68,702	0.846
Affective Organizational Commitment	75,164	0.944
Group Collective Efficacy	81,750	0.972
Corporate Reputation	63,530	0.935

Table 2: Results of Confirmatory Factor Analysis of Other Variables

disagree) to 5 (Strongly agree). The scale measures the three component (affective, continuance and normative) model of organizational commitment with 24 items. In this study we are interested in only the affective component of the model. Sample items are "This organization has a great deal of personal meaning for me" and "I would be very happy to spend the rest of my career with this organization".

Collective efficacy was measured with the scale developed by Italian researchers and used in different studies such as Petitta and Falcone (2007); Mastrorilli, Borgogni, and Petitta (2007); Russo, Dammacco, and Borgogni (2007). The scale comprises nine items measuring employees' thoughts about the group they are working in with a 5-point response scale from 1 (strongly disagree) to 5 (strongly agree). A sample item is "We always achieve coordination in order to get over the obstacles we face".

Corporate reputation was measured using a scale comprising 8 items developed by Fombrun and Shanley (1990) with a 5-point response scale from 1 (Strongly disagree) to 5 (Strongly agree). The items address the following attributes: quality of management; quality of products or services; long-term investment value; innovativeness; financial soundness; ability to attract, develop, and keep talented people; community and environmental responsibility; and use of corporate assets.

3.3. Analysis Technique

Because of the hierarchical nature of our data set we used hierarchical linear modeling (HLM7, Raudenbush & Bryk, 2002) in hypothesis testing. We used SPSS15 as an input file for creating the MDM file and for other analysis such as descriptive statistics, regressions among variables, confirmatory factor analysis and reliability analysis.

4. Results

4.1. Confirmatory Factor Analysis

We conducted a confirmatory factor analysis for each measure to see; (1) how many interrelated factors the construct comprises, and (2) how many dimensions are perceived by the Turkish respondents and whether they are similar with the dimensions perceived by the developers of the measure or by the other respondents the measure administered from other countries or cultures. In other words, we tried to display whether the construct exposes similar consequenses as described in literature with a different dataset from a different culture, Turkiye. We also investigated the reliability of measures because they are the translations of the original ones from English to Turkish. Although those translated

Variable	Level of Analysis	ICC (1)	ICC (2)
Authentic leadership	Group	0,66	0,955
Collective efficacy	Group	0,13	0,804
Organizational reputation	Organization	0,86	0,966

Table 3: Intraclass Correlations of Group/Organization Level Variables

Variable	M	s.d.	Correlations					
			AL	AOC	WB	CE	CR	APC
AL	2,59	0,705	(0,916)					
AOC	3,65	1,029	,505**	(0,944)				
WB	2,61	0,612	,481**	,495**	(0,846)			
CE	3,75	0,955	,413**	,365**	,396**	(0,972)		
CR	3,41	0,864	,444**	,603**	,454**	,450**	(0,935)	
APC	3,43	0,882	,499**	,566**	,488**	,517**	,765**	(0,935)

N=304. AL= Authentic Leadership, AOC= Affective Organizational Commitment, WB= Well-being at Work, CE= Collective Efficacy, CR= Corporate Reputation, APC= Authentizotic Psychological Climate.
** Correlation is significant at the 0.01 level (2-tailed).
Table 4: Descriptive Statistics

measures have been used in previous studies we wanted to affirm their reliability. Hair, Anderson, Tatham & Black (2006) defined reliability as "an assessment of the degree of consistency between multiple measurements of a variable". The generally agreed upon lower limit for Cronbach's Alpha, which assess this consistency, is 0.70.

Authentic leadership; the results showed that three factors explained 60,473% of the total variance in the items, and demonstrated acceptable internal consistency (coefficient α=.916). In the literature the construct is described as comprising four factors, but the results of our study showed that Turkish construction engineers who participated in this study perceive authentic leadership as comprising three factors.

As should be understood from Table 1 above, self-awareness and balanced processing components of authentic leadership are perceived by our sample as the same. To see the correlation between self-awareness and balanced processing factors, we analysed the individual means of these factors in SPSS. The results of the anaysis revealed that there is a high correlation (0,763, p<0,01) between these two factors.

Interestingly, the "ethical/moral" dimension, the main characteristic of authentic leaders which started the discussions over transformational leadership and opened the doors for the concept of authentic leadership, was found to have the least explanatory power for the concept. Hence, it was found to be the least distinguishable characteristic of authentic leaders for our sample. The confirmatory factor analysis results of the other variables are summarized below, in Table 2.

4.2. Aggregation Statistics

Measurement must be conducted at the appropriate level of analysis; or at a minimum, justification and tests for aggregation are necessary when concepts are measured at a lower level than their theoretical specification (Yammarino et al., 2008). For this reason we examined between-group differences and within-group agreement using two intraclass correlations (ICCs) to prove the viability of aggregating respondent ratings from an individual level of analysis into a group or organization level of analysis.

The three measures were found to be sufficiently supportive of aggregation. Supported by these findings we aggregated individual employee/follower perceptions of authentic leadership and collective efficacy to a group level variable, and finally organization reputation to a organization level variable.

4.3. Hypothesis Testing

For each hypothesis test we built a model in HLM. Before hypothesis testing of the results, Table 4 provides the descriptive statistics below

	affective organizational commitment (Model 1)	authentizotic psychological climates (Model 2)	well being at work (Model 3)
Intercept	3.665**	3.486**	2.618**
Authentic leadership	0.650**	0,634**	0.404**
n (Level 1)	304	304	304
n (Level 2)	154	154	154

**p < 0.001 (two-tailed)

Table 5: Hierarchical Linear Modeling Results

	collective efficacy (Model 4)	corporate reputation (Model 5)
Constant	2,330**	2,016**
Authentic leadership	0,548**	0,536**

**p < 0,001

Table 6: Regression Analysis Results

4.3.1. Tests of Hypotheses about Direct Effects

We edited the HLM results testing the direct effects of authentic leadership with affective organizational commitment, authentizotic psychological climates, well-being at work, collective efficacy, and corporate reputation as Table 5. The hypotheses are summarized as below;

H_1: Authentic leadership is positively related with affective organizational commitment.

H_2: Authentic leadership is positively related with authentizotic psychological climates.

H_3: Authentic leadership is positively related with followers' well-being at work.

H_5: Authentic leadership is positively related with collective efficacy.

H_7: Authentic leadership is positively related with corporate reputation.

The HLM results proved that authentic leadership significantly predicted affective organizational commitment (β=0.650, p<0.001; Model 1), authentizotic psychological climates (β=0.634, p<0.001; Model 2) and well-being at work (β=0.404, p<0.001; Model 3). Hence Hypotheses 1, 2 and 3 are supported by our data.

We had to test Hypotheses 5 and 7 in SPSS with regression analysis, because in HLM the output variable must be a level 1 variable but in our hypotheses the variables are all level 2 variables.

The SPSS results also revealed that authentic leadership significantly predicted collective efficacy (B=0.548, p<0.001; Model 4) and corporate reputation (B=0.536, p<0.001; Model 5). Hence we can say that Hypotheses 5 and 7 are supported by our data.

4.3.2. Tests of Hypotheses about Mediating Effects

In these hypotheses we explored the mediation effects of authentizotic psychological climates, well-being at work, collective efficacy, and corporate reputation in the direct positive relationships between authentic leadership and affective organizational commitment. To achieve this exploration we built a new model for each hypothesis in HLM and included the related variables with authentic leadership in the same regression model. The hypotheses to be tested are summarized below:

H_4: Authentizotic psychological climates and well-being at work mediate the positive relationship between authentic leadership and affective organizational commitment.

H_6: Collective efficacy mediates the positive relationship between authentic leadership and affective organizational commitment.

H_8: Corporate reputation mediates the positive relationship between authentic leadership and affective organizational commitment.

The HLM results of Model 6 revealed that authentizotic psychological climates (β=0.357, p<0.001) and well being at work (β=0.521, p<0.001) significantly

Variables	Affective Organizational Commitment			
	Model 1	Model 6	Model 7	Model 8
Intercept	3.665**	3.647**	3.667**	3.710**
Authentic leadership	0.650**	0.208*	0.574**	0.453**
Authentizotic psychological climates	-	0.357**	-	-
Well being at work	-	0.521**	-	-
Collective efficacy	-	-	0.182*	-
Corporate reputation	-	-	-	0.661**
n (Level 1)	304	304	304	304
n (Level 2)	154	154	154	154
n (Level 3)				115

* $p < 0.05$, **$p < 0.001$

Table 7: Hierarchical Linear Modeling Results of Hypotheses about Mediating Effects

predicted affective organizational commitment, as authentic leadership did (β=0.2 08, p<0.05). However, the results when other variables are included in the same regression model showed a decrease in the significance level of authentic leadership from 0.001 to 0.05 and β (explanatory power on affective organizational commitment) decreased from 0.650 to 0.208. Hence we can say that authentizotic psychological climates and well-being at work mediate (not fully, because the effect of authentic leadership is still significant) the positive relationship between authentic leadership and affective organizational commitment.

The HLM results of Model 7 and 8 were similar and revealed that collective efficacy (β=0.182, p<0.05) and corporate reputation (β=0.661, p<0.001) also significantly predicted affective organizational commitment. When these variables are included in the same regression analysis with authentic leadership, the β coefficient of authentic leadership decreased from 0.650 to 0.574 and 0.650 to 0.453, respectively. Hence we can say that either collective efficacy or corporate reputation mediate (not fully because the effect of authentic leadership is still significant) the positive relationship between authentic leadership and affective organizational commitment. Consequently Hypotheses 4, 6 and 8 are also supported by our data.

5. Discussion and Implications

Yammarino et al. (2008) reviewed and coded 27 conceptual and empirical publications in the area of AL for these criteria: (1) the degree of appropriate inclusion of levels of analysis in theory and hypothesis formulation; (2) the extent to which levels of analysis are represented appropriately in the measurement of constructs and variables; (3) the degree to which levels of analysis are addressed in data analytic techniques; and (4) the extent to which theory and data are aligned from a levels-of-analysis perspective in the drawing of inferences. Inside 27 publications there were only 4 empirical studies. Out of these 4 studies, only 1 was multi-level, but the concepts and measures in the study were at different levels, there was no use of a multi-level technique and theory was at some level other than data level. According to the results of their study, Yammarino et al. (2008) asserted that although approximately 40% of the articles explicitly noted the importance of multi-level theory and hypothesis development, the importance of developing multi-level models was not reflected in AL literature. Scholars (Yammarino et al., 2005; Yammarino & Dansereau, 2008; Schriesheim, Castro, Zhou & Yammarino, 2001) also indicated that to advance leadership theory and research further and faster, consideration of levels of analysis issues in theory, measurement, data analysis, and inference drawing must be held explicitly. In this study, we investigated authentic leadership effects from a multi level perspective, so our study contributed to developing a multi-level theory of authentic leadership.

The conceptual and empirical links between authentic leadership and follower attitudes, behaviors, and performance outcomes have not been fully developed (Avolio et. al., 2004). Avolio and Gardner (2005) also noted that authentic leadership is a root construct that forms the basis for what then constitutes other forms of positive leadership such as transformational, charismatic, servant and spiritual leadership. In light of these assertions, we thought that the outcomes of such leadership forms must

also be obtained as the effects of authentic leadership. In this study, we chose the variables of each level congruent with the theory of authentic leadership and other forms of positive leadership. We proposed that an authentic leader will (1) deepen his/her employees' affective organizational commitment through supporting authentic psychological climates and well-being at work, (2) enhance collective efficacy perceptions of employees who are members of the same department or group and (3) heighten corporate reputation.

Authentic leaders build open and frank communication with their employees, behave similarly and fairly to each employee, perform opportunities for learning and personel development, and demonstrate behaviors that are congruent with their beliefs and thoughts. As Mevlana Celaleddin Rumi (1207-1273)'s admonition "Either exist as you are, or be as you look", authentic leaders are those who achieve this. Through these characteristics, employees trust authentic leaders, they believe that their leader is honest and will fulfill his promises. Authentic leaders are likely to have a positive influence on followers' behaviors because such leaders provide support for followers' self-determination (Illies et al., 2005). They create the conditions that promote positive extra-role behaviors from followers through ethical role modeling, transparency in relationships and balanced decision-making (Avolio & Luthans, 2006). Consequently, a sense of family exists among the employees, and they care about the well-being of others. Their perceptions of collective efficacy heightens, and they become more stable when faced with obstacles. Employees feel happier and more motivated at work, such that they feel more committed to the organization. Because they feel themselves to be members of a family in their organizations, they perceive the problems of the organization as if the problems were their own, and so voluntarily become part of the solution.

An authentic leader will have high credibility and a high reputation because he or she is trustworthy and honest; cares about people and society in their decisions; displays actions indicating that he or she seeks to do the right thing personally and professionally and have the attributes of fairness, integrity, and openness. They are authentic even in the face of uncertainty or pressure. Through role modeling they try to develop all of their employees and all of the organization. Because an organization's corporate reputation is closely related with the leader's reputation, we proposed and our results revealed that authentic leadership is positively related with corporate reputation.

The results of the study revealed that all of the hypotheses we proposed were supported by our data. The results were consistent with our theoretical predictions. The present study provides several implications for future research on the effects of authentic leadership and ways to improve the current understanding of the multi-level effects of an authentic leader.

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Employment-adjusted Human Development Index

Hakan Mihci, Mehmet Tolga Taner, Bulent Sezen *

Abstract:

Purpose - The current HDI has a limited capacity to reflect the human condition and country rankings in an accurate way. In addition, the main critiques on the HDI suggest that it uses very few or perhaps the wrong indicators in measuring human development levels in countries. This paper aims to investigate whether the inclusion of employment as a criterion in the HDI would yield a different ranking of nations.

Design/methodology/approach - In this study, estimates of the proposed Employment-adjusted Human Development Index (E-HDI) are provided for seventy-seven countries for the 2000-2007 period, and comparisons are made both for changes in the human development index (HDI) and rankings over time in each country and for differences between the E-HDI and the UNDP's HDI across countries.

Findings - The experience of a relatively large number of 77 sample countries has offered promising results for the path to improve the current status of the HDI, and hence, to overcome its weakness in terms of ranking of countries. The additional indicator, i.e. employment, improves the explanatory power of the HDI and makes significant contributions to its reliability.

Research limitations/implications - The major limitation of the present study has been the lack of data for a number of the human development indicators for the rest of the countries in the world.

Practical implications - The employment-adjusted index has great potential to make the HDI more operational.

Social implications – By means of E-HDI, the human development performance of the countries can be better evaluated and compared with other countries by using additional information obtained from the employment position of their citizens.

Originality/value – This will be the first paper in the literature that incorporates employment into the HDI..

Keywords: Human Development Index, Employment, Development, Basic Needs, Human Security

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1. Introduction

The Basic Needs approach was a predictable consequence of studies on earlier views on development. The attainment of development had previously been evaluated in terms of growth maximization and industrialization in the early 1950's. Emphasis on employment as a new primary development objective evolved with time (Stewart, 1985).

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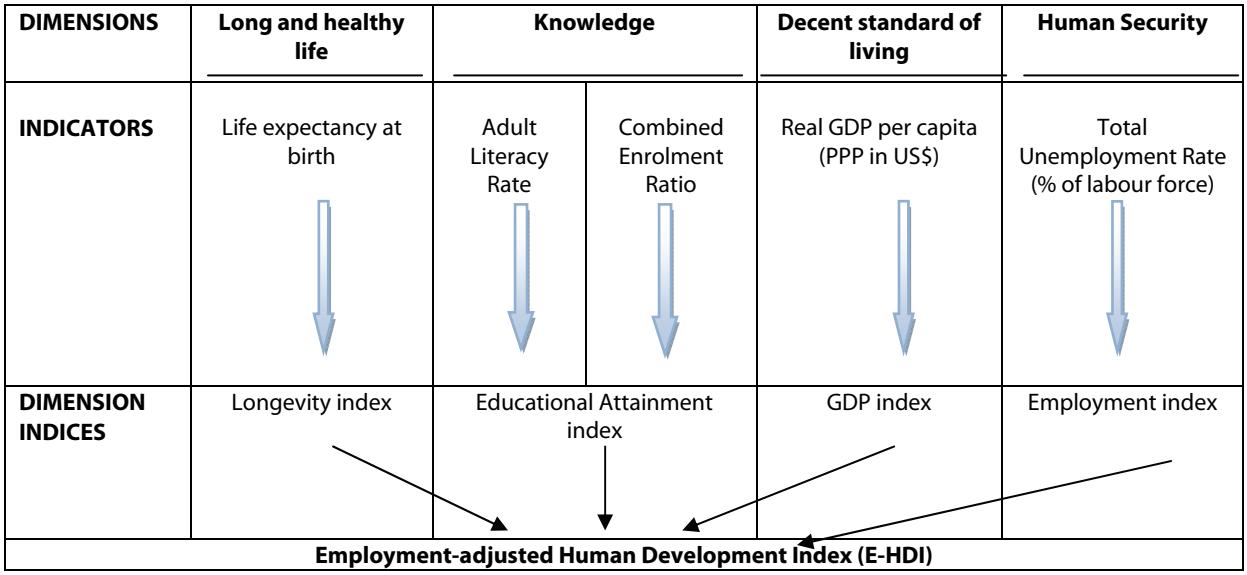

Figure 1: Employment-adjusted Human Development Index (E-HDI)

The basic requirements which are accepted as indicators of a decent life style include accessibility to certain goods and services. These fundamentals are acknowledged as essential criteria by the Basic Needs approach to development.

Although defined differently in different studies, Basic Needs has always included guaranteeing such basic fundamentals as access to safe food (adequate nutrition) and water, and universal provision of health and education services with shelter, clothing and non-material needs such as employment, participation, protection and political liberty. If any of these needs are absent or in a critically short supply, the problem of underdevelopment comes onto the scene (Ghosh 1984; Hicks and Streeten 1979; ILO 1976; UNDP 1994).

All attempts to achieve the expectation of fundamental human needs and development arise from the premise that development should be concerned with the elimination of absolute deprivation as a first priority.

For centuries, the constitutional rhetoric and aspirations of every leader and public figure in the developing and developed world have set forth these basic conditions as a fundamental right. It should also be mentioned that the basic needs approach seems to be consistent with Amartya Sen (1983)'s notion of "entitlement" and "capabilities".

It should be emphasized that the Basic Needs approach to development, while not a strategy, simply prioritizes the order of development techniques. Simply stated, the objectives themselves, and not the methods of implementation to arrive at these objectives, are the more important focus of the approach. (Stewart, 1995).

The Basic Needs approach prescribes a clear set of goals which address planning purposes and policy makers. These goals set the improvement of the quality of life of the indiviual as their main focus. Therefore, health, education, employment and a commensurate income can be seen as a measure of achieving lifelong goals.

