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From the Editor

It is with great sadness that we inform you that our founding member of the editorial board, prof. dr Besim Čulahović, passed away in Sarajevo on February 25th of this year. We will miss his dedication to contribute to the development of the South East Journal of Economics and Business. All faculty members of School of Economics and Business in Sarajevo are going to miss prof. Čulahović's intellectual and moral integrity. The current issue of the Journal is dedicated to this great scholar.

Joel I. Deichmann in the paper titled „Historical Legacies and Foreign Direct Investment in Bosnia and Herzegovina“ examines the origins of foreign direct investment (FDI) in Bosnia and Herzegovina with special reference to historical legacies. Because Bosnia and Herzegovina has spent time under the Ottoman, Austro-Hungarian, and Yugoslav flags, particular attention is paid to the role of history in impacting inflows of FDI. Five models are specified using various dependent variables to measure FDI, and all uphold the importance of historical legacies and cultural proximity. Equally interesting is the absence of significance among traditional gravity variables in this unique investment landscape. Policy implications include the need for government to assist firms in overcoming concern about instability, corruption, and a complex permitting process.

“Selection and Implementation of ERP Systems: A Comparison of SAP Implementation between B&H and Turkey” is the paper written by Seyda Findik, Ali Osman Kusakci, Fehim Findik, and Sumeyye Kusakci. The authors discuss the selection and implementation of ERP Systems. The ERP concept, the selection process, and the importance of selecting a certain ERP solution for the companies are also dealt with. After the literature review of ERP implementation strategies, the authors review the survey that was conducted among several large and mid-size companies that adopted SAP, one of the major ERP solutions, in their businesses in Bosnia and Herzegovina and Turkey. In the final section, a comparison is made

between Turkish and Bosnian companies. While the study indicates some differences in implementation strategies and major benefits, similarities between the two countries are more pronounced.

The third paper in this issue of the Journal is “Business Cycle Synchronization in Croatia.” It is written by Zdravko Šergo, Amorino Poropat, and Jasmina Gržinić. The authors analyze business cycle synchronization in the Croatian economy, using various annualized growth rate variables over a period of eighteen years (1992-2010), detrended by Hodrick-Prescott filter and following the Harding and Pagan methodological procedure in determination of its turning points. The conceptual analysis of synchronization is based on the technique of concordance indexes and correlation coefficients obtained by the HAC estimators. The main result of the research shows that there is a high degree of probability that dismissal of employees in the Croatian economy will coincide with the contraction phase in industry. The cyclic phase of growth in job creation in great measure coincides with the cyclic phase of growth in export and construction sector and also with tourist arrivals. There is almost perfect synchronization between the cyclic phases of the construction sector and import.

Laura Juznik Rotar in the paper titled “Evaluating the Effectiveness of an Institutional Training Program in Slovenia: A Comparison of Methods” aims to estimate the effect of an institutional training program on participants' chances of finding a job, using a rich dataset which comes from the official records of the Employment Service of Slovenia and taking into account the potential bias due to the existence of unobserved confounding factors. To deal with these selection biases, three methods are implemented in a comparative perspective: (1) instrumental variable (IV) regression; (2) Heckman's two-stage approach and (3) propensity score matching. The author points to several important divergences between the results of parametric and non-parametric estimators.

Some of the results indicate that the institutional training program impacts participants' chances of finding a job, especially in the short run. In the long run, however, the results are not so obvious.

The fifth manuscript is "Cross-National Variations in the Under-Reporting of Wages in South East Europe: A Result of Over-Regulation or Under-Regulation?" Author, Colin C. Williams, seeks to explain the cross-national variations in the tendency of employers in South East Europe to under-report the wages of their employees by paying them two wages, an official declared salary and an additional undeclared envelope wage. Reporting the results of a 2007 Eurobarometer survey of this practice undertaken in five South East European countries, the finding is that the commonality of this illicit wage practice markedly varies cross-nationally, with 23 percent of formal employees in Romania but just 3 percent in Cyprus receiving an under-reported salary. Finding that the under-reporting of wages is more prevalent in neo-liberal economies with lower levels of state intervention and less common in more 'welfare capitalist' economies in which there is greater state intervention in work and welfare, the resultant conclusion is that the under-reporting of employees wages by employers is correlated with the under- rather than over-regulation of work and welfare.

The sixth article in this issue of the Journal is titled "A Feasibility Study for Six Sigma Implementation in Turkish Textile SMEs". Mehmet Tolga Taner investigates the Critical Success Factors (CSFs) for the successful introduction of Six Sigma in Small and Medium Sized Turkish Textile Enterprises. A survey-based approach is used in order to identify and understand the current quality practices of the Small and Medium Sized Enterprises (SMEs). CSFs and impeding factors are identified and analyzed. The involvement and commitment of top management, linking quality initiatives to employee and information technology and innovation are found to be important CSFs to the textile

SMEs. The leadership and commitment of top management, strategic vision, and data collection and measurement are found to be the most CSFs for successful introduction of Six Sigma, whereas the lack of knowledge of the system to initiate and the presence of the ISO-certification in the company hinder its implementation. Lack of qualified personnel and incompetency with new technologies are found to lower the performance of Turkish textile SMEs.

Spyros Vassiliadis, Diogenis Baboukardos, and Panagiotis Kotsovolos contribute the paper "Is Basel III Panacea? Lessons from the Greek Sovereign Fiscal Crisis. In the period 2007-2009 the global economy faced the most severe crisis after the Great Recession of 1929. In the aftermath of the crisis a substantially revised version of Basel II, named Basel III, was proposed, introducing new, tighter capital adequacy and liquidity guidelines. Basel III constitutes the new basic embankment against a possible crisis in the future. The same period those discussions were taken place for the new global regulatory framework, the most severe sovereign debt crisis the country ever faced, burst out in Greece. Considering the Greek banking sector as the starting point and the effects of the fiscal crisis on the sector, this paper discusses the new Basel III guidelines and their possible implications in times of turmoil. The new framework can play a crucial role in deterring a new financial crisis; however it should not be regarded as panacea for all the shortcomings of banking sectors.

"Residential Characteristics of Armed-Forces Personnel and the Urban Economy: Evidence from a Medium Sized City in Greece" is authored by Dimitrios Skouras, Dimitrios Skouras, and Christos Kollias. The paper explores the location and residential decisions of Greek military households. To achieve this, primary data were collected by means of a questionnaire survey addressed to military personnel located in Volos, a medium-sized Greek city in the greater area of which a number of major military

facilities are located. The study starts by examining the residential distribution of the military households to consider whether clustering or dispersion is evident. Then, an attempt is made to explain the observed pattern with reference to conventional urban economics' determinants of location choice or to other factors related to social or professional characteristics of the group. Such analysis enables the authors to draw some preliminary conclusions regarding the potential effects military facilities have on both the urban spatial structure and the housing market.

Drini Imami in the paper titled "Corruption, Licensing and Elections – A New Analysis Framework" analyses corruption and licensing in conjunction to elections in Albania. The author develops an analysis framework utilizing datasets of two types of national licenses, namely licenses for media and notaries about which there have been concerns of transparency in Albania. In the months preceding elections, significantly more licenses of both types are issued. One possible explanation for the "intensification of licensing" during pre-election months is corruption.

"Evaluating the Impact of the Informal Economy on Businesses in South East Europe: Some Lessons from the 2009 World Bank Enterprise Survey" is written by John Hudson, Colin C. Williams, Marta Orviska, and Sara Nadin.

The aim of their paper is to evaluate the variable impacts of the informal economy on businesses and employment relations in South East Europe. Evidence is reported from the 2009 World Bank Enterprise Survey which interviewed 4,720 businesses located in South East Europe. The finding is not only that a large informal sector reduces wage levels but also that there are significant spatial variations in the adverse impacts of the informal economy across this European region. Small, rural and domestic businesses producing for the home market and the transport, construction, garment and wholesale sectors are most likely to be adversely affected by the informal economy. The paper concludes by calling for similar research in other global regions and for a more targeted approach towards tackling the informal economy.

Finally, we would like to invite you to submit papers 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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Historical Legacies and Foreign Direct Investment in Bosnia and Herzegovina

Joel I. Deichmann *

Abstract:

This paper examines the origins of foreign direct investment (FDI) in Bosnia and Herzegovina (BiH) with special reference to historical legacies. BiH is a very interesting case because of its position on the frontier of Europe, a region with a rich cultural history marked by alternating periods of coexistence and violence. Because the country has spent time under the Ottoman, Austro-Hungarian, and Yugoslav flags, particular attention is paid to the role of history in impacting inflows of FDI. Five models are specified using various dependent variables to measure FDI, and all uphold the importance of historical legacies and cultural proximity. Equally interesting is the absence of significance among traditional gravity variables in this unique investment landscape. Policy implications include the need for government to assist firms in overcoming concern about instability, corruption, and a complex permitting process. As little has been published on FDI in BiH, future research suggestions are presented.

Keywords: foreign direct investment, origin effects, Bosnia and Herzegovina

JEL: C50, E01, F15, F49, O52

DOI: 10.2478/v10033-012-0001-y

1. Introduction

Foreign Direct Investment (FDI) is generally considered to be an engine for economic growth (Balasubramanyam, Salisu, and Sapsford 1999; Bevin and Estrin 2004; Demekas, Horváth, and Ribakova 2007), and as such it is pursued actively by government agencies such as FIPA, the Foreign Investment Promotion Agency of Bosnia and Herzegovina (Mustafic-Cokoja 2010). FDI brings advantages to the host country, such as technology transfer, skill diffusion, and income effects (Balasubramanyam et al. 1999), all of which have especially important implications for Bosnia and Herzegovina (BiH) given its transitional status. Although a Stabilization and Association Agreement was signed with the European Union (EU) on 16 June 2008, BiH remains one of Europe's poorest countries, and thanks in part to its complex political structures, is generally considered to be at best a distant candidate for EU accession (*Economist*, 2011).

What makes BiH remarkable as a case for studying FDI inflows is its historical political and cultural affiliation with multiple powerful entities. This young state represents a unique geographic context as a successor region of the Ottoman and Austro-Hungarian Empires, as well as Yugoslavia. It is plausible that cultural linkages developed through these historical associations have led to a considerable portion of BiH's inward investment stock across present-day borders. Much work has been done to analyze FDI in transition economies of Europe, but most of these studies omit BiH, in large part due to a lack of FDI until recently. Here, we focus on BiH alone because as Bevin and Estrin (2004, 780) convincingly

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argue, in the former Yugoslavia, “conditions make (countries) special cases... they require country-specific explanations.”

With regard to the transformational recession that has characterized the region of Central and Eastern Europe since the fall of the Iron Curtain and the demise of the former Yugoslavia, BiH finds itself in the “most miserable situation” (Koyama 2008, 138), largely due to its central position in the recent Balkan wars. Income levels remain considerably lower in SEE (Southeastern Europe) than in Central Europe and the Balkans, and investment inflows have generally been sluggish with the notable exception of Croatia, which itself has attracted more than half of the FDI stock in the Western Balkans (EBRD 2011). However, BiH and the broader region will likely gain relative attractiveness for some industries as conditions continue to stabilize, especially because the most attractive assets in Central Europe have already been sold, and wages there have increased (Kekic 2005).

1.1. Overview of FDI in Bosnia- Herzegovina

In attracting FDI, Bosnia and Herzegovina lags behind most states in the region, especially those countries that participated in the 2004 and 2007 EU expansions. Among twenty transition economies of Europe as of the end of 2009, BiH ranks sixteenth with €5.6 billion, ahead of only Montenegro, Macedonia, Albania, and Moldova (calculations by Hunya 2010, 24). However, in terms of stock per capita, BiH has attracted €1500, more than Russia, Ukraine, Moldova, or Belarus. Like most transition states, FDI in BiH peaked in 2007 (with €1.517 billion), and has since struggled to attract the attention of foreign firms, which are facing very difficult economic times (Vogel 2011).

Why has BiH been unable to attract large amounts of foreign capital, even long before the global economic crisis? According to a report by *Business Monitor International* (2010) the country continues to be plagued by weaknesses in the business environment, an uncompetitive tendering process, and the inefficiencies caused by the divided structure of the country and its bureaucracy. The consultants conclude that “this confused and dense bureaucracy presents further obstacles to the smooth running of a project and contributes to Bosnia's poor overall score of 40 out of 100 in BMI's Infrastructure Business Environment Ratings”. These assertions are corroborated in *The Economist* (2011), which bemoans the complexity of BiH's

government, headed by a “six-pack” of leaders from three distinct geographical entities.

In order to overcome the aforementioned disadvantages and facilitate FDI, BiH's Foreign Investment Promotion Agency (FIPA) was established in 1998. The agency also publishes data on investment inflows to the country since 1994. These data are obtained from the Bosnian Central Bank and by contacting investors themselves. Bandelj (2010, 487) points out that “professionalizing FDI by establishing a state FDI agency... show(s) the commitment of post socialist governments to FDI and will facilitate FDI transactions”. FIPA serves three government entities: the Federation of Bosnia and Herzegovina, the Republika Srpska, and the small district of Brčko. Dika Mustafic-Cokoja (2010), Senior Advisor at FIPA, encourages investors by highlighting the advantages of the country's location at the crossroads of east and west, as well as low labor costs, inexpensive privatization deals, tax holidays, an investment support fund, and free trade with EU member states by virtue of the association agreement that was signed by Bosnia and Herzegovina in 2008. Importantly, such agencies confirm a commitment on the part of host governments to facilitating FDI, and an embrace of FDI as an engine for growth.

Table 1 shows the annual inflows of FDI to BiH from 2001-2009 in million Euros. By 2001, the total FDI stock had reached 10.2% of GDP (Hunya 2002, 11), about \$125 per capita. Since that time FDI inflows increased steadily until the financial crisis began in 2007, at which point FDI inflows to BiH, like elsewhere, dropped off precipitously.

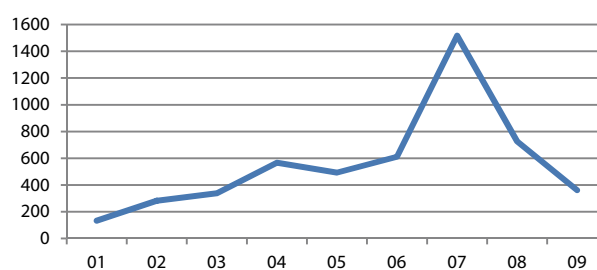


Figure 1: Annual Inflows of FDI into Bosnia and Herzegovina (Source: Hunya 2010)

Table 1 summarizes the leading origins of FDI in BiH, as measured in thousands of Euros and in number of transactions. Both measures are deemed important because the value of investment represents its potential impact to the host economy, while the number of

transactions is important because it signifies the number of firms that made the decision to invest in BiH.

	Country	€ mil	#
1.	Austria	963	56
2.	Serbia	881	67
3.	Croatia	692	115
4.	Slovenia	547	78
5.	Russia	468	5
6.	Germany	286	35
7.	Switzerland	265	19
8.	Lithuania	256	3
9.	Netherlands	145	19
10.	Turkey	131	7
11.	Italy	120	45
12.	Luxembourg	83	5
13.	United States	55	16
14.	UAE	51	2
15.	France	49	4
16.	Saudi Arabia	48	5
17.	Denmark	36	9
18.	Virgin Islands	23	2
19.	Cayman Islands	22	1
20.	United Kingdom	22	11
21.	Belgium	21	1
22.	Liechtenstein	21	2
23.	Kuwait	20	5
24.	Cyprus	20	8
25.	Sweden	13	2
26.	Bulgaria	11	1
27.	Poland	9	1
28.	Slovakia	7	2
29.	Montenegro	7	3
30.	Hungary	7	4
31.	Egypt	5	1
32.	Czech Republic	4	3
33.	Malaysia	4	3
34.	Norway	3	2
35.	China	2	1
36.	Spain	1	2
37.	Australia	1	1
38.	Guinea	1	1
39.	Tunisia	1	1

Data Sources: Central Bank of Bosnia and Herzegovina (€ values, converted by author from KM), FIPA (#). Note: transaction numbers (“#”) are estimates only.

Table 1: Leading Origins of FDI in Bosnia and Herzegovina, 1994-2010

BiH's investment picture is dominated by European countries—in fact, the twelve leading origins of FDI are from Europe, followed by the United States and UAE. Three of the top four home countries were constituent regions of the former Yugoslavia. Intuitively, a glance at Table 1 suggests that gravity forces are likely at work. In other words, it is reasonable to expect that FDI is

facilitated by geographical proximity, although most of the leading origins are not among the world's largest economies (note that the USA is #13, Germany is #6, and China, Japan, and India are absent from the rankings). The goal of the present research is to determine the explanatory variables governing the patterns presented in Table 1.

This paper is organized as follows. Following Section 1, the relevant literature is reviewed in Section 2, followed by an overview of hypotheses in Section 3. Section 4 presents the data and methodology. The five models are analyzed in Section 5, along with a discussion of limitations and suggestions for policy and future study. Finally, Section 6 offers conclusions.

2. Literature

John Dunning (1980) set forth his pioneering “eclectic” framework for explaining the locational determinants of the origins and destinations of foreign direct investment, and subsequently (1998) reaffirmed the importance of place-specific advantages as facilitators of firms seeking resources, markets, efficiency, and/or strategic assets abroad. The first pillar of Dunning's “O-L-I” (ownership- location- internalization) approach establishes the precedent for the present study. Ownership advantages are enabling characteristics specific to home countries, and are also referred to as “origin-effects”. Rodrigues-Pose and Crescenzi (2008) forcefully criticize Friedman's (2005) metaphor of a “Flat World”, making the case for an enduring role of “mountains” that should not be overlooked in what has become a flourishing literature on economic geography with substantial reference to FDI. The case for the present study is made on the basis of interrogating findings from existing papers. Keeping existing contributions in mind, a manuscript by Grosse and Trevino (1996) offers the first such empirical study published on origin effects (of FDI in the USA), and provides a basic template to be replicated here in the context of BiH.

In her analysis of FDI in Europe's transition economies, Bandelj (2002) introduces a relational approach that focuses on institutional, political, economic, and cultural connections as channels for transactions. She argues that such ties are particularly important in conditions of high risk. Although the only country from the Western Balkans that she considers is Croatia due to instability and incomplete data in this early (2002) paper, one might expect her findings to be applicable to the rest of South

East Europe with the return of stability and acceleration of FDI one decade later.

Hunya (2002) provides an insightful commentary on South East Europe using *WiiW* data through 2001, observing that the global decline of FDI did not dramatically impact the region. Hunya laments that during the early 1990s, when the region needed FDI the most, its economic and political situation caused most investors to stay away, except for projects that yielded rapid returns. He further observes that beginning in 1997, with evidence of stability and progress in transformation, many countries in the region began to attract noteworthy levels of FDI. Even during this period, however, the complexity of administrative rules, lack of transparency, and excessive perceived risk crippled the region's ability to attract satisfactory FDI, a finding echoed by others (Brada, Kutun, and Yigit, 2006). For all of the reasons raised by Hunya, flows into BiH remained negligible until the late 1990s. The *WiiW* dataset continues to be a useful source of information on FDI flows, and Hunya (2010) provides regular discussions as updates are released.

Extending this rather pessimistic appraisal of the Balkan FDI scene is an inquiry by Bitzenis (2004) into the case of Bulgaria. Bitzenis examines the sub-national distribution of FDI according to the leading origins: Turkey, Russia, Greece, Germany, and Cyprus. He employs survey questionnaires to obtain answers on the importance of historical ties, common religion, and cultural closeness. This project is particularly instructive for the present study because the surveys permit the author to demonstrate a deep understanding of historical inertia and cultural proximity. Counter to his expectations, Bitzenis finds that in most investment cases in Bulgaria, historical links do not significantly affect the decision to invest, and his examination of the role of culture is inconclusive.

Bevin and Estrin (2004) offer one of the most comprehensive early analyses of FDI into European transition economies. While countries from the former Yugoslavia (with the exception of Slovenia) are excluded from their dataset, these authors set forth a useful framework to examine the role of GDP of origin and destination, distance, trade flows, and host country labor costs as well as a composite variable of risk factors. They find that FDI in transition countries is largely explained by gravity factors, including home country GDP and the distance of the home country to the host country. In addition, low labor costs and EU accession prospects are

found to be significant facilitators of inward flows to the host countries.

Noting that only negligible FDI stock was present in CEE until the 1990s, and observing the dramatic upsurge thereafter, Brada et al. (2006) examine the enduring effects of economic transition and political instability in some countries, mainly those in the Balkans. Specifically, they point out that in addition to the aspect of political instability that captures uncertainty about whether democratic reform will continue, Balkan countries were hampered by investors' perceived risk in the midst of actual or potential warfare. Using benchmarks, the authors predict inflows to Europe's transition countries and compare them with the actual FDI. It was not until 1999 when actual FDI in BiH surpassed the levels predicted by two equations of economic and political determinants. The authors attribute shortfalls from expected FDI inflows to the added risks caused by regional strife in BiH and its neighbors.

Demekas et al. (2007) demonstrate the practicality of gravity approaches for understanding the distribution of FDI in transition economies of Central and Eastern Europe (CEE), highlighting the importance of government policies. They find that unit labor costs, corporate tax burden, infrastructure, and foreign exchange and trade regime all impact the relative attractiveness of host countries, and they estimate the total FDI that can be achieved with careful policy. Among the countries under investigation, Bosnia and Herzegovina exhibits the largest gap between actual and potential FDI (83 percent). In other words, due to failed government policies, actual FDI in the country is only 17 percent of its potential. This finding underscores the need to better understand the investment situation in Bosnia and Herzegovina in particular.

Koyama (2008) offers an extensive volume that analyzes various aspects of transition in Central and Eastern European Countries using data from the Vienna Institute for International Economic Studies ("*WiiW*", see Hunya 2010), which in turn are collected from respective national banks. In his chapter on Foreign Direct Investment in the region, he maintains that FDI in BiH remains stunted by high corruption levels and residual memories of conflict, resulting in FDI stock per capita of merely \$435 by 2004, surpassing only Serbia and Montenegro. However, he cites a recent upswing in FDI attributable to privatization deals. Because of data constraints, his analysis of BiH is broadened to regional groupings, and the country is absent from most of the

data tables. However, Koyoma (2008, 202) does refer to projects that show “strong economic connection” between BiH and other republics of the former Yugoslavia. As evidence, he shows that within the Balkans, BiH participates in the highest percentage of intra-regional trade since 1995.

Bandelj (2010) provides an excellent analysis of EU integration and legacies as factors raising FDI inflows into the ten CEE countries that joined the European Union in 2004 and 2007. In particular, her articulation of post-socialist legacies is relevant to the consideration here of the linkages that developed throughout the former Yugoslavia. She also finds evidence that EU accession has both direct and indirect advantages for investors. She then goes on to discuss the temporary handicap to foreign firms introduced in Slovakia under Mečiar’s corrupt and repressive regime that favored political cronies, a similar phenomenon to that which at times has been at work in BiH.

3. Hypotheses

Based on the aforementioned literature and on related plausible expectations, the seven hypotheses are set forth. It is expected that the origins of FDI in BiH can be explained in large part by a shared history of political union, origin country market size and market strength, EU membership, geographic and cultural distance, and bilateral trade flows.

H1 History of Political Union (POL)

Firms from countries that have been formally aligned with BiH are more likely to do business there. The rationale for this expectation is that BiH did not begin with a “clean slate” on November 21, 1995 when the Dayton Accords were signed. Like elsewhere in transition economies (Bandelj 2002), embedded networks in various forms are likely to channel economic transactions such as investment. Moreover, Murat and Pistoiesi (2009) demonstrate that migration facilitates investment, and centuries of human movement throughout the region are enabled within territorial regimes, although their borders have shifted.

The nascent federal democratic republic of BiH has a long history as part of other empires and nation-states. For four centuries (1463-1878), the region was dominated by the Ottoman Empire, and was later ceded to Austro-Hungary, with which it remained formally affiliated until

1918. From 1918-1992, BiH was predominantly affiliated with various forms of the Yugoslav state, and following Bandelj (2010) socialist legacies are likely to remain, connecting it to the other former republics. In particular and most recently, BiH’s centralized location within Yugoslavia and its natural resources served as advantages for developing military and other manufacturing industries that were distributed to portions of Yugoslavia that now represent separate states.

H2 Market Size (GDP)

Gravity models predict that the interaction between two bodies is positively related to the size of those bodies. With the bodies in question here representing Bosnia and its FDI origins, and, following Kleinert and Toubal (2010) who define interaction as FDI flows, it is expected that FDI will be greater from countries with larger economies, measured by Gross Domestic Product. Evidence of GDP’s role was documented by Bevan and Estrin (2004) in the context of other European transition economies, and Botrić and Škuflić (2006) report its significant effect in South East Europe. The testing of H2 will either extend or refute the role of economic mass as a determinant of FDI in BiH.

H3 Market Strength (GNIPC)

Gross National Income per capita (GNIPC) is a measure of relative economic strength. It is expected that firms from wealthier economies as measured by GNIPC will be more inclined to invest in BiH due to an access to venture capital at home. The variable can also be viewed as a surrogate for wages, which could be a reason for firms to pursue labor-intensive production outside their own borders.

H4a EU membership (EU)

Bevin and Estrin (2004) note that announcements about EU accession help attract FDI inflows into European transition countries, and Brada et al. (2006, 669) argue that many investments are made “with a view to (host countries’) entry into the EU”. Similarly, Bandelj (2010) finds that impending EU membership reduces perceived risks, and therefore facilitates cross-border FDI among transition economies. Although its membership is not yet “impeding”, since 1998 BiH has participated in the EU Stabilization and Association Process (SAP), which grants

the Western Balkans access to the European Union market for almost all products. The SAP is in place for Albania, Croatia, the former Yugoslav Republic of Macedonia, and Montenegro, while Bosnia and Herzegovina has made interim agreements on trade and trade-related matters.

H4b EU Membership post-2007

EU membership will be relatively less important as an FDI facilitator since 2007, when firms from the leading European origins of FDI became preoccupied with more immediate challenges related to the financial collapse. FDI flows have declined in many regions since 2007, but the European Union is expected to be particularly hard-hit as a source of investment (Hunya 2010), beginning to recover only in 2011 (Vogel 2011).

H5 Geographic Distance (GEOG)

Gravity models predict that the distance between two bodies will obstruct interaction between them, and this is found to be the case by Bevan and Estrin (2004) as a location choice determinant in European transition economies, measured as the distance between the capital cities of country *i* and country *j*. Bitzenis (2004) corroborates this finding with Greek MNEs in Bulgaria. Although these authors do not examine BiH in their work, the same “distance decay” effect can be expected to hold true in this case. Appreciation for the friction of geographic distance is making a revival in the broader economic geography literature (Rodríguez-Pose and Crescenzi 2008), and for FDI models specifically (Kleinert and Toubal 2010), where distance is widely accepted as increasing fixed costs of operating between two countries.

H6 Cultural Distance (CULT)

Following Bandelj (2002), cultural ties are expected to facilitate FDI. However, these are not the same facilitators as shared political authority as articulated in H1. In this case, cultural distance is measured by a language proxy index ranging from 1-5, based on the degree of differences between origin country language and alphabet, and those of BiH. For example, Croats and Serbs (“1”) use a mutually intelligible tongue and share alphabets (Latin and Cyrillic, respectively); Russians (“2”) use a different Slavonic tongue and the Cyrillic alphabet.

Because English and German are widely spoken in BiH, all native English and German speaking states are assigned “2”, and so on, whereas China, Japan, and are assigned a “5” for the extreme end of the cultural continuum. Given the historical importance of Islam in BiH, on a case-by-case basis scores for countries sharing the Islamic faith are reduced by one in order to capture this cultural tie (for example, Turkey and Saudi Arabia), both of which score a “4” rather than a “5”.¹

H7 FDI will be positively related to trade flows (InTRADE)

Earlier evidence of trade’s role in facilitating FDI in transition economies is presented by Bevin and Estrin (2004), albeit in a lagged model. Blonigen (2001) finds evidence of both substitutional and complementarity effects of trade. Others argue that the two are modes are alternative forms of international operation, and that no theoretical basis exists for them to be related. (Meredith and Maki 1992) find evidence that they are mutually reinforcing. The World Trade Organization (1996) suggests that the relationship between FDI and trade is...

“more complex than is suggested by the traditional view that FDI and trade are alternative means of servicing a foreign market, and hence substitutes. FDI and the trade of home and host countries are, as has been noted, generally complementary. In this connection, liberal trade and investment policies boost FDI and strengthen the positive relationship between FDI and trade. In contrast, high tariffs, threats of contingent protection and financial or tax-based subsidies can create strong incentives to substitute investment for trade, including – in the case of countries with large domestic markets relative to their neighbours – for the diversion of investment by neighbouring firms into the protecting country”.

Given these divergent points of view and a lack of concrete evidence about the relationship, beyond the scope of this paper lies a more complete debate about the relationship between trade and FDI.

This analysis leaves out some conventional origin effects such as exchange rate change (Grosse and Trevino 1996), omitted because the BiH convertible mark (KM) is

¹ A full list of scores is available from the author.

pegged to the Euro, in use by many of the leading investing countries. Other variables, including political

countries that are most associated with the Ottoman and Austro-Hungarian Empires, and the former Yugoslavia. EU

	Model 1 Coefficients	Model 2 Coefficients	Model 3 Coefficients	Model 4 Coefficients	Model 5 Coefficients
Independent Variable ↓	1994-2010	1994-2010	1994-2006	2007-2010	Transactions
Constant (e)	86.639	8.313	54.039	63.532	12.090
ln(GDP)					
POL	129.098 ^a	216.973 ^a	63.643 ^a	76.802 ^a	19.556 ^a
GNIPC					
EU			3.356 ^c		
GEOG					
CULT	-19.173 ^c	-28.182 ^a	-12.086 ^b	-13.840 ^b	-2.589 ^a
ln(TRADE)	9.792 ^c				
R²	.305 ^c	.284 ^a	.250 ^a	.192 ^b	.329 ^a

^a Statistically significant at the 0.001 level (two-tailed)

^b Statistically significant at the 0.01 level (two-tailed)

^c Statistically significant at the 0.05 level (two-tailed)

Table 2: Coefficients and Significance Levels of Variables in the Models

stability (Brada et al. 2006), and corruption measures in the home country, as examined by Deichmann (2010) are omitted in the interest of parsimony. Moreover, they are not expected to play a role in corporations' decisions to invest in BiH.

4. Data and Methodology

The data for the dependent variables are acquired from the Central Bank of Bosnia and Herzegovina. Following Zademach and Rodríguez-Pose (2009), both the value of investment and the number of transactions are considered here in an effort to accurately capture the investment picture. The dependent variables represent mean values over the period under consideration (2000-2009), and are measured in millions of Euros. Where missing values are present, the means are used.

The approach employed is ordinary least squares (OLS) regression, roughly as applied by Gross and Trevino (1996) to examine Origins of FDI in the USA. With the exception of Model 1, following Botrić and Škuflić (2006), in order to allow for more degrees of freedom, the independent variables are added selectively. Two of the independent variables (GDP, GNIPC) are obtained from the World Bank, and are measured in millions of US\$ and in US\$, respectively. POL is a dummy variable for the

is the number of years that an origin country held EU membership during the time period in question. For example, the Netherlands has the value of ten, Slovenia six, and Romania three. Distance is measured between economic centroids, improving upon Bevan and Estin's (2004) use of capital cities. For example, for Germany this is the distance between Sarajevo and Frankfurt rather than Berlin. Cultural distance is estimated on a scale of 1-5 based mainly on linguistic affinities. Adapted from Deichmann (2010), countries where Slavonic languages represent the mother tongue are given a score ranging from "1-2, depending on the level of similarity", with Japanese, Chinese, and Korean at the opposite end of the continuum with "5". Because of the prominence of Islam and use of the Cyrillic alphabet in the Republika Srpska of BiH, these language-based scores are lowered by one point to indicate cultural links to countries including Saudi Arabia and Russia, respectively. The trade variable, reported by Bosnia and Herzegovina's Federal Office of Statistics, is in millions of US\$. Finally, to correct for heteroscedasticity, logarithmic transformations are applied to the GDP and trade variables. Following Burger, Van Oort, and Linders (2009), to avoid bias, values equal to or less than zero are replaced with a small positive number, and in this case 0.1 is employed. This practice is

in order because the goal is to understand FDI inflows, not the withdrawal of investment (negative values).

Table 2 reports the outputs of the five models. Model 1 offers an initial solution by entering all variables including trade for cumulative FDI through 2010. In the interest of efficiency, Model 2 follows a stepwise forward selection algorithm to explain the same variable. Model 3 uses the same selection process for all variables, but only through 2006 (prior to the global recession). Model 4: repeats the process for the next time period: 2007-2010. Finally, Model 5 allows the algorithm to specify the best explanatory variables, but using the number of transactions from 1994-2010 as the dependent variable, thereby interrogating findings on FDI values.

5. Analysis

Table 2 shows that a handful of variables performed well across all of the models, irrespective of specification and dependent FDI variable. As predicted, political legacy and cultural distance both play a role as origin-effects of FDI in Bosnia and Herzegovina. Evidence is abundant that firms from countries that once represented the Ottoman and Austro-Hungarian Empires, as well as the former Socialist Federal Republic of Yugoslavia, enjoy advantages that facilitate FDI across present-day borders. The value of trade (logarithmic transformation) is omitted from models subsequent to 1, because of its high correlation with many of the dependent and independent variables (notably, its simple correlation with the dependent variables in Appendix C). Moreover, uncertainty remains as to whether trade and FDI are substitutes for one another (Meredith and Maki 1992), bringing to question whether trade itself should be considered a dependent variable in such models (see also World Trade Organization 1996). While it was worthwhile to include the variable in Model 1, because of this ambiguity and its non-significance, it is removed from this exercise to allow for further debate elsewhere.

Model 2 yields determinants of cumulative value through 2010. With the removal of trade, the significant variables remain political legacy and cultural distance, with the model's tolerance improving to .758 and the variance inflation factor (VIF) at the satisfactory level of only 1.319. As predicted, political legacy shows a positive valence, while FDI is negatively related to distance. T-scores are 4.928 and -3.728, respectively, and both are significant at the $p = .000$ level. Because of the complexity of operating in BiH, an investment environment that lacks

transparency, the advantage of cultural knowledge is enormous. FIPA's senior advisor Dika Mustafic-Cokoja (2010) clarifies this observation with her explanation that companies from "neighboring countries are informed about safety in Bosnia".

Model 3 examines only FDI stock through 2006, but yields similar results. Again, political legacy and cultural distance are both significant factors, but EU membership also enters this equation with $p = .04$ that the relationship is due to chance. A glance at the model's marginal effects suggests that every year of EU membership for the origin country leads to €3,356,000 of additional FDI, lending credence to the assertion that EU associate membership is indeed important. Finally, it is worth noting that the model's tolerance and VIF show further convergence toward the value of 1.0 and therefore no sign of problematic multi-collinearity in the model.

The dependent variable in Model 4 is the total FDI flow from 2007-2010, approximating the years of global recession. During this time period, EU membership drops out of our explanation, suggesting that leading firms from EU countries were unsurprisingly preoccupied with challenges outside of BiH, corroborating observations from Hunya (2010) and EBRD (2011) elsewhere in the region.

Following Zademach and Rodríguez-Pose (2009), Model 5 is intended to either confirm or refute the findings of Models 1-4 by replacing the dependent variable of FDI value with the number of investment decisions. The rationale for using "transactions" as a dependent variable is that each investment represents a location decision by foreign executives, irrespective of their firm's size. Remarkably, the model yields an identical set of significant variables to those yielded by Model 2; again, political affiliations and cultural distance are key players in the origins of FDI to the nascent federal democratic republic.

Overall, the models performed well, with satisfactorily high tolerances and low VIFs, suggesting a reasonable level of parsimony. The R^2 scores were relatively low (.192-.329), but nonetheless significant. What is surprising in these models is the non-role of traditional gravity variables, specifically origin country size and geographic distance. Less than two decades after the demise of Yugoslavia and the region's debilitating war, the situation of Bosnia and Herzegovina remains unique in that traditional explanations of FDI that have been confirmed in many other contexts (Demekas et al. 2007) do not appear to apply. Of course, the role of these gravity

variables was likely confounded by the global economic crises that began in 2007, especially when EU countries in southern Europe demanded the attention of larger and more stable EU members, from which investors might have otherwise been looking outside for opportunities to attain new markets, resources, or efficiencies.

This paper yields several policy implications. First, the government of BiH, led by its investment agency FIPA, needs to continue its assertive external public relations campaign to attract investors. They have gone a long way with their new high-profile headquarters in the Avaz Twist Tower. As the *Economist* (2011) report to its business-oriented readership, many problems remain for BiH, including an enduring association with the destructive war, a lack of central authority in the country, fifteen months leading into 2012 without a proper national government, and problems with transparency and permitting. Visiting 500 foreign companies in BiH, FIPA documented complaints from “most” about administration and corruption (Mustafic-Cokoja 2010). Ms. Cokoja adds that most potential investors ask about corruption in the country and they “need to be reassured”.

As articulated by Bitzenis (2004) in Bulgaria, such factors contribute to a negative reputation and deter investors. What can help the country is the government’s attention to such investment climate ills, and a rapid pursuit of EU membership, which will take the respective cooperation of the sometimes obstructionist parties in the Republika Srpska and the Bosniak-Croat Federation. FDI is not an end in itself, but it has enormous potential in promoting convergence with the rest of Europe (Balasubramanyam et al. 1999, Ribakova 2007) through wage increases and technology transfers, and it should continue to be a high priority for Bosnia’s new leadership.

It is reasonable to acknowledge some methodological limitations of this work, and to point to further work that needs to be done on the topic. While the paper succeeds at its goals of identifying overarching trends—the origin effects of agglomeration, historical connections, and EU membership, these general tendencies do not hold true in every investment case. For example the Central Bank lists one investment project from China and two from the United Arab Emirates. Neither of these countries shares historical ties or cultural proximity with BiH, nor are they EU members. In other words, while these findings claim that such historical and cultural factors are important, the econometric approach overlooks the stories of these firms. Given the limited scope of the present paper, by

necessity such firm-specific considerations are passed over at the expense of grasping the big picture, or “the forest for the trees”. To better understand such investments, a case study approach would be in order. Moreover, many of the determinants under consideration, including gravity variables, could be usefully re-examined at the sub-national scale, which would similarly require a case study approach, or better data from the constituent agencies of the BiH government.

6. Conclusions

This paper has examined the origins of FDI into Bosnia and Herzegovina, paying special attention to historical and cultural factors. Evidence is unveiled that both factors, as well as EU membership, play a strong role in facilitating FDI to Bosnia and Herzegovina. Over the past five centuries, BiH represented a portion of the Ottoman and Austro-Hungarian Empires, and later the Socialist Federal Republic of Yugoslavia, and there is evidence that this shared history has facilitated the establishment or re-opening of business relationships across present-day borders. In the period of 1994–2006 following the war, companies from European Union members enjoyed an advantage in FDI, thanks also to bilateral agreements between those countries and BiH.

Finally, among the most interesting results of this study is the absence of evidence for traditional gravity variables as FDI determinants, including market size and geographical distance, although proximity is admittedly captured partly by the political legacies variable. This observation is attributed to the unique investment environment of BiH. Vis-à-vis its neighbors, BiH had a late start attracting FDI (Hunya 2002), but as indicated by Mustafic-Cokoja (2010), investors from familiar countries possess the necessary local knowledge to operate in this challenging and unique environment. While bilateral trade flows are related to FDI, it is unclear from this analysis whether they facilitate FDI or compete with it. 

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Appendix A: Countries in the dataset

Afghanistan	Dominica	Lesotho	Saint Lucia
Albania	Dominican Republic	Liberia	Saint Vincent
Algeria	East Timor	Libya	Samoa
Andorra	Ecuador	Liechtenstein	San Marino
Angola	Egypt	Lithuania	Saudi Arabia
Antigua and Barbuda	El Salvador	Luxembourg	Senegal
Argentina	Equatorial Guinea	Macedonia	Serbia/Montenegro
Armenia	Eritrea	Madagascar	Seychelles
Australia	Estonia	Malawi	Sierra Leone
Austria	Ethiopia	Malaysia	Singapore
Azerbaijan	Fiji	Maldives	Slovakia
Bahamas, The	Finland	Mali	Slovenia
Bahrain	France	Malta	Solomon Islands
Bangladesh	Gabon	Marshall Islands	Somalia
Barbados	Gambia	Mauritania	South Africa
Belarus	Georgia	Mauritius	Spain
Belgium	Germany	Mexico	Sri Lanka
Belize	Ghana	Micronesia	Sudan
Benin	Greece	Moldova	Suriname
Bhutan	Grenada	Monaco	Swaziland
Bolivia	Guatemala	Mongolia	Sweden
Bosnia	Guinea-Bissau	Morocco	Switzerland
Botswana	Guinea	Mozambique	Syria
Brazil	Guyana	Namibia	Taiwan
Brunei	Haiti	Nauru	Tajikistan
Bulgaria	Honduras	Nepal	Tanzania
Burkina Faso	Hungary	Netherlands	Thailand
Burma (Myanmar)	Iceland	New Zealand	Togo
Burundi	India	Nicaragua	Tonga
Cambodia	Indonesia	Niger	Trinidad and Tobago
Cameroon	Iran	Nigeria	Tunisia
Canada	Iraq	Norway	Turkey
Cape Verde	Ireland	Oman	Turkmenistan
Central African Rep	Israel	Pakistan	Tuvalu
Chad	Italy	Palau	Uganda
Chile	Jamaica	Panama	Ukraine
China	Japan	Papua New Guinea	United Arab Emirates
Colombia	Jordan	Paraguay	United Kingdom
Comoros	Kazakhstan	Peru	United States
Congo (Brazzaville)	Kenya	Philippines	Uruguay
Congo (Kinshasa)	Kiribati	Poland	Uzbekistan
Costa Rica	Korea (North)	Portugal	Venezuela
Cote d'Ivoire	Korea (South)	Puerto Rico	Vietnam
Croatia	Kuwait	Qatar	Yemen
Cuba	Kyrgyzstan	Romania	Zambia
Cyprus	Laos	Russian Federation	Zimbabwe
Denmark	Latvia	Rwanda	
Djibouti	Lebanon	Saint Kitts and Nevis	

Appendix B: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
94-2010	190	.1	963.00	25.5326	122.08973
94-2006	190	.1	575.00	12.8432	63.09071
07-2010	190	.1	818.00	12.5168	72.38503
Transactions	190	.1	115.0	2.959	12.6028
lnGDP	190	4.4400	16.1600	9.702632	2.3378685
POL	189	0	1	.08	.271
GNIPC	190	114.0000	113999.3300	8192.531632	14432.46417
EU	189	0	10	1.08	2.904
DIST	189	170	18261	5866.29	4105.105
CULT	190	1	5	4.13	1.148
lnTRADE	187	.6	7.05	.7925	2.46145

Appendix C: Correlation Matrix

	94-2010	94-2006	07-2010	Trans	lnGDP	POL	GNIPC	EU	DIST	CULT	Ln TRADE
94-2010	1	.854	.859	.859	.188	.480	.148	.221	-.257	-.438	.458
94-2006	.854	1	.489	.854	.207	.427	.200	.300	-.248	-.400	.442
07-2010	.859	.489	1	.651	.124	.395	.045	.109	-.212	-.360	.380
Trans	.859	.854	.651	1	.196	.535	.158	.271	-.271	-.442	.498
lnGDP	.188	.207	.124	.196	1	.138	.302	.379	-.187	-.386	.499
POL	.480	.427	.395	.535	.138	1	.036	.313	-.380	-.489	.561
GNIPC	.148	.200	.045	.158	.302	.036	1	.400	-.279	-.313	.431
EU	.221	.300	.109	.271	.379	.313	.400	1	-.421	-.286	.614
DIST	-.257	-.248	-.212	-.271	-.187	-.380	-.279	-.421	1	.374	-.403
CULT	-.438	-.400	-.360	-.442	-.386	-.489	-.313	-.286	.374	1	-.598
lnTRADE	.458	.442	.380	.498	.499	.561	.431	.614	-.403	-.598	1

Selection and Implementation of ERP Systems: A Comparison of SAP implementation between BIH and Turkey

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Abstract:

In this research, the selection and implementation of ERP Systems will be discussed. The ERP concept, the selection process, and the importance of selecting a certain ERP solution for the companies will also be dealt with. However, implementation of ERP software brings not only benefits, but also incurs costs. After the literature review of ERP implementation strategies, a survey is reviewed that was conducted among several large and mid-size companies that adopted SAP, one of the major ERP solutions, in their businesses in Bosnia and Herzegovina and Turkey. The focus of the survey will be on different aspects of SAP implementation, such as struggles that have been faced during its implementation and its benefits following implementation. In the final section, a comparison is made between Turkish and Bosnian companies. While the study indicates some differences in implementation strategies and major benefits, similarities between the two countries are more pronounced.

Key words: ERP, Enterprise Resource Planning, ERP selection, ERP implementation, SAP

JEL: M10, M15, O32, O33

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1. Introduction

In this current information age, the automation of service and production systems is an inevitable process. One of the main pillars of the automation process in business is so-called Enterprise Resource Planning systems. Hirt & Swanson (1999) defines ERP software as a management information tool designed to model and automate many of the basic processes of a company, from finance to the shop floor, with the goal of integrating information across the company and eliminating complex, expensive links between computer systems that were never meant to communicate.

ERP systems are also enterprise-wide software systems which integrate processes impeccably throughout several functional areas and also across geographical locations. By using a common database for data storage, ERP Systems are able to provide developed workflow, access to real-time information, and adjustments which make business practices more convenient (Parkhill, et. al. 2010).

ERP also solves fragmentation of information in large

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business organizations (Themistocleous, et. al. 2001). ERP systems create an environment which allows creativity, innovation, and the expansion of individual awareness.

With the help of ERP, the best practices can easily be confirmed, and companies can standardize business processes, and focus their efforts on serving their customers, therefore maximizing profits for the organization (Laframboise & Reye, 2005). ERP systems create an environment which allows creativity, innovation, and the expansion of individual awareness. Sixty-three percent of large ERP customers have acknowledged that ERP implementation brings benefits and success (Maguire, et. al. 2010).

Since the early 1990s, the ERP software market has been and continues to be one of the fastest growing segments of the information technology (IT) industry, with growth rates averaging from 30% to 40% per year. ERP packaged software purchases are very expensive disbursements for companies, with costs equalling hundreds of thousands, even millions of dollars. While these IT expenditures represent a significant portion of capital expenditures for many organizations and will continue to increase even more, little is known about how these expenditures are made, and what stages organizations have to go through when they buy ERP software (Verville & Halington, 2003).

There are dozens of vendors of ERP systems. However, the top five ERP system vendors are SAP, PeopleSoft, Oracle, J.D. Edwards, and Baan. SAP has been recognized as the leader with more than 50 percent of the market. This paper focuses on SAP implementation as a leading example of ERP system implementation both in Turkey and Bosnia and Herzegovina. The remaining portion of this paper is organized as follows: the overall ERP concept, the ERP selection process and the importance of selecting the right ERP software will be examined. After explaining the selection process, ERP implementation strategies and the advantages and drawbacks of ERP implementation will be touched upon. The key subject of the thesis is SAP implementation in both Turkish and BIH companies. The survey was conducted in twenty-eight companies both in Turkey and Bosnia. The final part of the paper deals with the results of the survey, a comparison between the two countries, and a discussion of the results.

2. ERP Selection Process

In this section, the importance of selecting the correct ERP system and different selection methods will be presented. The choice of the right ERP system and selection process are of considerable importance because of the fact that it depends upon a certain level of process adaptation and affects corporate culture and work organization (Verville & Halington, 2003). ERP selection processes are complex, demanding, intensive, and time-consuming (Verville & Halington, 2003), and failures in ERP implementation have been linked to the selection of ineffective, and inappropriate ERP systems (Bakås, et. al. 2007)

To demonstrate the importance making the right selection, Stefanou (2001) states that the cost of making a decision regarding the acquisition of ERP software can account for as much as 30 percent of the overall cost of the investment and that the ERP selection process can use up to 20 employees for 14 months. Stefanou (2001) proposes two approaches for ERP selection, financial and non-financial. Traditionally, the evaluation and selection of IS (Information System) investments were generally based on financial criteria. Financial measures, including Net Present Value (NPV), Internal Rate of Return (IRR), and Return on Investment (ROI) were employed only to show, most of the time, the validity of the so-called 'IT productivity paradox'. Although it is important to comprehend the financial measures, they are not the only concerns, nor are they sufficient to support the justification of ERP systems justification for the following reasons:

- A large number of ERP benefits and costs are not easily identifiable, as they span the entire life-cycle of an ERP project.
- Costs and benefits, even when they are identified, are not easily quantifiable, as has been already recognized to be generally the case with IT investments
- Major benefits (and costs) do not emerge from the use of ERP software per se but rather from the organizational change induced by ERP and the extendibility of the software to support additional functionality (Stefanou, 2001).

Apart from financial measures, the non-financial measures are to be taken into account to provide a complete picture of the potential and costs of ERP projects. The complexity of IT projects and customer service should be recognized as a considerable barrier to

effective evaluation. Furthermore, the decision makers' instincts, their ways of understanding and perceptions of the problem, as well as their ways of thinking and interpreting information may be an accurate factor in ERP selection and the implementation success (Stefanou, 2001).

Moreover, Bernroider & Koch (2000) identify 29 ERP selection criteria by applying the Delphi Method to a combination of 138 organizations comprised of 22 small or medium size companies and 116 large companies.

Illa, et al. (2000) develop, apply and propose SHERPA (Systematic Help for ERP Acquisitions), which is a very accurate and reliable methodology tailored for small and medium companies, for which other sophisticated methods are difficult to apply. The method covers the entirety of the ERP acquisition process, but does not cover the implementation of the selected ERP, its usage, maintenance, evolution or retirement.

3. ERP implementation

Themistocleous & Watson (2005) note that although there have been countless ERP implementation efforts during the past fifteen years, "many companies still have significant functions and resources that are not under the broad ERP umbrella". Maguire, et al. (2010) states that the comprehensive use of ERP reflects the need for businesses and organizations to replace older software systems and achieve integration of different organizational functions and processes. To integrate all departments of an organization, implementation of ERP is beginning to be considered inevitable by companies. "For many organizations, implementing ERP means moving from a confederation of loosely coupled systems to a tightly coupled one" (Yeh & OuYang, 2010).

Hakim & Hakim (2010) mentions the three most widely used and discussed ERP implementation strategies: Big Bang Theory, Phased Rollout, and Parallel Adoption. In Big Bang Theory, implementation happens in a single instance, and all users move to the new system on a specific date, with the appeal that it concentrates on the organization for a shorter period of time. The disadvantages of big bang implementation is that it is often rushed, details are mostly ignored, is riskier, and because of its intensive nature, the pain is often more severe. The other implementation strategy is the phased rollout approach. It allows project teams to take their time in the planning, customization, and testing of the system while continuing with their day-to-day jobs. The

disadvantages of this approach is that it might lead to "change fatigue," which can affect employees negatively through constant change. Since projects take longer periods than the big bang theory, it could be draining to employees (Kimberling, 2006). Parallel Adoption is another ERP implementation strategy, and is one of the least risky, as it includes running the old and new ERP systems together (Patrick, 2011).

Furthermore, according to Parr & Shanks (2000), there are three implementation approaches: comprehensive, middle-road, and vanilla. The comprehensive approach represents the most ambitious implementation approach. Typically it involves a multi-national company that decides to implement an ERP in multiple sites, often across national boundaries. The middle-road category is mid-way between a comprehensive and a vanilla implementation. Characteristically, there are multiple sites and a major decision is to implement a selection of only core ERP modules. Finally, the vanilla approach is the least ambitious and the least risky. Typically, the implementation is on one site only, and the number of prospective system users is small.

The implementation stage is a very crucial factor for an ERP adoption process. As stated by Doom et.al. (2010), 70 percent of companies implementing ERP in the USA consider the project successful. More than 55 percent of companies admit that the planned budget was exceeded, on average by 60.6 per cent. When these budget overflows are counted as failures, the success rate of ERP implementation is less than 50 percent. Another rate of success is given by Meta Group, which reports a 30% success rate in ERP implementation projects (Nair, et. al. 2010). Additionally, the business research firm Standish Group found that only 10 percent of ERP implementation projects are completed as planned, on time, and within budget. Fifty-five percent are completed late or over budget, and the other 35 percent of projects are canceled because of difficulties.

3.1. Benefits of ERP implementation

Shang & Seddony (2000) note that there are five dimensions of ERP benefits: operational, managerial, strategic, IT infrastructure, and organizational. Some of the important sub-dimensions are cost reduction, cycle time reduction, productivity improvement, quality improvement, customer services improvement, performance improvement, building of external linkages,

IT cost reduction, and empowerment. Table 1 shows these benefits of ERP implementation.