The search for an additional dimension for the composite index of socio-economic progress, namely the human development index (HDI), began in the early 1990's soon after it was introduced by the United Nations Development Programme. For it to be widely accepted and used, it is crucial that the HDI includes only the most important and a limited number of accessible variables for all nations, in order to keep it simple and manageable. The selection of these dimensions highly depends on how the society regards and defines an acceptable composite.

On the other hand, employment could be considered as a vector to raise personal income, which in turn secures the access of individuals to more goods and services. Therefore, it is our recommendation that employment or decent work should be regarded as one of the most important dimensions of human development. Hence, adding the employment dimension under the label of "human security" to the HDI will yield a more comprehensive measure of human development that captures more of people's needs for improving their way of life.

It is important to note that the employment data of many countries are readily available in contrast to variables from social, cultural and political dimensions.

As shown in Figure 1, in addition to the three essential choices of leading a long and healthy life, acquiring knowledge, having access to resources needed for a decent standard of living; and having security needed for a sustainable life are included in the measure of the E-HDI.

In today's world, employment can be recognized as a fundamental human right. It brings personal economic freedom. Additionally, providing and implementing strategies for meaningful and productive work for young generations is one of the main targets of the Millennium Development Goals. Thus, the capacity to develop and satisfy the job needs of its citizens must be among the major goals of every nation in the coming decades. Employment can be further considered a physical need. It constitutes the essential basis for peace, social justice, food security and human development. In this context, securing full employment levels can be considered one of the primary objectives of every nation. Moreover, rising employment levels is also beneficial in fostering economic growth and attaining sustainable development.

In short, employment could be regarded as one of the most critical indicators of human development. Economies functioning at a full employment level, and thus, high levels of gross domestic product (GDP) show radical improvements in terms of human development.

In other words, employment is positively related to the HDI. Its generation is particularly significant for economic growth and poverty reduction. Raising the employment level has been the major objective of the International Labor Organization since the early 1970s due to the fact that employment is not only considered an objective in itself but also a moderator to achieve various objectives, such as high levels of income, production and recognition. Therefore, one should argue that the employment-adjusted index has a great potential to make the HDI more operational.

2. The Rationale of the Study

The current HDI has a limited capacity to reflect the human condition and country rankings in an accurate way. In addition, the main critiques of the HDI suggest that it uses very few or perhaps the wrong indicators in measuring the human development levels of countries. This is mainly due to the fact that two of the current components used for calculating the HDI are not dynamic. It is true that the HDI value is developed to evolve with time; however, current HDI components fail to yield significantly perceiveable overall annual increases to affect the HDI value. This drawback lowers the sensitivity of the HDI towards annual changes.

Nonetheless, employment is a dynamic and fluctuating dimension which reflects the real life circumstances of the individual, similar to health, education and access to resources. It also shows considerable variation across countries.

The unemployment rate, although it has not yet been included in the sub-indices of the HDI, is a strong indicator of social inclusion and quality-of-life through the efficient use of human resources (Taner *et al.* 2011). In addition, Panigrahi and Sivramkrishna (2002), Osberg and Sharpe (2003) and Cherchye *et al.* (2008) have presented their concerns with the problems in HDI rankings in their publications. Furthermore, Wolff *et al.* (2009) and Taner *et al.* (2010), in their analyses, have suggested, and substantiated with statistics, that countries have been misclassified by the HDI.

Hence, this paper empirically investigates whether the inclusion of employment as a criterion in the HDI would yield a different ranking of nations. It is further argued that the HDI could be appropriately modified by simply incorporating an employment dimension to the current index. This Employment-adjusted Human Development Index is denoted as the E-HDI. Due to the limited availability of data for other countries, the sample addresses the situation in only seventy-seven countries.

3. Method

Formerly, the HDI had been based on three sub-indices and four indicators: a longevity index (LEI), as measured by life expectancy at birth; an educational attainment index, as measured by a combination of adult literacy (two-thirds weighting) and combined (i.e. primary, secondary and tertiary) enrolment (one-third weighting) ratios (EI); and standard of living, as measured by GDP index -real GDP per capita measured by purchasing power parity in US$- (GDPI). To calibrate the dimensions, the UNDP has assigned minimum and maximum values (goalposts) for each underlying sub-index. Performance in each sub-index is then calculated and expressed as a value between 0-1. In the UNDP's approach, these three sub-indices are assigned equal weightings as follows:

$$HDI = (LEI + EI + GDPI)/3$$

As indicated above, the HDI has included only a limited number of indicators to keep it simple and manageable. This simple HDI algorithm has been used for many years and calculated from regularly available data to produce a meaningful value that can be used to compare and rank countries across the world.

In the present approach, the four indices in the E-HDI represent a different set of indicators for assessing the aggregate level of human development with equal weighting in the following way:

E-HDI = (LEI + EI + GDPI + EMPI)/4, or

E-HDI = (3*HDI + EMPI)/4

where EMPI is the new included index, i.e. employment index. The unemployment rate is the starting point for the EMPI sub-index of the human security component. This, together with the risk of losing one's job, combined with being unable to find a new job quickly, is taken as a measure of what drives worker insecurity. The EMPI is likewise calculated via basic algebra for each country as shown below:

EMPI = 1 – Total Unemployment Rate

The proposed sub-index of EMPI covers all individuals of normal working age (above 15) including both the employed and the unemployed. In addition, the four sub-indices address conceptually different aspects of human development, which although correlated do not predetermine one another.

The equal weights allow easy comparison over time and across countries. The assessment of change in E-HDI over the years for all the countries is tabulated through using statistical tables. From E-HDI values, comparisons of achievements between countries at a given year or for a particular country for different periods can also be made. Like the HDI, the E-HDI captures both trends over time within countries and allows cross-country comparisons of the level of human development at particular points in time.

4. Data

In this study, a total of 77 highly developed, developed and developing economies are taken as the research sample; re-ranked and re-classified among themselves for the years between 2000 and 2007[1]. Scaled values of the sub-indices are shown in Table 1, 2 and 4-8.

The countries consisted mainly European Union (EU), OECD, Asian, and Central and South American countries. The limitation of the sample size was due to the lack of unemployment data for the rest of the countries for most of the years under study. Another limitation of the study is that statistical analysis has not been possible for the most recent data covered by the 2010 and 2011 Human Development Reports, since the UNDP has opted to change both education and income indicators and the method of calculating HDI in these reports.

5. Descriptive Statistical Analysis

This section presents the main findings of descriptive statistical analysis. In the first sub-section, the main trends for all countries in the sample are thoroughly reviewed, focusing on the HDI, E-HDI values and the rankings together with basic changes in these indicators throughout the period under investigation. Consequently, the analysis is detailed through dividing the sample of 77 countries into two main categories under the titles of OECD and developing countries. While the first category consists of the 30 countries presented at the top of the statistical tables, the remaining 47 countries are covered by the developing country category.

5.1. General Evaluation

The sample consists of 38 European, 16 Asian, 10 South American, 9 Central and North American, 2 Oceanian and 2 African countries. Of the 38 European countries, from the latest available data it is found that 22 are very highly employment-adjusted developed (EAD) where the absolute values of the E-HDI exceed a threshold level of 0.900, 15 are highly EAD (the values of the E-HDI are between 0.800 and 0.900) and only Macedonia is moderately EAD (the values of the E-HDI are between 0.700 and 0.800). Both of the Oceanian countries are very highly EAD. Of the 16 Asian countries, 7 are very highly employment-adjusted developed (EAD), 4 are highly EAD and 5 are moderately EAD. Of the 10 South American countries, 9 are highly EAD and only Bolivia is moderately EAD. Of the 9 Central and North American countries, 2 are very highly employment-adjusted

[1] The data for the HDI and its components is taken from UNDP's **Human Development Reports** from 2002 to 2009.

	LEI	GDPI	EMPI	EI	E-HDI	HDI	HDI-E-HDI	R(HDI)	R(E-HDI)	R(HDI-E-HDI)
Iceland	0,90	0,95	0,986	0,96	0,949	0,936	-0,013	7	1	6
Norway	0,89	0,95	0,966	0,98	0,9465	0,942	-0,0045	1	2	-1
Australia	0,90	0,93	0,937	0,99	0,93925	0,939	-0,00025	4	7	-3
Canada	0,90	0,94	0,932	0,98	0,938	0,94	0,002	3	8	-5
Ireland	0,86	0,95	0,957	0,96	0,93175	0,925	-0,00675	16	13	3
Sweden	0,91	0,92	0,953	0,99	0,94325	0,941	-0,00225	2	5	-3
Switzerland	0,90	0,94	0,98	0,94	0,94	0,928	-0,012	11	6	5
Japan	0,93	0,93	0,953	0,93	0,93575	0,933	-0,00275	9	11	-2
Netherlands	0,89	0,93	0,974	0,99	0,946	0,935	-0,011	8	3	5
France	0,89	0,92	0,905	0,99	0,92625	0,928	0,00175	11	16	-5
Finland	0,88	0,92	0,902	0,99	0,923	0,93	0,007	10	18	-8
United States	0,87	0,97	0,96	0,98	0,945	0,939	-0,006	4	4	0
Spain	0,89	0,88	0,859	0,97	0,89975	0,913	0,01325	20	25	-5
Denmark	0,85	0,94	0,953	0,98	0,93075	0,926	-0,00475	14	15	-1
Austria	0,89	0,93	0,953	0,96	0,93325	0,926	-0,00725	14	12	2
United Kingdom	0,88	0,91	0,945	0,99	0,93125	0,928	-0,00325	11	14	-3
Belgium	0,89	0,94	0,93	0,99	0,9375	0,939	0,0015	4	9	-5
Luxembourg	0,87	1	0,974	0,9	0,936	0,925	-0,011	16	10	6
New Zealand	0,88	0,88	0,94	0,99	0,9225	0,917	-0,0055	19	19	0
Italy	0,89	0,91	0,893	0,94	0,90825	0,913	0,00475	20	20	0
Germany	0,88	0,92	0,925	0,97	0,92375	0,925	0,00125	16	17	-1
Greece	0,89	0,85	0,886	0,92	0,8865	0,896	0,0095	22	28	-6
Republic of Korea	0,83	0,86	0,959	0,95	0,89975	0,888	-0,01175	24	25	-1
Portugal	0,84	0,86	0,96	0,94	0,9	0,885	-0,015	26	24	2
Czech Republic	0,83	0,82	0,911	0,89	0,86275	0,885	0,02225	26	29	-3
Hungary	0,77	0,8	0,935	0,93	0,85875	0,883	0,02425	29	29	0
Poland	0,81	0,75	0,839	0,94	0,83475	0,88	0,04525	32	39	-7
Slovakia	0,80	0,79	0,812	0,91	0,828	0,882	0,054	31	42	-11
Mexico	0,79	0,75	0,978	0,84	0,8395	0,8	-0,0395	44	35	9
Turkey	0,75	0,71	0,936	0,77	0,7915	0,742	-0,0495	61	52	9
Estonia	0,76	0,77	0,864	0,95	0,836	0,826	-0,01	39	38	1
Georgia	0,8	0,55	0,892	0,89	0,783	0,748	-0,035	58	58	0
Hong Kong	0,91	0,92	0,951	0,83	0,90275	0,888	-0,01475	24	22	2
Israel	0,9	0,89	0,912	0,91	0,903	0,896	-0,007	22	21	1
Latvia	0,76	0,71	0,856	0,93	0,814	0,8	-0,014	44	46	-2
Lithuania	0,78	0,71	0,836	0,93	0,814	0,808	-0,006	42	46	-4
Malaysia	0,79	0,75	0,97	0,8	0,8275	0,782	-0,0455	49	43	6
Argentina	0,81	0,8	0,85	0,92	0,845	0,844	-0,001	34	34	0
Bulgaria	0,76	0,68	0,837	0,9	0,79425	0,779	-0,01525	51	51	0
Chile	0,84	0,76	0,917	0,9	0,85425	0,831	-0,02325	37	33	4
Croatia	0,81	0,73	0,839	0,88	0,81475	0,809	-0,00575	41	45	-4
China	0,76	0,61	0,969	0,8	0,78475	0,726	-0,05875	67	55	12
Russia	0,68	0,74	0,902	0,92	0,8105	0,781	-0,0295	50	49	1
Belarus	0,73	0,72	0,979	0,92	0,83725	0,788	-0,04925	47	37	10
Cuba	0,85	0,64	0,946	0,9	0,834	0,795	-0,039	46	40	6
Ecuador	0,75	0,58	0,91	0,87	0,7775	0,732	-0,0455	64	59	5
Panama	0,82	0,68	0,865	0,86	0,80625	0,787	-0,01925	48	50	-2
Romania	0,75	0,69	0,929	0,88	0,81225	0,775	-0,03725	52	48	4

	LEI	GDPI	EMPI	EI	E-HDI	HDI	HDI-E-HDI	R(HDI)	R(E-HDI)	R(HDI-E-HDI)
Trinidad	0,82	0,75	0,878	0,84	0,822	0,805	-0,017	43	44	-1
Ukraine	0,72	0,61	0,884	0,92	0,7835	0,748	-0,0355	58	56	2
Slovakia	0,8	0,79	0,814	0,91	0,8285	0,835	0,0065	35	41	-6
Paraguay	0,75	0,63	0,924	0,83	0,7835	0,74	-0,0435	62	56	6
Uruguay	0,82	0,75	0,864	0,92	0,8385	0,831	-0,0075	36	36	0
South Africa	0,45	0,76	0,746	0,88	0,709	0,695	-0,014	71	68	3
Malta	0,88	0,86	0,933	0,88	0,88825	0,875	-0,01325	33	27	6
Moldova	0,69	0,51	0,927	0,9	0,75675	0,701	-0,05575	70	64	6
Kyrgyzstan	0,71	0,55	0,925	0,87	0,76375	0,712	-0,05175	68	61	7
Cyprus	0,88	0,89	0,951	0,88	0,90025	0,883	-0,01725	29	23	6
Albania	0,8	0,59	0,832	0,8	0,7555	0,733	-0,0225	63	65	-2
Bolivia	0,62	0,53	0,925	0,8	0,71875	0,653	-0,06575	74	67	7
Kuwait	0,85	0,84	0,992	0,74	0,8555	0,813	-0,0425	40	32	8
Nicaragua	0,72	0,53	n/a	0,65	n/a	0,635	n/a	77	n/a	n/a
Macedonia	0,8	0,66	n/a	0,86	n/a	0,772	n/a	54	n/a	n/a
Singapore	0,88	0,91	n/a	0,87	n/a	0,885	n/a	26	n/a	n/a
Tajikistan	0,71	0,41	0,827	0,88	0,70675	0,667	-0,03975	73	70	3
Uzbekistan	0,73	0,53	0,864	0,91	0,7585	0,727	-0,0315	65	63	2
Peru	0,73	0,65	n/a	0,87	n/a	0,747	n/a	60	n/a	n/a
Colombia	0,77	0,69	0,834	0,85	0,786	0,772	-0,014	53	54	-1
Philippines	0,74	0,61	0,888	0,91	0,787	0,754	-0,033	56	53	3
Indonesia	0,69	0,57	0,939	0,79	0,74725	0,684	-0,06325	72	66	6
Egypt	0,7	0,6	0,91	0,62	0,7075	0,642	-0,0655	75	69	6
El Salvador	0,75	0,64	0,93	0,74	0,765	0,706	-0,059	69	60	9
Honduras	0,68	0,53	n/a	0,7	n/a	0,638	n/a	76	n/a	n/a
Dominican Republic	0,7	0,68	0,861	0,8	0,76025	0,727	-0,03325	65	62	3
Bahrain	0,81	0,84	0,939	0,85	0,85975	0,831	-0,02875	36	30	6
Kazakhstan	0,66	0,68	n/a	0,91	n/a	0,75	n/a	57	n/a	n/a
Brazil	0,71	0,72	n/a	0,83	n/a	0,757	n/a	55	n/a	n/a

EMPI, E-HDI, R(E-HDI): Authors' own calculations
HDI-E-HDI=Numerical difference between the two indices
R(HDI)=Rank of a country in terms of its HDI
R(E-HDI)=Rank of a country in terms of its E-HDI
R(HDI-E-HDI)=Difference between the HDI ranking and E-HDI rank of a country

Source: UNDP (2002); ILO
Table 1: Employment- adjusted Human Development Index (E-HDI): 2000