A survey held of companies in Bahrain found a number of benefits according to interviewees' opinions and the degree to which these benefits have been realized after implementation. The results of the survey indicated that ERP systems offer substantial benefits. Out of the 27 mentioned benefits, improving productivity was perceived by interviewees as the prime benefit, while optimizing inventory was considered the second most beneficial factor. The least beneficial factor according to the survey was reducing the number of employees (Kamhawi, 2008).

3.2. The Drawbacks of ERP implementation

It is inevitable that the full implementation of ERP software carries with it some subsequent problems and drawbacks. It has been estimated that about half of ERP implementations fail to meet expectations for some reason (Stefanou, 2001) and it is estimated that at least 90% of ERP implementations end up late or over budget (Gibson, et. al. 1999). Due to their complexity, ERP systems are difficult to implement, as well as to carry on with and maintain. Their implementation can be very expensive and extremely time consuming and there is no guarantee that it will be a success. For instance, at Hewlett-Packard, a \$400 million loss in the third quarter of 2004 was blamed on poorly managed migration to a new ERP system (Oz, 2009). As an additional example, out of 100 firms investigated, Davenport (2000) found that only ten derived any real value from implementing an ERP system (Tsamantanis & Kogetsidis, 2006).

According to (Jorney, n.d.), the main drawbacks can be classified into five main issues, which are cost, time, efficiency, customization, and data integration.

- **Cost:** ERP solutions are very expensive and may also require additional acquisitions or modifications during training sessions, so the implementation costs can rise considerably.
- **Time:** The implementation requires a tremendous time commitment from a company's information technology department or outside professionals. Furthermore, training employees to efficiently and effectively use the ERP system can be very time consuming.
- **Efficiency:** Even though an ERP system should improve efficiency if implemented and used

correctly, the adoption period may cause inefficient business flow.

- **Customization:** ERP systems are either not very customizable, or customization involves a lot of time and money.
- **Data Integration:** To integrate an ERP system with other software might require that the software be modified.

As a result the drawbacks and barriers of ERP Implementation should not be disregarded. In order to be successful in implementing ERP systems in companies, they should be examined deeply in order to turn these drawbacks into benefits.

The human- and organizational-change aspects, and the resistance to these changes, are also an essential factor of success. Hence some researchers argue that social factors, more than technical or economic factors, are critical to the success of ERP projects. According to Yeh & OuYang (2010), the main drawback faced by all of the companies has been resistance to change. Either employees are often reluctant to learn new techniques or the information technology (IT) department is reluctant to change because of the department's attachment to existing software.

Implementation of ERP systems can fail because of some external challenges: the space between system capabilities and business needs, lack of expertise on the consultant's part, and mismanagement of the implementation project.

4. Data Set and Methodology

The data used in this study was obtained in a survey investigating SAP implementation, benefits, and the drawbacks of implementation in both BIH and Turkish companies. After creating a draft survey, the survey was sent to a SAP Consultant to be checked and developed. After some relevant changes in the survey, the survey was shared with companies. The survey was conducted during the spring of 2011. For the purposes of this study, the data was acquired through multiple questions. The survey consists of fifteen questions. Nineteen adequate answers from Turkey and nine answers from BIH have been provided through an online survey.

The present study has certain limitations that should be taken into account. The most significant impediment in this study is that the test was not adapted according to the cultures of the participants, and none of the

	BIH	TR
Q1: Which products of SAP has your company been using?		
SAP R/3	7	17
SAP Business One	2	2
Q2. Have you done implementation in your entire Company?		
Yes	5	16
No	4	3
Q3. When did your organization purchase the software?		
Pre-2005	3	4
2006-2007	1	6
2008-2009	4	7
2010	1	2
Q4. What is the size of your company?		
Small	4	7
Medium	0	3
Large	5	9

Table 1: Answers of first four questions related to general data about surveyed companies

	BIH	TR
Q5: Do you find it costly and time consuming to modify SAP to adapt to changes in your business process?		
Yes	3	6
No	1	6
Partially	3	7
Q6. How would you rate the difficulty of the process change and organizational change aspects of your SAP system?		
Very easy	0	2
Easy	1	3
Difficult	6	12
Very difficult	1	1
No idea	1	1
Q7. Overall, how would you rate the difficulty of the technical aspects of your SAP implementation?		
Very easy	0	2
Easy	2	3
Difficult	5	11
Very difficult	1	2
No idea	1	1
Q8. What issues have you faced during SAP implementation?		
Delay	3	8
Lack of satisfaction in terms of requirements	0	4
Lack of satisfaction in terms of objectives	0	0
None	2	4
Other	4	3
Q9. How long was it before business users were able to independently perform tasks such as report and workflow wizards?		
Less than 6 months	5	6
6 months to 1 year	1	6
1 year +	3	7

Table 2: Answers for second part related to implementation phase

participants were native English speakers. The study could have been adapted to the language of the questionnaire by using forward and back-translation methods, such that the potential for misinterpretation

could have been minimized. Another major drawback of this study is that the number of responses was not sufficient: 19 responses were received from Turkish participants, while the number of responses obtained

from Bosnian participants was 9. This highly unbalanced dataset is partially due to the highly different scales of the abovementioned economies.

5. Results

The data is analyzed using a t-test and a chi-square test through the statistical package for social sciences (SPSS). The t-test was used to make a comparison of the means of the two independent samples and identify whether the means of the two groups are statistically different from each other.

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\text{var}_1}{n_1} + \frac{\text{var}_2}{n_2}}} \quad (1)$$

Another test used throughout this study is the chi-square test to determine whether there is a significant difference between the expected frequencies and the observed frequencies in one or more categories.

$$\chi^2 = \sum \frac{(\text{Observed Freq.} - \text{Expected Freq.})^2}{\text{Expected Freq.}} = \sum \frac{(F_o - F_e)^2}{F_e} \quad (2)$$

The survey contains 15 questions aiming at different aspects of SAP implementation strategies. The first four questions relate to common statistics. The results are given in Table 1.

The second part of the survey questions possible issues, problems and difficulties during the implementation phase of SAP software. This part contains five questions, and the results are illustrated in Table 2.

To compare both samples the following four hypotheses were proposed and tested.

- **H1:** There is no significant difference between both samples to question 5.
- **H2:** There is no significant difference in question 6 between BIH and Turkish SAP users.
- **H3:** There is no significant difference in question 7 between BIH and Turkish SAP users.
- **H4:** There is no significant difference between both samples to question 8.

H1: There is no significant difference between both samples to question 5.

Results	
Critical Value	5.9915
Chi-Square Test Statistic	1.5283
p-Value	0.4657
Do not reject the null hypothesis	

Table 3: Chi-square test statistics for H1

In the first hypothesis, the critical value is 5.9915 at the 5% significance level. The Chi-square value was 1.5283. Therefore, there is no significant difference between the two groups. The amount of difference between the expected and actual data is likely just due to chance. Thus, the hypothesis may not be disregarded.

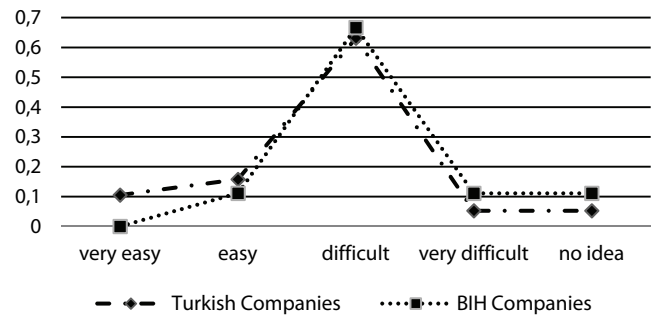


Figure 1: Answers to the sixth question

Figure 1 demonstrates the percentages for the sixth question. The percentages are 11% for easy, 67% for difficult, 11% for very difficult and 11% for don't know for the Bosnian participants and 11% for very easy, 16% for easy, 63% for difficult, 5% for very difficult and 5% for don't know for the Turkish participants.

		N	Mean	Std. Deviation	Std. Error Mean
Q6	Bosnian	9	3.78	.833	.278
	Turkish	19	3.37	1.165	.267
Q7	Bosnian	9	3.56	1.014	.338
	Turkish	19	3.42	1.216	.279

Table 4: Descriptive statistics for questions 6 and 7

H2: There is no significant difference in question 6 between BIH and Turkish SAP users.

The t-test for the second hypothesis was not significant ($M=3.575$; $sd=0.999$ $t=0.942$; $df=26$; $p > 0.05$). ($M= 35.012445$, $SD=5.605$). Based on the statistical data

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Q6	*	2.780	.107	.942	26	.355	.409	.434	-.484	1.302
	**			1.062	21.482	.300	.409	.385	-.391	1.210
Q7	*	.574	.455	.287	26	.776	.135	.469	-.829	1.098
	**			.307	18.754	.762	.135	.438	-.784	1.053
* equal variances are assumed										
** equal variances are not assumed										

Table 5: Independent Samples Test for Questions 6 and 7

given in **Table 4** and **Table 5** there is no statistically significant evidence to reject the second (H_2) (hypothesis which assumes that there is no significant difference in question 6 between Bosnian and Turkish SAP users.

H3: There is no significant difference in question 7 between BIH and Turkish SAP users.

The t-test for the third hypothesis was not significant ($M=3.49$; $sd=1.115$ $t=.287$; $df=26$; $p > 0.05$). Based on the statistical data given in **Table 4** and **Table 5** there is no statistically significant evidence to reject the third (H_3) (hypothesis, which assumes that there is no significant difference in question 7 between BIH and Turkish SAP users.

H4: There is no significant difference between the two samples to question 8.

Results	
Critical Value	7.8147
Chi-Square Test Statistic	11.4402
p-Value	0.0096
Reject the null hypothesis	

Table 6: Chi-square test statistics for H4

In the fourth hypothesis, the critical value is 7.8147 at the 5% significance level. The Chi-square value was 11.4402, which is greater than 7.8147. There is a significant difference between the groups we are studying. The amount of difference between expected and actual data is not likely just due to chance. Thus, we conclude that our sample supports the hypothesis of a difference.

The third part of the survey contains questions aiming to study the after-implementation phase of SAP software and discuss the results of the implementation. This part

contains five questions, while the results are illustrated in **Table 7**.

	BIH	TR
Q10: Do you find SAP easy and intuitive to use?		
Yes	6	10
No	0	1
Partially	3	8
Q11. Was the implementation a success?		
Yes	9	18
No	0	1
Q12. Are you satisfied with your implementation of SAP?		
Very satisfied	3	5
Satisfied	6	10
Neutral	0	3
Dissatisfied	0	0
Very dissatisfied	0	1
Q13. Do you feel a positive difference in your everyday business between before and after SAP implementation?		
Yes	9	17
No	0	2
Q14. Please choose the benefits of implementing SAP in your company.		
Better integration of business processes	6	6
Saving time and efforts in employees' activ	0	3
Transparent and on-time reports	0	4
Better control of business processes	3	6

Table 7: Answers for third part related to after-implementation phase

To compare both samples the following four hypotheses are proposed and tested.

- **H5:** There is no significant difference between both samples to question 10.
- **H6:** There is no significant difference in question 12 between BIH and Turkish SAP users.
- **H7:** There is no significant difference in question 14 between BIH and Turkish SAP users.

Results	
Critical Value	5.9915
Chi-Square Test Statistic	0.8038
p-Value	0.6690
Do not reject the null hypothesis	

Table 8: Chi-square test statistics for H5

		N	Mean	Std. Deviation	Std. Error Mean
Q12	Bosnian	9	4.33	.500	.167
	Turkish	19	3.95	.970	.223

Table 9: Descriptive statistics for questions 12

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Q12	*	.427	.519	1.117	26	.274	.386	.345	-.324	1.096
	**			1.388	25.680	.177	.386	.278	-.186	.958
* equal variances are assumed										
** equal variances are not assumed										

Table 10: Independent Samples Test for Questions 12

Results	
Critical Value	7.8147
Chi-Square Test Statistic	3.1813
p-Value	0.3645
Do not reject the null hypothesis	

Table 11: Chi-square test statistics for H7

H5: There is no significant difference between both samples to question 10.

In the fifth hypothesis, the critical value is 5.9915 at the 5% significance level. As indicated in Table 8, the Chi-square value obtained is 0.8038, which is less than the critical value. There is no significant difference between the two groups. The amount of difference between the expected and actual data is likely just due to chance. Thus, it can be concluded that the sample does not support the hypothesis of a difference.

H6: There is no significant difference in question 12 between BIH and Turkish SAP users.

As given in Table 9 and Table 10, the t-test for the sixth hypothesis was not significant ($M=4.14$; $sd=0.735$ $t=1.117$; $df=26$; $p > 0.05$). There is no statistically significant evidence to reject the sixth (H_0) hypothesis which assumes that there is no significant difference in question 11 between Bosnian and Turkish SAP users.

H7: There is no significant difference between both samples to question 14.

In the seventh hypothesis, the critical value is 7.8147 at the 5% significance level. The Chi-square value was 3.1813, which is less than 7.8147. There is no significant difference between the groups we are studying. The amount of difference between expected and actual data is likely just due to chance. Thus, we conclude that our sample does not support the hypothesis of a difference.

5.1. Discussion

The results of the survey reveal some differences in SAP implementation between Bosnian and Turkish Companies.

The results of the first question suggest that both in BIH and Turkey mostly SAP R/3 is being used. Considering the fourth question about companies' sizes, in BIH, out of

nine, five are large, and four small sized companies, and in Turkey, out of nineteen, nine are large, three medium, and seven small sized companies. This indicates that regardless of the size of the companies, SAP R/3 is being used both in BIH and Turkey.

Question 2 gives a good representative point about the implementation extent in companies. Fifty-six percent of the Bosnian companies implemented SAP throughout their entire company, while 84% of the Turkish companies implemented SAP throughout their entire company. Taking into consideration the economic development of two countries and the costly implementation of SAP, this significant difference is likely to occur.

The chi-square result of the tenth question suggests that notions and perceptions about the ease and intuitiveness of using SAP are statistically independent. Given the statistical percentages, namely 67% yes from BIH, and 53% yes from Turkey, it can be concluded that SAP usage is convenient and not troublesome.

By looking at the percentages from answers to the ninth question, it can be seen that Bosnian users are more able to independently perform tasks such as report and workflow wizards. While Bosnian SAP users' percentage for less than six months is 56%, the Turkish SAP users' percentage is 31%. This difference may be the result of the differences between Turkish and Bosnian users' inclination to use SAP.

The chi-square test result for the fifth question states that the question and nation are independent. The question asks whether it is costly and time consuming to implement SAP, and both Bosnian and Turkish users generally describe it as partially so. Although the chi-square test indicates that there is no significant difference in terms of nationality for this question, the percentages for Bosnian and Turkish users who chose no were 11% and 32%, respectively. This statistical data shows that more Turkish SAP users than Bosnians think of SAP implementation as more time consuming and costly. This may be the consequence of the fact that the costs of implementing SAP are higher for Turkish companies.

No significant difference was found regarding questions 6, 7, and 12, showing that Bosnian and Turkish SAP users do not differ in rating the difficulty of the process change and the organizational change aspects of the SAP system, the difficulty of the technical aspects of SAP implementation, and satisfaction with their implementation of the SAP. Since the implementation processes of SAP are the same in both countries, these

results are not surprising. Even though there is no significant difference in satisfaction with SAP implementation, Bosnian participants rated higher on satisfied with 67%, compared to 53% of Turkish participants.

With regard to question 11 concerning implementation success, almost 100% percent of both Bosnian and Turkish participants answered yes referring to the success of SAP implementation in their company, which could mean that consultancy services were successful in the implementations. There is no difference between nations for this question.

Unlike the other chi-square result, the eighth question suggests that nationality and question 8 are somehow related. Answers yielded the only significant difference between BIH and Turkey. As the question asks about issues faced during implementation, the statistical difference is clear. Whereas 33% of Bosnian participants chose "delays" as the drawback to SAP implementation, 42% of Turkish participants chose the same. Although the difference is minor, it could be interpreted in different ways, such as a difference in the availability or amount of consultancy services. Notwithstanding the fact that SAP is new, developing software in BIH, the consultancy services may work well, and perform the implementations in a sufficient way so that there is relatively little tardiness. The huge disproportion in the percentages of responses to "it didn't fulfil your requirements" is another difference between BIH and Turkey. While Bosnian participants' percentage is zero for that question, for Turkish participants it is 21%. This statistical data is also a good confirmation of the case in the first "delay" option.

6. Conclusion

After analysis and interpretation of the data some conclusions can be drawn. The results of this study demonstrate that there is only one significant difference among seven hypotheses between Bosnian and Turkish SAP users. Even though no significant difference has been found for seven hypotheses, hypothesis 4 related to the eighth question suggests that that nationality is a factor in that area.

The present study found only one significant relationship between BIH and Turkey, the underlying reasons for which may be related to the small number of participants from both Turkey and BIH. Since these numbers are nine from BIH and nineteen from Turkey, the results may not be sufficient. If we could have reached

more SAP users, we might have obtained different results through comprehensive data. Further research can be directed toward collecting statistically more representative data and extending the questionnaire with additional dimensions such as detailed SAP implementation strategies in both countries. 

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Business Cycle Synchronization in Croatia

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Abstract:

The purpose of this paper is to analyze business cycle synchronization in the Croatian economy using various annualized growth rate variables over a period of eighteen years (1992-2010), de-trended by a Hodrick-Prescott filter, and following the Harding and Pagan methodological procedure in the determination of its turning points. Our conceptual analysis of synchronization is based on the technique of concordance indexes and correlation coefficients obtained by the HAC estimators. The main result of the research shows that there is a high degree of probability that dismissal of employees in the Croatian economy will coincide with the contraction phase in industry. The cyclic phase of growth in job creation in great measure coincides with the cyclic phase of growth in exports and the construction sector, as well as with tourist arrivals. There is an almost perfect synchronization between the cyclic phases of the construction sector and imports. The central conclusion of the paper is that this study can establish stylized facts about the dynamics of Croatian business cycles.

Keywords: business cycles, synchronization of business cycles, Croatia

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1. Introduction

The theme of turning point dating and research into the synchronization of business cycles, the co-movements of two cycles by a method of concordance indexes, and the calculation of correlation coefficients in the manner the authors conducted in this study on the case of Croatia is a widely exploited research field in the modern analysis of business cycles. Methodologically, our study leans on the research program of concordance index calculations by the authors hereafter.

Various aspects of economic complexity today in Croatia (as a Mediterranean country) deal with different but dependent economic parts such as tourism, labor, monetary flows and production ingredients which will be presented and examined in this paper. It should also be noted that understanding the cyclical characteristics in Croatia's economic activities in a systematic way could be important for the purposes of planning, coordinating and resource allocation in the economy of Croatia.

This paper applies a nonparametric procedure to estimate the concordance index for the assumed variable and studies its cyclical features in relation to the reference variable. In other words, our working assumption is: in Croatia's economy some fields of economic complexity are more interdependent and hence more synchronized

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than others. We do not, however, know a priori the direction or strength of synchronizations among cycles of two opposite variables. In some way our approach is non-theoretical, where first a fact is focused upon, followed by theoretical speculation based on the derived empirical fact. However, the empirical fact should pass regression significance testing. Again, in this context, the word 'non-theoretical' does not refer to something being 'missing'; but rather that something can be shown to be false by testing the various cycles emanating from a "black box economy". In order to characterize business cycle fluctuations and its synchronizations based on our macroeconomic time series, we use correlation coefficients of the cyclical component of each series, with the cyclical component of the reference variable. If these correlation coefficients show significance in the regressions, that (yet true) evidence should hopefully lead us to important stylized facts about business cycle dynamics in Croatia.

The paper is organized as follows: after the *Introduction*, we select 15 variables stretching from tourism and labor issues to production and monetary flows in *Section II*. *Section III* as the main part of this paper studies the business and growth cycle characteristics of the paired variables, e.g. their synchronization based on its concordance indexes. These include the conventional Harding and Pagan nonparametric approach analyzed by a Bry-Bosh algorithm. The relationship between cycles in the assumed sector and those in the particular part of the economy are also explored by a correlation coefficient obtained as a regression parameter. The last *Section IV* summarizes the main conclusions of this paper.

2. Literature Review

Since Clement Juglar (1862) in the nineteenth century economists have been familiar with a cyclic description of economic activity over time, whereby periods of expansion in economic activity are followed by periods of contraction in what has become known as the business cycle. Burns and Mitchell (1946) formalized this nomenclature and derived a dating method whereby peaks and troughs would separate the phases of the business cycle; and the latter could be analyzed statistically in terms of duration, amplitude and so on. The dating committee of the National Bureau of Economic Research in the USA still follows their lead in defining the turning points of business cycles for that country.

Fifteen years ago Blanchard and Fischer (1989) observed that "most macroeconomists (...) have abandoned the Burns-Mitchell methodology." Blanchard and Fischer (1989) explained this shift in the method by arguing that the Burns-Mitchell approach did not generate statistics with "well-defined statistical properties."

Don Harding and Adrian Pagan (2001) have recently stimulated renewed interest in the Burns Mitchell method with a series of articles in which they demonstrated that the statistical foundations of a dating algorithm can be described formally, and that such algorithms may be attractively robust and practically easy tools for identifying the phases of the cycle.

Zhang and Zhuang (2002) in their paper construct leading indicator systems for the Malaysian and Philippine economies using economic and financial data, with an attempt to predict the turning points of growth cycles in the two countries. The study conducted by Lahiri et al. (2003), underscores the importance of transportation indicators in monitoring cyclical movements in the aggregate economy. The paper by Avouyi-Dovi et al. (2006) provides an analysis of co-movements between real and financial variables in three new EU member countries (the Czech Republic, Hungary and Poland) and the Eurozone. Biscarri and Pérez de Gracia (2002) find that cycles in European countries have become substantially more concordant in recent years, a result that was to be expected given the increased integration of European financial markets, but that the degree of concordance is not high.

We did not study the concordance between business and financial cycles in a broader sense and the interactions between their different phases for Croatia, but we should mention some interesting works, because after the financial crises in 2008 this research program has become promising. To provide a broad perspective about financial cycles Stijn Claessens, M. Ayhan Kose and Marco E. Terrones (2011) employ three measures: credit, house and equity prices in their paper. Their paper analyzes the interactions between business and financial cycles using an extensive database of over 200 business and 700 financial cycles in 44 countries for the period 1960-2007. They suggest that there are strong linkages between different phases of business and financial cycles. Bordo and Haubrich (2010) analyze cycles in money, credit and output between 1875 and 2007 in the U.S. They argue that credit disruptions tend to exacerbate cyclical downturns. Claessens, Kose and Terrones (2009)

analyze the implications of credit crunches and asset price busts for recessions. Gilchrist and Zakrajsek (2009) provide a short review of literature for models presenting channels of transmission between the financial sector and real economy. The seminal work of Reinhart and Rogoff (2009) analyzes the evolution of macroeconomic aggregates around episodes of financial crisis.

We followed Harding and Pagan (2001) in this paper and applied their dating algorithm, improved by Bry and Bosch (1971), to identify the turning points of a heterogeneous set of macro-economic variables and to try in a broader way to determinate business cycles in the Croatian economy.

3. Conceptual Background

Our benchmark theoretical consideration about business cycle issues in Croatia's economy emphasizes the interrelatedness of the various sectors of the economy. Hence, disturbances in one part of the economy – for example, labor productivity in the industrial sector can result in symptoms in other parts that seem far removed, such as job vacancy rate or imports.

Where disturbances originate in the system (are they real or nominal shock?) and where the forces that prevent the system from quick and smooth readjustment are when it is disturbed, are not questions within the focus of our research.

The central idea of business-cycle literature that dominated economic schools and that holds that the economy has regular and periodic waves – i.e. cycles, has few adherents today. Both the conservative real-business cycle theory, which emerged from new classical ideas, and the liberal new Keynesians business cycle theory, agree on this issue (for more see: Lutz, 2002). Although they look for the cause of cycles in different sources and directions, these issues are outside the focus of our research.

We do, however, conjecture that there exist seemingly random irregular fluctuations around the growth trends of particular parts of the economy proxied by the cyclical component of time series. Thus, given two snapshots in time, predicting the latter with the earlier is nearly impossible and we do not try to do this. Behind the synchronization of the duration of a discrete event (recession/expansion), and within two particular parts of the economic system there stands mere chance, which we call event congruency, and from which the

synchronization of two cycles emanates. For more about the concept of statistic congruency and event synchronization, see Aczel (2004).

A crucial part of the tracing system of business cycles is the computation of the cycles. We select one of the most frequently used cycle extraction methods, or filters: the Hodrick –Prescott filter.

3.1. Cycle Extraction Method

We should smooth our time series. We use the Hodrick-Prescott (1981) filter again for trend cycle decompositions. The filter contains only one parameter, which controls the smoothness of the filtered series.

Hodrick and Prescott (1981) use the following model:

$$y_t = \mu_t + ct, \quad (1)$$

According to this model the series contains only a trend and a cycle. The ratio of the variances of ct and μ_t is assumed to be equal to the chosen parameter λ . For a larger λ , a smoother trend will be obtained. As a measure of the smoothness of the trend, Hodrick and Prescott (1981) take the sum of squares of the second order differences. Furthermore, they pose that the cycle is the deviation from the trend, and its long-term average should be zero. This results in the following minimization problem:

$$\min_{(\mu_t)} \left\{ \sum_{t=1}^T c_t^2 + \lambda \sum_{t=1}^T [(\mu_t - \mu_{t-1}) - (\mu_{t-1} - \mu_{t-2})]^2 \right\} \quad (2)$$

According to the literature, the optimal values are $\lambda = 1600$ and $\lambda = 14400$ for quarterly and monthly data, respectively. In our computations, we employ $\lambda = 1600$, although we are dealing with monthly data frequencies as we have stressed before. There are two reasons for this: first, $\lambda = 14400$ implies too smooth a trend line, where it is more difficult to identify the turning points, and second, the time series which are analyzed are, in fact, annual growth rates at a monthly level.

We present the non-linear trends obtained from the application of the HP filter, with $\lambda = 1600$, to the monthly growth rate of the included time series in Croatia.

All the time series are given as year-on-year growth rates (YoY). This rate is calculated by dividing the figure $Y(i,t)$ for a given period t (a month in relation to the frequency of the data i) by the value of the corresponding

period in the previous year $Y(i,t-12)$.

For monthly data:

$$YoY(i,t) = \{ [Y(i,t) / Y(i,t-12)] - 1 \} * 100 \quad (3)$$

The same result is obtained by the difference of the logged original series.

$$YoY(i,t) = \Delta y_{i,t} = \ln(Y_{i,t}) - \ln(Y_{i,t-12}) \quad (4)$$

The non-linear trends highlight the cyclical nature of the series, enabling the identification of peaks and troughs for each case.

3.2. Dating Method

The dating algorithm used here is by Bry and Boschan (1971) as suggested by Harding and Pagan (2002) in various recent papers. This algorithm identifies local minima (troughs) and local maxima (peaks) in a single time series, or $\{\Delta y_t\}$ after a log transformation. Peaks are found where Δy_t is larger than k values of $\{\Delta y_t\}$ in both directions $[t-k, t+k]$ and troughs where Δy_t is smaller than k values of $\{\Delta y_t\}$ in both directions. The k value stands for the minimal duration of a phase given in the number of months.

The size of k is set by the censoring rule of the algorithm. There is no optimal size for k , but Bry and Boschan (1971) suggest a value of 5 at a monthly frequency. A censoring rule is also required to ensure that the cycle (and each of its phases) is of a minimum duration. Again we followed Harding and Pagan (2001) and set the minimum duration for a single phase at 9 months and the minimum duration for a complete cycle (from peak-to-peak or trough-to-trough) at 24 months. The Bry-Boschan algorithm therefore identifies turning points according to the requirements in equation 3 and 4, subject to the abovementioned censoring rules.

Peak at t if

$$\{(\Delta y_{t-9}, \Delta y_{t-8}, \dots, \Delta y_{t-2}, \Delta y_{t-1}) < \Delta y_t > (\Delta y_{t+1}, \Delta y_{t+2}, \dots, \Delta y_{t+8}, \Delta y_{t+9})\} \quad (5)$$

Trough at t if

$$\{(\Delta y_{t-9}, \Delta y_{t-8}, \dots, \Delta y_{t-2}, \Delta y_{t-1}) > \Delta y_t < (\Delta y_{t+1}, \Delta y_{t+2}, \dots, \Delta y_{t+8}, \Delta y_{t+9})\} \quad (6)$$

Once the turning points of the cycle have been identified it is possible to describe the characteristics of the cycle in terms of duration, amplitude, steepness, non-linearity, and synchronization among the two assumed cycles.

In practice, the Bry-Boschan algorithm is supplemented by censoring procedures to distinguish the real peaks and troughs from spurious ones, e.g., a movement from a peak to a trough (phase) cannot be shorter than 9 months and a complete cycle must be at least 24 months long. The resulting turning points define the "specific cycle" of each component series.

3.3. Turning Point Determination in Relevant Cycles

The classical approach defines the business cycle directly by analyzing the change in the level of a variable, characterizing the cycle as a succession of expansions and recessions. Formally, an expansion is defined as the period of time separating a trough from a peak; conversely, a recession is the period between a peak and a trough. What is crucial in this approach, then, is to precisely define and identify the turning points, i.e. the peaks and troughs. Using these turning points, a recession (expansion) is defined as the time separating a peak (trough) from a trough (peak).

3.4. Synchronization and concordance index in growth cycles

Though it fell out of fashion after the 1970s, this view of the cycle has recently been the subject of several papers, which proposed a simple method for analyzing the concordance between two series, i.e. the simultaneous presence of the two series in the same recessionary or expansionary phase of the cycle. Before compiling the concordance index, we first have to define a function to indicate the phases of increase (or decline), $S_y, t=1$ of a variable, y for example, which we will use to calculate the index: $S_y, t=1$ if y increases at t , and 0 otherwise. We use a statistic developed by Harding and Pagan as the concordance index (see Canova:2007).

The concordance index for x , written c_{xy} , is defined as the average number of periods in which two variables x and y coincide at the same phase of the cycle, i.e.:

$$C_{x,y} = \frac{1}{T} = \sum_{t=1}^T [S_{x,t} S_{y,t} + (1 - S_{x,t})(1 - S_{y,t})] \quad (7)$$

The index has a value of 1 if x and y are always in the same phase, i.e. the two series are in perfect concordance, with expansions and contractions perfectly juxtaposed. If the index reads 0, x and y are always in opposite phases, i.e. the two series are in perfect discordance, with either a pronounced lag or a total contrast in phase.

3.5. Synchronization of Cycles Test

In general, the distributional properties of $C_{x,y}$ is unknown. To calculate the significance levels for these indices, we use the method suggested by Harding and Pagan (2004), which we detail below. Let $\mu_{s,i}$ and $\sigma_{s,i}$, $i = (x,y)$ denote the empirical mean and the empirical standard deviation of $S_{i,t}$ respectively. If ρ_s denotes the empirical correlation between $S_{x,t}$, and $S_{y,t}$, it can be shown that the concordance index is equal to:

$$C_{x,y} = 1 + 2\rho_s \sigma_{s_x} \sigma_{s_y} - \mu_{s_x} - \mu_{s_y} \quad (8)$$

According to this equation, C_{xy} and ρ_s are linked in such a way that either of these two statistics can be studied to the same effect. To estimate ρ_s , Harding and Pagan suggest estimating the linear relationship:

$$\frac{S_{y,t}}{\sigma_{S_y}} = \text{const} + \rho_s \left(\frac{S_{x,t}}{\sigma_{S_x}} \right) + \varepsilon_t \quad (9)$$

where const is a constant and ε_t a residual. The estimation procedure for equation (9) must be robust to serial correlation in the residuals, because ε_t inherits the serial correlation properties of $S_{y,t}$, under the null hypothesis $\rho_s = 0$.

We should test if the synchronization of cycles is significant between the indicators and the reference cycle. A simple way to do so is the t-test for $H_0: \rho_s = 0$.

Standard t-statistics is based on OLS regression. We use the Newey-West heteroskedasticity and autocorrelation consistent (HAC) standard errors (lag truncation = 5) to account for possible serial correlation and heteroskedasticity in errors ε_t .

The synchronization of cycles among our chosen variables can be measured and tested based on the index of concordance between two paired specific cycles.

How many concordance indexes can we obtain? We have a total of 15 different cyclic variables (see the following chapter about the empirical data), which need

to be paired provided they can be repeated according to the equation from combination theory as permutation with repetition:

$$\text{Number of matches} = (n+r-1)! / r! (n-1)! \quad (10)$$

Where:

$n = 15$ cycle variables

$r = 2$ chosen numbers

Inclusion of the values in the equation gives 120 possible pairs which result in the concordance indexes C_{xy} , and the correlation coefficients ρ .

4. Empirical Data and Analysis

The data on the 15 time series which appear in the analysis relates to the time period between the years (and months) 1991m1 and 2010m3. Some time series are somewhat shorter and they start in 1992 or later, ending in 2010m4 (see table 1.). As a result, while calculating concordance indexes of the two time series, the work technique was adjusted to the shorter time series. The data was taken from the Monthly Database on Central, East and South East Europe, which can be found on the following website: <http://mdb.wiiw.ac.at/>.

We use a uniquely comprehensive sample of monthly frequency data. Our data sets considered in this paper are monthly seasonally unadjusted data generated by the Croatian economy.

The variables we study are: the unemployment rate (UR); vacancy rate (VR); tourism arrivals (ARR); tourism overnight stays (ON); real NB discount rate (RDR); the construction production index (CI); nominal narrow money (M1); the retail consumer price index (RPCI); industry production index (IND); productivity in industry index (PROD); nominal total import in Euro (IMP); nominal total export in Euro (EXP); nominal wage (WAGE); real wage (RW); real exchange rate (RE); nominal exchange rate (HRK).

While longer data sets are usually preferred for studies of data synchronization turning points, estimating only over the given period will be less susceptible to charges of regime change. When it comes to our data, the synchronization processes of the business cycles mainly coincide with the process of economic transition and start with the majority of large structural changes in the economy, politics and environment in the first half of the 90s.

Applying the dating rule described above with a minimum duration of the cycle of 9 months to the selected annualized growth rate time series for the various time span period from January 1990 to March 2010 yields the statistics displayed in Table 1. Expansion phases are under the heading TP (or PT in the case of unemployment) and recession phases under the heading PT.

Table 1 (in the appendix) presents the dating chronology and different turning points for the relevant time series, the annualized growth rate variable and its annualized growth rate cycles based on this procedure.

Figures 1-4 (in the appendix) illustrate the filtered year on year growth of industrial production and the construction index rate and their cycles graphically, showing their growth rate expansion and recession phases according to trended components. Because of the limited space in this paper we show only these figures and not the rest of the 26 graphs that refer to the remaining 13 time series variable.

On average, expansion in unemployment rates (or contraction in economic activity) is shorter and much weaker than expansion phases in vacancy rates. Also, unemployment displays a much stronger change in expansion than other variables, but a shorter average duration measured by conjectural phases and relatively long contraction phases. In general, asymmetries over cyclical phases are present in all series.

We do not intend to further quote Table 1's interpretation of the remaining introduced variables, but will below, concentrating on the synchronization aspect of Croatian business cycles.

We have tabulated the concordance measures and the test statistics in Tables 2 and 3. In the first part of Table 2, the concordance statistics C_{xy} 's are reported above the diagonal while the correlation coefficients ρ 's are reported below the diagonal, and μS and σS are given at the bottom.

In the second part of Table 2, standard t 's are reported below the diagonal while the robust t 's are reported above it. Some of these statistics significantly reject H_0 . The large t -values (approximately above the value of 2) also suggest the existence of co-movement between the cycle and the reference cycle.

Our *ad hoc* criteria by rule of thumb for grading the synchronization strength between the two cycles of the paired variables according to the concordance index are:

- 0-0.25 very weak synchronization,
- 0.26-0.5 weak synchronization,
- 0.51-0.75 moderately strong,
- 0.76-1 very strong.

Clearly, synchronization is only present in the case of a significant correlation coefficient, whose sign determines the direction of the mutual cycle movement of the two variables. In principle, in a weak or a very weak synchronization of the two cycles, the correlation coefficient is not significant even in the standard form.

5. Results and Discussion

In our discussion and analysis of the results, we will refer mainly to strong synchronization phenomenon such as paired cycles, and in that domain, we will have significant correlation coefficients according to the regression equation (9) and the t -value.

Judging by the height of the concordance index from the aspect of unemployment, as a referent variable, it appears that the highest degree of cycle synchronization exists between the cyclic growth in unemployment and the cyclic decline in industrial production. The latter concordance index equals 0.75, yet the associated correlation coefficient, which equals approximately 0.44 and which, although significant with application of both the t -statistic and the robust t -statistic, only gives the indication of an incomplete inter-temporal interdependency in movement. Towards the top of the moderately strong synchronization, there are movements between tourist arrivals and unemployment rates. This is not surprising as Croatia is, however, a tourist country with an abundance of employment potential for "non-voluntarily unemployed persons".

How does the nature of unemployment cycles as part of business cycles vary across different phases of financial cycles?

The result of the pairing of the areas of the unemployment rate and a real discount rate (part of the financial cycle) can give us the appropriate answer. It appears that the instrument of the discounting interest rate is, (albeit in an interplay with domestic inflation trends) one with which the Croatian National Bank intervenes in the economy, be it by facilitating or aggravating the inflow of new loan funds for the economy, moderately strongly synchronized with unemployment. A common feature of these labor recessions in Croatia (from 2009 to 2010 and afterwards

underlined) was that they were accompanied by various types of financial disruptions, including contractions in the supply of credit and declines in asset prices. The bursting of the housing bubble in the USA (during 2007) and the resulting financial crisis worldwide was followed by the worst output slowdown in Croatia since the early 1990s. In a very short period, after barely one year, the international financial crisis has spilled over with numerous negative effects to Croatia's financial and labor markets.

A moderately strong degree of synchronization exists between unemployment and the movement of the real exchange rate between the Croatian Kuna and the Euro (HRK/EURO) (as opposed to the nominal rate, where synchronization is of a weak intensity). In fact, a strong degree of coincidence exists between unemployment cyclic growth and the appreciation of the real Kuna exchange rate. Although the correlation coefficient is not high (it equals 0.28), this positive correlation is, however, significant, according to both concepts of measuring the t-values.

A very strong degree of synchronization of two paired cycles can be seen in the movement of the growth of the vacancy rate, i.e. the growth rate of tourist arrivals, as well as the growth rate of the vacancy rate and the growth rate of exports. In both cases, the concordance index is 0.8, and the associated correlation coefficient, which is significant in both cases and considerable, suggests coinciding variables due to a pronounced co-movement of variables. It is clear that the rate of filling of vacant work positions grows in the same direction as the growth in tourist arrivals (in Croatia otherwise chronically problematic) and goods export.

A moderately strong degree of synchronization also exists between the vacancy rate and the rate of construction sector (the concordance index is 0.7); this is not surprising as the expansion of the construction sector is, in fact, closely associated with the expansion of employment, thus growth in construction is a pro-cyclical variable. It should be noted that the bubble bursting in the property market and the decline in the demand for flats during the last two years directly facilitated the decline in the employment rate in Croatia. The correlation coefficient, calculated as the regression coefficient, points to the mutual movement of the said variables, with a high significance for the correlation coefficient estimate. These negative occurrences, in Croatia are linked to the cause of the financial crises in the USA and the global world economy after 2008. During

the pre-great recession period the Federal Reserve kept interest rates at historically low levels, which fueled housing demand (hence expansion of the housing price index) and encouraged lenders to relax mortgage-lending criteria. The international financial crisis was precipitated by the bursting of the housing price bubble in America and increases in actual and expected mortgage defaults.

The cycles of tourist overnights, as a referent variable, were not paired with any other cycle in the form of a very strong mutual synchronistic cycle. Towards the top of the moderate synchronization, judging by the concordance indexes of these tourist cycles, are industrial production variables (0.7) and the variables of the construction industry (0.65). We presume that the strong degree of synchronization of the given phases of the tourist overnights and industry cycles, in the inter-temporal sense, is a consequence of a greater realization of the food and crude oil industries within a tourist season, as well as the expansion of construction investment, although the latter may only be a pure chance in coincidence. Moderately strong synchronization exists between cyclical phases of tourism (both from the aspect of overnights and total arrivals) and cyclic phases of import. As the correlation coefficient is not significant from the point of view of the robust t-value, it is inopportune to make conclusions on the simultaneous movement of imported goods due to the great import dependency of the Croatian tourist economy. A high degree of moderately strong synchronization also exists between the probability that a certain cyclic phase of tourist arrivals will coincide with the cyclic phase of goods export. The correlation coefficient is, in this case, significant. We do not have either a rational answer, or a theory that would explain this puzzle. Is this a question of coincidence, an increased delivery of built ships during the summer months, or something else?

The cyclic phase of the real discount rate's inclining trend is in the largest measure synchronized with the acceleration of inflation measured according to the RCPI. The high concordance index (0.75), as a result of the pairing of these two areas, should not be surprising. The real discount rate is, in fact, a result of the nominal discount rate, reduced by the inflation percentage; apart from this, it is logical that in the inflation episodes, by instrument of discount rate operation, thus influencing the business banks' loan potential, the Croatian National Bank increases the loan price by increasing the discount rate, in order to reduce inflation pressures. It is clear that

the Croatian National Bank uses this credit and monetary instrument very successfully for the purposes of anti-inflation politics, but it is also clear that it is done in a predictable way, as the correlation coefficient is relatively high and highly significant among real discount rate and RCPI cycles. It seems that cycles of labor productivity, too, are rather strongly synchronized with the cycles of the real discount rate. Labor productivity in the circumstances of, say, more expensive money, is perhaps synchronized with the discount rate growth, due to the illusion of higher wages and the so-called wealth effect, with labor entropy measured by absenteeism degree thereby being reduced. In the latter case also, the regression parameter, which measures the correlation coefficient, is highly significant. It is interesting that the construction sector is, to a very large degree, synchronized with external trade trends to a larger measure with imports (concordance index 0.9) than with exports (concordance index 0.74). This is why it is not surprising that imports in 2009 and 2010 were slowed also as a consequence of the fall in conjunction with the construction industry. According to the Official Statistics Department of Croatia the GDP in 2009 decreased by about 5.8%, and in 2010 about 2%. The current recession (perhaps better put, depression) is specifically associated with financial disruption episodes in advanced economies (America and EU), notably housing price busts, and is longer and deeper than other recessions in Croatia's past.

Given that the construction sector is pro-cyclically directed compared to GDP trends, the revival of the construction sector will signify the exit from a very serious recession but also the revival of external trade flows, a larger fiscal income due to larger custom income, etc. The construction sector is moderately strongly synchronized also with cyclical inflation fluctuations. It appears that the increase of prices in the construction sector present in the observed period (the bubble price in the construction sector in pre-recession years before 2008) stimulates the strengthening of the offer in the flat construction sector, this further being reflected in the inflation of retail prices. The cyclic fluctuations of the construction sector are moderately strongly synchronized both with the movements of productivity and the industrial production movements. It should be emphasized that in all of the noted cases the correlation coefficients are high.

The cyclical movement of the monetary aggregate M1 is, as expected, considerably synchronized with the cycles of nominal foreign exchange rate of the Croatian Kuna

(HRK). Namely, the cyclical growth of M1 causes cyclical depreciation impulses in the Kuna. In the exercise of determination of the synchronization index RCPI, as a referential variable, the cyclical movement of retail prices is closely synchronized with the cyclical movement of labor productivity and imports (both correlation coefficients are significant, i.e. different from zero). Industrial production is very synchronized with the fluctuation of import movements; in this case, too, the correlation coefficient is significant. The cyclical movement of productivity is, to a considerable degree, synchronized with the movement of import and nominal wages. As imports represent an important input in the economy due to the high import dependency of the Croatian economy, imports in Croatia can act proactively from the aspect of productivity strengthening, but also from the aspect of nominal wages growth, provided that productivity also grows. In Croatia, import is, to a considerable degree, synchronized strictly with export movements, probably due to the domination of the re-export business, but also due to the import dependency of the export business.

Finally, it can be concluded that the complex of nominal and real wages, together with the Croatian Kuna's (HRK) exchange rate, is a highly inter-synchronized area of cyclic movement. Although the correlation coefficients are highly significant when it comes to the robust testing of the t-values, these findings are of a trivial nature and are of no surprise to us.

6. Conclusions

The hypothesis of this paper, that the results should lead us to some important stylized facts regarding business cycle dynamics in Croatia, has been proven.

Our regression exercise findings allowed us to identify significant correlation coefficients and concordance between the following business cycles in Croatia: first, stark co-movement exists between unemployment cycles and industrial production cycles. That result shows that there is a high level of probability that the dismissal of employees in the Croatian economy will coincide with a contraction phase in industry. This is the first stylized fact of Croatian business cycles. This abstracted result is a trivial novelty in itself, but could be a substantial contribution to Croatia's economic literature due to formal testing deduction. The implications of this result on the conceptualization and creation of the economic and developmental politics of the Republic of Croatia

touch on normative economics. In order to amortize contraction shocks to the increase in unemployment, Croatian economic politics needs to create a new industrial policy.

The cyclic phase of growth of new job position openings coincides, in large measure, with the cyclic phase of growth of exports and construction, as well as with tourist arrivals. The latter finding is the second stylized fact of Croatian business cycles. In terms of novelty and scientific contributions to this result we emphasize the following: the job creation process, as a phenomenon in the labor market in Croatia's recent history, neglects the impulses coming from industry and are much more attracted by those coming from the service economy. The implication of this result on the formation and creation of economic and developmental policies is the need for a stronger proactive policy of strengthening service (tourism, construction) and export economics for the purposes of the creation of new work positions.

The third stylized fact derived from our statistical results and their contribution to economics literature is that there is an almost perfect synchronization between the cyclic phases of the construction industry and imports, and a somewhat a lesser one concerning exports. Thus the picture of the general economic recession adequately corresponds to that finding. It is very well known from the empirical findings that the construction sector, as the bearer of the so-called price bubble, works pronouncedly pro-cyclically during growth phases, but also vice versa. In our case, this is additionally aggravated by the decline in the external trade exchange, which occurs in synchronization with the construction contraction. The implications of this result on the conceptualization and creation of developmental policies of the Republic of Croatia are opposed. If a state wants to strengthen its budget revenue in a short period of time based on customs duties, it will support expansion of the construction sector, with occasional bubble surges, especially due to the nearing of Croatia's EU accession, and if on the other hand it wants to strengthen the industrial sector of the industry complementary to construction, it will have to opt for an import substitution strategy.

The estimation of the turning points from a relatively medium time run time series despite the monthly or high frequency intensity was a constraint in our research. Statistical data on the monthly basis of our time series are missing in the longer time span in Croatia. Thus, a

relatively short time span is one of the major limitations of the data as well as our regression results.

In our opinion, it may be useful to further investigate the dichotomy between the lag and lead terms of two opposite cycles in calculating the concordance index or using an approach based on a different filter data, or synchronization methodology.

One step to improve and justify the success of our research in light of its results would be a more proactive anti-recession policy, both on the real side (the construction building sector, as well as tourism and industry) and the financial part of economy (injecting more money into the economy by dropping interest rates). 

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Appendix

Variables/ Estimation period	Turning Point (month)	Duration (months)		Amplitude (percentage)	
Unemployment 1991m1-2010m3	T P 1995m6 1999m9 2004m2 2005m4 2007m5	39	32.5	-10.056	8.568
Vacancy rate 1991m1-2010m3	P T 1993m4 1996m8 2000m1 2003m1 2007m5	38	46.5	-17.270	18.662
Tourism Arrivals 1991m1-2010m3	P T 1995m3 1997m2 1998m5 2003m5 2007m1	41.5	29.5	-30.255	5.926
Overnight stays 1991m1-2010m3	P T 1993m6 1994m11 1997m6 1999m11 2001m10 2004m8 2007m8	26.6	30	-2.271	2.253
Real Discount Rate 1993m1-2010m3	T P 1995m6 1999m7 2003m9 2007m9	50	48.5	-2.484	1.298
Construction 1992m1-2010m1	P T 1992m8 1998m6 2001m6 2004m4 2006m8	52	32	-1.562	0.975
M1 1992m12-2010m2	T P 1997m10 2002m2 2005m2 2006m11	36	36.5	-18.197	20.262
RCPI 1993m1-2010m3	T P 1994m7 1998m7 2002m1 2005m5 2006m5 2007m5	27	33.3	-0.25	2.563
Industry 1993m1-2010m3	P T 1996m11 1999m9 2002m12 2004m3 2006m3	24.5	31.5	-1.928	1.883
Productivity 1994m1-2010m2	P T 1995m6 1999m1 2001m6 2004m10 2007m2 2008m1	31.3	28.5	-3.146	2.509
Import 1994m1-2010m3	P T 1994m10 1999m1 2001m6 2004m2 2006m4	41.5	27.5	-20.7	7.257
Export 1994m1-2010m3	P T 1994m4 1997m7 2000m7 2002m9 2005m12	32.5	37.5	-8.439	7.241

Variables/ Estimation period	Turning Point (month)	Duration (months)		Amplitude (percentage)	
Nominal Wage 1995m1-2010m3	T P 1997m3 1998m3 2001m9 2004m4 2005m6 2007m12	28	24.33	-4.375	1.274
Real Wage 1995m1-2010m3	T P 1997m4 1998m3 2001m9 2002m12 2005m6 2008m1	36	19	-4.261	1.144
Real exchange rate 1994m2-2010m3	P T 1996m4 1998m2 2000m2 2002m1 2004m3 2005m6 2007m6 2008m12	19.5	24.6	-0.42	0.50
HRK/USA \$ 1995m1-2010m4	P T 1997m8 1998m9 2000m2 2003m8 2005m12 2007m9 2009m5	25.33	21.66	-12.864	10.627

Source: calculated by authors

Table 1: Cyclical phases of variables

A. Concordance indexes and correlations of cycles among time series variables

	UR	VR	ON	AR	INTR	CONI	M1	RCPI	IND	PROD	IMP	EXP	RE	WA	RW	HRK
UR	-	0,52	0,65	0,66	0,7	0,54	0,41	0,54	0,75	0,62	0,62	0,5	0,64	0,29	0,36	0,28
VR	0,02	-	0,59	0,75	0,16	0,7	0,37	0,34	0,34	0,42	0,58	0,8	0,54	0,36	0,45	0,59
ON	0,29	0,18	-	0,58	0,23	0,65	0,41	0,43	0,7	0,58	0,61	0,38	0,39	0,28	0,48	0,52
AR	0,31	0,51	0,17	-	0,33	0,55	0,14	0,35	0,55	0,54	0,66	0,68	0,51	0,28	0,32	0,54
INTR	0,37	-0,68	-0,27	-0,31	-	0,4	0,57	0,75	0,62	0,69	0,52	0,36	0,5	0,63	0,56	0,38
CONI	0,11	0,37	0,31	0,07	-0,22	-	0,16	0,68	0,59	0,64	0,9	0,74	0,42	0,6	0,51	0,53
M1	-0,19	-0,27	-0,21	0,05	0,13	-0,7	-	0,35	0,48	0,36	0,28	0,34	0,54	0,5	0,59	0,65
RCPI	0,1	-0,33	-0,14	-0,29	0,49	0,27	-0,42	-	0,52	0,74	0,65	0,45	0,47	0,63	0,53	0,45
IND	0,44	-3,2	0,41	0,1	0,25	0,21	-0,05	0,02	-	0,55	0,74	0,48	0,44	0,6	0,52	0,54
PROD	0,23	-0,16	0,15	0,08	0,36	0,4	-0,26	0,47	0,11	-	0,75	0,44	0,56	0,67	0,58	0,52
IMP	0,26	0,15	0,2	0,24	0,02	0,73	-0,42	0,41	0,51	0,51	-	0,71	0,42	0,59	0,5	0,55
EXP	-0	0,59	-0,27	0,32	-0,29	0,42	-0,27	-0,11	-0,04	-0,11	0,33	-	0,56	0,44	0,53	0,57
RE	0,28	0,09	-0,21	0,05	3,22	-0,1	-0,04	-0,06	-0,12	0,11	-0,1	0,08	-	0,42	0,5	0,45
WA	-1,51	-0,28	0,12	-0,38	0,2	0,26	-0,04	0,26	0,21	0,35	0,23	-0,05	-0,2	-	0,91	0,69
RW	-0,28	-0,11	-0,04	-0,26	0,16	0,14	0,12	0,12	0,06	0,18	0,17	0,13	-0,04	0,78	-	0,7
HRK	-0,43	0,14	0,04	0,029	-0,26	0,07	0,35	-0,09	0,07	0,04	0,15	0,15	-0,01	0,37	0,37	-
Mean	0,571	0,523	0,512	0,466	0,518	0,328	0,645	0,531	0,531	0,518	0,33	0,41	0,6	0,6	0,687	0,534
STDEV	0,494	0,498	0,399	0,499	0,499	0,469	0,477	0,478	0,488	0,499	0,47	0,491	0,489	0,49	0,463	0,499

Note: Concordance indexes above the diagonal cells / correlations of cycles below the diagonal

Table 2 (A): Measuring and testing of synchronization of cycles

B. Standard and robust t-statistics for $H_0: \rho S = 0$

	UR	VR	ON	AR	INTR	CONI	M1	RCPI	IND	PRO	IMP	EXP	RE	WA	RW	HRK
UR	-	0,22	4,54	5,07	5,74	1,6	-2,87	0,56	6,95	3,3	3,52	-0,11	4,06	-6,12	-3,94	-6,38
VR	0,01	-	2,75	8,97	-13,2	5,91	-4,08	-5,18	-4,85	-2,37	2,14	9,92	1,22	-4,05	-1,61	1,99
ON	2,09	1,23	-	2,62	-4,77	4,65	-2,94	-1,98	6,38	2,13	2,78	-3,9	-1,57	1,56	-0,4	0,63
AR	2,32	4,16	1,22	-	-4,83	1,08	0,74	-4,21	1,5	1,08	3,64	4,97	0,78	-5,98	-3,66	2,6
INTR	2,65	-6,66	-1,9	-2,18	-	-2,8	1,97	7,88	3,54	5,45	0,4	-4,23	4,6	2,87	2,23	-3,34
CONI	0,75	2,81	2,86	0,48	-1,3	-	-13,22	4,04	3,3	5,43	14,8	6,46	-1,36	3,76	1,99	0,95
M1	-1,32	-1,86	-1,37	0,33	0,87	-6,6	-	-4,85	-0,84	-3,64	-6,4	-4,08	0,54	-0,65	1,45	3,64
RCPI	0,14	-2,67	-0,93	-2,02	3,66	2,02	-2,81	-	0,42	7,5	4,66	-1,61	-0,8	3,65	0,83	-1,24
IND	3,44	-2,2	3,06	0,69	1,67	1,56	-0,42	0,19	-	1,51	7,72	-0,66	-1,8	2,87	0,97	1,01
PROD	1,51	-1,1	1,02	0,53	2,56	3,04	-1,75	3,32	0,69	-	8,19	-1,66	1,69	4,96	2,44	0,54
IMP	1,59	0,98	1,3	1,61	0,18	7,06	-2,8	2,16	4,12	3,82	-	5,73	-1,66	3,35	2,67	1,89
EXP	-0,06	5,11	-1,82	2,27	-1,99	2,98	-1,98	-0,71	-0,25	-0,76	2,72	-	1,18	-1,12	1,97	2,1
RE	1,9	0,57	-2,98	0,37	2,22	-0,62	0,26	-0,37	-0,67	0,77	-0,7	0,67	-	-2,8	-1,05	-1,5
WA	-2,96	-1,94	0,78	-2,75	1,32	1,82	-0,31	1,67	1,39	2,45	1,69	-0,43	-1,4	-	18,8	5,52
RW	-1,9	-0,76	-0,2	-1,66	1,1	0,98	0,65	0,67	0,52	1,16	0,98	0,95	-0,54	6,98	-	6,57
HRK	-3,18	0,94	0,25	1,29	-1,43	0,45	1,74	-0,56	0,47	0,25	0,92	0,87	-0,67	2,8	3,34	-

Source: calculated by authors

Note: Standard t-statistics above the diagonal cells / robust t-value below the diagonal cells.