	LEI	GDPI	EMPI	EI	E-HDI	HDI	HDI-E-HDI	R(HDI)	R(E-HDI)	R(HDI-E-HDI)
Iceland	0,95	0,981	0,97	0,98	0,96925	0,969	-0,00025	3	2	1
Norway	0,93	1	0,974	0,989	0,972	0,971	-0,001	1	1	0
Australia	0,94	0,977	0,958	0,993	0,967	0,97	0,003	2	3	-1
Canada	0,93	0,982	0,939	0,991	0,95975	0,966	0,00625	4	7	-3
Ireland	0,91	1	0,94	0,985	0,959	0,965	0,006	5	8	-3
Sweden	0,93	0,986	0,938	0,974	0,957	0,963	0,006	7	11	-4
Switzerland	0,95	1	0,966	0,936	0,96175	0,96	-0,00175	9	5	4
Japan	0,96	0,971	0,96	0,949	0,96025	0,96	-0,00025	9	6	3
Netherlands	0,91	0,994	0,972	0,985	0,96625	0,964	-0,00225	6	4	2
France	0,93	0,971	0,926	0,978	0,952	0,961	0,009	8	15	-7
Finland	0,91	0,975	0,936	0,993	0,953	0,959	0,006	12	13	-1
United States	0,90	1	0,942	0,968	0,953	0,956	0,003	13	13	0
Spain	0,93	0,96	0,887	0,975	0,93775	0,955	0,01725	14	24	-10
Denmark	0,89	0,983	0,967	0,993	0,9575	0,955	-0,0025	14	9	5
Austria	0,92	0,989	0,962	0,962	0,957	0,955	-0,002	14	11	3
United Kingdom	0,91	0,978	0,944	0,957	0,94625	0,947	0,00075	20	21	-1
Belgium	0,91	0,977	0,93	0,974	0,94725	0,953	0,00575	17	19	-2
Luxembourg	0,91	1	0,949	0,975	0,9575	0,96	0,0025	9	9	0
New Zealand	0,92	0,936	0,959	0,993	0,95175	0,95	-0,00175	19	16	3
Italy	0,94	0,954	0,933	0,965	0,94675	0,951	0,00425	18	20	-2
Germany	0,91	0,975	0,925	0,954	0,94175	0,947	0,00525	20	23	-3
Greece	0,90	0,944	0,923	0,981	0,9375	0,942	0,0045	24	25	-1
Republic of Korea	0,90	0,92	0,968	0,988	0,945	0,937	-0,008	25	22	3
Portugal	0,89	0,906	0,924	0,929	0,913	0,909	-0,004	29	28	1
Czech Republic	0,86	0,916	0,956	0,938	0,9165	0,903	-0,0135	30	27	3
Hungary	0,81	0,874	0,922	0,96	0,89025	0,879	-0,01125	37	36	1
Poland	0,84	0,847	0,929	0,952	0,8925	0,88	-0,0125	34	33	1
Slovakia	0,83	0,885	0,905	0,928	0,88625	0,88	-0,00625	34	37	-3
Mexico	0,85	0,826	0,96	0,886	0,8805	0,854	-0,0265	45	40	5
Turkey	0,78	0,812	0,906	0,828	0,83125	0,806	-0,02525	57	54	3
Estonia	0,799	0,887	0,953	0,964	0,90075	0,883	-0,01775	33	31	2
Georgia	0,777	0,641	0,867	0,916	0,80025	0,778	-0,02225	62	60	2
Hong Kong	0,953	1	0,96	0,879	0,948	0,944	-0,004	22	18	4
Israel	0,928	0,93	0,927	0,947	0,933	0,935	0,002	26	26	0
Latvia	0,788	0,851	0,94	0,961	0,885	0,866	-0,019	41	38	3
Lithuania	0,78	0,863	0,957	0,968	0,892	0,87	-0,022	40	34	6
Malaysia	0,819	0,819	0,968	0,851	0,86425	0,829	-0,03525	50	44	6
Argentina	0,831	0,828	n/a	0,947	n/a	0,866	n/a	41	n/a	n/a
Bulgaria	0,802	0,788	0,931	0,93	0,86275	0,84	-0,02275	46	47	-1
Chile	0,891	0,823	0,929	0,919	0,8905	0,878	-0,0125	38	35	3
Croatia	0,85	0,847	0,904	0,916	0,87925	0,871	-0,00825	39	41	-2
China	0,799	0,665	0,96	0,851	0,81875	0,772	-0,04675	64	58	6
Russia	0,686	0,833	0,939	0,933	0,84775	0,817	-0,03075	53	49	4
Belarus	0,733	0,782	0,99	0,961	0,8665	0,826	-0,0405	51	43	8
Cuba	0,891	0,706	0,982	0,993	0,893	0,863	-0,03	44	32	12
Ecuador	0,833	0,719	0,939	0,866	0,83925	0,806	-0,03325	57	50	7
Panama	0,842	0,79	0,932	0,888	0,863	0,84	-0,023	46	46	0
Romania	0,792	0,804	0,936	0,915	0,86175	0,837	-0,02475	48	48	0

	LEI	GDPI	EMPI	EI	E-HDI	HDI	HDI-E-HDI	R(HDI)	R(E-HDI)	R(HDI-E-HDI)
Trinidad	0,737	0,911	0,945	0,861	0,8635	0,837	-0,0265	48	45	3
Ukraine	0,72	0,707	0,936	0,96	0,83075	0,796	-0,03475	61	55	6
Slovakia	0,827	0,885	0,89	0,928	0,8825	0,88	-0,0025	34	39	-5
Paraguay	0,778	0,633	0,944	0,871	0,8065	0,761	-0,0455	65	59	6
Uruguay	0,852	0,788	0,908	0,955	0,87575	0,865	-0,01075	43	42	1
South Africa	0,442	0,765	0,77	0,843	0,705	0,683	-0,022	77	74	3
Malta	0,91	0,908	0,936	0,887	0,91025	0,902	-0,00825	31	29	2
Moldova	0,722	0,541	0,96	0,899	0,7805	0,72	-0,0605	71	66	5
Kyrgyzstan	0,71	0,5	0,927	0,918	0,76375	0,71	-0,05375	72	69	3
Cyprus	0,91	0,92	0,961	0,91	0,82275	0,914	0,09125	28	57	-29
Albania	0,858	0,71	n/a	0,886	n/a	0,818	n/a	52	n/a	n/a
Bolivia	0,673	0,624	0,948	0,892	0,78425	0,729	-0,05525	70	65	5
Kuwait	0,875	1	n/a	0,872	n/a	0,916	n/a	27	n/a	n/a
Nicaragua	0,795	0,542	0,951	0,76	0,762	0,699	-0,063	75	70	5
Macedonia	0,819	0,753	0,651	0,88	0,77575	0,817	0,04125	53	68	-15
Singapore	0,92	1	0,96	0,913	0,94825	0,944	-0,00425	22	17	5
Tajikistan	0,691	0,478	0,799	0,896	0,716	0,688	-0,028	76	73	3
Uzbekistan	0,711	0,532	0,908	0,888	0,75975	0,71	-0,04975	72	71	1
Peru	0,8	0,728	0,933	0,891	0,838	0,806	-0,032	57	52	5
Colombia	0,795	0,743	0,891	0,881	0,8275	0,807	-0,0205	56	56	0
Philippines	0,777	0,589	0,927	0,888	0,79525	0,751	-0,04425	66	61	5
Indonesia	0,758	0,603	0,909	0,84	0,7775	0,734	-0,0435	68	67	1
Egypt	0,749	0,664	0,911	0,697	0,75525	0,703	-0,05225	74	72	2
El Salvador	0,771	0,678	0,936	0,794	0,79475	0,747	-0,04775	67	62	5
Honduras	0,783	0,607	0,971	0,806	0,79175	0,732	-0,05975	69	64	5
Dominican Republic	0,79	0,702	0,844	0,839	0,79375	0,777	-0,01675	63	63	0
Bahrain	0,843	0,95	0,932	0,893	0,9045	0,895	-0,0095	32	30	2
Kazakhstan	0,666	0,782	0,927	0,965	0,835	0,804	-0,031	60	53	7
Brazil	0,787	0,761	0,918	0,891	0,83925	0,813	-0,02625	55	51	4

EMPI, E-HDI, R(E-HDI): Authors' own calculations.
Source: UNDP (2009); ILO
Table 2: Employment-adjusted Human Development Index (E-HDI): 2007

	HDI GROWTH RATE 2000-2007 (% change)	R-HDI 2000	R-HDI 2007	CHANGE IN HDI RANK 2000-2007	E-HDI GROWTH RATE 2000-2007 (% change)	R-E-HDI 2000	R-E-HDI 2007	CHANGE IN E-HDI RANK 2000-2007
Iceland	3,526	7	3	4	2,134	1	2	-1
Norway	3,079	1	1	0	2,694	2	1	1
Australia	3,301	4	2	2	2,954	7	3	4
Canada	2,766	3	4	-1	2,319	8	7	1
Ireland	4,324	16	5	11	2,925	13	8	5
Sweden	2,338	2	7	-5	1,458	5	11	-6
Switzerland	3,448	11	9	2	2,314	6	5	1
Japan	2,894	9	9	0	2,618	11	6	5
Netherlands	3,102	8	6	2	2,141	3	4	-1
France	3,556	11	8	3	2,780	16	15	1
Finland	3,118	10	12	-2	3,250	18	13	5
United States	1,810	4	13	-9	0,847	4	13	-9
Spain	4,600	20	14	6	4,223	25	24	1
Denmark	3,132	14	14	0	2,874	15	9	6
Austria	3,132	14	14	0	2,545	12	11	1
United Kingdom	2,047	11	20	-9	1,611	14	21	-7
Belgium	1,491	4	17	-13	1,040	9	19	-10
Luxembourg	3,784	16	9	7	2,297	10	9	1
New Zealand	3,599	19	19	0	3,171	19	16	3
Italy	4,162	20	18	2	4,239	20	20	0
Germany	2,378	16	20	-4	1,949	17	23	-6
Greece	5,134	22	24	-2	5,753	28	25	3
Republic of Korea	5,518	24	25	-1	5,029	25	22	3
Portugal	2,712	26	29	-3	1,444	24	28	-4
Czech Republic	2,034	26	30	-4	6,230	29	27	2
Hungary	-0,453	29	37	-8	3,668	29	36	-7
Poland	0,000	32	34	-2	6,918	39	33	6
Slovakia	-0,227	31	34	-3	7,035	42	37	5
Mexico	6,750	44	45	-1	4,884	35	40	-5
Turkey	8,625	61	57	4	5,022	52	54	-2
Estonia	6,901	39	33	6	7,745	38	31	7
Georgia	4,011	58	62	-4	2,203	58	60	-2
Hong Kong	6,306	24	22	2	5,012	22	18	4
Israel	4,353	22	26	-4	3,322	21	26	-5
Latvia	8,250	44	41	3	8,722	46	38	8
Lithuania	7,673	42	40	2	9,582	46	34	12
Malaysia	6,010	49	50	-1	4,441	43	44	-1
Argentina	2,607	34	41	-7	3,609**	34	37****	-3******
Bulgaria	7,831	51	46	5	8,624	51	47	4
Chile	5,656	37	38	-1	4,243	33	35	-2
Croatia	7,664	41	39	2	7,917	45	41	4
China	6,336	67	64	3	4,333	55	58	-3
Russia	4,609	50	53	-3	4,596	49	49	0
Belarus	4,822	47	51	-4	3,494	37	43	-6
Cuba	8,553	46	44	2	7,074	40	32	8

	HDI GROWTH RATE 2000-2007 (% change)	R-HDI 2000	R-HDI 2007	CHANGE IN HDI RANK 2000-2007	E-HDI GROWTH RATE 2000-2007 (% change)	R-E-HDI 2000	R-E-HDI 2007	CHANGE IN E-HDI RANK 2000-2007
Ecuador	10,109	64	57	7	7,942	59	50	9
Panama	6,734	48	46	2	7,039	50	46	4
Romania	8,000	52	48	4	6,094	48	48	0
Trinidad	3,975	43	48	-5	5,049	44	45	-1
Ukraine	6,417	58	61	-3	6,031	56	55	1
Slovakia	5,389	35	34	1	6,518	41	39	2
Paraguay	2,838	62	65	-3	2,936	56	59	-3
Uruguay	4,091	36	43	-7	4,442	36	42	-6
South Africa	-1,727	71	77	-6	-0,564	68	74	-6
Malta	3,086	33	31	2	2,477	27	29	-2
Moldova	2,710	70	71	-1	3,138	64	66	-2
Kyrgyzstan	-0,281	68	72	-4	0,000	61	69	-8
Cyprus	3,511	29	28	1	-8,609	23	57	-34
Albania	11,596	63	52	11	8,041**	65	57****	8******
Bolivia	11,639	74	70	4	9,113	67	65	2
Kuwait	12,669	40	27	13	6,867**	32	28****	4******
Nicaragua	10,079	77	75	2	6,722*	77***	70	7*****
Macedonia	5,829	54	53	1	1,571	51***	68	-17*****
Singapore	6,667	26	22	4	4,721*	27***	17	10*****
Tajikistan	3,148	73	76	-3	1,309	70	73	-3
Uzbekistan	-2,338	65	72	-7	0,165	63	71	-8
Peru	7,898	60	57	3	5,375*	58***	52	6*****
Colombia	4,534	53	56	-3	5,280	54	56	-2
Philippines	-0,398	56	66	-10	1,048	53	61	-8
Indonesia	7,310	72	68	4	4,048	66	67	-1
Egypt	9,502	75	74	1	6,749	69	72	-3
El Salvador	5,807	69	67	2	3,889	60	62	-2
Honduras	14,734	76	69	7	6,957*	75***	64	11*****
Dominican Republic	6,878	65	63	2	4,406	62	63	-1
Bahrain	7,702	36	32	4	5,205	30	30	0
Kazakhstan	7,200	57	60	-3	4,505*	57***	53	4*****
Brazil	7,398	55	55	0	3,739*	54***	51	3*****

*Growth between 2001 and 2007
**Growth between 2000 and 2006
***E-HDI Ranking in 2001
****E-HDI Ranking in 2006
*****Change in E-HDI Ranking between 2001 and 2007
****** Change in E-HDI Ranking between 2000 and 2006

Table 3: Employment-adjusted Human Development Index (E-HDI) Trends: 2000-2007

developed (EAD), 3 are highly EAD and 4 are moderately EAD. The two African countries are moderately EAD (See Table 2).

During the period under study, 10 countries (i.e. Turkey, Ukraine, Bulgaria, Georgia Colombia, Albania, Paraguay, China and Ecuador) were promoted to being highly EAD from being moderately EAD. Likewise, 8 countries (i.e. Malta, Kuwait, Bahrain, Spain, Greece, Korean Republic, Czech Republic and Estonia) were elevated to being very highly EAD from highly EAD. Only Cyprus declined in its status from being very highly to highly EAD (See Tables 1 and 2).

The analysis shows that the E-HDI and HDI have classified some countries in different categories in terms of human development. In 2007, while Bahrain and Estonia are highly developed countries according to the HDI, they are found to be very highly developed according to the E-HDI. While Ukraine, China, Paraguay and Georgia are moderately developed countries according to the HDI, they are found to be highly developed according to the E-HDI. Similarly, while Tajikistan, Nicaragua, South Africa are low developed countries according to the HDI where the absolute values are lower than 0.700, they are found to be moderately developed according to the E-HDI.

Likewise, while Macedonia is highly developed according to the HDI, it is found to be moderately developed according to the E-HDI. Similarly, Cyprus is very highly developed according to the HDI, and is found to be only highly developed according to the E-HDI.

Furthermore, there has been very small fluctuation in the E-HDIs of Uzbekistan, Kyrgyzstan, United States and South Africa with an E-HDI growth rate of less than 1%. High E-HDI growth rates of more than 7.5% were experienced by Lithuania, Latvia, Estonia, Croatia, Ecuador, Bolivia, Chile and Albania. Only Cyprus and South Africa have experienced negative E-HDI growth rates during the period under investigation (See Table 3).

According to the present calculations, while Hungary, Slovakia, Uzbekistan and Phillipines experienced negative HDI growth rates during the analysis period, the E-HDI growth rates of these countries are found to be positive. Lastly, out of 77 countries, the E-HDI of only 22 countries was found to be greater than their HDIs.

5.2. Analysis of OECD Countries

The sample included 30 OECD countries, most of which are highly developed and developed countries. Norway has led OECD countries for six years. According to both the HDI and E-HDI, it has always ranked within the top two countries.

Nineteen OECD countries consistenly had an E-HDI score greater than 0.900, whereas only five countries (i.e. Hungary, Poland, Slovakia, Mexico and Turkey) among OECD countries consistently had an E-HDI score of less than 0.900. The relatively less developed nine countries (Greece, the Republic of Korea, Portugal, Czech Republic, Hungary, Poland, Slovakia, Mexico and Turkey) constitute a "low category" with respect to the E-HDI, by ranking always below the other 20 OECD countries. Five countries (i.e. Hungary, Poland, Slovakia, Mexico and Turkey) always ranked in the last five among OECD countries.

Being the least developed OECD country, the E-HDI of Turkey has become greater than 0.800 only after 2005/6. This positive trend can be related to the significant rise in its employment rate alongside per capita growth in GDP and improvement in educational attainment figures (See Table 2 and 8).

The other cluster of OECD countries which could be categorized as "middle" ranked always between the 13rd and 22th among the 30 OECD countries. These six countries are New Zealand, Italy, Germany, France, Finland and Spain.

The "High" E-HDI category included Iceland, Norway, Australia, Canada, Ireland, Sweden, Switzerland and Japan since these countries always ranked in the top 11 OECD countries during the analysis period.

Switzerland and Austria have had mostly stable rankings during the analysis period, whereas the most unstable rankings were observed for Ireland and Denmark. Furthermore, Ireland and the Unites States had a similar range of rankings. Likewise, Finland and New Zealand has had the same range of rankings between the 13th and 18th. The United Kingdom experienced a drastic fall in its 2007 rankings. Likewise, Luxembourg had a drastic fall in its 2005/6 rankings.

Between 2005/6 and 2007, the E-HDI decreased only for Spain and the UK (See Table 2 and 8). Between 2004 and 2005, the E-HDI only decreased for Portugal (See Table 7 and 8). This trend can be associated with the signs of the global economic crisis for these countries. As is well known, Spain, Portugal and UK were adversely affected from the recent economic crisis, which manifested itself through declines in GDP, and especially a drastic rise in unemployment rates[2].

[2] These three countries are among those which heavily suffered from the recent financial crises. According to Reinhart and Rogoff (2009),

The highest E-HDI value (0.972) was achieved by Norway in 2007. Spain, the Republic of Korea and Portugal reached 0.900 in 2000, Italy in 1999, Greece in 2002, and the Czech Republic in 2005/6.

Among OECD countries, highest loss of rankings (-8) was experienced by Denmark during 2000-2001, whereas the highest gain in ranking (+7) was achieved by Belgium during the same period (See Table 1 and 4).

The Highest annual increase in E-HDI was achieved by Turkey with 3.0% between 2005/6-2007 (See Table 2 and 8). Similarly, the highest annual decrease in the E-HDI was again achieved by Turkey, with -1.6% during the 2000-2001 period (See Table 1 and 4) owing to the most destructive crisis that the country ever experienced in its economic history. Consequently, severe unemployment problems deteriorated the human development performance of the country.

None of the OECD countries enjoyed continuous increases in its ranking. However, 13 OECD countries (i.e. Ireland, Japan, Finland, Spain, Denmark, Austria, United Kingdom, New Zealand, Italy, Greece, the Republic of Korea, Hungary and Poland) had a rising E-HDI trend during the analysis period. Ireland succeeded in increasing its ranking from 2000 through 2005/6. Nevertheless, the global economic crisis jeopardized this trend and negatively affected its performance in terms of human development (See Table 1, 2, 4, 5, 6, 7 and 8)[3].

The E-HDI is greater than the HDI during the whole period for eight OECD countries, namely the Republic of Korea, New Zealand, Portugal, Turkey, Iceland, Japan, Mexico, Switzerland and Denmark. These countries had been underestimated by the HDI in terms of their human development levels. The addition of the employment factor to the HDI had significant effects on the values of the relatively less developed countries, such as Turkey, Mexico, the Republic of Korea and Portugal. Furthermore, Canada, France, Finland, Spain, Belgium and Italy had higher HDIs than E-HDIs for all years except 2005/6, which could be considered the starting period of the recent global economic crisis.

5.3. Analysis of Developing Countries

In addition to 30 OECD countries, the sample also consisted of 44 developing and 3 highly developed (i.e. Singapore, Israel and Hong Kong) countries. According to the E-HDI and HDI statistics, Kuwait began classed as very highly developed (i.e. HDI and E-HDI values exceeded 0.900) in 2004 and 2007 respectively, mainly due to its high per capita income level originating from the export revenues of oil products[4]. Additionally, the E-HDI and HDI statistics also depicted Malta as a very highly developed country with respect to human development in 2007 (See Table 2 and 7).