Table 2 (B): Measuring and testing of synchronization of cycles

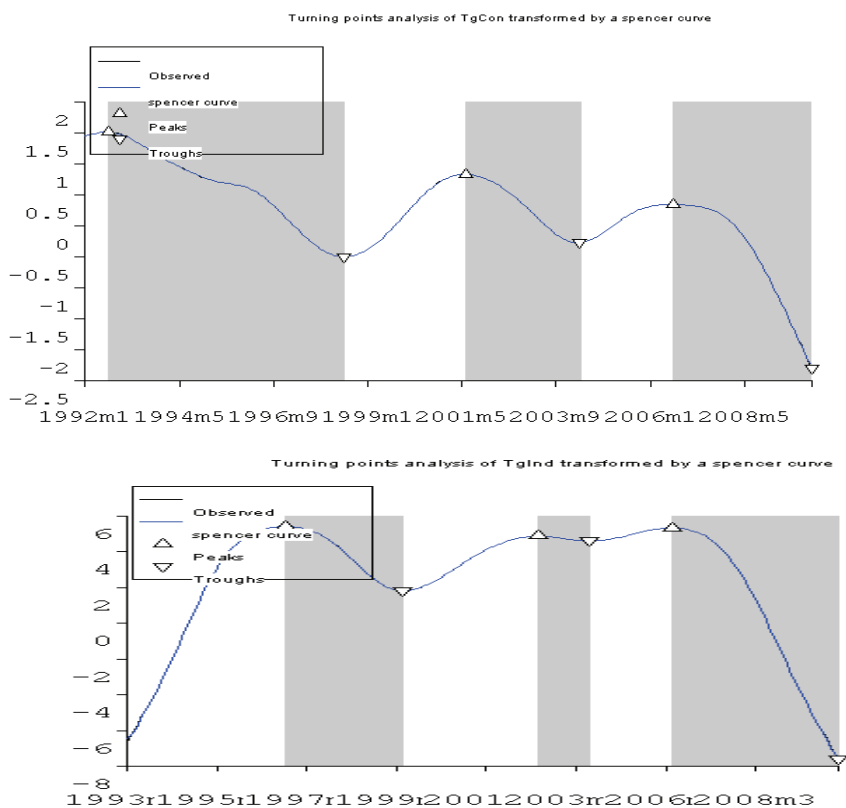


Figure 1-2: Turning points of trended growth rate on annual basis of Construction and Industrial Production Index

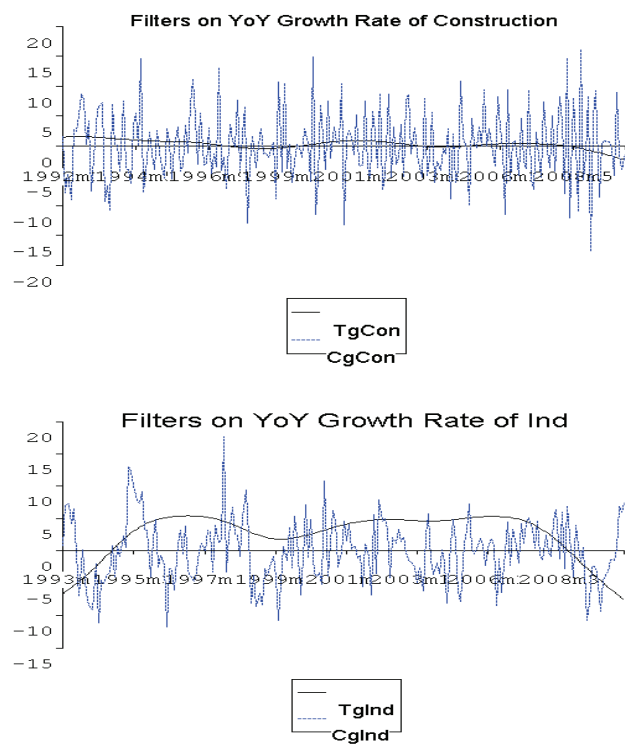


Figure 3-4: Trend and cycle of growth rate on annual basis of Construction and Industrial Production index

Evaluating the Effectiveness of an Institutional Training Program in Slovenia: A Comparison of Methods

Laura Juznik Rotar *

Abstract:

This paper aims to estimate the effect of an institutional training program on participants' chances of finding a job, using a rich dataset which comes from the official records of the Employment Service of Slovenia and taking into account the potential bias due to the existence of unobserved confounding factors. To deal with these selection biases, three methods are implemented in a comparative perspective: (1) instrumental variable (IV) regression; (2) Heckman's two-stage approach and (3) propensity score matching. This paper underlines important divergences between the results of parametric and non-parametric estimators. Some of the results, however, show the impact of the institutional training program on participants' chances of finding a job, especially in the short run. In the long run, however, the results are not so obvious.

Keywords: active employment policies, evaluation, institutional training program, IV and Heckman models, propensity score matching, Slovenia.

JEL: C50, J38, J68

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1. Introduction

Active employment policies are essentially public interventions in the labour market. For the measures of active employment policies in Slovenia in the year 2008 there was a budget of approximately 98,6 mio EUR (current prices). Measures of active employment policies are financed from the state budget, with some of these resources being European resources. Most heavily financed are training programs and programs dealing with social inclusion. Based on scientific methodology there are few studies on the evaluation of the effectiveness of employment programs in Slovenia. This leads to the overestimation of results and the inadequate distribution of resources.

The aim of the empirical analysis is to determine the effectiveness of an institutional training program for future employment probability. We are interested in the future employment probability of the young unemployed who participated in an institutional training program compared with the young unemployed who did not participate in the employment program. Because it is not

possible to identify the individual causal effect for inclusion in the employment program, it is necessary to introduce certain assumptions.

In the empirical analysis, which is based on a rich database, we implement three ways to deal with selection/endogeneity biases (instrumental variables, Heckman two stages, and propensity score matching). Matching means pairing individuals from different groups, where program participants are similar in terms of their observable characteristics. In this case the estimates of the employment program are unbiased. The main assumption on which the matching method is based is a conditional independence assumption. Considering this assumption, the participation in a program and outcome are conditionally independent

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according to the set of observable variables. When facing a highly dimensioned vector of observable variables, the propensity score can ease the calculations greatly. Moreover, results from the matching analysis are compared to results obtained from instrumental variables and the Heckman procedure.

The rest of this paper is organised as follows: (2) Estimation of an institutional training effect: a special case of the evaluation problem, (3) Data set and estimation strategy, (4) Results and discussion, (5) Conclusion.

2. Estimation of an Institutional Training Effect: A Special Case of the Evaluation Problem

We are interested in measuring the effect of an institutional training program (our treatment variable) on participants' chances of finding a job. This problem can be seen as a specific case of the more general evaluation problem dealing with causality (Angrist and Krueger, 1999; Barnow, Cain and Goldberger, 1980; Briggs, 2004; Caliendo and Hujer, 2006; Cameron and Trivedi, 2005; Dehejia and Wahba, 1999; Heckman, 1998). The main hindrance for modelling the causality arises from the basic problem of causal inference, which is to say that for an individual, we cannot simultaneously observe (1) the outcome when the individual receives the treatment and (2) the outcome when the individual does not receive the treatment, and as a result, we cannot observe the outcome for such an individual at the same time in the event of the treatment and in the event of the absence of treatment. In short, each causal inference includes a comparison of the actual outcome with the counterfactual outcome. We cannot say anything about the causal effect if we do not have a record of the counterfactual status. The problem of treatment effect assessment may actually be defined as a problem of missing data (Baltagi, 1995; Hujer and Caliendo, 2000; Ichino, 2006).

We observe the outcomes of individuals participating in an institutional training program and the outcomes of those not participating in the institutional training program. To know the »true« effect of the institutional training program on a particular individual, we must compare the observed outcome with the outcome that would have resulted had that individual not participated in the institutional training program. However, only one outcome is actually observed. What would have resulted had the individual not been treated -the counterfactual- cannot be observed (Ackum, 1991; Ashenfelter, 1978;

Barron, Berger and Black, 1997; Fraker and Maynard, 1987). And this is precisely what gives rise to the evaluation problem. Yet, information on non-participants can be used to derive the counterfactual for participants.

Before stating how this idea can be implemented, it is important to specify the parameters of interest when estimating the treatment effect. Three types of estimates are mentioned in the literature (Heckman et al., 1996; Imbens and Angrist, 1994). In this paper, we will focus on the impact that the institutional training program has on individuals who were actually treated – the average effect of treatment on the treated (hereafter referred to as ATT). However, one could also be interested in the effect of the institutional training program on a random individual – the average treatment effect (ATE). These two effects are identical if we assume homogeneous responses to treatment among individuals; should the responses be allowed to vary across individuals, ATT and ATE would differ. The third parameter of interest is known as the local average treatment effect or LATE (Imbens and Angrist, 1994); it measures how a treatment affects people at the margin of participation, that is, it gives the mean effect of a program on those people whose participation changes as a result of the program.

Of these three parameters (ATT, ATE and LATE), ATT constitutes an obvious start: it easily makes sense for policy makers, who may consider it the most relevant. The first question policy makers want to see addressed is, of course, whether a program has any impact. Very often, they also want to know whether the expansion of a given program is worth considering (for instance, increasing the number of individuals participating in an institutional training program). While ATT may provide answers to these questions, other measures (ATE, for instance) are needed to go further. For instance, if only individuals with the largest expected gains participate in an institutional training program, ATE will be smaller than ATT. A generalisation of the program may thus produce a lower effect than the one measured by ATT (Lee, 2005; Vandenberghe and Robin, 2004; Verbeek, 2004). The empirical analysis outlined in this paper, however, is mostly exploratory. It will therefore focus on ATT only, but will propose different ways of measuring it.

2.1. Ordinary Least Squares Model

Since the outcome of participating in an institutional training program is defined by the probability of being employed, the ordinary least squares model to estimate

the effect of a treatment on probability of being employed (EMP_i) can be written as:

$$EMP_i = \beta X_i + \delta ITP_i + \varepsilon_i \quad (1)$$

where ITP_i is a dummy variable indicating whether or not the i th individual participated in an institutional training program. In this basic »benchmark« case, the dummy has a constant coefficient, which gives the ATT.

If the independent variables X_i perfectly control for the other determinants of participation (usually the individual's background and other characteristics), then estimating equation (1) with OLS yields unbiased estimates of ATT. In this case ATT and ATE are equivalent since a homogeneous and constant response to the treatment is assumed. Implicit in this approach is the assumption that (having controlled for X_i), the treatment is independent of the process-determining outcomes (ITP_i and ε_i are uncorrelated) (Amemiya, 1985). The rest of this paper focuses on the sensitivity of OLS results to the relaxation of two assumptions: first, the absence of any selection bias beyond what is observed by the statistician and second, the linearity of the institutional training program effect across individuals.

2.2. Cross-Section Estimators Dealing with Selection on Unobserved Variables

Since the early 1980s, the literature has repeatedly emphasized that the OLS approach to the treatment effect is likely to be biased by the imperfect measurement or omission of some variables (Heckman, 1979; Heckman, 1990; Heckman and Robb, 1986; Vandenberghe and Robin, 2004). For example, more able or motivated individuals – dimensions that remain unobserved by the statistician – could select themselves into the institutional training program. On the other hand, administrative procedures to define eligibility to participate in an institutional training program can be such to select such individuals (e.g., through a selection procedure via consultation with the representative of the employment office). Technically, the OLS measure of ATT – the parameter associated with the ITP_i dummy in equation (1) – could be confounded with the effect of the unobserved (selection) variables. Means of controlling for this selection bias (i.e., for the endogeneity of ITP_i) consists of implementing the Instrumental Variable (IV) and the Heckman Selection estimators.

2.2.1. Instrumental Variables Two-Stage Least Square

The IV method consists of estimating a two-stage regression model. The second stage equation (eq. (3)) uses the linear prediction $ITPHAT_i$, obtained by regressing ITP_i against all other exogenous variables plus one D_i (eq. (2)). This variable, known as the »instrument«, introduces an element of randomness into the assignment, which approximates the effect of an experiment (Lee, 2005; Wooldridge, 2010)

$$ITP_i = \gamma X_i + \theta D_i + \mu_i \quad (2)$$

$$EMP_i = \beta X_i + \delta ITPHAT_i + \varepsilon_i \quad (3)$$

Provided D_i exists, the estimation of equations (2) and (3) gives an estimate of ATT. The main drawback to the IV approach, however, is that it will often be difficult to find a suitable instrument. To be valid as an instrument candidate, D_i should influence the probability to be treated, without being itself determined by any confounding factors affecting outcome (i.e., without being correlated with the error term ε_i) (Wooldridge, 2010). Since this last condition can never be tested, the choice of a valid instrument largely depends on intuition and economic reasoning.

2.2.2. Heckman Two-Step Procedure

The Heckman Selection estimator is the other extensively used method to control for selection on unobserved variables. It relies on the assumption that a specific distribution of the unobservable characteristics jointly influences participation and outcome. By explicitly modelling the participation decision (estimating the first step equation similar to equation (2), generally using a Probit specification), it is possible to derive a variable that can be used to control for the potential correlation between the residual of the outcome equation and that of the selection equation. By including this new variable alongside the observable variables (X_i) and the institutional training program dummy in the second step (outcome) equation, Heckman can generate unbiased estimates of ATT. However, as with the IV approach, credible implementation requires the selection equation to contain an instrument and the identification of a suitable instrument is often an obstacle to proper implementation (Heckman, 1998; Vandenberghe and Robin, 2004).

2.3. Non-Parametric Estimators: Propensity Score Matching

A major drawback of the IV and Heckman methods (as well as OLS) is that they impose a linear form on the outcome equation. The institutional training program effect is assumed to be uniform across the distribution of covariates and adequately captured by the (constant) coefficient of a dummy variable. But economic theory provides no justification for such a linear restriction. We therefore complement our analysis with the non-parametric matching approach (Dehejia and Wahba, 2002; Heckman, Ichimura and Todd, 1997; Larsson, 2003; Rosenbaum and Rubin, 1983; Rosenbaum and Rubin, 1984; Rubin, 1977).

The underlying principle consists of matching treatment with comparison units (i.e., individuals participating in the institutional training program vs. those not participating in the institutional training program) that are similar in terms of their observable characteristics. This approach has an intuitive appeal, but rests on a very strong assumption: that any selection of unobserved variables is trivial, in the sense that the latter do not affect outcomes in the absence of treatment (Vandenberghe and Robin, 2004). This identifying assumption for matching, which is also the identifying assumption for OLS regression, is known as the Conditional Independence Assumption (CIA).

Under the CIA, estimators relying on matching techniques can yield unbiased estimates of ATT. They allow the counterfactual outcome for the treatment group to be inferred and therefore for any differences between the treated and non-treated to be attributed to the treatment. To make this approach credible, a very rich dataset is needed as the evaluator should be confident that all variables affecting both participation and outcome are observed. Matching individuals directly on their vector of covariates would be computationally demanding, especially when the number of covariates to control is large. The number of »cells« into which the data has to be divided would then augment exponentially. Rosenbaum and Rubin (1984) suggest a way to overcome this problem. They demonstrate that matching can be done on a single-index variable, the propensity score, defined as $p(X_i) \sim \Pr(\text{ITP}_i = 1 | X_i)$, which considerably reduces the dimensionality problem, as conditioning is done on a scalar rather than a vector basis (Vandenberghe and Robin, 2004).

The propensity score, however, must verify the balancing property. This means that individuals with the same propensity score must have the same distribution of observed covariates. The function used to compute the propensity score should be such that individuals with a similar propensity score and participate in an institutional training program, display, on average, similar values of X_i .

When doing propensity score matching, it is possible that for a particular individual in the treatment group no match can be found (i.e., no one in the non-treatment group has a propensity score that is »similar« to that particular individual). This is known as the common support problem. One way of addressing it is to drop treatment observations whose propensity score is higher than the maximum or less than the minimum of the within the common support. Enforcement of the common support can result in the loss of a sizeable proportion of the treated population. For these discarded individuals, the program effect cannot be estimated (Becker and Ichino, 2002; Vandenberghe and Robin, 2004).

Finally, even within the common support, the probability of observing two individuals with exactly the same value of $p(\text{ITP}_i = 1 | X_i)$ is in principle zero, since this index is a continuous variable. Various methods have been proposed to overcome this difficulty (e.g., nearest neighbour matching, kernel matching, radius matching). According to the sensitivity analysis implemented (using the Nannicini program code), we choose to present the results with the nearest neighbour matching approach (Nannicini, 2007). The nearest neighbour matching approach consists of an algorithm that matches each individual participating in an institutional training program with an individual not participating in an institutional training program displaying the nearest propensity score. The resulting match is as good as it is possible to achieve, in that the bias across the treatment and comparison groups is minimised. However, this method disregards potentially useful observations. Over reliance on a reduced number of individuals (the nearest neighbours) can result in ATT with large standard errors (Vandenberghe and Robin, 2004).

3. Data Set and Estimation Strategy

3.1. Data and variables

The data used in this empirical study is a random sample of approximately 3000 unemployed persons collected from an unemployment register kept by the

Variable	Non-participants	Participants in the institutional training program
Gender (%)		
Male	53,4	34,0
Female	46,6	66,0
Age (average)	24,4	25,3
Region (%)		
Pomurska	5,3	15,6
Podravska	16,9	29,8
Koroska	5,1	2,1
Savinjska	12,7	13,2
Zasavska	2,2	4,4
Spodnjeposavska	2,9	5,2
JV Slovenija	4,8	5,1
Osrednjeslovenska	27,6	8,0
Gorenjska	9,8	7,3
Notranjsko-kraska	2,6	2,7
Goriska	5,8	3,9
Obalno-kraska	4,3	2,7
Education (%)		
Unfinished/finished elementary school	15,8	7,3
Lower vocational school (2 years)	3,1	4,1
Lower vocational school (3 years)	0,7	0,6
Vocational school (4 years)	18,7	8,3
High school	41,4	42,2
University (2 year degree)	1,7	5,4
University (4 year degree)	18,5	32,1
Master's degree	0,1	0
PhD	0	0
Duration of unemployment before the program's start in months (average)	4,3	18,2
Number of observations	1346	1456

Note: "Program start" for the group of non-participants is a hypothetical date randomly assigned by a procedure suggested by Lechner (see Lechner, 1999). "Duration of unemployment before the program's start" for the group of non-participants is based on this hypothetical date.

Table 1: Descriptive statistics

Employment Service of Slovenia. The unemployment register includes records of all individuals who have been registered with the Employment Service as unemployed persons and are actively searching for a job. The advantages of this source of data are the availability and accuracy of data, that the data can be shown at the lowest possible level (with regard to the protection of personal data), whereas the disadvantage of such a database is that the data do not allow for international comparisons. The target group in our empirical analysis represents young unemployed persons aged from 20 to 29. For each person used in this study we have data on registration dates, data on labour market status: unemployed persons not included in employment programs and unemployed persons included in the institutional training program, and individual characteristics. Descriptive statistics used in this empirical analysis are presented in Table 1.

Table 1 presents descriptive statistics of some selected variables for the group of non-participants and the group of participants in the institutional training program. The data are for the years 2002 and 2003. Among the group of non-participants and the group of participants in the institutional training program there are differences in program characteristics as well as in individual characteristics. The duration of unemployment before the program start is shorter for the group of non-participants compared with the group of participants in the institutional training program. Secondly, the group of participants in the institutional training program consists of persons who registered quite early with the Employment Service, and thus also started earlier in the program. There are also differences in gender, age, education and region.

Variable	Marginal effect	Std. err.	z	P
Gender	0,136	0,0216	6,33	0,000
Age	0,179	0,0724	2,47	0,013
Age ²	-0,004	0,0015	-2,53	0,012
Education	0,055	0,0062	8,87	0,000
Unemployment before the program's start	0,036	0,0015	20,14	0,000

Table 2: Sensitivity of probability of being employed to the variable region (probit estimates)

Algorithm	ATT – basic result	ATT – simulated result	Outcome effect	Selection effect
Measure of success: probability of being employed one year after the program's start				
ATTND	0,408	0,412	1,161	0,325
ATTK	0,452	0,452	1,186	0,334
ATTR	0,301	0,309	1,124	0,333
Measure of success: probability of being employed two years after the program's start				
ATTND	0,160	0,196	1,127	0,334
ATTK	0,215	0,214	1,117	0,327
ATTR	0,077	0,083	1,102	0,328

Note: ATTND indicates nearest neighbour matching algorithm; ATTK indicates kernel matching algorithm; ATTR indicates radius matching algorithm.

Table 3: Sensitivity analysis: average effect of treatment on the treated (ATT)

3.2. Estimation Strategy

We focus on the impact of the institutional training program on participants' chances of finding a job (measured as the probability of being employed one/two years after the program start and expressed as the differential being equal to participant mean minus the non-participant mean). Using the independent variables presented above, we run a traditional OLS model to get a first estimate of ATT. The next step is to implement the IV and Heckman models in order to control for the potential endogeneity of the treatment. As stated in section 2, both models crucially depend on the presence of a proper instrument in the first equation (choice equation). We have opted for a dummy variable »region«, equal to 1 (osrednjeslovenska, gorenjska, notranjsko-kraska, goriska and obalno-kraska region) and to 0 otherwise.

This variable fulfills the first condition of an instrumental variable candidate (Wooldridge, 2002) to be correlated with the endogenous variable or choice variable *ITP*, ceteris paribus. As can be seen in Table 2, the (marginal) effect of region on participants' chances of finding a job is strongly significant and evident.

As stated in section 2, the second condition for a variable to be an instrumental candidate (non-correlation with the residuals of the outcome equation) cannot be tested, which makes the choice of an instrument largely dependent on sensible arguments. We believe that there are plausible circumstances that would make »region« a valid instrument. If participation in an institutional training program is more frequent in regions that are less

developed and have more rural areas, the risk of overestimating the effectiveness of an institutional training program is serious. Since the values of coefficients in Table 2 are not very large and the sign of coefficients is not the same across variables, we could consider that this somehow reduces the risk of overestimating the effectiveness of the institutional training program. But it could still be the case that the relative prevalence of the institutional training program according to region somehow reflects demand-side factors, in which case the endogeneity problem would remain.

The last step is to implement the propensity score matching approach presented in section 2. This is done (using program code written by Becker and Ichino, 2002) by using a Logit model to compute a propensity score, and the nearest neighbour as a matching algorithm, under the condition that common support is satisfied. The matching algorithm uses the same set of covariates (X_i) as in all previous estimations. As stated in section 2, due to the verification of common support less than 2% of individuals are discarded from the sample. Therefore, we estimate that our sample is still representative enough.