The countries with the highest HDI growth rate between 2000 and 2007 were Honduras (14.734%), Kuwait (12.669%), Bolivia (11.639%), Albania (11.596%), Ecuador (10.109%) and Nicaragua (10.079%). The country with the lowest HDI growth rate was found to be Uzbekistan (-2.338%).

In 2000, there was no developing country in the sample which had an HDI higher than its E-HDI. Argentina's HDI exceeded its E-HDI during the 2001-2004 period. For all years under study, Israel and Macedonia had HDIs higher than E-HDIs. In 2001, Lithuania's E-HDI was equal to its HDI.

Bahrain, Romania, Indonesia, Trinidad and Ukraine have had mostly stable rankings during the analysis period. Controversially, developing countries like Macedonia, Cyprus and Cuba have had the most fluctuating rankings in their E-HDI.

The countries with the highest E-HDI growth rates during the analysis period were found to be Lithuania (9.582%), Bolivia (9.113%), Latvia (8.722%), Bulgaria (8.624%) and Albania (8.041%). The country with the lowest E-HDI growth rate was found to be Cyprus. In fact, Cyprus had a negative growth rate during the analysis period (-8.609%).

Furthermore, the biggest gains in E-HDI rankings between 2000 and 2007 were realised by Lithuania (+12), Honduras (+11), Singapore (+10), Ecuador (+9), Latvia (+8), Cuba (+8), Albania (+8), Estonia (+7) and Nicaragua (+7). The biggest drops in E-HDI rankings in this period were experienced by Cyprus (-34), Macedonia (-17), Phillipines (-8) and Kyrgyzstan (-8) (See Table 3).

Depending on the comparison between HDI and E-HDI rankings, it can be argued that at the beginning of the analysis period (in 2000), the current HDI underestimated the rankings of China (+12), Belarus (+10)

severe financial crises have adverse and lasting effects on output and unemployment.

[3] To examine the effects of the current economic crisis on the basic fundamentals of the Irish economy, see for example Lane (2011), Hardiman (2010) and Kelly (2010).

[4] According to Wikipedia, Kuwait is a small economy with crude oil reserves of about 96 billion barrels which constitute nearly nine per cent of the total world oil reserves. In turn, oil accounts for about half of GDP, and 90 per cent of export revenues (http://en.wikipedia.org/wiki/Economy_of_Kuwait).

and El Salvador (+9), whereas Slovakia, Lithuania and Croatia were overestimated by +6, +4 and +4 rankings, respectively (Table 1). For the following year, the highest negative difference between the rankings of HDI and EHDI were observed for Belarus (-11), Kuwait (-10), China (-9), Malaysia (-9) and Cuba (-9). Macedonia gained 15 places (Table 4).

In 2002, however, the highest negative differences between the rankings of the HDI and E-HDI were observed for Macedonia (-17), Argentina (-8) and Bulgaria (-7). Cuba, Kuwait and Malaysia gained +9, +8 and +8 places, respectively (Table 5). In 2005-6, the highest difference between the rankings of the HDI and E-HDI was observed for Macedonia (-18). Cuba gained 6 places. The rankings of Cyprus, Moldova, Malta, Russia and Georgia remained the same (Table 7).

At the terminal year of the analysis period (in 2007), addition of the unemployment factor to the HDI has caused Cyprus and Macedonia to lose (-29) and (-15) places, respectively. On the other hand, Cuba and Belarus have gained +12 and +8 places, respectively (Table 8). This brief descriptive analysis indicates that addition of the unemployment factor to the HDI affected Macedonia the most among developing countries. This effect remained mostly stable after 2001.

6. Conclusion

This paper on the Human Development Index represents a first attempt to construct a measure of human development for 77 countries based on the framework developed incorporating the human security component. A new index on human development, the E-HDI, is defined as the average of the scaled value of the four components: income, human security, health and education. While sub-indices of income, health and education are taken from the UNDP's Human Development Reports, the total unemployment rate has been pointed to and used as an indicator of human security, i.e. the new proposed sub-index. In doing so, the current study searches for whether the inclusion of an employment indicator into the existing HDI would result in different rankings of countries. Additionally, it is disputed that the HDI could be appropriately altered via integrating an employment dimension to the current index.

The experiences of a relatively large number of 77 sample countries offer promising results for the path to improve the current status of the HDI, and hence, to overcome some of its weaknesses. Above all, the dimension of the current index could be enriched with the E-HDI. An additional indicator obviously improves the explanatory power of the HDI and makes significant contributions to its reliability. Moreover, the human development performance of countries could be better evaluated and compared with other countries by using additional information obtained from the employment situations of their citizens.

However, it should be mentioned that the present study could further be ameliorated through assigning each component a weighting depending on any predetermined criteria rather than assigning these on an arbitrary basis. Future research may focus on this field.

A major limitation of the present study has been the lack of data for a number of the human development indicators for the rest of the countries in the world. Future work will hopefully address these gaps and permit the development of more comprehensive and reliable measurement of the various components of the HDI as better data sources are identified and data accessed. Nevertheless, we believe that the current research, despite its exploratory nature, provides significant insight on evaluating and ranking countries over the last decade.

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Appendix

	LEI	GDPI	EMPI	EI	E-HDI	HDI	HDI-E-HDI	R(HDI)	RANK-E-HDI	R(HDI-E-HDI)
Iceland	0,91	0,95	0,977	0,96	0,94925	0,942	-0,00725	2	3	-1
Norway	0,90	0,95	0,965	0,99	0,95125	0,944	-0,00725	1	1	0
Australia	0,90	0,92	0,933	0,99	0,93575	0,939	0,00325	4	10	-6
Canada	0,90	0,94	0,928	0,97	0,9345	0,937	0,0025	6	14	-8
Ireland	0,86	0,96	0,961	0,96	0,93525	0,93	-0,00525	11	11	0
Sweden	0,91	0,92	0,96	0,99	0,945	0,941	-0,004	3	4	-1
Switzerland	0,90	0,94	0,981	0,95	0,94275	0,932	-0,01075	9	5	4
Japan	0,94	0,92	0,95	0,94	0,9375	0,932	-0,0055	9	9	0
Netherlands	0,89	0,94	0,98	0,99	0,95	0,938	-0,012	5	2	3
France	0,90	0,91	0,913	0,96	0,92075	0,925	0,00425	17	19	-2
Finland	0,88	0,92	0,908	0,99	0,9245	0,93	0,0055	11	16	-5
United States	0,86	0,97	0,952	0,97	0,938	0,937	-0,001	6	8	-2
Spain	0,90	0,89	0,895	0,97	0,91375	0,918	0,00425	19	20	-1
Denmark	0,86	0,95	0,957	0,99	0,93925	0,93	-0,00925	11	6	5
Austria	0,89	0,93	0,951	0,97	0,93525	0,929	-0,00625	16	11	5
United Kingdom	0,88	0,92	0,949	0,99	0,93475	0,93	-0,00475	11	13	-2
Belgium	0,89	0,92	0,934	0,99	0,9335	0,937	0,0035	6	15	-9
Luxembourg	0,88	1	0,974	0,9	0,9385	0,93	-0,0085	11	7	4
New Zealand	0,88	0,88	0,947	0,99	0,92425	0,917	-0,00725	20	17	3
Italy	0,89	0,92	0,904	0,93	0,911	0,916	0,005	21	22	-1
Germany	0,88	0,92	0,927	0,96	0,92175	0,921	-0,00075	18	18	0
Greece	0,89	0,86	0,896	0,93	0,894	0,892	-0,002	28	24	4
Republic of Korea	0,84	0,84	0,963	0,96	0,90075	0,879	-0,02175	27	28	-1
Portugal	0,85	0,87	0,959	0,97	0,91225	0,896	-0,01625	23	21	2
Czech Republic	0,83	0,83	0,918	0,91	0,872	0,861	-0,011	30	29	1
Hungary	0,77	0,8	0,942	0,93	0,8605	0,837	-0,0235	32	34	-2
Poland	0,81	0,76	0,818	0,95	0,8345	0,841	0,0065	41	32	9
Slovakia	0,80	0,8	0,807	0,9	0,82675	0,836	0,00925	44	35	9
Mexico	0,80	0,74	0,975	0,86	0,84375	0,8	-0,04375	36	47	-11
Turkey	0,75	0,68	0,915	0,77	0,77875	0,734	-0,04475	61	64	-3
Estonia	0,77	0,77	0,874	0,96	0,8435	0,833	-0,0105	37	38	-1
Georgia	0,81	0,54	0,89	0,89	0,7825	0,746	-0,0365	60	61	-1
Hong Kong	0,91	0,92	0,949	0,83	0,90225	0,889	-0,01325	26	26	0
Israel	0,9	0,88	0,906	0,93	0,904	0,905	0,001	22	22	0
Latvia	0,76	0,73	0,869	0,95	0,82725	0,811	-0,01625	42	43	-1
Lithuania	0,79	0,74	0,826	0,94	0,824	0,824	0	46	40	6
Malaysia	0,8	0,75	0,965	0,83	0,83625	0,79	-0,04625	40	49	-9
Argentina	0,81	0,79	0,826	0,94	0,8415	0,849	0,0075	38	31	7
Bulgaria	0,76	0,71	0,806	0,91	0,7965	0,795	-0,0015	55	48	7
Chile	0,85	0,75	0,921	0,89	0,85275	0,831	-0,02175	33	39	-6
Croatia	0,82	0,75	0,842	0,88	0,823	0,818	-0,005	47	42	5
China	0,76	0,62	0,964	0,79	0,7835	0,721	-0,0625	59	68	-9
Russia	0,69	0,71	0,911	0,93	0,81025	0,779	-0,03125	49	52	-3
Belarus	0,74	0,72	0,977	0,95	0,84675	0,804	-0,04275	34	45	-11
Cuba	0,86	0,66	0,959	0,9	0,84475	0,806	-0,03875	35	44	-9
Ecuador	0,76	0,58	0,89	0,85	0,77	0,731	-0,039	64	65	-1

	LEI	GDPI	EMPI	EI	E-HDI	HDI	HDI-E-HDI	R(HDI)	RANK-E-HDI	R(HDI-E-HDI)
Panama	0,82	0,68	0,853	0,86	0,80325	0,788	-0,01525	51	50	1
Romania	0,76	0,68	0,934	0,88	0,8135	0,773	-0,0405	48	55	-7
Trinidad	0,78	0,75	0,892	0,88	0,8255	0,802	-0,0235	45	46	-1
Ukraine	0,74	0,63	0,891	0,93	0,79775	0,766	-0,03175	54	56	-2
Slovakia	0,8	0,8	0,808	0,9	0,827	0,836	0,009	43	35	8
Paraguay	0,76	0,66	0,924	0,84	0,796	0,751	-0,045	56	59	-3
Uruguay	0,83	0,74	0,847	0,93	0,83675	0,834	-0,00275	39	37	2
South Africa	0,43	0,79	0,706	0,83	0,689	0,684	-0,005	76	71	5
Malta	0,88	0,81	0,936	0,87	0,874	0,856	-0,018	29	30	-1
Moldova	0,72	0,51	0,932	0,86	0,7555	0,7	-0,0555	69	70	-1
Kyrgyzstan	0,72	0,55	0,922	0,91	0,7755	0,727	-0,0485	62	67	-5
Cyprus	0,88	0,89	0,96	0,9	0,9075	0,891	-0,0165	23	25	-2
Albania	0,81	0,6	0,836	0,8	0,7615	0,735	-0,0265	67	63	4
Bolivia	0,64	0,52	0,915	0,85	0,73125	0,672	-0,05925	72	74	-2
Kuwait	0,86	0,87	0,992	0,73	0,863	0,82	-0,043	31	41	-10
Nicaragua	0,73	0,53	0,936	0,66	0,714	0,643	-0,071	74	77	-3
Macedonia	0,81	0,69	0,695	0,86	0,76375	0,784	0,02025	66	51	15
Singapore	0,88	0,91	0,962	0,87	0,9055	0,884	-0,0215	24	27	-3
Tajikistan	0,72	0,41	0,832	0,9	0,7155	0,677	-0,0385	73	73	0
Uzbekistan	0,74	0,53	0,847	0,91	0,75675	0,729	-0,02775	68	66	2
Peru	0,74	0,64	0,921	0,88	0,79525	0,752	-0,04325	57	58	-1
Colombia	0,78	0,71	0,854	0,85	0,7985	0,779	-0,0195	53	52	1
Philippines	0,74	0,61	0,889	0,9	0,78475	0,751	-0,03375	58	59	-1
Indonesia	0,69	0,56	0,919	0,8	0,74225	0,682	-0,06025	70	72	-2
Egypt	0,72	0,59	0,908	0,63	0,712	0,648	-0,064	75	76	-1
El Salvador	0,76	0,66	0,93	0,74	0,7725	0,719	-0,0535	63	69	-6
Honduras	0,73	0,56	0,961	0,71	0,74025	0,667	-0,07325	71	75	-4
Dominican Republic	0,7	0,71	0,844	0,81	0,766	0,737	-0,029	65	62	3
Bahrain	0,81	0,85	n/a	0,86	n/a	0,839	n/a	n/a	33	n/a
Kazakhstan	0,68	0,7	0,896	0,92	0,799	0,765	-0,034	52	57	-5
Brazil	0,71	0,72	0,906	0,9	0,809	0,777	-0,032	50	54	-4

EMPI, E-HDI, R(E-HDI): Authors' own calculations
Source: UNDP (2003); ILO
Table 4: Employment-adjusted Human Development Index (E-HDI): 2001

	LEI	GDPI	EMPI	EI	E-HDI	HDI	HDI-E-HDI	R(HDI)	R(E-HDI)	R(HDI-E-HDI)
Iceland	0,91	0,95	0,967	0,96	0,94675	0,941	-0,00575	7	4	3
Norway	0,90	0,99	0,96	0,99	0,96	0,956	-0,004	1	1	0
Australia	0,90	0,94	0,937	0,99	0,94175	0,946	0,00425	3	7	-4
Canada	0,90	0,95	0,924	0,98	0,9385	0,943	0,0045	4	13	-9
Ireland	0,86	0,98	0,956	0,96	0,939	0,936	-0,003	10	10	0
Sweden	0,92	0,93	0,96	0,99	0,95	0,946	-0,004	2	3	-1
Switzerland	0,90	0,95	0,969	0,95	0,94225	0,936	-0,00625	10	6	4
Japan	0,94	0,93	0,946	0,94	0,939	0,938	-0,001	9	11	-2
Netherlands	0,89	0,95	0,977	0,99	0,95175	0,942	-0,00975	5	2	3
France	0,90	0,93	0,91	0,96	0,925	0,932	0,007	18	18	0
Finland	0,88	0,93	0,909	0,99	0,92725	0,935	0,00775	13	17	-4

	LEI	GDPI	EMPI	EI	E-HDI	HDI	HDI-E-HDI	R(HDI)	R(E-HDI)	R(HDI-E-HDI)
United States	0,87	0,98	0,942	0,97	0,9405	0,939	-0,0015	8	8	0
Spain	0,89	0,9	0,886	0,97	0,9115	0,922	0,0105	20	22	-2
Denmark	0,86	0,96	0,955	0,98	0,93875	0,932	-0,00675	16	12	4
Austria	0,89	0,95	0,947	0,96	0,93675	0,934	-0,00275	14	15	-1
United Kingdom	0,88	0,93	0,948	0,99	0,937	0,936	-0,001	10	14	-4
Belgium	0,90	0,94	0,927	0,99	0,93925	0,942	0,00275	5	9	-4
Luxembourg	0,89	1	0,97	0,91	0,9425	0,933	-0,0095	15	5	10
New Zealand	0,89	0,9	0,948	0,99	0,932	0,926	-0,006	18	16	2
Italy	0,89	0,93	0,909	0,93	0,91475	0,92	0,00525	21	20	1
Germany	0,89	0,94	0,919	0,95	0,92475	0,925	0,00025	19	19	0
Greece	0,89	0,87	0,9	0,95	0,9025	0,902	-0,0005	24	28	-4
Republic of Korea	0,84	0,86	0,969	0,97	0,90975	0,888	-0,02175	27	23	4
Portugal	0,85	0,87	0,949	0,97	0,90975	0,897	-0,01275	26	23	3
Czech Republic	0,84	0,84	0,927	0,92	0,88175	0,868	-0,01375	30	30	0
Hungary	0,78	0,82	0,941	0,95	0,87275	0,848	-0,02475	34	32	2
Poland	0,81	0,78	0,801	0,96	0,83775	0,85	0,01225	33	40	-7
Slovakia	0,81	0,81	0,814	0,91	0,836	0,842	0,006	36	43	-7
Mexico	0,81	0,75	0,973	0,85	0,84575	0,802	-0,04375	45	37	8
Turkey	0,76	0,69	0,897	0,8	0,78675	0,751	-0,03575	61	60	1
Estonia	0,78	0,8	0,897	0,98	0,86425	0,853	-0,01125	31	33	-2
Georgia	0,81	0,52	0,877	0,89	0,77425	0,739	-0,03525	64	65	-1
Hong Kong	0,91	0,93	0,927	0,86	0,90675	0,903	-0,00375	23	25	-2
Israel	0,9	0,88	0,897	0,94	0,90425	0,908	0,00375	22	26	-4
Latvia	0,76	0,75	0,88	0,95	0,835	0,823	-0,012	43	45	-2
Lithuania	0,79	0,77	0,862	0,96	0,8455	0,842	-0,0035	36	38	-2
Malaysia	0,8	0,75	0,965	0,83	0,83625	0,793	-0,04325	49	41	8
Argentina	0,82	0,78	0,804	0,96	0,841	0,853	0,012	31	39	-8
Bulgaria	0,77	0,71	0,824	0,91	0,8035	0,796	-0,0075	47	54	-7
Chile	0,85	0,77	0,922	0,9	0,8605	0,839	-0,0215	39	34	5
Croatia	0,82	0,77	0,852	0,9	0,8355	0,83	-0,0055	42	44	-2
China	0,76	0,64	0,96	0,83	0,7975	0,745	-0,0525	63	57	6
Russia	0,69	0,74	0,921	0,95	0,82525	0,795	-0,03025	48	48	0
Belarus	0,75	0,67	0,97	0,95	0,835	0,79	-0,045	52	45	7
Cuba	0,86	0,66	0,967	0,91	0,84925	0,809	-0,04025	44	36	8
Ecuador	0,76	0,6	0,907	0,85	0,77925	0,735	-0,04425	66	63	3
Panama	0,83	0,69	0,859	0,86	0,80975	0,791	-0,01875	51	51	0
Romania	0,76	0,7	0,916	0,88	0,814	0,778	-0,036	54	50	4
Trinidad	0,77	0,76	0,896	0,87	0,824	0,801	-0,023	46	49	-3
Ukraine	0,74	0,65	0,904	0,94	0,8085	0,777	-0,0315	55	53	2
Slovakia	0,81	0,81	0,815	0,91	0,83625	0,842	0,00575	36	41	-5
Paraguay	0,76	0,64	0,892	0,85	0,7855	0,751	-0,0345	61	62	-1
Uruguay	0,84	0,73	0,83	0,94	0,835	0,833	-0,002	41	45	-4
South Africa	0,4	0,77	0,696	0,83	0,674	0,666	-0,008	76	77	-1
Malta	0,89	0,86	0,93	0,87	0,8875	0,875	-0,0125	29	29	0
Moldova	0,73	0,45	0,921	0,87	0,74275	0,681	-0,06175	71	71	0
Kyrgyzstan	0,72	0,46	0,875	0,92	0,74375	0,701	-0,04275	69	69	0
Cyprus	0,89	0,87	0,967	0,89	0,90425	0,883	-0,02125	28	26	2
Albania	0,81	0,65	0,842	0,89	0,798	0,781	-0,017	53	56	-3