As we mentioned above, we use the nearest neighbour as a matching algorithm due to the results of sensitivity analysis. We follow the procedure suggested by Nannicini (2007). Identification of the ATT relies crucially on the validity of the CIA. Since the data are completely uninformative about the distribution of the outcome in the case of no treatment for treated

OLS		IV		Heckman				Nearest neighbour matching	
ATT	t	ATT	t	ATT	P(rho=0)	rho	P	ATT	t
0,250	13,95	0,167	3,24	0,981	0,000	0,488	0,000	0,396	5,99

Table 4: Probability of being employed one year after the program's start

OLS		IV		Heckman				Nearest neighbour matching	
ATT	t	ATT	t	ATT	P(rho=0)	rho	P	ATT	t
0,025	1,33	-0,168	-3,16	0,164	0,009	0,389	0,000	0,169	2,60

Table 5: Probability of being employed two years after the program's start

Variable	Experimental group	Control group	% of std. err.
Gender	1,66	1,61	9,5
Age	24,32	24,48	-5,9
Region	4,55	4,62	-1,9
Education	5,18	5,17	0,6
Unemployment before the program's start	16,72	14,91	11,0

Table 6: Balancing of covariates: mean standardised bias/difference

individuals, the CIA is untestable. Credibility of the CIA can be supported/rejected by theoretical reasoning and additional evidence. The Nannicini procedure for sensitivity analysis is a way to estimate whether average treatment effects are robust with possible deviations from the CIA. According to this procedure the results are presented in Table 3.

Since the basic and simulated results are for all three of the abovementioned algorithms very close to one another, we can conclude that matching algorithms are robust with possible deviations from the CIA. The outcome effect (which reports the magnitude and the sign of the simulated confounder in the case of no treatment) is positive and relatively small, whereas the selection effect (which reports the magnitude and the sign of the simulated confounder in the case of treatment) is negative and relatively small. This is not the problem, as the outcome effect and selection effect somehow balance, so that the basic and simulated results are very close to each other. According to the evidence presented, we chose the nearest neighbour as the matching algorithm to present our results.

4. Results and discussion

In Tables 4-5, four types of results of interest are detailed: (1) ATT as captured by the ITP dummy (δ) in an OLS regression model without control for selection biases; (2) ATT estimated via IV two-stage least squares; (3) ATT obtained with the Heckman two-stage estimates;

(4) ATT from the nearest neighbour propensity score matching.

It is worth noting that all of the methods investigated here lead to estimates of ATT that diverge from the OLS results. When we measure the probability of being employed two years after the program's start, the Heckman two-stage method and nearest neighbour propensity score matching generate results that are relatively similar. The real differences emerge with IV and Heckman estimates and quite logically for cases where selection biases (as detected by the correlation between error terms in the Heckman model – rho in Tables 4-5) are significant. The correction can be positive (rho>0 with Heckman), suggesting that OLS exaggerates the effectiveness of the institutional training program. It can also be significantly negative (rho<0 with Heckman), suggesting that OLS underestimates the effectiveness of the institutional training program.

The results, however, show the impact of the institutional training program on participants' chances of finding a job, especially in the short run. With a propensity score matching method the probability of being employed one year after the program start is approximately 40%. In the long run, however, the results are not so obvious.

Table 6 provides some diagnostics of the performance of the match. Mean standardised bias/difference (MSB) provides a test of the balancing of covariates between the experimental and control groups (Rosenbaum, 2010; Rosenbaum and Rubin, 1983). The smaller the value of the MSB, the greater the similarity between the

experimental and control groups. There is no clear theoretical foundation for the limit to which these differences are still acceptable or the matching procedure still adequate. Oakes and Kaufman (2006) report that differences exceeding 10% of the standard error are unacceptable. On the other hand, Caliendo and Hujer (2006) report that acceptable differences are between 3% and 5% of the standard error. Only for the variable unemployment before the program start does the MSB exceed the abovementioned limits. In general, however, the results show that the balancing of covariates is satisfied (Table 6).

5. Conclusion

The objective of this paper was to estimate the effectiveness of an institutional training program on participants' chances of finding a job. The target group in our empirical analysis was young unemployed persons aged from 20 to 29. The problem of measuring the effectiveness of active employment programs was formulated as a specific case of the evaluation problem dealing with causality. The major problem represents constructing the proper counterfactual. The methods used were essentially twofold: IV and Heckman, on the one hand, in an attempt to control for potential selection on unobserved variables (ability, motivation), and propensity score matching (using the nearest neighbour algorithm) on the other to depart from the linearity restriction imposed by the OLS estimator.

From a methodological perspective, this paper underlines the main obstacle to the implementation of the IV and Heckman approaches, namely the difficulty of finding a valid instrument. The propensity score matching method helps overcome this obstacle, but at the cost of a risky assumption that the differences between the treated and control groups are fully embedded in the observed variables.

With regard to the results of our empirical study, we found that the effectiveness of the institutional training program on participants' chances of finding a job is different depending on the method used. However, the results show the impact of the institutional training program on participants' chances of finding a job, especially in the short run. With the propensity score matching method the probability of being employed one year after the program's start is approximately 40%, In the long run, however, the results are not so obvious.

The results presented in this paper can be of great help to the Slovenian government in deciding how to spend financial resources effectively. Moreover, this study also contributes to a lack of literature on the topic of evaluation of the active employment policies of Slovenia.



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Cross-National Variations in the Under-Reporting of Wages in South-East Europe: A Result of Over-Regulation or Under-Regulation?

Colin C. Williams*

Abstract:

This paper seeks to explain the cross-national variations in the tendency of employers in South East Europe to under-report the wages of their employees by paying them two wages, an official declared salary and an additional undeclared envelope wage. Reporting the results of a 2007 Eurobarometer survey of this practice undertaken in five South East European countries, the finding is that the commonality of this illicit wage practice markedly varies cross-nationally, with 23 percent of formal employees in Romania but just 3 percent in Cyprus receiving an under-reported salary. Finding that the under-reporting of wages is more prevalent in neo-liberal economies with lower levels of state intervention and less common in more 'welfare capitalist' economies in which there is greater state intervention in work and welfare, the resultant conclusion is that the under-reporting of employees wages by employers is correlated with the under- rather than over-regulation of work and welfare.

Keywords: undeclared work; informal economy under-reported employment; envelope wages; tax compliance; tax evasion; South-East Europe

JEL: E26, M26, O17, K42

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1. Introduction

Over the past decade or so, a small but growing literature has highlighted how formal employers sometimes under-report the wages that they pay to their formal employees by paying them two wages, a declared salary and an undeclared 'envelope' wage (Karpuskiene 2007; Meriküll and Staehr 2010; Neef 2002; Sedlenieks 2003; Williams 2007, 2008, 2009a,b; Woolfson 2007; Žabko and Rajevska 2007). Beyond highlighting that employers do this in order to reduce the social contributions they pay, there has been no attempt to explain why this wage practice varies cross-nationally. This paper, therefore, seeks to do so by evaluating whether it is more common for employers to under-report employees' wages in some economic systems than others. To do this, two competing economic perspectives will be evaluated.

From a neo-liberal viewpoint, it could be argued that the under-reporting of wages is a product of high taxes, over-regulation and state interference in the free market

and that the remedy is therefore to pursue tax reductions, de-regulation and to minimize state interference in the market. Viewed through this neo-liberal lens, therefore, the under-reporting of wages would be more common in countries with higher taxes and levels of state intervention in work and welfare systems. From a structuralist viewpoint, meanwhile, it could be argued that the under-reporting of wages is a product of inadequate levels of labour market intervention and social protection and that the solution is therefore to pursue greater state intervention. Viewed through this structuralist lens, in consequence, the under-reporting of wages would be less prevalent in countries with higher levels of state intervention in work and welfare. The aim of this paper is to evaluate these competing economic

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perspectives by analysing in the context of South-East Europe whether the under-reporting of wages is more prevalent in neo-liberal regimes with lower levels of state intervention or in more 'welfare capitalist' economies where there is greater intervention in work and welfare.

To achieve this, the first section will review the existing literature on the under-reporting of employees' wages along with the competing explanations regarding its cross-national variations that view it as the result of either over-regulation or under-regulation. To evaluate the validity of these competing explanations, the second section will then set out the methodology used to compare the under-reporting of wages in different economic and welfare systems in South-East Europe, followed in the third section by the findings. Finding that in more 'welfare capitalist' countries with higher levels of intervention in the labour market and greater social protection, the under-reporting of wages is less prevalent, whilst in 'neo-liberal' regimes with less intervention in the labour market and social protection, the under-reporting of wages is more extensive, the final section will then review the implications of the findings both for explaining the cross-national variations in the commonality of the under-reporting of wages and for how it might be tackled.

Before beginning, nevertheless, it is necessary to clarify what is being discussed in this paper. Based on the notion that a job is either formal or informal, the focus was upon work which is wholly hidden from, or unregistered by, the state for tax, social security and/or labour law purposes (European Commission 2007b; ILO 2002; Williams and Windebank 1998). There was little recognition that not all jobs paying an undeclared wage are entirely hidden from, or unregistered by, the state for tax, social security and/or labour law purposes. In recent years, however, an emergent literature has begun to discuss how formal employers sometimes under-report the wages that they pay to their formal employees by paying them two wages, a declared salary and an undeclared 'envelope' wage which is hidden from, or unregistered by, the state for tax and social security purposes (Karpuskiene 2007; Meriküll and Staehr 2010; Williams 2008, 2009a; Woolfson 2007; Žabko and Rajevska 2007). It is these jobs, where the wage packet paid to formal employees by formal employers is under-reported, that are the subject matter of this article.

2. Explaining the Under-Reporting of Employees' Wages by Employers: A Literature Review

Since the turn of the millennium, there has been a small but growing literature which has recognised that formal employers sometimes under-report the wages of their formal employees by paying them two wages, an official declared salary and an undeclared wage, or what is termed an 'envelope wage' which is hidden from, or unregistered by, the state for tax and social security purposes. Studies of this tendency for formal employers to under-report their formal employees' wages have been conducted in Estonia (Meriküll and Staehr 2010), Latvia (OECD 2003; Meriküll and Staehr 2010; Sedlenieks 2003; Žabko and Rajevska 2007), Lithuania (Karpuskiene 2007; Meriküll and Staehr 2010; Woolfson 2007), Romania (Neef 2002), Russia (Williams and Round 2007) and Ukraine (Round et al. 2008; Williams 2007).

Until now, these have tended to be mostly small-scale qualitative studies or more extensive surveys of a single country. For instance, Woolfson (2007) in Lithuania examines one single person whose wages were under-reported by his formal employer, albeit a *cause celebre*, whilst Sedlenieks (2003) reports 15 face-to-face interviews conducted in the city of Riga in Latvia. Single nation extensive surveys, meanwhile, include a survey of 600 household in three Ukrainian localities by Williams (2007), and a study of 313 households in three districts of Moscow in Russia (Williams and Round 2007). Neither, however, are representative national samples. The only known nationally representative sample survey of this subject is reported by Meriküll and Staehr (2010). They review the findings of 900 interviews undertaken in Estonia, Latvia and Lithuania. This study, however, was conducted between 1998 and 2002 at an earlier stage in the transition process.

The findings of these studies nevertheless provide strong indicative evidence that this wage arrangement is widely used in the countries so far studied. In Ukraine, Williams (2007) finds that 30 per cent of the formal employees interviewed in the three localities received unreported (envelope) wages in addition to their declared salary. In Moscow, meanwhile, 65 per cent of formal employees received unreported wages from their formal employer equating to anywhere between 20 to 80 per cent of their gross wage (Williams and Round 2007). In Latvia, meanwhile, the OECD (2003) report that 20 percent of private sector employees received unreported

wages as a supplement to their declared wage from their formal employer.

The main reason for formal employers under-reporting the wages of their formal employees by paying an additional unreported ('envelope') wage is so that they can evade their full social insurance and tax liabilities. This, however, is not the sole rationale for this wage arrangement. It can also be used by formal employers seeking redundancies. By not paying the undeclared component of an employee's wage, formal employers can encourage those formal employees they no longer wish to retain to voluntarily leave their formal job, and thus avoid social costs in the form of redundancy pay. Indeed, anecdotal evidence in several studies suggests that this is a common practice (Hazans 2005; Round et al. 2008).

Until now, however, no studies have sought to understand whether it is more common for employers to under-report employees' wages in some economic systems than others. This paper, therefore, seeks to do so. In order to achieve this, two competing economic perspectives will be evaluated.

From a neo-liberal economic perspective, it could be argued that the under-reporting of wages is a product of high taxes, over-regulation and state interference in the free market (Becker 2004; De Soto 1989, 2001; London and Hart 2004; Nwabuzor 2005; Small Business Council 2004). As Nwabuzor (2005: 126) asserts, 'Informality is a response to burdensome controls, and an attempt to circumvent them', or as Becker (2004: 10) puts it, 'informal work arrangements are a rational response ... to over-regulation by government bureaucracies'. From this neo-liberal viewpoint, therefore, the under-reporting of wages would be more common in countries with higher taxes and levels of state intervention in work and welfare systems. To solve the problem of the under-reporting of wages, therefore, tax reductions, de-regulation and minimal state intervention would be pursued.

Alternatively, and from a structuralist economic perspective, it could be argued that the under-reporting of wages is a result of the lack of regulation of labour markets and inadequate levels of labour market intervention and social protection provided to employees. For structuralists, the contemporary mode of production is one where employers are using informal modes of organising and organisation in order to achieve flexible production, profit and cost reduction (Castells and Portes 1989; Davis 2006; Gallin 2001; Sassen 1996; Slavnic 2010). From this perspective, the under-reporting of wages by employers is one manifestation of how this is

being achieved. Besides sub-contracting various stages in the production process to the informal economy, formal employers are also achieving flexible work arrangements, profit and cost reduction by paying formal employees some of their wage as an undeclared 'envelope' wage. Those employees whose wages are under-reported are thus seen as unwilling pawns who are forced into this illicit wage arrangement by unscrupulous employers (Ahmad 2008; Geetz and O'Grady 2002; Ghezzi 2010). The under-reporting of wages by employers is therefore viewed as having arisen due to the lack of regulation in the economy and greater regulation is required to resolve this problem. Viewed through this structuralist lens, therefore, the under-reporting of wages will be less prevalent in countries with higher levels of state intervention in work and welfare.

In this paper, in consequence, the aim is to evaluate in the context of South East Europe these competing economic perspectives by analysing whether the under-reporting of wages is more prevalent in neo-liberal regimes with lower levels of state intervention or in more 'welfare capitalist' economies where there is greater intervention in work and welfare. To achieve this, two hypotheses will be tested:

- that under-reported wages are more common in countries with higher tax rates; and
- that under-reported wages are more common in countries with greater levels of state interference in the economy and welfare provision.

3. Methodology: Examining the Under-Reporting of Wages in South-East Europe

To evaluate cross-national variations in the under-reporting of wages in South East-Europe and whether they are more common in countries with higher or lower tax rates and levels of state intervention, two sources of data will be used. To evaluate the prevalence of the under-reporting of wages, the findings of the 2007 Eurobarometer survey of undeclared work will be reported (TNS Infratest et al, 2006; European Commission, 2007a). This provides the results of 4,544 face-to-face interviews conducted in five South-East European nations, namely Bulgaria, Cyprus, Greece, Romania and Slovenia. Although these are all EU member states, and thus not representative of South-East Europe as a whole (which also includes Albania, Bosnia and Herzegovina, Croatia, Republic of Macedonia, Montenegro, Serbia, Moldova and Turkey), this survey nevertheless provides the first

insight into the under-reporting of employees' salaries in South-East Europe. To collect the data, a multi-stage random (probability) sampling method was employed with sampling points drawn with probability proportional to population size and population density according to the Eurostats NUTS II (or equivalent) and the distribution of the resident population in terms of metropolitan, urban and rural areas. Further addresses (every *n*th address) were subsequently selected by standard 'random route' procedures from the initial address. At the household level, meanwhile, the 'closest birthday rule' was used to select respondents.

The interview gradually moved towards more sensitive questions. It commenced by asking attitudinal questions with regard to participation in undeclared work, followed by questions on whether they had received undeclared goods and services. Questions then turned to the issue of whether those who were formal employees had received an additional undeclared ('envelope') wage from their formal employer and finally, questions were asked regarding their supply of undeclared work. Given the focus in this paper on the under-reporting of formal employees by formal employers, the questions asked on this issue are here outlined. Firstly, those who reported that they were formal employees were asked, 'Sometimes employers prefer to pay all or part of the regular salary or the remuneration for extra work or overtime hours cash-in-hand and without declaring it to tax or social security authorities. Did your employer pay you all or part of your income in the last 12 months in this way?'. Secondly, and in order to comprehend the nature of this under-reporting of the wages of formal employees, participants were asked 'Was this income part of the remuneration for your regular work, was it payments for overtime, or both?'. Thirdly, they were asked to estimate the percentage of their gross yearly income from their main job received as an undeclared ('envelope') wage and fourthly, they were asked whether they were happy to receive a portion of their salary in this manner.

To analyse the cross-national variations in tax rates and the level of state intervention in work and welfare, meanwhile, the data used is directly taken from the official sources of the European Commission. To analyse the variations in tax rates across these five South East European nations, three different measures of tax rates are analysed with the data in all cases taken from the official publications of the European Statistical Office (Eurostat, 2007, 2011). Firstly, the implicit tax rates (ITRs)

on employed labour are analysed, which is the sum of all direct and indirect taxes and employees' and employers' social contributions levied on employed labour income divided by the total compensation of employees working in the economic territory. Secondly, the total tax revenue (excluding social contributions) as a percentage of GDP is analysed, which includes all taxes on production and imports (e.g., taxes enterprises incur such as for professional licenses, taxes on land and building and payroll taxes), all current taxes on income and wealth (including both direct and indirect taxes) and all capital taxes (Eurostat 2007). Third and finally, employers' social contributions as a percentage of GDP are analysed.

To evaluate whether the under-reporting of employees' wages by formal employers is correlated with different levels of state intervention, meanwhile, two indicators are used based on data again taken from official data sources of the European Commission. Firstly, the level of spending by the state as a proportion of GDP on labour market interventions to correct disequilibria is analysed (Eurostat 2011) and secondly, the level of state social protection expenditure (excluding old age benefits) as a proportion of GDP (European Commission 2011: Table 3).

Before reporting the findings from comparing these data-sets, it is important to highlight that one previous paper has used the 2007 Eurobarometer survey to describe the commonality of envelope wages in South-East Europe (Williams 2010). No attempt, however, was made to explain the cross-national variations in this wage arrangement. Here, therefore, by combining the data sets on cross-national variations in tax rates, labour market interventions and levels of social protection with the data-set on under-reported salaries, the competing economic perspectives can be evaluated critically. In other words, this paper for the first time begins to explain the cross-national variations in the under-reporting of employees' wages, rather than simply describing its existence.

4. Findings: Cross-National Variations in the Under-Reporting of Wages in South-East Europe

Of the 4,544 face-to-face interviews conducted in these five South-East European nations (Bulgaria, Cyprus, Greece, Romania and Slovenia), 1,657 participants reported that they had formal jobs. Of these 1,657 formal employees, one in ten (162 employees in total) had received an additional undeclared (envelope) wage from

their formal employer over the past 12 months. The prevalence of this illicit wage arrangement, however, is not evenly distributed across these South East European countries. As Figure 1 graphically portrays, there are marked cross-national variations, ranging from 23 percent of formal employees in Romania reporting that they receive an additional undeclared (envelope) wage from their employer to just 3 per cent of formal employees in Greece.

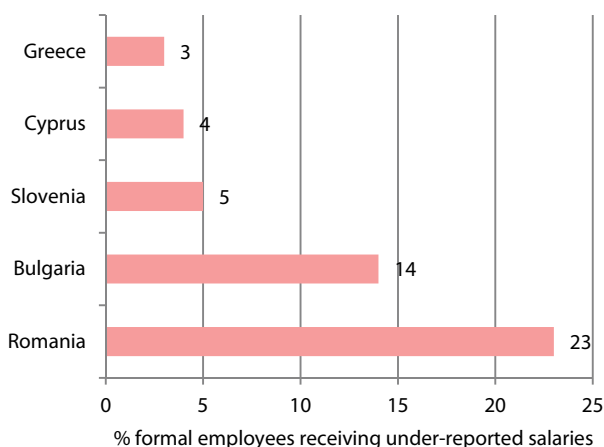


Figure 1: Prevalence of under-reporting of employees' wages in South East Europe

Neither is the nature of these under-reported wages the same in all five countries. As Table 1 reveals, across all five South East European countries, those receiving under-reported wages receive 38 per cent of their total wage undeclared, but this ranges from recipients receiving on average 86 per cent of their gross wage undeclared in Romania to 10 per cent in Cyprus. There are also variations in whether formal employees are paid an undeclared (envelope) component of their salary for their regular work and/or for overtime conducted. Across the five countries as whole, 34 per cent receive such a wage for their regular work, 30 per cent for overtime and 31 per cent for both their regular work and overtime. In Romania

and Bulgaria, however, the vast majority of employees receive envelope wages for their regular work and/or both regular work and overtime, whilst in Greece, Cyprus and Slovenia, around a half of recipients of undeclared (envelope) wages receive them for overtime or extra work conducted.

On the one hand, therefore, there are South East European nations in which this practice is extensive, paid to employees more for their regular hours and amounting to a considerable proportion of formal employees' wages (i.e., Bulgaria and Romania). On the other hand, there are South East European countries where such a wage arrangement is less common, paid more for overtime or extra work and amounting on average to around one sixth of employees' gross wages (i.e., Slovenia, Cyprus and Greece).

How, therefore, can the cross-national variations in the under-reporting of wages be explained? Is this employer practice more common in 'welfare capitalist' societies in which there is greater state intervention in work and welfare? Or is it more common in neo-liberal regimes where interference in work and welfare is much lower? To evaluate this, firstly, the relationship between wage under-reporting and tax rates, and secondly, between wage under-reporting and state intervention in work and welfare, will be evaluated. This will allow conclusions to be reached on the validity of the neo-liberal and structuralist explanations concerning whether the under-reporting of wages is correlated with over- or under-regulation.

4.1. Relationship between Tax Rates and Wage Under-Reporting

The neo-liberal perspective argues that employers under-report employees' wages due to high tax rates and that the resultant solution is to reduce taxes so as to decrease the commonality of this practice. To evaluate this, an analysis is undertaken of the relationship between

Country	No. of formal employees surveyed	% of gross income received as undeclared ('envelope') wage	Unreported (envelope) wage paid for:			
			Regular work	Overtime/extra work	Both regular & overtime work	Refusal or don't know
Romania	452	86	49	9	41	2
Bulgaria	415	30	48	16	34	2
Slovenia	357	15	12	41	29	18
Greece	247	15	29	57	14	0
Cyprus	186	10	14	57	29	0
All five	1,657	38	34	30	31	5

Table 1: Character of wage under-reporting in South East Europe

wage under-reporting and implicit tax rates (ITR) on employed labour in these five countries (Eurostat 2011). This summary measure of the average effective tax burden on labour income is calculated by totalling all direct and indirect taxes and employees' and employers' social contributions levied on employee income and dividing this by the total compensation of employees. Direct taxes on labour income cover the revenue from personal income tax, while indirect taxes on labour income are taxes such as payroll taxes paid by the employer. Employers' contributions to social security (including imputed social contributions) and to private pensions and related schemes are also included. The compensation of employees is the total declared remuneration, in cash or in kind, payable by an employer to an employee. It is thus the gross (declared) wage from employment before any charges are withheld (Eurostat 2007).

Figure 2 displays the relationship between the cross-national variations in the prevalence of wage under-reporting by employers and the cross-national variations in implicit tax rates on labour (i.e., the average effective tax burden on labour income) in these five South East European countries. Using Spearman's rank correlation coefficient (r_s), the finding is that there is no significant correlation between the cross-national variations in the average effective tax burden on labour income and cross-national variations in wage under-reporting by employers ($r_s = -.200$). Indeed, just 15 percent of the variance in the prevalence of wage under-reporting is correlated with the variance in implicit tax rates ($R^2 = 0.1471$). Consequently, the neo-liberal representation that wage under-reporting directly results from high taxes, and that the remedy is to therefore pursue tax decreases, is refuted.



Figure 2: Relationship between implicit tax rates on labour and under-reported salaries

This outcome, however, might purely be a product of looking at ITRs on labour income. To evaluate whether it differs when other measures of tax rates are analysed, the relationship between wage under-reporting and total tax revenue (excluding social contributions) as a percentage of GDP is analysed. Total tax revenue here includes: all taxes on production and imports (e.g., taxes enterprises incur such as for professional licenses, taxes on land and building and payroll taxes), all current taxes on income and wealth (including both direct and indirect taxes) and all capital taxes. As Figure 3 displays, there is again no significant correlation between cross-national variations in total tax revenue as a proportion of GDP and cross-national variations in the prevalence of wage under-reporting ($r_s = -.300$; $R^2 = 0.223$).

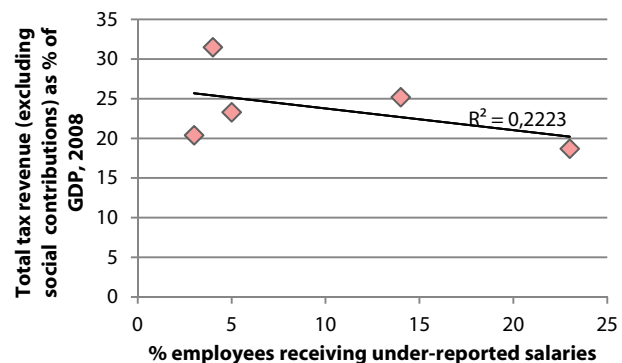


Figure 3: Relationship between total tax revenue and under-reported salaries

It is similarly the case when the relationship between the cross-national variations in the prevalence of envelope wages and the cross-national variations in the level of employers' social contributions as a percentage of GDP are analysed. Indeed, given that a major reason for employers paying envelope wages is to avoid paying their social contributions, this is perhaps the most relevant tax rate to analyse. The finding, however, as Figure 4 reveals, is that there is again no statistically significant correlation ($r_s = .800$; $R^2 = 0.2234$).

Consequently, whether one examines cross-national variations in implicit tax rates on labour, the total tax revenue as a percentage of GDP, or the level of employers' social contributions as a percentage of GDP, there is no evidence that cross-national variations in the prevalence of under-reporting of wages by employers are significantly correlated with cross-national variations in tax rates in the manner neo-liberals assert, namely that wage under-reporting rises when tax rates increase.

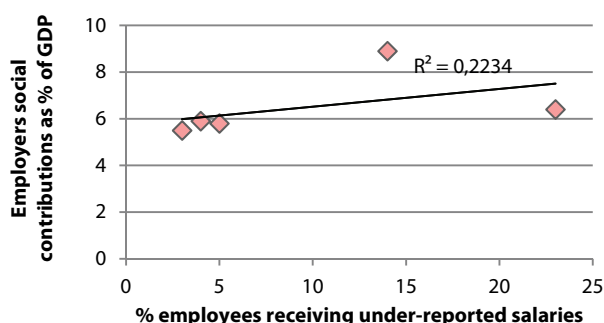


Figure 4: Relationship employers social contributions and under-reported salaries

4.2. Relationship between State Intervention and Wage Under-Reporting

Is it nevertheless the case that a relationship exists between cross-national variations in levels of state intervention and cross-national variations in the prevalence of wage under-reporting by employers? If so, is it the case that nations with greater levels of state interference have higher levels of wage under-reporting, as neo-liberals assert? Or is it that nations with greater state intervention have lower levels of wage under-reporting, as the structuralist perspective asserts? To answer these questions, the correlation between the cross-national variations in the prevalence of employer wage under-reporting and the cross-national variations in, firstly, the extent of state labour market interventions as a proportion of GDP and, secondly, the level of social protection expenditure as a proportion of GDP, will be analysed.

To evaluate whether welfare capitalist societies in which there is greater intervention in the labour market have a higher prevalence of wage under-reporting by employers, a bivariate analysis is conducted of the cross-national variations in the prevalence of wage under-reporting and the cross-national variations in the level of spending on labour market interventions to correct disequilibria, explicitly targeted at groups of the population with difficulties in the labour market, such as those who are unemployed, in employment but at risk of involuntary job loss, and inactive persons currently excluded from the labour force but who would like to join the labour market but are somehow disadvantaged (Eurostat 2011).

As Figure 5 displays, there is a strong statistically significant correlation between the cross-national variations in the proportion of GDP spent on labour market policy measures and the cross-national variations

in the prevalence of wage under-reporting ($r_s = -0.900^{**}$), with 74 percent of the variance in the prevalence of wage under-reporting correlated with the variance in the proportion spent on labour market interventions ($R^2 = 0.7415$). Examining the direction of this correlation, the finding is that the proportion of employees receiving under-reported wages decreases as the proportion spent by the state on labour market adjustments increases. Akin to tax rates, in consequence, there is no support for the neo-liberal explanation for the cross-national variations in wage under-reporting. Instead, there is strong support for the structuralist economic perspective, which asserts that the under-reporting of wages by employers is a by-product of a lack of intervention in the labour market.

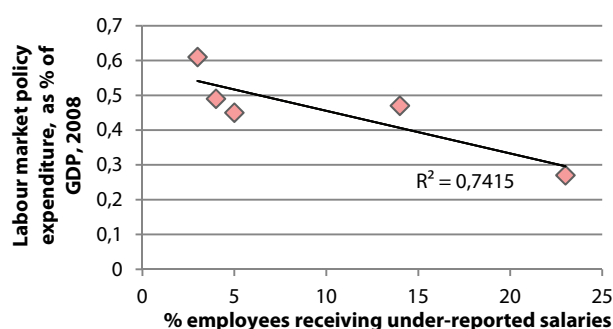


Figure 5: Relationship between labour market policy expenditure and under-reported salaries

Analysing the relationship between cross-national variations in the commonality of wage under-reporting and cross-national variations in the degree of intervention in welfare, moreover, there is again a significant correlation. Analysing the relationship between the prevalence of envelope wages and the proportion of GDP spent on social protection benefits, excluding old age benefits (European Commission 2011: Table 3), as Figure 6 displays, there is a very strong statistically significant correlation ($r_s = -0.900^{**}$), with 54 percent of the variance in the prevalence of wage under-reporting correlated with the variance in the proportion spent on social protection ($R^2 = 0.5403$). However, it is not in the direction intimated by neo-liberal thought. Countries where a higher proportion of GDP is spent on social protection have fewer employees receiving undeclared (envelope) wages from their employers. In consequence, a higher level of state intervention in the form of social protection is correlated with a decrease in the commonality of undeclared (envelope) wage payments, as argued by the structuralist economic perspective.

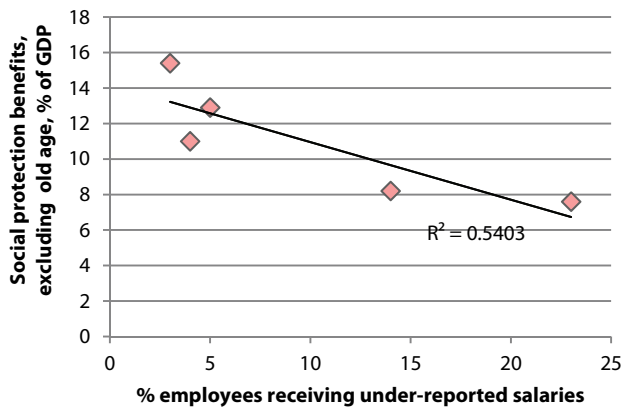


Figure 6: Relationship between social protection and under-reported salaries

5. Conclusions

This article has sought to explain the cross-national variations in the commonality of wage under-reporting by employers in South Eastern Europe. To do so, two competing economic perspectives regarding the correlation between wage under-reporting and economic and welfare systems have been evaluated critically. On the one hand, a neo-liberal economic perspective has been evaluated which asserts that wage under-reporting by employers is a direct by-product of high taxes, over-regulation and state interference in the economy and welfare, and that wage under-reporting is therefore higher in more 'welfare capitalist' economies characterised by greater state intervention in the economy and welfare (Becker 2004; De Soto 1989, 2001; London and Hart 2004; Nwabuzor 2005). On the other hand, a structuralist economic perspective has been evaluated which views wage under-reporting by employers to result from under-regulation rather than over-regulation and thus depicts the under-reporting of wages to be more widespread in neo-liberal economies where there is less state intervention in economic and social provision.

No evidence has been found in this comparative analysis of five South East European nations to support the neo-liberal view that wage under-reporting by employers arises due to high taxes. This is the case whether one examines the implicit tax rates on labour (as a summary measure of the average effective tax burden on labour income), the total tax revenue as a percentage of GDP or the level of employers' social contributions as a percentage of GDP. Neither is any evidence found to support the neo-liberal notion that greater levels of state

interference result in higher levels of wage under-reporting by employers. Instead, the finding is that greater state intervention in the labour market and social welfare is significantly correlated with a reduction, rather than increase, in the prevalence of wage under-reporting by employers, as the structuralist economic perspective asserts.

In policy terms, therefore, decreasing the degree of state intervention is not correlated with a reduction in employer wage under-reporting. Instead, the under-reporting of wages employee wages by employers is most prevalent in those South East European countries where the degree of intervention is lower. These findings consequently raise considerable doubts about whether de-regulation, tax reductions and minimal state intervention would be a progressive way forward in eradicating the persistence of wage under-reporting in South East Europe. The problem is perhaps less one of over-regulation, but rather one of under-regulation.

To summarise, this study of employee wage under-reporting by employers in South East Europe has provided supporting evidence for a structuralist perspective that views such a wage practice to result from under-regulation. Meanwhile, no evidence has been found to support the neo-liberal depiction of this practice as a product of high taxes, over-regulation and too much state interference. If this article now encourages further research in other regions across the globe to evaluate whether the cross-national variations in the prevalence of wage under-reporting by employers can be similarly explained to result from under- rather than over-regulation, then it will have fulfilled one of its key intentions. If this paper also facilitates greater discussion both within South East Europe and beyond concerning how the state might intervene to deal with this wage practice, then it will have fulfilled all of its intentions. 

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A Feasibility Study for Six Sigma Implementation in Turkish Textile SMEs

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Abstract:

This paper aims to investigate the Critical Success Factors (CSFs) for the successful introduction of Six Sigma in Small and Medium Sized Turkish Textile Enterprises. A survey-based approach is used in order to identify and understand the current quality practices of Small and Medium Sized Enterprises (SMEs). CSFs and impeding factors are identified and analyzed. The involvement and commitment of top management, linking quality initiatives to employee and information technology and innovation are found to be important CSFs for textile SMEs. The leadership and commitment of top management, strategic vision, and data collection and measurement, are found to be the most CSFs for the successful introduction of Six Sigma, whereas the lack of knowledge of the system to start the initiative and the presence of ISO-certification in the company are found to hinder its implementation. The lack of qualified personnel and incompetence with new technologies are found to lower the performance of Turkish textile SMEs.

Keywords: Six Sigma, textile industry, SMEs, Turkey

JEL: L15, L67

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1. Introduction

In the intensity and pace of today's cutthroat business world, many large organizations have sought strategies such as TQM, balance scorecard, ISO-certification and Six Sigma to improve process and product quality. Since the early 90's, numerous global organizations have undertaken the implementation of Six Sigma methodologies which seek to improve yield and productivity through the identification and elimination of defects, mistakes or failures in business processes or systems by concentrating on the more important aspects of production as seen by their customers. (Snee, 2004; Antony, 2008).

The implementation of Six Sigma extends way beyond the industries of manufacturing and services, to government, the public sector, healthcare and non-profit organizations (Antony et al., 2005; Montgomery, 2005; Pande et al., 2000; Pyzdek, 2003; Breyfogle, 1999). The relevance of Six Sigma has been successfully proven

across the industrial spectrum from shop floor personnel to the senior management level in the organizations which have embraced it. The companies which have invested in and implemented Six Sigma (i.e., allocated a special budget to launch it and created a separate organizational culture), have been rewarded with reduced operational costs and defect rates, achieved high rates on business profits, increased employee morale, and improved the quality of their final product. In addition to these, customer loyalty and Return on Investment (ROI) have also shown measurable improvement (Antony et al., 2005; Kumar et al., 2006, 2008; Snee, 2004).

The importance of Six Sigma as a business strategy has recently been recognized by SMEs as their

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understanding of Six Sigma's ability to address supply chain issues (Antony et al., 2005, 2007). Keller (2003) and Snee and Hoerl (2003) have stated that Six Sigma can offer many SMEs the same benefits as larger organizations. In the Turkish context, however, Turkish SMEs have yet to follow the lead given by large and institutionalized Turkish organizations, as it seems that they have yet to be convinced of the benefits of the implementation of Six Sigma (Antony et al., 2005, 2008; Antony, 2008; Harry and Crawford, 2004; Kumar, 2007). Lack of a formalized strategy, operational focus, limited managerial and capital resources, and misconception of efficiency measurement are the characteristics which distinguish the SMEs from larger organizations (Brouthers et al., 1998; Fuller-Love, 2006; Garengo et al. 2005; Ghobadian and Galleary, 1997; Hudson et al., 2001; Hussein et al., 1998; Jennings and Beaver, 1997).

While there is ample evidence to support the success of Six Sigma in many large corporations, there is still a need for documented evidence in SMEs. The evidence which does exist on Six Sigma implementation in SMEs is based on quality management practices in SMEs, which in turn are based on consultants/ practitioners experience and are not of sufficient depth and volume. (Antony et al., 2005 and 2008; Kumar, 2007; Kumar and Antony, 2008; Wessel and Burcher, 2004).

Using a sample of SMEs in Germany, Wessel and Burcher (2004) have identified the specific requirements for implementation of Six Sigma. Similarly, Antony et al. (2005, 2007) have assessed the current status of Six Sigma implementation in UK SMEs and shown that many of the SMEs show a lack of awareness. In addition, these companies do not have the resources available to implement Six Sigma projects. Likewise, a case study on Six Sigma implementation in a UK manufacturing SME brought to light a cost-effective approach of eliminating the critical-to-quality issue (Thomas and Barton, 2005). Six Sigma application in an Indian SME has also proven successful in improving their delivery rates (Darshak and Desai, 2004 and Desai, 2006). Recently, Timans et al. (2011) implemented Lean Six Sigma in Dutch SMEs.

Improvement in on-time deliveries, labor efficiencies and annual profits have been among the other areas which have been shown to benefit SMEs when Six Sigma has been successfully implemented (Gupta and Schultz, 2005). Antony et al., (2005, 2007), Kumar (2007), Spanyi and Wurtzel (2003), Waxer (2004) have demonstrated that strong leadership and senior management commitment are crucial to successful Six Sigma implementation in

SMEs. Customer focus, communication, cultural change, education and training, rewards and recognition, shared understanding of core business processes, resource commitment, understanding of Six Sigma methodology; and project prioritization and selection have also been identified as significant factors (Antony et al., 2005, 2007; Kumar, 2007; Spanyi and Wurtzel, 2003; Waxer, 2004).

The single most important factor in the successful deployment of Six Sigma is found to be the combination of management involvement and commitment (Kumar, 2007). Kumar's study also shows that the lack of resources and poor training/coaching are the two most important impediments in the successful deployment of Six Sigma. Kumar and Antony (2010) have found that strong leadership and management commitment are the critical factors in the successful implementation of Six Sigma in the UK SMEs.

CSFs are those factors that play an essential role in leading to the success of any organization, since if the objectives associated with these factors are not met, the organization will inevitably fail (Rochart, 1979). Thus, this paper investigates the CSFs for the successful introduction of Six Sigma in Turkish textile SMEs.

2. Turkish SMEs and Six Sigma

Constituting one of its major parts, SMEs are the backbone of the Turkish economy. While the integration of Turkey to the EU is progressing, the business environment and performance of the Turkish SMEs are becoming more important. With the acceptance of EU's Basel-II framework, Turkish SMEs are expected to foster entrepreneurship, competition, innovation and growth by means of access to more financial resources.

The regional rather than global focus of Turkish SME's remains one of their major drawbacks. To attain more share in international markets, they should primarily work on their core competencies, focus more on marketing, human resources, new technologies, innovation and environmental values, and most importantly continuously improve their manufacturing processes to lower scrap rates and increase efficiency rates.

Turkish SMEs are in the earliest stages of implementing Six Sigma. Turan et al. (2008) states that Turkish SMEs readily accept implementing the TQM tools and/or ISO but are still reluctant to introduce the Six Sigma concept. In fact, the use of ISO can be beneficial to SMEs before embarking on Six Sigma (Kumar et al., 2008).

To achieve this, Turkish SMEs should maintain a higher quality of thought. The factors hindering the introduction of Six Sigma in Turkish textile SMEs are investigated in this paper.

2.1. Interview with an A-class Turkish Textile Company

A face-to-face interview with the CEO of Company-A revealed the following facts about the industry. Company-A is one of the most successful SMEs specializing in manufacturing towels and bathrobes in the Turkish textile industry. However, it has not implemented any quality initiative in the past. There are a total of 225 employees working in the SME, including five engineers. The SME has a quality department. All employees are trained for quality. The CEO believes in the benefits of CI and is open to implementing Six Sigma in the SME to decrease the scrap rates in their manufacturing process as the company has been suffering from high rates of 15.07%, 17.48% and 13.44% in 2009, 2010 and 2011, respectively. Following assistance from a Swiss consultancy company, structural improvements have been realized. A French company named SGS periodically continues auditing the SME's quality standards.

The current quality control practice of the SME is as follows. Inspections are made daily during the manufacturing process. Errors are classified into groups such as stains, (mildew, fluff, penmarks, oil stains), holes, tears, folding errors, printing smudge, dying inconsistency, sewing error, fastener error (e.g. missing, damaged, misplaced), joining error, elastic too loose/tight/torn, size error, bridging error, etc. Each error group also has subcategories for different sections of the garment. Next, the number of scrap pieces (i.e. pieces with error) is recorded. Finally, error rates are calculated and reported weekly to the top management.

3. Methodology and Data

In this study, a survey-based approach is used to identify the continuous improvement (CI) initiatives commonly practiced in Turkish textile SMEs as well as understanding the approach of these SMEs to Six Sigma. The 15-item questionnaire was tailored to Turkish textile SMEs requirement from Kumar et al. (2009) with the purpose of identifying the CSFs for implementing Six Sigma in Turkish SMEs (See the Appendix). In the context

of Six Sigma implementation, CSFs represent the essential ingredients without which SMEs performance stands little chance of success (Kumar et al., 2009).

The questionnaire was emailed to 100 randomly selected Turkish SMEs operating in the textile industry. Twenty-eight SMEs returned the questionnaire. This resulted in a response rate of 28%. Six of these SMEs (21.4%) were small-sized enterprises and 22 of them (78.6%) were medium-sized (Figure 1).

The respondents of the survey consisted of CEOs, managing directors and quality managers. The responses reveal that 17.85% of the SMEs (5 out of 28) implemented only the ISO certification. The results show that all the SMEs under study have quality departments and that their employees are trained for quality.

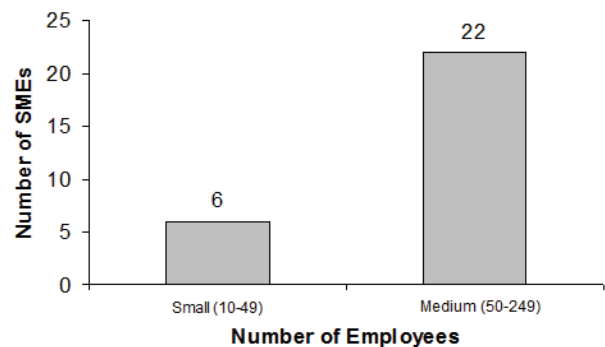


Figure 1: Histogram showing the number of employees for the SMEs under study

3.1. Analysis

The respondents of the survey were asked to shortlist three factors out of seven alternatives available that mostly define the organization's strategic objectives. They were then asked to give information regarding the quality initiatives deployed in the past and present. After this they were asked to rate the importance of 26 CSFs necessary for and 5 impeding factors hindering the introduction of Six Sigma as a quality initiative in their SMEs. Finally, they were asked to rate the 7 possible reasons lowering the performance of their SMEs. The respondents made use of the Likert scale of 1 to 5 while rating the importance of CSFs, e.g. a rating of 1 corresponding to "not important at all", 2 corresponding to "not important", 3 corresponding to "neither important nor not important", 4 corresponding to "important", and 5 corresponding to "very important". Consequently, the ratings are collected and averaged.

Table 1 summarizes the factors defining the strategic objective(s) of the Turkish textile SMEs. Profitability (100%), flexibility (71.43%) and quality (53.57%) are the three most important factors which the SMEs in this study have taken into account while deciding their strategic objectives.

Strategic Objective	Count	%
Profitability	28	100%
Flexibility	20	71.43%
Quality	15	53.57%
Lower costs	13	46.43%
Higher market share	8	28.57%
Innovation	0	0%
Other	0	0%

Table 1: Factors defining the strategic objective (s) of the Turkish textile SMEs

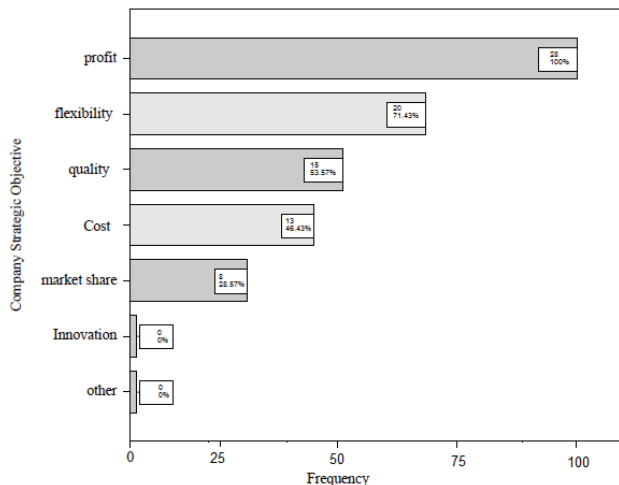


Figure 2: Factors defining the objectives of the textile SMEs

Quality Initiatives Undertaken	Count	%
ISO 9000	5	17.86%
Six Sigma	0	0
TQM	0	0
Lean	0	0
Kaizen	0	0
Others	0	0
No initiative undertaken	23	82.14%

Table 2: History of quality initiatives in Turkish textile SMEs

The results reveal that ISO certification hinders the introduction of Six Sigma in Turkish textile SMEs as the

CEOs are satisfied with the status quo. Those SMEs (23 out of 28, i.e. 82.14%) which have not undertaken any quality initiative, expressed interest in learning more about Six Sigma.

Turkish textile SMEs were asked to identify the top three inhibiting factors that were felt to be barriers to quality initiative implementation. Table 3 shows that 64.29% of the responding enterprises stated that internal resistance was the most common factor in the SMEs. This was followed by lack of knowledge and lack of top management commitment.

Reasons for not implementing quality initiatives	Count	%
Internal resistance	18	64.29%
Lack of knowledge	15	53.57%
Lack of top management commitment	12	42.86%
Availability of resources	11	39.29%
Changing business focus	10	35.71%
Inadequate process control techniques	9	32.14%
Poor employee participation	6	21.43%
Lack of training	5	17.86%

Table 3: Barriers to implementation of quality improvement initiatives in SMEs

It is crucial to understand the perception of Six Sigma and the factors preventing its implementation from the Turkish textile SMEs perspective. SMEs were asked to state the reasons for not implementing Six Sigma as an initiative to drive CI effort within their enterprises. Table 4 shows that all of the Turkish SMEs were discouraged to implement Six Sigma due to a lack of knowledge of the system to start the initiative. This was followed by complacency.

Reasons for not implementing Six Sigma	Count	%
Lack of knowledge of the system to start initiative	28	100%
Complacency/ People prefer status quo	27	96.43%
Availability of Staff/Time for Projects	22	78.57%
Other competing quality initiatives such as ISO	5	17.86%
Cost	4	14.29%

Table 4: Reasons for not implementing Six Sigma in SMEs

CSFs and their mean importance and standard deviation are given in Table 5. The mean ratings above 2.50 signify that the majority of the respondents have

Question	CSF	Mean Rating	Standard Deviation	Rank
Importance of CSF to SME	Involvement and commitment of top management	4.571	0.5040	1
	Organizational infrastructure	3.393	0.4973	12
	Vision and Planning	3.964	0.5079	6
	Linking Quality Initiatives to Employee	4.536	0.5079	2
	Linking Quality Initiatives to Customer	3.643	0.4880	10
	Linking Quality Initiatives to Business	3.857	0.5909	8
	Linking Quality Initiatives to Supplier	3.929	0.6627	7
	Project selection	3.786	0.4170	9
	Project management skills	4.286	0.4600	4
	Information Technology and innovation	4.464	0.5079	3
	Communication	4.250	0.4410	5
	Cultural change	2.857	0.6506	13
	Education and training	3.464	0.5079	11
CSFs for successful introduction of Six Sigma in SME	Leadership and Commitment of top management	4.786	0.4179	1
	Strategic vision	4.750	0.4410	2
	Change management	3.750	0.5853	10
	Commitment of middle managers	4.286	0.4600	7
	Funds and Resources	3.464	0.5079	11
	Education and training	3.929	0.5394	9
	Empowerment of employees	3.429	0.5040	12
	Communication	4.143	0.3563	8
	Cross-functional teamwork	4.607	0.4973	4
	Data collection and measurement	4.714	0.4600	3
	Process documentation	4.357	0.4880	6
	Resource allocation	2.464	0.5079	13
	Regular audits	4.571	0.5040	5
Factors hindering the implementation of Six Sigma in SME	Lack of knowledge of the system to initiate	4.714	0.4600	1
	Availability of Staff/Time for Projects	2.679	0.8630	4
	Cost	2.321	0.6696	5
	Other competing quality initiatives such as ISO	3.214	0.6299	2
	Complacency/ People prefer status quo	3.071	1.0157	3
Factors Lowering SME's performance	Lack of qualified personnel	4.536	0.5079	1
	Lack of financial resources	2.821	0.9833	4
	Incompetence with the organizational structure	1.536	0.5079	7
	Incompetence with new technologies	4.464	0.5079	2
	Legal procedures and obligations (bureaucracy, taxes, etc.)	1.750	0.4410	6
	Lack of quality management	4.429	0.5040	3
	Lack of infrastructure	2.107	0.7860	5

Table 5: CSFs and Mean Ratings of Importance

rated the effect of the CSF as above average. The three most important CSFs cited across the SMEs are found to be the involvement and commitment of top management (4.571), linking quality initiatives to employee (4.536) and information technology and innovation (4.464). The three most common important CSFs cited across the SMEs for successful introduction of Six Sigma are found to be the leadership and commitment of top management (4.786), strategic vision (4.750), and data collection and measurement (4.714).

The majority of the SMEs have stated that they are hesitant to implement Six Sigma due to a lack of knowledge of the system to start the initiative (4.714) and the presence of the ISO-certification (3.214) in the company. The two most important CSFs lowering the performance of SMEs are found to be lack of qualified personnel (4.536), and incompetence with new technologies (4.464). To test internal consistency, Cronbach's alpha values were calculated for each

performance measure. All the Cronbach's alpha values showed satisfactory levels (above 0.7).

Capacity usage per annum	Count	%
81%-100%	5	17.86%
61%-80%	19	67.86%
31%-60%	4	14.29%
Below 30%	0	0%

Table 6: Capacity of the sample SMEs

The respondents were asked about the annual capacity usage rate of their SME (Table 6) and to shortlist the factors that can increase their SME's performance and capacity by lowering the SME's process inefficiencies. Table 7 shows that reductions in scrap rates, increase in productivity and improved sales are the top three factors that can improve the performance and capacity of SMEs.

Factors	Count	%
Reduction in scrap rate	20	71.43%
Increase in productivity	14	50%
Improved sales	12	42.86%
Reduction of customer complaints	11	39.26%
Reduction in cycle time	10	35.71%
Increase in profitability	7	25%
Reduction in delivery time	6	21.43%
Reduction of employee complaints (return rate)	4	14.29%
Reduction of costs	2	7.14%

Table 7: Factors to increase the SME's performance and capacity by lowering its process inefficiencies

The respondents received by email a document (of 15 pages) briefly explaining the Six Sigma methodology with a case study of Six Sigma implementation in a foreign textile company. They were then asked to state the five most important post-benefits that are thought to be realized by their SMEs following the implementation of Six Sigma. The questioned benefits were related to customer satisfaction, employee satisfaction, work environment, learning and job involvement.

Table 8 displays that established performance metrics, top-down and bottom-up communication, increase in customer satisfaction and regular internal audits are found to be the four soft benefits that are to be realized by the SMEs. Development in human capability to sustain the benefits, employee empowerment and process ownership and organizational learning through sharing of benefits and challenges experienced during projects

are to be equally perceived by the SMEs as the fifth benefit.