	LEI	GDPI	EMPI	EI	E-HDI	HDI	HDI-E-HDI	R(HDI)	R(E-HDI)	R(HDI-E-HDI)
Bolivia	0,64	0,53	0,913	0,86	0,73575	0,681	-0,05475	71	73	-2
Kuwait	0,86	0,85	0,989	0,81	0,87725	0,838	-0,03925	40	31	9
Nicaragua	0,74	0,54	0,878	0,73	0,722	0,667	-0,055	75	74	1
Macedonia	0,81	0,7	0,681	0,87	0,76525	0,793	0,02775	49	66	-17
Singapore	0,88	0,92	0,944	0,91	0,9135	0,902	-0,0115	24	21	3
Tajikistan	0,73	0,38	0,803	0,9	0,70325	0,671	-0,03225	74	76	-2
Uzbekistan	0,74	0,47	0,83	0,91	0,7375	0,709	-0,0285	68	72	-4
Peru	0,74	0,65	0,923	0,86	0,79325	0,752	-0,04125	60	58	2
Colombia	0,78	0,69	0,848	0,84	0,7895	0,773	-0,0165	57	59	-2
Philippines	0,75	0,62	0,886	0,89	0,7865	0,753	-0,0335	59	61	-2
Indonesia	0,69	0,58	0,909	0,8	0,74475	0,692	-0,05275	70	68	2
Egypt	0,73	0,61	0,898	0,62	0,7145	0,653	-0,0615	77	75	2
El Salvador	0,76	0,65	0,938	0,75	0,7745	0,72	-0,0545	67	64	3
Honduras	0,73	0,54	0,962	0,74	0,743	0,672	-0,071	73	70	3
Dominican Republic	0,7	0,7	0,839	0,82	0,76475	0,738	-0,02675	65	67	-2
Bahrain	0,81	0,86	0,913	0,85	0,85825	0,843	-0,01525	35	35	0
Kazakhstan	0,69	0,68	0,907	0,93	0,80175	0,766	-0,03575	58	55	3
Brazil	0,72	0,73	0,908	0,88	0,8095	0,775	-0,0345	56	51	5

EMPI, E-HDI, R(E-HDI): Authors' own calculations
Source: UNDP (2004); ILO
Table 5: Employment-adjusted Human Development Index (E-HDI): 2002

	LEI	GDPI	EMPI	EI	E-HDI	HDI	HDI-E-HDI	R(E-HDI)	R(HDI)	R(HDI-E-HDI)
Iceland	0,93	0,96	0,955	0,98	0,95625	0,956	-0,00025	2	2	0
Norway	0,91	0,99	0,966	0,99	0,964	0,963	-0,001	1	1	0
Australia	0,92	0,95	0,94	0,99	0,95	0,955	0,005	5	3	-2
Canada	0,92	0,96	0,924	0,97	0,9435	0,949	0,0055	10	4	-6
Ireland	0,88	0,99	0,954	0,97	0,9485	0,946	-0,0025	6	8	2
Sweden	0,92	0,93	0,951	0,99	0,94775	0,949	0,00125	7	4	-3
Switzerland	0,93	0,96	0,96	0,96	0,9525	0,947	-0,0055	3	7	4
Japan	0,95	0,94	0,947	0,94	0,94425	0,943	-0,00125	9	11	2
Netherlands	0,89	0,95	0,959	0,99	0,94725	0,943	-0,00425	8	11	3
France	0,91	0,94	0,903	0,97	0,93075	0,938	0,00725	18	16	-2
Finland	0,89	0,94	0,909	0,99	0,93225	0,941	0,00875	17	13	-4
United States	0,87	0,99	0,94	0,97	0,9425	0,944	0,0015	11	10	-1
Spain	0,91	0,9	0,887	0,97	0,91675	0,928	0,01125	22	21	-1
Denmark	0,87	0,96	0,944	0,99	0,941	0,941	0	13	13	0
Austria	0,90	0,95	0,943	0,96	0,93825	0,936	-0,00225	14	17	3
United Kingdom	0,89	0,94	0,95	0,99	0,9425	0,939	-0,0035	11	15	4
Belgium	0,90	0,94	0,921	0,99	0,93775	0,945	0,00725	15	9	-6
Luxembourg	0,89	1	0,962	0,95	0,9505	0,949	-0,0015	4	4	0
New Zealand	0,90	0,9	0,954	0,99	0,936	0,933	-0,003	16	19	3
Italy	0,92	0,94	0,912	0,95	0,9305	0,934	0,0035	19	18	-1
Germany	0,90	0,94	0,909	0,96	0,92725	0,93	0,00275	20	20	0
Greece	0,89	0,88	0,905	0,97	0,91125	0,912	0,00075	26	24	-2
Republic of Korea	0,85	0,87	0,966	0,97	0,914	0,901	-0,013	24	27	3
Portugal	0,87	0,87	0,937	0,97	0,91175	0,904	-0,00775	21	26	5

	LEI	GDPI	EMPI	EI	E-HDI	HDI	HDI-E-HDI	R(E-HDI)	R(HDI)	R(HDI-E-HDI)
Czech Republic	0,84	0,85	0,922	0,93	0,8855	0,874	-0,0115	29	29	0
Hungary	0,80	0,83	0,941	0,96	0,88275	0,862	-0,02075	30	32	2
Poland	0,82	0,79	0,804	0,96	0,8435	0,858	0,0145	44	33	-11
Slovakia	0,82	0,82	0,825	0,91	0,84375	0,849	0,00525	43	37	-6
Mexico	0,83	0,75	0,975	0,85	0,85125	0,814	-0,03725	39	45	6
Turkey	0,73	0,7	0,897	0,82	0,78675	0,75	-0,03675	63	64	1
Estonia	0,77	0,82	0,9	0,97	0,865	0,853	-0,012	34	35	1
Georgia	0,76	0,54	0,885	0,9	0,77125	0,732	-0,03925	65	66	1
Hong Kong	0,94	0,94	0,921	0,87	0,91775	0,916	-0,00175	21	22	1
Israel	0,91	0,88	0,893	0,95	0,90825	0,915	0,00675	27	23	-4
Latvia	0,78	0,77	0,894	0,96	0,851	0,836	-0,015	40	43	3
Lithuania	0,79	0,79	0,876	0,97	0,8565	0,852	-0,0045	36	36	0
Malaysia	0,8	0,76	0,964	0,83	0,8385	0,796	-0,0425	45	50	5
Argentina	0,82	0,8	0,846	0,96	0,8565	0,863	0,0065	36	31	-5
Bulgaria	0,79	0,73	0,863	0,91	0,82325	0,808	-0,01525	51	46	-5
Chile	0,88	0,77	0,926	0,91	0,8715	0,854	-0,0175	33	34	1
Croatia	0,83	0,79	0,857	0,9	0,84425	0,841	-0,00325	41	41	0
China	0,78	0,65	0,957	0,84	0,80675	0,755	-0,05175	54	62	8
Russia	0,67	0,76	0,92	0,96	0,8275	0,795	-0,0325	48	51	3
Belarus	0,72	0,68	0,969	0,95	0,82975	0,786	-0,04375	47	54	7
Cuba	0,87	0,67	0,977	0,91	0,85675	0,817	-0,03975	35	44	9
Ecuador	0,82	0,6	0,885	0,86	0,79125	0,759	-0,03225	62	60	-2
Panama	0,83	0,71	0,864	0,88	0,821	0,804	-0,017	52	47	-5
Romania	0,77	0,72	0,93	0,89	0,8275	0,792	-0,0355	48	52	4
Trinidad	0,75	0,78	0,895	0,88	0,82625	0,801	-0,02525	50	48	-2
Ukraine	0,69	0,67	0,909	0,95	0,80475	0,766	-0,03875	55	57	2
Slovakia	0,82	0,82	0,826	0,91	0,844	0,849	0,005	42	37	-5
Paraguay	0,77	0,64	0,919	0,86	0,79725	0,755	-0,04225	60	62	2
Uruguay	0,84	0,74	0,831	0,94	0,83775	0,84	0,00225	46	42	-4
South Africa	0,39	0,77	0,72	0,81	0,6725	0,658	-0,0145	76	76	0
Malta	0,89	0,86	0,924	0,85	0,881	0,867	-0,014	32	30	-2
Moldova	0,71	0,45	0,919	0,85	0,73225	0,671	-0,06125	72	73	1
Kyrgyzstan	0,7	0,48	0,901	0,93	0,75275	0,702	-0,05075	68	68	0
Cyprus	0,89	0,87	0,959	0,91	0,90725	0,891	-0,01625	28	28	0
Albania	0,81	0,64	0,85	0,89	0,7975	0,78	-0,0175	59	56	-3
Bolivia	0,65	0,54	n/a	0,87	n/a	0,687	n/a	n/a	72	n/a
Kuwait	0,87	0,87	0,987	0,8	0,88175	0,844	-0,03775	31	40	9
Nicaragua	0,75	0,58	0,923	0,74	0,74825	0,69	-0,05825	70	71	1
Macedonia	0,81	0,7	0,633	0,87	0,75325	0,797	0,04375	67	49	-18
Singapore	0,89	0,92	0,941	0,91	0,91525	0,907	-0,00825	23	25	2
Tajikistan	0,64	0,4	0,919	0,91	0,71725	0,652	-0,06525	75	77	2
Uzbekistan	0,69	0,48	0,831	0,91	0,72775	0,694	-0,03375	73	70	-3
Peru	0,75	0,66	0,928	0,88	0,8045	0,762	-0,0425	56	58	2
Colombia	0,79	0,7	0,856	0,86	0,8015	0,785	-0,0165	57	55	-2
Philippines	0,76	0,63	0,886	0,89	0,7915	0,758	-0,0335	61	61	0
Indonesia	0,7	0,59	0,903	0,81	0,75075	0,697	-0,05375	69	69	0
Egypt	0,75	0,61	0,89	0,62	0,7175	0,659	-0,0585	74	75	1
El Salvador	0,76	0,65	0,931	0,76	0,77525	0,722	-0,05325	64	67	3

	LEI	GDPI	EMPI	EI	E-HDI	HDI	HDI-E-HDI	R(E-HDI)	R(HDI)	R(HDI-E-HDI)
Honduras	0,71	0,55	0,949	0,74	0,73725	0,667	-0,07025	71	74	3
Dominican Republic	0,7	0,7	0,833	0,84	0,76825	0,749	-0,01925	66	65	-1
Bahrain	0,82	0,86	0,883	0,86	0,85575	0,846	-0,00975	38	39	1
Kazakhstan	0,64	0,7	0,912	0,94	0,798	0,761	-0,037	58	59	1
Brazil	0,76	0,73	0,903	0,89	0,82075	0,792	-0,02875	53	52	-1

EMPI, E-HDI, R(E-HDI): Authors' own calculations
Source: UNDP (2005); ILO
Table 6: Employment-adjusted Human Development Index (E-HDI): 2003

	LEI	GDPI	EMPI	EI	E-HDI	HDI	HDI-E-HDI	R(HDI)	R(E-HDI)	R(HDI-E-HDI)
Iceland	0,93	0,98	0,975	0,97	0,96375	0,96	-0,00375	2	1	1
Norway	0,91	0,99	0,954	0,99	0,961	0,965	0,004	1	2	-1
Australia	0,92	0,95	0,949	0,99	0,95225	0,957	0,00475	3	4	-1
Canada	0,92	0,96	0,932	0,97	0,9455	0,95	0,0045	6	10	-4
Ireland	0,88	1	0,957	0,99	0,95675	0,956	-0,00075	4	3	1
Sweden	0,92	0,95	0,944	0,98	0,9485	0,951	0,0025	5	8	-3
Switzerland	0,93	0,97	0,959	0,95	0,95225	0,947	-0,00525	9	4	5
Japan	0,95	0,95	0,956	0,94	0,949	0,949	0	7	7	0
Netherlands	0,89	0,96	0,938	0,99	0,9445	0,947	0,0025	9	11	-2
France	0,91	0,95	0,9	0,97	0,9325	0,942	0,0095	16	19	-3
Finland	0,89	0,95	0,914	0,99	0,936	0,947	0,011	9	17	-8
United States	0,88	1	0,949	0,97	0,94975	0,948	-0,00175	8	6	2
Spain	0,91	0,92	0,909	0,98	0,92975	0,938	0,00825	19	21	-2
Denmark	0,87	0,96	0,951	0,99	0,94275	0,943	0,00025	15	13	2
Austria	0,90	0,96	0,942	0,96	0,9405	0,944	0,0035	14	15	-1
United Kingdom	0,89	0,96	0,952	0,97	0,943	0,94	-0,003	18	12	6
Belgium	0,90	0,96	0,916	0,98	0,939	0,945	0,006	12	16	-4
Luxembourg	0,89	1	0,954	0,94	0,946	0,945	-0,001	12	9	3
New Zealand	0,90	0,91	0,964	0,99	0,941	0,936	-0,005	20	14	6
Italy	0,92	0,94	0,923	0,96	0,93575	0,94	0,00425	18	18	0
Germany	0,90	0,9	0,907	0,96	0,91675	0,932	0,01525	21	26	-5
Greece	0,89	0,9	0,894	0,97	0,9135	0,921	0,0075	24	27	-3
Republic of Korea	0,87	0,89	0,962	0,98	0,9255	0,912	-0,0135	26	22	4
Portugal	0,87	0,88	0,925	0,96	0,90875	0,904	-0,00475	27	28	-1
Czech Republic	0,85	0,88	0,92	0,93	0,895	0,885	-0,01	29	30	-1
Hungary	0,80	0,86	0,929	0,95	0,88475	0,869	-0,01575	32	32	0
Poland	0,83	0,81	0,822	0,95	0,853	0,862	0,009	34	42	-8
Slovakia	0,82	0,83	0,836	0,92	0,8515	0,856	0,0045	39	43	-4
Mexico	0,84	0,77	0,964	0,86	0,8585	0,821	-0,0375	45	39	6
Turkey	0,73	0,73	0,9	0,81	0,7925	0,757	-0,0355	63	63	0
Estonia	0,78	0,83	0,903	0,97	0,87075	0,858	-0,01275	37	35	2
Georgia	0,76	0,56	0,874	0,91	0,776	0,743	-0,033	66	65	1
Hong Kong	0,95	0,96	0,932	0,88	0,9305	0,927	-0,0035	22	20	2
Israel	0,92	0,92	0,896	0,95	0,9215	0,927	0,0055	22	24	-2
Latvia	0,78	0,79	0,896	0,96	0,8565	0,845	-0,0115	43	40	3
Lithuania	0,79	0,81	0,886	0,97	0,864	0,857	-0,007	38	38	0
Malaysia	0,81	0,77	0,965	0,84	0,84625	0,805	-0,04125	49	46	3
Argentina	0,83	0,82	0,874	0,95	0,8685	0,863	-0,0055	33	36	-3

	LEI	GDPI	EMPI	EI	E-HDI	HDI	HDI-E-HDI	R(HDI)	R(E-HDI)	R(HDI-E-HDI)
Bulgaria	0,79	0,73	0,88	0,92	0,83	0,816	-0,014	46	50	-4
Chile	0,89	0,78	0,922	0,91	0,8755	0,859	-0,0165	35	34	1
Croatia	0,84	0,8	0,862	0,9	0,8505	0,846	-0,0045	42	44	-2
China	0,78	0,68	0,958	0,84	0,8145	0,768	-0,0465	59	54	5
Russia	0,67	0,77	0,922	0,95	0,828	0,797	-0,031	51	51	0
Belarus	0,72	0,71	0,981	0,95	0,84025	0,794	-0,04625	53	47	6
Cuba	0,88	0,67	0,981	0,93	0,86525	0,826	-0,03925	44	37	7
Ecuador	0,82	0,61	0,914	0,86	0,801	0,765	-0,036	61	61	0
Panama	0,83	0,72	0,876	0,88	0,8265	0,809	-0,0175	47	56	-9
Romania	0,78	0,74	0,92	0,9	0,835	0,805	-0,03	49	49	0
Trinidad	0,75	0,8	0,917	0,88	0,83675	0,809	-0,02775	47	48	-1
Ukraine	0,69	0,69	0,914	0,94	0,8085	0,774	-0,0345	58	57	1
Slovakia	0,82	0,83	0,819	0,92	0,84725	0,856	0,00875	39	45	-6
Paraguay	0,77	0,65	0,926	0,86	0,8015	0,757	-0,0445	63	59	4
Uruguay	0,84	0,76	0,869	0,95	0,85475	0,851	-0,00375	41	41	0
South Africa	0,37	0,79	0,738	0,8	0,6745	0,653	-0,0215	76	76	0
Malta	0,89	0,87	0,928	0,86	0,887	0,875	-0,012	31	31	0
Moldova	0,72	0,48	0,927	0,89	0,75425	0,694	-0,06025	73	71	2
Kyrgyzstan	0,7	0,49	0,915	0,92	0,75625	0,705	-0,05125	69	69	0
Cyprus	0,9	0,91	0,953	0,91	0,91825	0,903	-0,01525	28	25	3
Albania	0,82	0,65	0,856	0,88	0,8015	0,784	-0,0175	56	59	-3
Bolivia	0,65	0,55	0,938	0,87	0,752	0,692	-0,06	74	72	2
Kuwait	0,87	0,88	0,986	0,87	0,9015	0,875	-0,0265	30	29	1
Nicaragua	0,75	0,6	0,935	0,75	0,75875	0,698	-0,06075	71	67	4
Macedonia	0,82	0,7	0,628	0,87	0,7545	0,796	0,0415	52	70	-18
Singapore	0,9	0,94	0,942	0,91	0,923	0,916	-0,007	25	23	2
Tajikistan	0,65	0,41	0,84	0,9	0,7	0,652	-0,048	77	75	2
Uzbekistan	0,69	0,49	n/a	0,91	n/a	0,696	n/a	72	n/a	n/a
Peru	0,75	0,67	0,926	0,87	0,804	0,767	-0,037	60	58	2
Colombia	0,79	0,72	0,872	0,86	0,8105	0,79	-0,0205	55	55	0
Philippines	0,76	0,64	0,882	0,89	0,793	0,763	-0,03	62	62	0
Indonesia	0,7	0,6	0,901	0,83	0,75775	0,711	-0,04675	68	68	0
Egypt	0,75	0,62	0,897	0,73	0,74925	0,702	-0,04725	70	73	-3
El Salvador	0,77	0,65	0,932	0,76	0,778	0,729	-0,049	67	64	3
Honduras	0,72	0,56	0,941	0,77	0,74775	0,683	-0,06475	75	74	1
Dominican Republic	0,71	0,72	0,816	0,83	0,769	0,751	-0,018	65	66	-1
Bahrain	0,82	0,89	0,937	0,86	0,87675	0,859	-0,01775	35	33	2
Kazakhstan	0,64	0,72	0,916	0,96	0,809	0,774	-0,035	57	56	1
Brazil	0,76	0,74	0,911	0,88	0,82275	0,792	-0,03075	54	53	1

EMPI, E-HDI, R(E-HDI): Authors' own calculations
Source: UNDP (2006); ILO
Table 7: Employment-adjusted Human Development Index (E-HDI): 2004

	LEI	GDPI	EMPI	EI	E-HDI	HDI	HDI-E-HDI	R(HDI)	R(E-HDI)	R(HDI-E-HDI)
Iceland	0,94	0,985	0,97	0,978	0,9685	0,968	-0,0005	1	1	0
Norway	0,91	1	0,965	0,991	0,96725	0,968	0,00075	1	2	-1
Australia	0,93	0,962	0,951	0,993	0,95925	0,962	0,00275	3	3	0
Canada	0,92	0,97	0,937	0,991	0,95475	0,961	0,00625	4	6	-2
Ireland	0,89	0,994	0,956	0,993	0,95825	0,959	0,00075	5	4	1
Sweden	0,92	0,965	0,93	0,978	0,94925	0,956	0,00675	6	11	-5
Switzerland	0,94	0,981	0,96	0,946	0,95625	0,955	-0,00125	7	5	2
Japan	0,95	0,959	0,959	0,946	0,9545	0,953	-0,0015	8	8	0
Netherlands	0,90	0,966	0,961	0,988	0,95475	0,953	-0,00175	8	6	2
France	0,92	0,954	0,906	0,982	0,94025	0,952	0,01175	10	18	-8
Finland	0,90	0,964	0,923	0,993	0,9445	0,952	0,0075	10	16	-6
United States	0,88	1	0,954	0,971	0,9515	0,951	-0,0005	12	10	2
Spain	0,93	0,935	0,915	0,987	0,9405	0,949	0,0085	13	17	-4
Denmark	0,88	0,973	0,961	0,993	0,952	0,949	-0,003	13	9	4
Austria	0,91	0,971	0,952	0,966	0,949	0,948	-0,001	15	12	3
United Kingdom	0,90	0,969	0,947	0,97	0,9465	0,946	-0,0005	16	14	2
Belgium	0,90	0,963	0,918	0,977	0,93875	0,946	0,00725	16	20	-4
Luxembourg	0,89	1	0,952	0,942	0,94625	0,944	-0,00225	18	15	3
New Zealand	0,91	0,922	0,962	0,993	0,9475	0,943	-0,0045	19	13	6
Italy	0,92	0,944	0,932	0,958	0,939	0,941	0,002	20	19	1
Germany	0,90	0,949	0,916	0,953	0,93	0,935	0,005	22	23	-1
Greece	0,90	0,91	0,911	0,97	0,92225	0,926	0,00375	24	26	-2
Republic of Korea	0,88	0,9	0,965	0,98	0,93175	0,921	-0,01075	26	22	4
Portugal	0,88	0,888	0,923	0,925	0,90375	0,897	-0,00675	28	29	-1
Czech Republic	0,85	0,889	0,928	0,936	0,9005	0,891	-0,0095	29	30	-1
Hungary	0,80	0,866	0,925	0,958	0,887	0,874	-0,013	32	32	0
Poland	0,84	0,823	0,862	0,951	0,868	0,87	0,002	33	40	-7
Slovakia	0,82	0,846	0,866	0,921	0,8635	0,863	-0,0005	37	43	-6
Mexico	0,84	0,781	0,968	0,863	0,86375	0,829	-0,03475	45	41	4
Turkey	0,77	0,74	0,901	0,812	0,8065	0,775	-0,0315	61	62	-1
Estonia	0,77	0,842	0,95	0,968	0,8825	0,86	-0,0225	40	35	5
Georgia	0,761	0,587	0,862	0,914	0,781	0,754	-0,027	66	66	0
Hong Kong	0,949	0,977	0,944	0,885	0,93875	0,937	-0,00175	21	20	1
Israel	0,921	0,927	0,91	0,946	0,926	0,932	0,006	23	25	-2
Latvia	0,784	0,821	0,913	0,961	0,86975	0,855	-0,01475	41	39	2
Lithuania	0,792	0,831	0,917	0,965	0,87625	0,862	-0,01425	39	36	3
Malaysia	0,811	0,783	0,965	0,839	0,8495	0,811	-0,0385	50	47	3
Argentina	0,836	0,815	0,905	0,946	0,8755	0,869	-0,0065	34	37	-3
Bulgaria	0,795	0,752	0,91	0,926	0,84575	0,824	-0,02175	46	48	-2
Chile	0,889	0,799	0,94	0,914	0,8855	0,867	-0,0185	35	33	2
Croatia	0,839	0,813	0,889	0,899	0,86	0,85	-0,01	43	45	-2
China	0,792	0,703	0,959	0,837	0,82275	0,777	-0,04575	60	56	4
Russia	0,667	0,782	0,928	0,956	0,83325	0,802	-0,03125	52	52	0
Belarus	0,728	0,73	0,988	0,956	0,8505	0,804	-0,0465	51	46	5
Cuba	0,879	0,683	0,981	0,952	0,87375	0,838	-0,03575	44	38	6
Ecuador	0,828	0,629	0,922	0,858	0,80925	0,772	-0,03725	63	60	3
Panama	0,836	0,723	0,909	0,878	0,8365	0,812	-0,0245	49	51	-2

	LEI	GDPI	EMPI	EI	E-HDI	HDI	HDI-E-HDI	R(HDI)	R(E-HDI)	R(HDI-E-HDI)
Romania	0,782	0,752	0,927	0,905	0,8415	0,813	-0,0285	48	50	-2
Trinidad	0,737	0,832	0,938	0,872	0,84475	0,814	-0,03075	47	49	-2
Ukraine	0,711	0,705	0,932	0,948	0,824	0,788	-0,036	58	55	3
Slovakia	0,821	0,846	0,867	0,921	0,86375	0,863	-0,00075	37	41	-4
Paraguay	0,771	0,641	0,933	0,853	0,7995	0,755	-0,0445	65	63	2
Uruguay	0,848	0,768	0,894	0,942	0,863	0,852	-0,011	42	44	-2
South Africa	0,43	0,786	0,745	0,806	0,69175	0,674	-0,01775	76	77	-1
Malta	0,901	0,877	0,927	0,856	0,89025	0,878	-0,01225	31	31	0
Moldova	0,724	0,508	0,926	0,892	0,7625	0,708	-0,0545	70	70	0
Kyrgyzstan	0,676	0,494	0,919	0,917	0,7515	0,696	-0,0555	74	73	1
Cyprus	0,9	0,905	0,955	0,904	0,916	0,903	-0,013	27	27	0
Albania	0,853	0,663	0,862	0,887	0,81625	0,801	-0,01525	53	57	-4
Bolivia	0,662	0,557	0,92	0,865	0,751	0,695	-0,056	75	74	1
Kuwait	0,871	0,93	0,985	0,871	0,91425	0,891	-0,02325	29	28	1
Nicaragua	0,782	0,601	0,944	0,747	0,7685	0,71	-0,0585	69	68	1
Macedonia	0,814	0,714	0,627	0,875	0,7575	0,801	0,0435	53	71	-18
Singapore	0,907	0,95	0,955	0,908	0,93	0,922	-0,008	25	23	2
Tajikistan	0,689	0,435	0,81	0,896	0,7075	0,673	-0,0345	77	76	1
Uzbekistan	0,696	0,505	0,894	0,906	0,75025	0,702	-0,04825	72	75	-3
Peru	0,761	0,684	0,928	0,872	0,81125	0,773	-0,03825	62	59	3
Colombia	0,788	0,716	0,873	0,869	0,8115	0,791	-0,0205	57	58	-1
Philippines	0,767	0,657	0,92	0,888	0,808	0,771	-0,037	64	61	3
Indonesia	0,745	0,609	0,897	0,83	0,77025	0,728	-0,04225	68	67	1
Egypt	0,761	0,629	0,894	0,732	0,754	0,708	-0,046	70	72	-2
El Salvador	0,772	0,661	0,934	0,772	0,78475	0,735	-0,04975	67	65	2
Honduras	0,739	0,59	0,969	0,771	0,76725	0,7	-0,06725	73	69	4
Dominican Republic	0,776	0,736	0,84	0,827	0,79475	0,779	-0,01575	59	64	-5
Bahrain	0,837	0,896	0,936	0,864	0,88325	0,866	-0,01725	36	34	2
Kazakhstan	0,682	0,728	0,919	0,973	0,8255	0,794	-0,0315	56	54	2
Brazil	0,779	0,74	0,916	0,883	0,8295	0,8	-0,0295	55	53	2

EMPI, E-HDI, R(E-HDI): Authors' own calculations
Source: UNDP (2007-8); ILO
Table 8: Employment-adjusted Human Development Index (E-HDI): 2005-6

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Supply Management: A Transaction Cost Economics Framework

Reza Mohammady Garfamy*

Abstract:

Transaction Cost Economics (TCE) is an economic theory that provides an analytical framework for investigating the governance structure of contractual relations within a supply chain. The purpose of this paper is to examine existing research in an effort to understand the potential effects of transaction costs on the vertical coordination of a supply chain. The paper arrives at many insights into how supply chains are organized under different governance structures. These insights can certainly be shared via the development and introduction of related propositions. The conceptual typology of contractual relations developed herein can help researchers better understand the scope of both the problems and the opportunities associated with supply management. It will be of value, therefore, not only to researchers who desire to expand their research into this area, but also to those who have already investigated this topic in isolation or with limited scope.

Keywords: Transaction cost economics, TCE, Supply chain, Supply management, vertical coordination.

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1. Introduction

A variety of changes in the business environment, including global competition, international cooperation, and vertical disintegration, along with a focus on core competencies, have fueled interest in networked supply chains (Chen & Paulraj, 2004). This novel perspective has created the challenge of developing insights into how and why different supply chain arrangements emerge and understanding the consequences of these arrangements for industry efficiency and competitiveness.

During recent years, new theories on supply management have emerged seeking to solve a well-known problem within economic theory, i.e. the issue of division of labor and specialization. Each theory, however, has its own specific basis in pursuing solutions to problems concerning how to use and cooperate with suppliers. The reasons for supply management vary, and its conceptual frameworks, which have been used to explain the practice and degree of success obtained, include Transaction Cost Economics (TCE) (Williamson, 1979) and the Core Competence Approach (Prahalad & Hamel, 1990) among others. TCE represents a general, domain spanning, integrating framework and considerable opportunities for understanding and evaluating many supply management related issues, and has as well the potential to be combined in an interdisciplinary setting with the insights provided by management literature. Williamson (1981) on TCE profoundly altered views on inter-firm exchange. In effect, it has been one of the most influential theories in the study of supply management and makes a valuable contribution to understanding sourcing and predicting the likely success of some supply chain arrangements both in theory and practice, although it alone cannot fully explain the complexities of sourcing (McIvor, 2009).

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Moreover, a recent publication by Williamson (2008) points to the need for further elaboration of the link between TCE and supply management, where TCE examines individual transactions, while supply management introduces a broader systems perspective in which groups of related transactions are managed as chains.

Although research interests in supply management are growing, no research has been directed towards a systematic development of its framework. The objective of this study, therefore, is to examine the existing research in an effort to illustrate the possibility of using TCE as a basis for understanding the potential effects of transaction costs on the vertical coordination of a supply chain. We build on existing theoretical perspectives, as well as advance the existing body of literature by proposing a new framework with possibly broader appeal. This paper offers many insights into how supply chains are organized under different governance structures. This study tries to take the approach of developing a typology to illustrate the relationships among concepts and to systematically consider phenomena. The conceptual typology of contractual relations developed herein can help researchers better understand the scope of both the problems and the opportunities associated with supply management.

2. Literature Review

2.1. Supply Management

A supply chain can be defined as a set of three or more entities (firms or individuals) directly involved in the upstream and downstream flows of products, services, finances and/or information from a source to a customer (Mentzer, DeWitt, Keebler, Min, Nix, Smith, & Zacharia, 2001). Analytically, a typical supply chain is a network of materials, information and services processing links with the characteristics of supply, transformation and demand (Chen & Paulraj, 2004). The processes and links under the supply chain umbrella are central to industrial modernity.

The complexity of a supply chain stems from the fact that it is a complex network of chains. Given the potential for countless alternative supply chain configurations, any one firm can be part of numerous supply chains (Mentzer et al., 2001). Each supplier and customer in the supply chain has also many supply chains with its own suppliers and customers. Therefore, a small change in any of the partners' supply chains or even a weak or broken link in the network can create a major reaction in the entire supply chain.

The traditional view of supply management is to leverage the supply chain to achieve the lowest initial purchase prices while assuring supply. Its typical characteristics include multiple suppliers, supplier evaluations based on purchase price, cost-based information bases, arms-length negotiations and formal short-term contracts as well as centralized purchasing. Operating under these conditions encourages fierce competition among suppliers. The fundamental assumption in this environment is that trading partners are interchangeable (Spekman, Kamauff Jr., & Myhr, 1998) and that they seek advantages based on the survival of the fittest. Under the new paradigm, supply management is redefined as a process for designing, developing, optimizing and managing the internal and external supply components of the supply chain, which is consistent with overall business objectives and strategies. While reduced cost is typically a result, supply management emphasizes leveraging the skills, expertise and capabilities of firms that comprise this competitive network. Supply chain strategy development would be a part of the business unit planning process, which includes efforts aimed at developing and maintaining global information systems, addressing strategic aspects of production or purchasing issues as well as accessing and managing innovation with the purpose of protecting and enhancing core technologies (Prahalad & Hamel, 1990).

Firms are now pursuing more intensive and interactive relationships with their suppliers, collaborating in operations coordination, developing new products, integrating key business processes, outsourcing non-core processes and sharing cross-functional information on a range of issues (McIvor, Humphreys, & McAleer, 1997; Wu, Chiag, Wu, & Tu, 2004). In fact, firms are striving to develop long-term strategic partnerships with a few competent and innovative suppliers and collaborate with them in joint problem-solving efforts to acquire resources, develop technology, access markets and respond to changing business needs (Mohammady Garfamy, 2009). In essence, supply chain partnering is an arrangement by which separate firms share administrative authority, form social links and accept joint ownership of operating policies. Looser, more open-ended arrangements replace highly specific, arms-length contracts to remove the firm's boundaries and permit an easier exchange of knowledge. Thus, the traditional pattern of a large, vertically integrated business is being

replaced by one consisting of complex networks of collaborating firms. This structured approach to the design of a supply chain will result in an organization that is an appropriate mix of the firm's own capabilities with those of suppliers in a relationship that is appropriate to the business strategy.

In this paradigm shift, cooperation is no longer seen as a process between one set of trading partners, but now exists along the entire supply chain (Spekman et al., 1998). Cooperation emphasizes the need to integrate functional silos and views these units as interdependent parts responsible for maximizing the overall effectiveness of the supply chain. What evolves is a network of interrelated firms whose primary objective is to gain strategic advantage for the whole supply chain.

However, some of the implementation issues in supply management are the alignment of partners' business interests, long-term relationship management, reluctance to share information, the complexity of a large scale supply chain, the competence of personnel supporting the supply chain, performance measurement and the incentive systems to support supply management.

2.2. Transaction Cost Economics

Unlike Neoclassical Economics, the New Institutional Economics recognizes the costs of using the market mechanism and it terms them transaction costs. Transaction costs are the costs of creating, using, maintaining, changing and governing the organization of economic activity within a vertically integrated firm or in a market. In effect, they are divided into market, managerial and political transaction costs including legal, administrative, information-gathering and other costs associated with negotiating and writing contracts, monitoring performance and enforcing promises. The minimization of absolute or relative transaction costs is not an economically reasonable aim. Rather, what matters for the judgment of the economic quality (efficiency) of an economic entity is its total economic results, and not its level of transaction costs (Furubotn & Richter, 2000).

TCE uses the concept of transaction costs to explain the organization of firms and the method of their interactions along a supply chain by providing a conceptual framework for investigating some of the organizational challenges and economic risks that firms face. A number of other disciplines including organization theory and contract law have all contributed to the theoretical development of TCE. TCE is also called the markets and hierarchies paradigm, where hierarchies (or firms) replace markets when the price system fails. The choice between markets and hierarchies, as alternative governance mechanisms for completing a set of transactions, depends on the relational efficiency of each. Williamson (1979) outlines the cost-determining attributes (dimensions) of individual transactions as their frequency (the rate of reoccurrence of transactions), the environmental political, social or economic risk surrounding them (environmental and behavioral uncertainty or ambiguity as to transaction definition and performance) and the level of the transferability of assets associated with them (asset specificity). Asset specificity can arise in any of three ways; namely, site specificity (resource immobility), physical asset specificity (technology advantages) and human asset specificity (know-how advantages) (Williamson, 1981). Asset specificity can be non-specific (highly standardized), idiosyncratic (highly customized to the organization) or mixed (incorporating standardized and customized elements in the transaction). In a world where individuals are subject to bounded rationality (neurophysiological, language and judgment limits), opportunistic behavior (cheating, lying and subtle forms of violation of agreements guided by considerations of self-interest with guile), small numbers bargaining (the degree to which a firm has alternative sources of supply to meet its requirements), information impactedness (asymmetrical distribution of information among the exchanging parties) and loss of resource control (outsourcing a product that may be proprietary in nature) as well as the random nature of some events, these characteristics have a major influence on the efficiency of alternative transaction modes (Williamson, 1985).

Governance structures are defined as "discrete structural alternatives that possess distinctive strengths and weaknesses in autonomous and coordinated adaption respects" (Williamson, 2008, p. 15). TCE focuses primarily upon the governance skills or the role of efficient governance through transaction analysis in explaining firms as institutions for organizing economic activity (McIvor, 2009). For efficient governance, three generic structures emerge: market, hybrid and hierarchy. The three structures differ in governance attributes such as the intensity of the cooperation and coordination mechanisms (or safeguards) (Grover & Malhotra, 2003). Williamson (1993) argues that TCE deals predominantly

with dyadic contractual relations. Viewing the firm as a nexus of contracts, the object is to prescribe the best governance structure between firm and its suppliers, customers, workers, etc.

However, there have been criticisms from a conceptual perspective of TCE, whereby some doubts have been raised about the significance and validity of the theory. For instance, Blomqvist, Kyläheiko and Virolainen (2002) mention that classic TCE does not account for the benefits of transactions and neglects the knowledge-based view that also considers evolving capabilities and the knowledge of firms. The other weakness is in applying the idea of human interactions and exchanges as based on the contractual approach so that its most fundamental concept (contractual relations) remains undefined and does not lead to a dynamic perspective. While providing a number of important insights regarding the most efficient means to govern a particular transaction, TCE has been developed and tested under a set of restrictive assumptions that ignore the potential influence that an extant governance form, a firm's existing portfolio of transactions or other firm-specific asset and capability stocks may have on a focal transaction (Leiblein & Miller, 2003). Furthermore, the empirical work on successful measurement of transaction costs has mostly been treated at the conceptual rather than at the measurement level.

For the purpose of this paper, although there are enormous sources of related literature that have addressed the topics in great depth and breadth over the past years, there is no choice but to ignore a significant majority of the research in the fields and just consider the relevant and available sources in order to address the subject of this study.

3. Research Method

A conceptual paper is one in which the objective is to generate and present a theory without verification and empirical adornment, defined as a system of abstract concepts and the relationships between them, with/without presenting a measurement model based on the specific operationalization of those concepts and relationships to stimulate subsequent attempts at verification (Skilton, 2011). On the other hand, since theories that are developed to explain human activities cannot simultaneously be generalizable, accurate and simple, scholars can thereby be content to pursue just one or two when developing theory (Weick, 1979).

In order for an insight to yield a theory, it needs to decompose into concepts and the relationships among them and to integrate these into an elaborated whole. As Kilduff (2006) suggests, the process of theory development requires attending to the activities through which provisional theoretical inputs evolve into a well-organized whole. In this study, to integrate a wide and diverse body of information about a particular phenomenon, a meta-analysis procedure is used that allows for the examination of trends, patterns and substantial commonalities that may exist in many different studies that have already been conducted. Meta-analysis is a very effective technique for summarizing, comparing and combining as a whole outcomes from several different studies that use the same dependent variable (Salkind, 2006). These conceptual theory development efforts are aimed at helping to close the gap or tensions between what we know and what we need to know about the implications of TCE for supply management.

4. The Transactıon Cost Economıcs Framework for Supply Management

Vertical coordination (the governance structure of contractual relations), which is central to the study of supply management, can be viewed as a continuum. At one extreme lie spot markets where products are exchanged between multiple partners, with price as the sole determinant of the final transaction, and where supply management is entirely absent. At the other end of spectrum lies vertical integration where products move between various stages of the supply chain as a result of within-firm managerial orders (Hobbs, 1996). In between the two extremes of polar form lies a myriad of alternative ways of organizing economic activity, which are neither clear market nor clear hierarchy, from strategic alliances, formal written contracts, quasi-vertical integration (joint ventures, franchises and licenses) to tapered-vertical integration, which represent different degrees of vertical coordination.

Over the past few decades, TCE has been the dominant theory for analyzing governance structure choices (Leiblein & Miller, 2003). TCE argues that one of the determinants of vertical coordination is the nature and level of transaction costs, wherein a change in the transaction costs arising from the exchange of a product may lead to a change in that supply chain (Hobbs, 1996). As infrequency, uncertainty and asset specificity of a

transaction increase, the choice moves along the spectrum of vertical coordination from spot market towards a more formal type of vertical coordination, where one party has more control over the outcome of transaction, e.g., a strategic alliance, a long-term contract or some form of vertical integration (David & Han, 2004). The underlying logic of TCE is that firms will favor vertical integration when transaction costs (i.e. adaptation, performance evaluation and safeguarding costs) are greater than internal costs (i.e. production and administration costs).

TCE combines the economic theory with the organization theory to determine the best type of relationship a firm should develop in the marketplace. A firm could have all the activities within its boundary and operate as a hierarchy or it could outsource most of its activities, except for its core competencies, and operate as a virtual corporation, depending on the market for most of its input. There are also hybrid structures in which a firm may outsource only a few activities. Therefore, the hybrid transaction is especially pertinent to the supply chain literature (Williamson, 2008). Firms make decisions on organizational design based on various factors including what investments have to be made specific to the relationship, what activity is critical for effective business performance, uncertainty in the relationship with partners and product complexity. Grover and Malhotra (2003) state that TCE can be used to evaluate how various types of investments within firms can build long-term capabilities and what their impact is on performance. Investments specific to the relationship lock in the supplier and increase the costs of switching to another buyer. The greater the level of asset specificity, the more an alliance partner needs cooperation adaptability in modifying the agreement rather than in leaving the partnership. In the case of a low level of asset specificity, the desire for cooperation adaptability diminishes while the need for exit flexibility is preferred.

It is also difficult to completely eliminate uncertainty because the organization deals with customer orders, which are randomly generated. The demand uncertainty may force a firm to develop a closer relationship with its suppliers to better meet market requirements or alternatively to develop standardized products and have extra inventory to counter the uncertainty (Premkumar, 2000). Similarly, there is uncertainty related to supplies from the suppliers. The supply uncertainty can be due to variations in the lead-time or the quality of the products. Firms also experience uncertainty in their internal subunits, that is, whenever there is a transfer of products or information between subunits, which requires coordination, uncertainty is created. Firms often have twin objectives in managing uncertainty: to reduce their environmental uncertainty by obtaining as much information as possible and to increase information asymmetry to gain maximum benefits from interaction with their partners. However, information asymmetry among participating partners leads to uncertainty, which in turn leads to the inefficiency of the total supply chain (Premkumar, 2000).

A distinguishing feature of the supply chain from traditional vertically integrated firms is that the former is organized on the fundamental premise of synchronization among multiple autonomous entities represented in it. That is, improved coordination within and between various supply chain members is achieved inside the framework of mutually agreed to commitments made by members to each other. The supply chain enforces its common goals and policies on members only to the extent of mutual commitments made to each other. Thus, Pareto-optimality in decisions due to the competing objectives of members may occur. However, decision making at the member level is decentralized. Each member pursues its own goals, objectives and policies conceptually independently of the supply chain, but pragmatically in congruence with supply chain goals. In this respect, a common knowledge base supports the supply chain structure (Chandra & Kumar, 2000).

Transaction cost economists argue that nonstandard forms of contracting, of which vertical integration is an extreme form, have the purpose and effect of economizing on transaction costs (Williamson, 1985). Considering the hazards of the spot market and contractual incompleteness, transaction costs economists predict that parties will adopt appropriate governance structures from a set of institutional alternatives under a variety of environmental and firm-related factors to prevent ex-post opportunism and thus promote an efficient level of investment. In a supply chain, the contract is a coordination mechanism, which provides incentives to all of its members so that the decentralized supply chain behaves nearly or exactly the same as an integrated one.

Increasingly, successful firms use a higher level of strategic alliance-based global sourcing to address the never-ending battle to reduce costs while maintaining and improving quality and service by cooperating with their suppliers, even when highly specific assets are

Vertical Coordination		Hierarchy (Vertical Integration)	Hybrid (Alliance)	Market (Spot Market)
Cost-determining Attribute of Transaction	*Infrequency*	High	Medium	Low
	Uncertainty	High	Medium	Low
	Asset Specificity (Competence)	High (Core)	Medium (Complementary)	Low (Residual)
Factor Producing Transactional Difficulties	*Bounded Rationality*	High	Medium	Low
	Opportunism	High	Medium	Low
	Small Numbers Bargaining	High	Medium	Low
	Information Asymmetry	High	Medium	Low
	Loss of Resource Control	High	Medium	Low
Transaction Cost		High	Medium	Low
Type of Contractual Relation		Internal Contracts	Strategic Alliances / Network Sourcing / Single Sourcing / Preferred Sourcing	Arms-length Contracts
Boundary of Firm		Variable	Fuzzy	Fixed

Table 1: The conceptual typology of contractual relations

involved. Murray (2001) argues that this phenomenon is contradictory to the recommendation of TCE in which global internal sourcing (hierarchy) should be used by firms when asset specificity is highly involved. However, it is quite possible for a firm to develop a core competency by integrating the skills of a supplier into a process.

The idea of forming an outsourcing system is meant to establish a dynamic organization through the synergetic combination of dissimilar firms with different core competencies to perform a given business project for achieving a maximum degree of customer satisfaction (Choy & Lee, 2003). Outsourcing is a form of supply management where the outsourcing firm deliberately rids itself of its assets, infrastructure and people it had used previously or will use in the future to perform the particular process by contracting out or selling some or all of them to a supplier, who in return, provides and manages the services for a certain time and a monetary fee. Outsourcing is thus a specifically defined contractual relationship that is dependent on the supplier meeting the firm's defined performance goals (Razzaque & Sheng, 1998). An increased level of outsourcing places a premium on the skills needed to identify and distinguish between core and non-core processes, to select and develop suppliers, to structure long-term relationships and to manage suppliers across a range of processes.

The conceptual basis and basic design alternatives for the sourcing decision are based theoretically on TCE, which determines the internal and external boundaries of the firm. The key issue in the sourcing decision is determining the boundaries between two extremes of vertical coordination. Williamson (1985) argues that the decision will always be made in relation to the scope for cost reduction and the importance of asset specificity. Therefore, a firm should outsource activities if to carry them out internally would require excessive investment to get the lowest unit cost. In this respect, hierarchy is directly linked with insourcing and all governance structures with market elements are relevant for the outsourcing design. Thus, as well as assisting in assessing supplier performance, TCE can enhance our understanding of whether it is more appropriate to insource or outsource an activity (Stratman, 2008).

The governance structure decision involves understanding the profitability of an exchange, which can be reached through economizing (reducing transaction costs) or developing completely unforeseen opportunities for exchange (reconfiguring transaction

costs). It also involves redefining the dimensions of transactions in terms of fitness of purpose in achieving a sustainable position for the supply chain. Core competencies, as defined by their relevance to the sustainability of a margin, can always be controlled through internal contracts. Complementary competencies can be outsourced through close external contracts based on various forms of alliance. And finally, low competencies can be outsourced through arms-length contracts. These concepts and the relationships between them are represented in Table 1 by their degree of vertical coordination, which aligns these prototypical governance structures along the market-to-hierarchy continuum.

This table represents the major predictive aspect of TCE with respect to governance structures. A key part of this analytic approach involves undertaking value chain positioning. This refers to the process by which the key decision makers within a firm consciously undertake market positioning through an analysis of the totality of supply and value relationships within their markets, which is achieved through the use of TCE.

In summary, if transaction costs are low due to low levels of cost-determining attributes of a transaction and factors producing transactional difficulties, then market governance will be preferred. Production costs are generally lower in markets due to economies of scale and the scope available to external suppliers, which are subsequently reflected in the market prices. If, on the other hand, transaction costs are high enough to exceed the production cost advantages of the market, then hierarchical governance will be the more appropriate governing structure. Of course, internalization of activities should only take place if the cost reduction exceeds incremental costs due to additional administrative burdens and losses in production efficiencies.

The literature and practice have seen the growth of buyer and supplier relationships from a focus on operational purchasing relationships to strategic partnerships and boundary evaporation based on long-term contracts, mutual support, non-adversarial negotiations and information and risk sharing (Choy & Lee, 2003). These long-term relationships lead to reduced political, social or economic risks, reduced transaction costs and increased access to economies of scale by bypassing traditional market arrangements to enable a firm to compete with an alternative supply chain. Numerous firms have been downsizing, concentrating on their core competencies, moving away from vertical integration and outsourcing more extensively (Goffin, Szwejczewski, & New, 1997). The old habits of instigating supplier competition to maintain low prices and dumping suppliers that do not meet expectations are changing, as downsized firms shift more responsibility to their supply bases and recognize the high cost of switching suppliers (Krause & Ellram, 1997).

TCE can be used to assess different aspects of the quality and richness of the relationships as well as the true value of the developing partnership between inter-firm entities. The real productivity, design and quality improvements are not obtainable unless the suppliers in the collaborative relationship innovate to the best of their abilities in conjunction with the firm (Humphreys, Mak, & Yeung, 1998). The factors, which determine how close the relationships will become, are the degree of mutual dependence, the length of cooperation, the extent of joint projects and technological links as well as the degree of economic satisfaction with the cooperation (Monczka, Callahan, & Nichols, 1995). Developing relationships, however, takes considerable effort and requires participants to assume a level of trust and reliance in their partners that may reflect a significant departure from established norms. An open and honest environment, key management, coherent and effective internal measurement systems, mutual respect and empathy, commitment to investment as well as financial and commercial arrangements are of particular importance in this aspect (Razzaque & Sheng, 1998).

Furthermore, TCE focuses on important concerns for operations management scholars, including the development and leveraging of capabilities for competitive advantage, and understanding where it is appropriate to pursue efficiencies and where it is appropriate to pursue collaborative relations with suppliers (McIvor, 2009). Therefore, the ability of a firm to find a strategic partner to provide the needed supplementary services and maintain the relationship is a source of competitive advantage. It involves the firm attempting to develop and manage a competence-based supplier network and in turn, increases dependence on the supply base and make supply management a key success factor and an organizational imperative (Prahalad & Hamel, 1990). For some firms, this has meant reducing and streamlining the supplier base so they can better manage relationships with strategic suppliers and for others, it has meant developing cooperative relationships with suppliers.

5. Conclusion

As is obvious from the prior discussion, the major uses and applications of TCE in the supply management field lie in examining inter-firm relationships evident in buyer–supplier linkages. Drawing from the New Institutional Economics literature, TCE may be one of the frameworks for testing theories about supply management in order to further our understanding of its intricacies. The economic theory underlying TCE provides an explanation for the existence and structure of firms and for the nature of vertical coordination within a supply chain. Therefore, considerable opportunities exist for evaluating many supply management related issues from this perspective by devising a large number of testable hypotheses and propositions using the theoretical framework of TCE. Although TCE is progressive in terms of mainstream economics literature, and will lead to future research, the insights that it provides on the effect of transaction costs on vertical coordination need to be empirically verified through micro-analytical studies of supply chains (Hobbs, 1996). A convergence of interests is thus suggested for joint research by attempting to provide conceptual and empirical facilitation for future research.

By examining the existing research in an effort to illustrate the possibility of using TCE as a basis for understanding the potential effects of transaction costs on the vertical coordination of a supply chain, a conceptual typology of contractual relations is developed that can have a broader appeal and can help researchers better understand the scope of both the problems and the opportunities associated with supply management.

Concerning the debate between theoretical rigor and managerial practice, the implementation of supply management is a cultural change in any firm and needs dedicated efforts from upper management (Huang, Uppal, & Shi, 2002). Strategic issues involve understanding the dynamics of the supply chain, development of objectives for the whole supply chain and development of relations with business partners. The strategic aspect also includes the research determination of opportunities, which can enhance the competitiveness of a firm as a part of the supply chain or network of supply chains.

Several research avenues can be outlined with the application of the rich lens of TCE to lower overall transaction costs in sourcing, allocation of investments as well as supply chain coordination, integration and distribution (Grover & Malhotra, 2003). To present a meaningful discussion of the testability and/or extension of the theory, the presented conceptual typology can be tested as a whole by considering all of its elements and can be extended by integrating other aspects of TCE in its content. As a research limitation, however, researchers dealing with supply management should augment the conceptual typology by integrating further parameters, such as risk preferences, trust propensity, sourcing strategy or market environment, into their calculus and combining it with other factors influencing the outcome of supply arrangements.

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The Influence of Globalization in Promoting Entrepreneurship in Malaysia

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Abstract:

Entrepreneurship is increasingly becoming a very relevant instrument in promoting economic growth in a country. Thus the role of globalization in promoting entrepreneurship in Malaysia is analyzed in this context. In this regard, universities as teaching and research units and according to their potential and capabilities play an important role in development, entrepreneurship and job creation. What affect does globalization have on an economy? Globalization of education and entrepreneurial studies has allowed efficient access to the scientific environment and culture of various countries. Given the ever-changing world in which we live, this paper aims to explain the importance of investigating educational and research activities of universities converging towards globalization and entrepreneurship.

Keywords: Entrepreneurship education; economic growth; higher education; government role; university students, job creation..

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1. Introduction

Globalization can be understood as the process of increasing the connectivity and interdependence of the world's markets and businesses. Two major recent driving forces are advances in telecommunication infrastructure and the rise of the internet. According to Hill (2009), globalization can be defined as the shift toward a more integrated and interdependent world economy. Globalizarion has several facets, including the globalization of markets and the globalization of production. A major concern when dealing with openness or globalization in general regards the pressure that this phenomenon puts on nations to change their customs, norms and social values.

Globalization and entrepreneurship cannot be discussed in isolation, yet the topic has not been given much attention by scholars in the field of international business. Audretsch (2007) argues that globalization has led to a shift in developed countries from an industrial to an entrepreneurial model of production. The importance of entrepreneurship education is derived from the importance of the entrepreneurs to the economic system. Why is entrepreneurship education important? Webb et al. (1982) cited in Garavan and O'Cinneide (1994a) found that students who participated in entrepreneurship programmes were more likely to start their own business than other students. Upton et al. (1995) found that 40 percent of those who had attended courses in entrepreneurship had started their own businesses, while 30 percent had joined family businesses and only 30 percent worked for large organizations. This view is supported by Charney and Libercap (2000, p. 5) who found that entrepreneurship graduates are three times more likely than non-entrepreneurship graduates to start new business ventures. In other words, entrepreneurship becomes a valuable asset either as a stimulus to business start-up or as embedded knowledge for graduates. As understanding of what constitutes entrepreneurs and entrepreneurship extended into a wider range of the

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social sciences this contributed to more multi-disciplinary perspectives and methodologies. According to Tribe (2006) this is beneficial, as the dominance of one discipline cannot only determine what will be excluded or included in research but can literally discipline both perception and knowledge creation.

The concept of globalization has been discussed in many scientific areas, making it necessary to reconceptualize many long-established ideas. Globalization is considered a breakthrough factor in the scientific and academic arena of the 21st century. It should be noted that globalization in its modern sense is the product of transnational interactions materialized within the past two or three decades. The phenomena of globalization can be interpreted differently in different situations. From an economic viewpoint, globalization means "a process of increasing involvement in international business operations" (Galloway, L. & Brown, W. (2002). Marguardt and Berger (2003) generalized globalization as "a single market place with growing free trade among nations; the increasing flow and sharing of information, connection or links of people around the world"; the opportunity for organization and people to shop around the world and not be constrained by national boundaries. According to Charney and Libercap (2000) the significance of the study in entrepreneurship education is generally to foster risk-taking and the creation of new business ventures; to increase the likelihood of graduates being self-employed, which causes a significant positive impact on the income of graduates, and increases job satisfaction from increased income; to contribute to the growth of businesses, especially small ones; to promote the transfer of technology from the university to the private sector; and to promote technology-based firms and products. Several studies have shown that entrepreneurship has been identified as a potential catalyst for expanding economic growth (Charney and Libercap, 2000) and to maintain competitiveness in facing the challenges of globalization. The involvement of graduates in the field of entrepreneurship is supported by the government as an alternative to reducing the unemployment rate in the country. This effort can be implemented through education, training and lifelong learning.

2. Entrepreneurship

It is not the objective of this article to develop new insights into the definition of entrepreneurship, nor is this within its scope. According to Abdullah (1999), in a developing country like Malaysia, entrepreneurial activities through venture creation are seen as a mechanism to improve the distribution of income, to stimulate economic growth, and to reshape an economic structure which has been highly dependent on the activities of large firms. In essence, entrepreneurship is crucial to the health of Malaysia's economy. The government of Malaysia, throughout its constitutional bodies, has been playing a crucial role in developing and encouraging homegrown business entrepreneurs. The rapidly changing environment has brought about new conditions for higher education. The outcome of this situation is the necessity to develop entrepreneurial capabilities in the world in order to create new businesses, take advantage of unused capacities, develop existing capacities and solve social problems. To this end, universities should first prepare to play this role.

A low level of education and exposure could prevent motivated entrepreneurial movement in their surroundings. Undoubtedly, we suppose that the proximity of entrepreneurial universities does indeed have a positive relationship to entrepreneurship. Etzkowitz (1983) coined the term "entrepreneurial university" to describe institutions that have become critical to regional economic development. Entrepreneur education and its relationship to performance have been widely examined (see for example, Bird, 1989; Cooper, et al., 1994; Robinson & Sexton, 1994). Not surprisingly, the entrepreneurial movement within universities has been met with both enthusiasm and resentment as the scholarly community struggles with the ethical implications of such activities (Mowery, Nelson, Sampat, & Ziedonis, 1998). As such, developing a more entrepreneurial culture can be regarded as the essential mechanism through which universities become effectively involved in economic development (Fairweather 1990; Hagen, 2002).

Research evidence by Clark (1998) has shown that the concept is related to univerrsity attempts to reform and to become more entrepreneurial by strengthening their steering core, enhancing their development periphery, widening their funding base, stimulating the academic heartland and promoting entrepreneurial beliefs. As Saxenian (1994) points out, one of the important mechanisms facilitating knowledge spillovers involves the mobility of human capital, embodied in graduating students as they move from the university to a firm. The entrepreneurial university is thus related not only to the

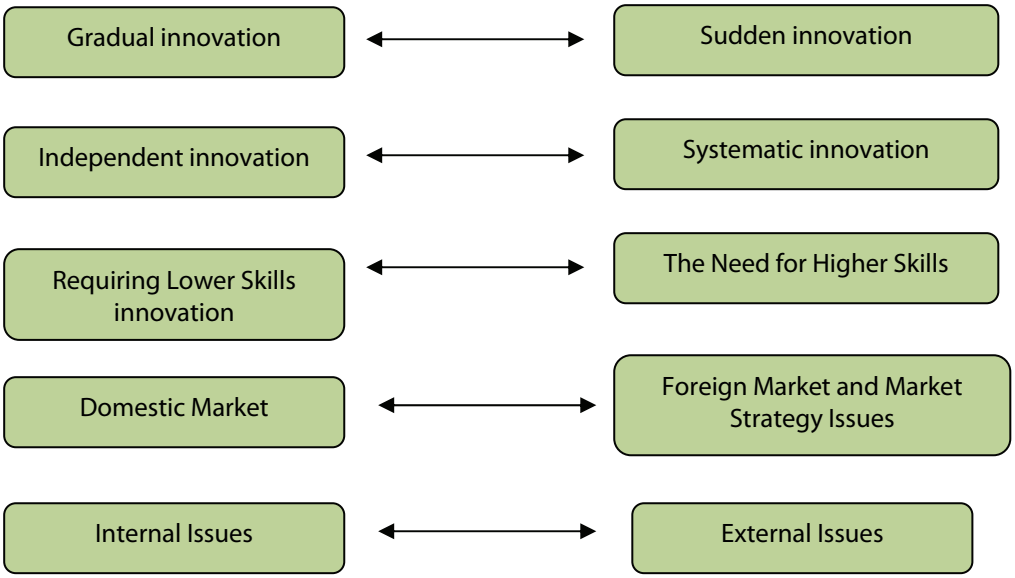

Figure 1

university's mission and tasks, but also to the organizational form, the deeply embedded activities and procedures, and the working practices and goals of individuals and research groups. It thus implies entrepreneurial action, structures and attitudes within the university (Rinne & Koivula, 2005).

In recent years, entrepreneurship as an ingredient of economy development has played a pivotal role in the fields change within world business. It currently has become one of the core elements of managerial reform around the world. Without doubt, entrepreneurship from all over the world is fully cognizant of this potential and thereby those with a high understanding of entrepreneurship roles among economic environments support government activities. Hence, entrepreneurship, or so-called independent business, has emerged for certain goals. Business activities are indeed the most powerful and popular means of delivering entrepreneurship to our life sectors by promoting new business investigations (Shumpeter, 1934).

The rapidly changing environment has brought about new conditions for higher education. The outcome of this situation is the necessity to develop entrepreneurial capabilities in the world in order to create new businesses, take advantage of unused capacities, develop existing capacities and solve social problems. In response to this challenge, the new mission of universities is to create new entrepreneurial capabilities in university graduates. To this end, universities should first get ready and prepare to play this role. In other words, the entrepreneurial approach is a path to adapting the university to real world needs. Academic entrepreneurship means solving the scientific problems of society, governments and firms; creating an innovation development environment within the university's members; supplying the results of academic researchers to the market supply; and producing and supplying new technologies and innovation in expanding the boundaries of human knowledge (Hasoumi and Abtahi, 2006).

3. Aspects of Globalization of Higher Education

Various scholars in their various studies have looked at several factors that could contribute to the inclination of an individual to entrepreneurship. According to Cooper, et al., (2004), there is a significant relationship between education and entrepreneurship. This is to say that the level of education or amount of education or amount of education received by an individual on the importance and development of entrepreneurship can really serve as ingredients of inclination. In a study by Hansmark, (1998), it was found that the need for achievement and locus of control could influence entrepreneurship education. In the same vein, Kirkwood, (2007) found that family background and the kind of orientation given to an

individual is closely related to the entrepreneurship inclination.

Adapting organizational structure and managerial functions for acting in accordance with the requirements of the globalization of higher education is analyzed through contrasting a set of two-dimensional concepts shown in Figure 1. These are the best and most relevant concepts to analyze the different aspects of globalization of higher education and to understand any kind of globalization (Gilbert, 2005).

1. Gradual innovation vs. sudden innovation
2. Independent innovation vs. systematic innovation
3. Requiring lower skills vs. the need for higher skills
4. Domestic market vs. foreign market and market strategy issues.
5. Internal vs. external issues.

Education is undergoing constant changes under the effects of globalization. The effects of Globalization on education bring rapid developments in technology and communications are foreseeing changes within school systems across the world as ideas, values and knowledge change the roles of students and teachers, and produce a shift in society from industrialization towards an information-based society. It reflects the effect on culture and brings about a new form of cultural imperialism. It brings rapid developments in technology and communications, which are bringing changes within school systems across the world as ideas, values and knowledge. The rise of a global society, driven by technology and communication developments is shaping children, the future citizens of the world into 'global citizens', intelligent people with a broad range of skills and knowledge they can apply to a competitive, information based society. The future of countries often lies within their ability to compete in a global market where industrial based economies are giving way to knowledge based industries, realizing the importance of "knowledge, skills and the intellectual capacity to meet the challenges of accelerated change and uncertainty". Education is becoming a lifelong learning and training process for developing transferable skills and knowledge that can be applied to competitive markets where knowledge and information are being traded as commodities.

The role of education has become more linked to globally competitive positions. Subsequent changes in university functions have led universities toward "direct entrepreneurial activity to sustain themselves." This in turn produces a change in institutional approaches to the development of overseas education. University courses must now be cross-cultural in content, which is in association with the growing number of students, particularly in the 1990's, searching for higher education outside of their own country. Education is becoming more invaluable to individuals. In today's environment, education provides individuals with a better chance of employment, which in turn leads to a better lifestyle, power and status.

Under the prevailing global forces, higher education institutions everywhere are subject to global trends. Universities now facing more challenges than ever before, and the rise of a globalised knowledgebase economy has brought universities in many countries under closer scrutiny for the economic contributions they make. Governments have been particularly concerned that universities serve national interests in the global marketplace. There is an international tendency to emphasize the practical, technical value of higher education. The commodification of knowledge as intellectual property has occurred particularly with regard to connecting the intellectual work of universities with community, business, and government interests and priorities. While such a tendency is often welcomed by so-called applied disciplines, it causes tensions between the more profitable applied subjects of science and technology, and those of basic theoretical enquiry, particularly arts and humanities subjects. It also creates institutional winners and losers.

Under the impact of globalizing market forces, there has been a general trend towards the reduction of per capita public funding to higher education at a time when the system is still expanding at both the initial and the 'life-long learning' levels. The burden of funding higher education is being shifted more and more to the shoulders of the individual on a 'users-pay' basis. Even public universities are increasingly funded by non-governmental sources, especially via student tuition and other fees, donations raised from alumni and others, and direct payment from business for services provided by universities.

4. What is the Government's Role in Promoting Entrepreneurship?

Government influence and support for entrepreneurship is very crucial to promoting

entrepreneurial development in order to guarantee SMEs future business success. Thus, it will contribute to greater ability and power for success factors in entrepreneurship. In developing areas, satisfactory government support has been shown to be important for small firm success (Yusuf, 1995). Small and Medium-sized Enterprises (SMEs) in market economies are the engine of economic development. Owing to their private ownership, entrepreneurial spirit, their flexibility and adaptability as well as their potential to react to challenges and changing environments, SMEs contribute to sustainable growth and employment generation in a significant manner. SMEs have strategic importance for each national economy due a wide range of reasons. Logically, the government shows interest in supporting entrepreneurship and SMEs. There is no simpler way to create new jobs, increase GDP and raise the standards of the population than supporting entrepreneurship and encouraging and supporting people who dare to start their own business. Every surviving and successful business means new jobs and GDP growth.

Therefore, designing a comprehensive, coherent and consistent approach by the Council of Ministers and entity governments to entrepreneurship and SMEs in the form of a government support strategy to entrepreneurship and SMEs is an absolute priority. A comprehensive government approach to entrepreneurship and SMEs would provide for a full coordination of the activities of numerous governmental institutions (chambers of commerce, employment bureaus, etc.) and NGOs dealing with entrepreneurship and SMEs.

Malaysia is among the countries now enjoying an emerging economy. The number of companies in Malaysia is growing rapidly and it is now becoming a centre of new business opportunities as international investors have begun to view Malaysia as the place to invest their money and establish their businesses. Of consequence, the development of entrepreneurship has become the main agenda, which is evident by the introduction of mechanisms that cater to entrepreneurs (Ariff and Abu Bakar, 2005; Ismail et al., 2009). Such mechanisms would spur economic activities and in turn, create employment growth. One of the mechanisms introduced by the government is support for entrepreneurship education, which has become an important part of the curriculum in higher education institutions in Malaysia (Ismail et al., 2009). The purpose of entrepreneurship education is to produce graduate entrepreneurship that defines the interaction between the graduate as a product of a higher education institution and their readiness to pursue their career as an entrepreneur (Nabi and Holden, 2008).

As a consequence, governments have a central role in supporting ventures whose success potential is not necessarily visible in the short term, but which may have a significant contribution to economic development (Hustedde & Pulver, 1992). Indeed, further research has shown that the provision of management and entrepreneurship training programs, various forms of start-up incentives (e.g., exemption from custom duties, tax concession) and the provision of consulting services enable a person to start a business (Dana, 1987; Hawkins, 1993). Moreover, an extra measurement of the environment is governmental support. Overall, these showed that governments in many countries are actively contemplating measures, both at the local and state levels, to stimulate entrepreneurial activity and to ensure that adequate financing and advice is present to back up business formation (Keuschnigg & Nielsen, 2000).

The pressures within the higher education sector have increased the interest of researchers on the connection between entrepreneurship and education in general and various entrepreneurship education programs in particular (Fayolle, 2006).Some institutions in Malaysia have responded to the need to impart entrepreneurship knowledge by establishing entrepreneurship centers and units catering to business students (Ismail et al., 2009). They have designed courses in the form of degree/certificate programs on major entrepreneurship but there is debate on the effectiveness of the content and the approaches (Donald, 2005). In essence, there is no common understanding of how entrepreneurship education can be realized within institutions and there is little experience of incorporating it within education institutions (Donald, 2005).

The development and delivery of entrepreneurship education is often affected by the internal organizational structure of an institution, controlled by an inflexible curriculum which impedes interdisciplinary approaches to such education (European Commission, 2008). Despite the efforts that institutions are devoting to mainstreaming entrepreneurship within institutions in Malaysia, there are many challenges that face these efforts, including resource constraints, the narrow understanding of entrepreneurship education, the ambivalence of different academic units, resistance from university managers and some teaching staff, as well as

	Not Sure	Not Affected	Somewhat Affected	Very Much Affected	NA	Total
Advances in production technology	1.4%	19.72%	57.75%	15.49%	5.64%	100%
Information technology	2.82%	14.08%	52.11%	25.35%	5.64%	100%
Global over capacity/ reduced demand	1.41%	25.35%	50.70%	16.90%	5.64%	100%
Trade liberalization	2.82%	22.52%	40.85%	29.58%	4.23%	100%
Changing consumer behavior	1.4%	23.94%	52.18%	15.44%	7.04%	100%
International quality management standards	0.00%	18.43%	54.32%	21.62%	5.63%	100%
International environmental management standards	4.23%	39.44%	39.44%	5.63%	5.63%	100%

Table 1: Impact of Global Business Environments on Entrepreneurship

the expansion in enrolment (Donald, 2005). Thus fitting entrepreneurship education into the current system of higher education structures and the way it can be fitted into the broad network of education theory is the central challenge (Gibb, 2011). Therefore, the process of embedding entrepreneurship within institutions may need more time and the design of new ways to sensitize it.

The fact that cooperation and regulation are required on many levels as a consequence of the complexities and transnational nature of current world issues has led a number of scholars to predict the "end" of national government power. Some argue that the government may only adjust to globalization, but not have an active role in it. Some believe that the government will become obsolete. Despite the many concerns about the loss of sovereignty, the government remains the key actor in domestic as well as international arenas. The popular assumption that the emergence of global civil society and increasing levels of cross-border trade, finance and investment flows will turn the government into an anachronism is wrong. In the international arena, closer cooperation and concerted action among governments represent an exercise of government sovereignty. Such concerted action does not necessarily weaken governments; rather, it can strengthen them by creating a more stable international environment and by giving them greater scope to expand their exchanges in a variety of fields. Moreover, globalization without effective and robust multilateralism is bound to lead to crisis because markets are neither inherently stable nor equitable.

5. What is the Influence of Globalization in Promoting Entrepreneurship?

Globalization is a term which has been used to describe and explain many worldwide phenomena. To be sure, globalization is a complex phenomenon, which encompasses a great variety of tendencies and trends in economic, social and cultural spheres. It has a multidimensional character and thus does not lend itself to a unique definition. For the purpose of simplicity, it may be described as increasing and intensifying flows between countries of goods, services, capital, ideas, information and people, which produces cross border integration for a number of economic, social and cultural activities. It creates both opportunities and costs and for this reason it should neither be demonized nor sanctified, nor should it be used as a scapegoat for the major problems that are affecting the world today.

Globalization has completely changed the way in which people communicate and conduct business.

Because international business is now a commonality rather than a strategic advantage, entrepreneurs must understand how globalization has a direct impact on operational decisions. It is common for small-businesses to be impacted by globalization because of the ability of corporate giants to acquire cheaper goods and labor. However, small-business entrepreneurs throughout the world are needed for many reasons such as maintaining low unemployment rates and upholding innovation levels. While entrepreneurship is extremely significant to the global economy, its direct impact and importance can be perceived differently throughout the world.

The decision for Malaysia to embrace globalization has obvious implications for its local enterprises. In a study conducted by the author for the Asian Productivity Organization on the impact of globalization, business representatives (72 respondents out of a sample of 235 SMEs) were asked to respond to a series of questions on the extent to which their businesses had been affected by the global environment. The findings of one aspect are shown in Table 1 below.

Globalization compels businesses to adapt to different strategies based on new ideological trends that try to balance the rights and interests of both the individual and the community as a whole. This change enables businesses to compete worldwide and also signifies a dramatic change for business leaders, labor and management by legitimately accepting the participation of workers and government in developing and implementing company policies and strategies. Globalization brings reorganization at the international, national and sub-national levels. Specifically, it brings the reorganization of production, international trade and the integration of financial markets. This affects capitalist economic and social relations via multilateralism and microeconomic phenomena, such as business competitiveness, at the global level. The transformation of production systems affects the class structure, the labor process, the application of technology and the structure and organization of capital. Globalization is now seen as marginalizing the less educated and low-skilled workers. Business expansion will no longer automatically imply increased employment.

6. Conclusion

There is a need for entrepreneurship in Malaysia as it faces the challenges of globalization and the knowledge-based economy. Only with entrepreneurship at various levels in society, including the government, can Malaysia continue to thrive. There is now a renewed effort in place to encourage entrepreneurship. Only time will tell if the efforts to foster entrepreneurship will bear fruit in Malaysia. The definition of entrepreneurship is also broad and encompasses entrepreneurial behavior. Malaysia needs entrepreneurial efforts at all levels of the economy. With concerted efforts, the outlook is promising, even as the task is challenging. There is a greater supply of potential entrepreneurs in society than what is now being produced by the education system. Whether this nation or any other will be able to solve its economic and social problems will depend on the availability of a continued and increasing stream of creative talent. Entrepreneurship education can be a major contributor to creating new education structures that are themselves entrepreneurial. If this happens, then the future of the nation will be insured.

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