Benefits	Count	%
Established performance metrics	18	64,29%
Top-down and bottom-up communication	17	60,71%
Increase in customer satisfaction	16	57,14%
Regular internal audit	15	53,57%
Development in human capability to sustain benefits	9	32,14%
Employee empowerment and process ownership	9	32,14%
Organizational learning through sharing of benefits and challenges experienced during projects	9	32,14%
Cross-functional team for projects	8	28,57%
Increase in employee satisfaction	7	25,00%
Proactive approach to problem solving	5	17,86%
Understanding and usage of CI tools and techniques for problem solving	4	14,29%
Investment in education and training	3	10,71%
Involvement of people from accounting and finance	0	0,00%

Table 8: Post-benefits thought to be realized by the implementation of Six Sigma

4. Conclusion

The Turkish textile industry will continue to be Europe's backyard. For Turkish textile SMEs to achieve and sustain a successful share in this market, they need to create difference variety in their products. To create this, they need to implement Six Sigma while investing in skilled personnel, innovative ideas and new technologies.

The key contribution of this article to the literature has been its being the first study that investigates the feasibility of Six Sigma in Turkish textile SMEs. This study shows that the implementation of Six Sigma or other CI initiatives in Turkish textile SMEs is heavily hindered due to a lack of understanding of how to get started.

Before embarking on Six Sigma, it is imperative that Turkish textile SMEs have strong management commitment and leadership skills. They should be aware of the promising benefits of the tools and techniques of CI. The results indicate that Turkish textile SMEs currently have the necessary financial resources to implement Six Sigma. However, the results reveal that the major problem of the industry is the lack of knowledge of Six Sigma. On the other hand, the SMEs complain about the

lack of a database developed specifically addressing the characteristics and necessities of the Turkish textile SMEs as their personnel are not competent enough to manage and work with the foreign software currently at hand. This suggests that the companies have employed unqualified personnel, and have not given the required importance to information technologies.

The results also reveal that the companies are aware of the cross-functional teamwork within the organization. Aside from this, data collection and measurement and regular audits are also indispensable. These show that the SMEs are mentally ready for implementing Six Sigma, yet still need to be more fully introduced to its benefits. This can be accomplished by presenting workshops to the top management of the Turkish textile SMEs by qualified Six Sigma consultants who are well-versed in the textile industry.

The major limitation of this study was the number (28 out of 100) of Turkish textile SMEs that responded to the questionnaire. Future studies should focus on performing a larger survey on quality management practices in Turkish SMEs operating in different industries and understanding the impact of industrial variability on successful implementation of Six Sigma. 

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Appendix

The questionnaire used in the study is given below.

1. Which of the following is the most important strategic objective of your SME? Please choose the three most applicable.
 - a. Profitability
 - b. Flexibility
 - c. Quality
 - d. Higher market share
 - e. Innovation
 - f. Lower costs
 - g. Other (Please state)
2. How many employees are working in your SME? Please state.
3. How many engineers are employed in your SME? Please state.
4. Is there any quality department in your SME? Yes/No
5. Are the employees trained for quality? Yes/No
6. Which quality initiative(s) has your SME implemented in the past and present? Please state the ones applicable.
 - a. Six Sigma
 - b. TQM
 - c. Lean
 - d. Kaizen
 - e. ISO certification
 - f. Others (Please state, e.g. TSE, OHSAS 18001, etc.)
 - g. No initiative undertaken
 - h. Undertook no initiative yet but would like to be informed about Six Sigma.
 - i. Is ISO-certified and would like to be informed about Six Sigma.
7. In your opinion, how important are the following CSFs to your SME? Please rate from 1 to 5.
 - a. Involvement and commitment of top management
 - b. Organizational infrastructure
 - c. Vision and Planning
 - d. Linking Quality Initiatives to Employee
 - e. Linking Quality Initiatives to Customer
 - f. Linking Quality Initiatives to Business
 - g. Linking Quality Initiatives to Supplier
 - h. Project selection
 - i. Project management skills
 - j. Information Technology and innovation
 - k. Communication
 - l. Cultural change
 - m. Education and training
8. In your opinion, what are the factors hindering the implementation of a quality initiative in your SME? Please choose the three most important.
 - a- Availability of resources
 - b- Lack of knowledge
 - c- Lack of training
 - d- Internal resistance
 - e- Poor employee participation
 - f- Inadequate process control techniques
 - g- Changing business focus
 - h- Lack of top management commitment
9. In your opinion, what is the importance of the following factor for successful introduction of Six Sigma in your SME? Please rate 1 to 5.
 - a. Leadership and Commitment of top management
 - b. Strategic vision
 - c. Change management
 - d. Commitment of middle managers
 - e. Funds and Resources
 - f. Education and training

- g. Empowerment of employees
 - h. Communication
 - i. Cross-functional teamwork
 - j. Data collection and measurement
 - k. Process documentation
 - l. Resource allocation
 - m. Regular audits
10. In your opinion, which of the following factors hinder the implementation of Six Sigma in your SME the most? Please rate each from 1 to 5. Also please choose the three most applicable.
- a. Lack of knowledge of the system to start the initiative
 - b. Availability of Staff/Time for Projects
 - c. Cost
 - d. Other competing quality initiatives such as ISO
 - e. Complacency/ People prefer status quo
11. What's your SME's annual capacity usage rate?
- a. Below 30%
 - b. 31%-60%
 - c. 61%-80%
 - d. 81%-100%
12. In your opinion, how important and effective are the following factors in lowering the performance of your SME? Please rate from 1 to 5.
- a. Lack of qualified personnel
 - b. Lack of financial resources
 - c. Incompetence with the organizational structure
 - d. Incompetence with new technologies
 - e. Legal procedures and obligations (bureaucracy, taxes, etc.)
 - f. Lack of quality management
 - g. Lack of infrastructure
13. Please list the current inefficiencies in your company.
14. In your opinion, which of the following factors can increase your SME's performance and capacity by lowering the inefficiencies in your SME? Please state the most important three.
- a. Reduction in scrap rate
 - b. Reduction in cycle time
 - c. Reduction in delivery time
 - d. Increase in productivity
 - e. Reduction of costs
 - f. Increase in profitability
 - g. Improved sales
 - h. Reduction of customer complaints (return rate)
 - i. Reduction of employee complaints
15. In your opinion, what are the post-benefits that you think you will realize through the implementation of Six Sigma in your SME?
- a. Increase in customer satisfaction
 - b. Increase in employee satisfaction
 - c. Established performance metrics
 - d. Top-down and bottom-up communication
 - e. Organizational learning through sharing of benefits and challenges experienced during projects
 - f. Cross-functional team for projects
 - g. Involvement of people from accounting and finance
 - h. Development in human capability to sustain the benefits
 - i. Employee empowerment and process ownership
 - j. Investment in education and training
 - k. Regular internal audit
 - l. Understanding and usage of CI tools and techniques for problem solving
 - m. Proactive approach to problem solving

Is Basel III a Panacea? Lessons from the Greek Sovereign Fiscal Crisis

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Abstract:

In the period 2007-2009 the global economy faced the most severe crisis after the Great Recession of 1929. In the aftermath of the crisis a substantially revised version of Basel II, named Basel III, was proposed, introducing new, tighter capital adequacy and liquidity guidelines. Basel III constitutes the new basic embankment against a possible crisis in the future. The same period these discussions were taking place for the new global regulatory framework, the most severe sovereign debt crisis the country ever faced burst out in Greece. One of the main victims of the crisis is the country's banking sector which is sustaining great pressure in its profitability, volume of deposits and credit growth, amongst others. Having as a starting point the Greek banking sector and the effects of the fiscal crisis on it, this paper discusses the new Basel III guidelines and their possible implications in times of turmoil. The new framework can play a crucial role in deterring a new financial crisis; however it should not be regarded as a panacea for all the shortcomings of banking sectors.

Keywords: Basel Accord III, Banking Regulation, Fiscal Crisis, Greece

JEL: E51, G28

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1. Introduction

The need for tighter and more robust supervision of the global financial system was apparent long before the 2007-2009 financial crisis. Even though Basel I was the first serious effort for the imposition of international regulation on the banking system, soon it was outrun and superseded by Basel II. The economic shock of the recent financial crisis led the Committee of Banking Supervision of Basel to propose a new global regulatory framework that aims for a stronger and more resilient banking system. Basel III constitutes the new basic buttress against a possible crisis in the future. The new framework not only strengthens global capital standards but also introduces global liquidity standards. It is argued that the implementation of Basel III will lead to a future of more capital, more liquidity and less risk.

Nevertheless, whether Basel III is a major reform or a hurried reflexive action to the recent financial crisis is still a question to be answered. Even though there is a broad

consensus among the Basel Committee as well as in capital markets about the need for tighter rules, the effectiveness and possible failures of the new rules need to be identified. Such failures are manifested only in times of upheaval and crisis and hence the severe sovereign fiscal crisis in Greece is an interesting setting for showing

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that the new proposed guidelines of Basel III should not be regarded as a panacea for all the shortcomings of the banking sectors worldwide, but as another arrow in the quiver for stabilizing the global banking system.

The remainder of the paper is organized as follows. The second section presents the main reasons that led to Basel III and outlines the basic advantages of the new framework. The third section provides an analysis of the current Greek banking sector and the consequences of the sovereign fiscal crisis on it. The fourth section critically analyzes possible implications of Basel III in times of crisis and finally the fifth section summarizes the paper.

2. The Global Financial Crisis as a Trigger For More Rigorous Banking Supervision

In the period 2007-2009 the global economy faced the most serious crisis after the Great Recession of 1929. The main cause of the financial crisis was the real estate bubble in the US and the consequent collapse of the high risk mortgage loans market (Edward, 2010). The stock markets began to shake while financial institutions exposed to toxic financial products faced default risks. The extensive separation of supervising authorities in the US did not allow the immediate diagnosis of the crisis which might have led to a prompt and effective confrontation of this. The crisis soon passed to the other side of the Atlantic: Northern Rock, a UK-based investment bank, was the first victim.

According to Arestis and Karakitsos (2011), there are two main causes of the "great recession" in the US: The significant redistribution of income from wage earners to the financial institutions and the great expansion of the liquidity in the world economy. During the period 1970-2007 the wage share in five of the G8 countries (France, Germany, Japan, UK and US) decreased by 10.5% on average. Moreover, the world liquidity between 1988 and 2008 increased from 8% to 19% of the world GDP. The income redistribution forced ordinary households to borrow and invest in financial and physical assets. That was made possible through financial liberalization and financial innovation (Arestis & Karakitsos, 2011).

The global financial crisis brought on several discussions for the creation of a more resilient global banking system and led to a revised pact of Basel Accord II, named "Basel Accord III" that was presented and endorsed in 2010 by the G20 Leaders' Summit in Seoul. According to Caruana (2010), Basel III has four core advantages:

It increases the required level of capital: The higher the capital a bank holds, the less vulnerable it is in times of financial shocks. The new standards more than double the minimum quantity of common equity (Core Tier 1) a bank should hold, from 2% to 4.5%, and it also increases the minimum Tier 1 capital from 4% to 6%. Moreover, a minimum "capital conservation buffer" of 2.5% is required as an extra "equity cushion" (Kourtali, 2010). As a result, at the end of the transition period the minimum total capital required will be 8% plus 2.5% of the conservation buffer. These changes aim to construct a banking system much better prepared to withstand possible future periods of stress.

It improves banks' capital quality: A bank's common equity is comprised of various financial instruments. Each has different characteristics and hence a different loss-absorbing capacity (Zakka, 2010). The new guidelines not only increase substantially the required level of regulatory capital, but also provide a new, stricter definition of capital. According to the new definition several types of capital that proved to be risky and of uncertain quality are now excluded and hence the loss-absorbing capacity of banks is increased not only in terms of its quantity but also of its quality.

It reduces the systemic risk: The new framework is the first which takes into account the fact that financial institutions are not isolated entities that do not affect or are unaffected by their external environment. Basel III recognizes the interdependency of financial institutions and hence introduces tools for the effective management of systemic risk. As a supplement to the capital requirements discussed before, Basel III requires a minimum leverage ratio of 3% (which is subject to possible changes in the future) as well as a short-term liquidity coverage ratio and a longer-term net stable funding ratio. In addition, the new higher capital requirements and especially the introduction of a minimum "capital conservation buffer" will help banks to avoid procyclicality problems. Hence, as Caruana (2010) points out, "*the new regulatory capital framework is that it provides what might be called a 'macroprudential overlay' to deal with systemic risk, that is, the risk of financial system disruptions that can destabilize the macroeconomy*".

It gives sufficient time for a smooth transition: Inevitably a major reform such as Basel III needs sufficient time to be effective so as not to impede economic activity. Recognizing this fact, the Basel Committee has proposed a transition period of eight years. During this period the reforms will be effective gradually. For

	before 2013	01.01.2013	01.01.2014	01.01.2015
Tier 1 Capital	4%	4.5%	5.5%	6%
Core Tier 1	2%	3.5%	4%	4.5%

Table 1: Transition period for capital requirements

	before 2016	01.01.2016	01.01.2017	01.01.2018	01.01.2019
Capital Conservation Buffer	0%	0.625%	1.25%	1.875%	2.5%

Table 2: Transition period for capital conservation buffer

	1998	1999	2000	2001	2002	2003	2004
To Households							
- For new deposits (without agreed maturity)	8.84	8.30	3.95	1.83	1.10	0.87	0.96
- For new loans (without defined maturity)	22.35	21.91	17.80	15.39	14.54	14.08	13.41
To Non-Financial Corporations							
- For new deposits (without agreed maturity)	3.57	3.57	2.07	1.18	0.74	0.59	0.55
- For new loans (without defined maturity)	15.71	14.71	10.25	7.89	7.23	6.78	6.97
	2005	2006	2007	2008	2009	2010	2011a
To Households							
- For new deposits (without agreed maturity)	0.91	1.14	1.23	1.24	0.43	0.44	0.47
- For new loans (without defined maturity)	13.07	13.80	14.47	14.83	14.08	14.40	14.94
To Non-Financial Corporations							
- For new deposits (without agreed maturity)	0.71	0.92	1.05	0.96	0.35	0.36	0.42
- For new loans (without defined maturity)	7.00	7.35	7.56	7.13	5.81	6.79	7.59

Source: Bank of Greece Database, <http://www.bankofgreece.gr/Pages/en/Statistics/default.aspx>

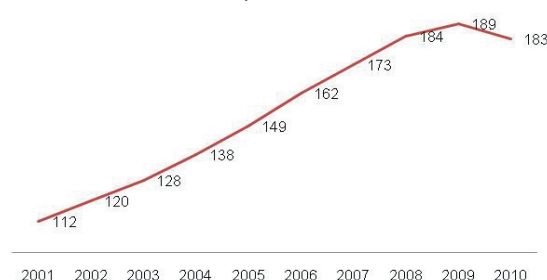
Table 3: End of year basic interest rates for loans and deposits

instance, the new definition of capital will be effective from January 2013 while the higher minima for Core Tier 1 and Tier 1 capital will be gradually adopted from January 2013 (Tables 1 and 2). The new standards shall be fully implemented in 2019.

3. Greek Sovereign Fiscal Crisis: The Banking Sector in Turmoil

The Greek banking sector can be characterized as one of the most active and dynamic sectors of the Greek economy. During the last two decades Greek banks have undergone tremendous changes which led to the substantial expansion of their activities both in Greece and abroad; especially in South Eastern Europe. The deregulation and harmonization of the European Union's banking/financial system, the privatization of most of the state-owned Greek banks and the introduction of Euro at the beginning of the 21st century are just but a few factors which have created favorable conditions for the

expansion of the Greek banks. A characteristic example is the evolution of interest rates (see Table 3). The introduction of a common currency in 2001 led to the rapid reduction in interest rates, which in turn led to a higher net interest rate for the banks and consequently more profits, a lower cost of borrowing, new investments and higher consumption, amongst others. Figure 1 describes one of these favorable consequences. From 2001 until 2009 the aggregate actual consumption of individuals increased by almost 70%.



Source: Hellenic Statistical Authority Database

Figure 1: Actual annual individual consumption (in bil. €)

	2008	2009	2010	2011a
Tier 1				
Alpha Bank	8%	11.6%	11.9%	11.1%
EFG Eurobank	8%	11.2%	10.6%	11.6%
National Bank	10%	11.3%	13.1%	11.2%
Piraeus Bank	8%	9.1%	8.4%	8.6%

Source: Banks' Annual Financial Statements 2009, 2010 and Interim Financial Statements 2011

Table 4: Tier-1 capital adequacy ratio of the "Big-4" Greek banks under Basel II rules

	2005	2006	2007	2008	2009	2010	2011a
Alpha Bank	634.14	800.76	985.26	625.63	501.82	216.37	-511.03
EFG Eurobank	676.00	832.00	1 050.00	818.00	398.00	136.00	-956.00
National Bank	943.09	1 268.30	1 902.93	1 937.01	1 252.07	637.63	-1.280.83
Piraeus Bank	304.62	556.55	785.31	385.79	286.62	10.75	-1.003.8
Sector*	3 312.67	4 367.74	6 498.24	4 243.74	1 902.05	-282.85	-

Notes: *Aggregate Results of the 14 Listed Banks on the ASE: ALPHA BANK, ATE BANK, ATTICA BANK, EFG EUROBANK, MARFIN POPULAR BANK, MARFIN EGNATIA, PROTON BANK, T BANK, GENERAL BANK, NATIONAL BANK, COMMERCIAL BANK, POST BANK, BANK OF CYPROUS, PIRAEUS BANK

Source: Corporate Benchmarking Financial Analysis Database, Hellastat Inc.

Table 5: Profit (Loss) before taxes of the "Big 4" Greek banks and of the banking sector (in mil. €)

	2006	2007	2008	2009	2010	2011a
Households	141 070	158 414	185 424	196 860	173 510	156 116
Non-financial corporations	30 612	35 107	38 185	35 877	29 810	25 767
General Government	5 979	7 011	8 258	7 940	13 269	9 102
Insurance corporations	1 357	1 859	1 810	1 787	2 377	2 341
Other financial institutions	1 898	2 549	2 201	3 007	3 908	3 955
Total	180 916	204 940	235 878	245 470	222 874	197 281

Source: Bank of Greece Database, <http://www.bankofgreece.gr/Pages/en/Statistics/default.aspx>

Table 6: Deposits and repos of domestic residents (in mil. €)

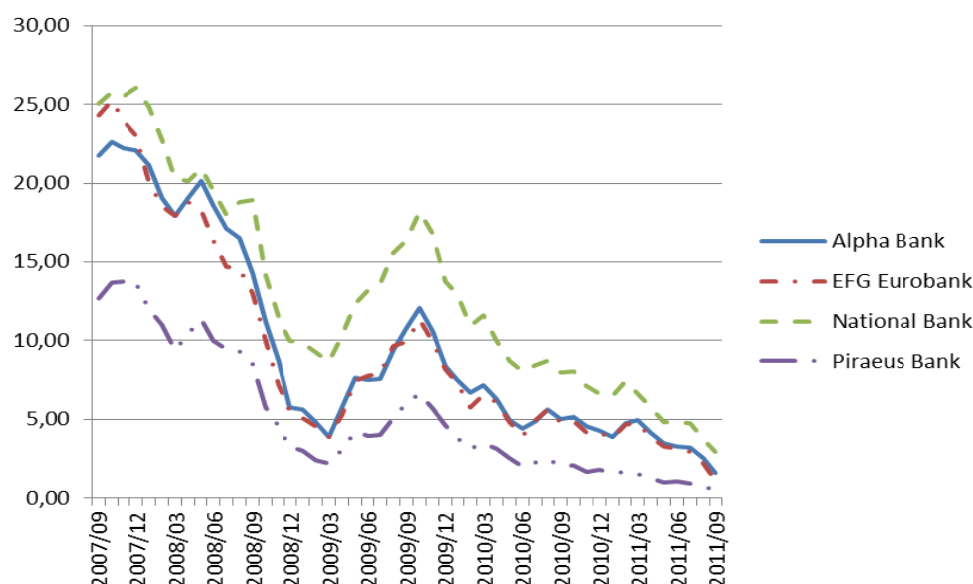
Today, however, the prosperous years of the 00's are only a fond memory. While these lines are being written, a super deal has probably been completed between the second and the third biggest Greek banks. The Boards of Directors of Alpha Bank and EFG Eurobank have come upon an initial agreement for the two banks being merged, forming a banking colossus in South East Europe and one of the top 25 largest banking groups in the Eurozone. The reasons that lead to this merger are far different from those that led to a series of mergers and acquisitions during the 90s. The merger is not a strategic movement for further expansion but simply a matter of survival: In the first half of 2011 the aggregate losses after taxes of the two banks reached €1.3bil. While the

aggregate impairment losses on the Greek Government's bonds net of taxes were more than €1.2bil. In addition, a few weeks before banks reported their interim financial statements, European Banking Authority stress tests¹ revealed inadequacies in EFG Eurobank's capital², speeding up the realization of rumors for the oncoming mergers among Greek banks.

At the same time, however, as Table 4 shows, Greek banks sufficiently cover the capital adequacy

¹ For a detailed discussion <http://stress-test.eba.europa.eu/>

² Vaughan et al. (2011) characterize EFG Eurobank as one of Europe's eight "problem children" due to the fact that it was found "...to have insufficient reserves to maintain a core Tier 1 capital ratio of 5 percent in the event of an economic slowdown."



Source: Athens Stock Exchange

Figure 2: Average daily stock prices of the "Big 4" Greek banks by month for the period September 2007 – September 2011 (in €)

requirements not only of Basel II but also of the newly proposed Basel III. Moreover, the recent stress tests of the European Banking Authority showed that three out of four major Greek banks (apart from EFG Eurobank) have a strong enough capital position to absorb the economic shocks resulting from the designed adverse scenarios. Hence, taking into consideration the ongoing merger of EFG Eurobank with Alpha Bank, it could be claimed that the backbone of the Greek economy is resilient. However, such an argument would be at best superficial. Even though Greek banks have succeeded in reporting an adequate level of capital, a more precise look into their fundamentals reveal some facts that are at the very least unsettling. In the space below the most important of those facts (namely profitability and performance, volume of deposits, credit growth and quality) are discussed.

Table 5 gives an illustrative picture of the deterioration of Greek banks' performance over the last few years. In 2008 the aggregate profits before taxes for all listed Greek banks (except for the Central Bank of Greece) dropped by 35% in comparison to 2007. In 2009 profits were less than half of 2008, while in 2010 the banking sector on the Athens Stock Exchange (ASE) presented aggregate losses of almost €283 mil. Moreover, the interim financial statements for the first six months of 2011 which were published in late August 2011 revealed that the results of the four biggest Greek banks would have been extremely negative even in case they had not had to recognize impairment losses on the Greek

Government's bonds. Specifically, profit before taxes and before impairment losses on the Greek Government's bonds net of tax would have been almost 90% less than in the same period of 2010 for Alpha Bank and the National Bank of Greece, while the Eurobank would have had to recognize losses of nearly €126 mil. It should also be mentioned that Piraeus Bank would have been the only one of the "Big 4" with relatively positive results, mainly due to the fact that it was the only one of the four banks which recognized impairment losses in the interim financial statements of 2010.

However, profitability is not the only problem the Greek banks are facing. Another alarming issue is the steep decrease of domestic residents' deposits and repos. In an 18-month period (end 2009 – June 2011), Greek banks have lost almost 20% of their domestic deposits (Table 6). This loss is translated into absolute numbers as €22.5bil. and €25.5bil. in 2010 and the first six months of 2011, respectively. In this year and a half the companies' accounts presented the most rapid drop as a percentage (almost 30%), while households' deposits presented the most rapid drop in absolute numbers (more than €40 bil.).

The causes of this vicious circle of illiquidity in which the Greek economy is entrapped are multiple. First, the uncertainty of the economic environment: the unending rumors of a possible default by Greece prohibit any capital inflow from foreign investments and also lead depositors to transfer their deposits to "safer" economies abroad. In addition, the consecutive austerity measures of the Greek government, and especially the increase of

	2001	2002	2003	2004	2005	2006
Private Sector	74 601	87 177	103 848	123 754	149 639	179 158
• Corporations	50 908	55 843	63 619	71 432	81 008	93 574
• Individuals	23 693	31 334	40 229	52 323	68 630	85 584
Housing	15 516	21 060	26 589	33 843	45 187	56 909
Consumer	7 852	9 755	12 385	17 025	21 794	26 540
Other loans	325	518	1 255	1 455	1 649	2 135

	2007	2008	2009	2010	2011a
Private Sector	215 088	249 324	249 321	257 474	253 102
• Corporations	111 288	132 457	130 042	139 726	137 398
• Individuals	103 801	116 866	119 280	117 747	115 704
Housing	69 075	77 386	80 225	80 155	79 442
Consumer	31 915	36 412	36 023	35 061	33 572
Other loans	2 811	3 068	3 032	2 532	2 690

Source: Bank of Greece Database, <http://www.bankofgreece.gr/Pages/en/Statistics/default.aspx>

Table 7: Credit to domestic private sector by domestic financial institutions (in mil. €)

	2006	2007	2008	2009	2010
Housing loans	3.4%	3.6%	5.3%	7.4%	10%
Consumer loans	6.9%	6%	8.2%	13.4%	20.5%
Business loans	6%	4.6%	4.3%	6.7%	8.7%
Total	5.4%	4.5%	5%	7.7%	10.4%
Accumulated provisions over NPLs	61.8%	53.4%	41.5%	41.5%	44.7%

Source: Bank of Greece Annual Reports 2006 - 2010

Table 8: Non-performing loans (NPLs)

both indirect and direct taxes as well as salaries' and pensions' cut off have reduced consumption dramatically, as well as economic activity, with the undesirable but also inevitable consequences of an increase in unemployment and further decreases in deposits, since households have seen their real purchasing power diminish, and have tried to compensate by using their deposits. Hence, banks are watching their cash reserves substantially decreases, having as a last resort for liquidity the European Central Bank.

Another negative aspect of the current condition of the Greek banking system is the cessation of lending activity. The total amount of credit to the domestic private sector has remained almost stable for the last three and a half years following a 7-year period of rapid expansion in which the annual credit growth rate fluctuated between 16% and 21% (Table 7).

Beyond the above findings, extreme increase of non-performing loans in the last few years should also be highlighted. Table 8 shows that from 2008 to 2010 housing and business non-performing loans doubled, while respective consumer loans increased by 150%. The halt in credit growth, as well as the increase of non-performing loans, are two more factors aggravating the illiquidity problem of the Greek banking system. Moreover these two factors deteriorate the profitability of banks due to the fact that the lack of credit growth means stagnation of turnover, and the increase of non-performing loans means increases in costs due to the loans' write-offs.

Last but not least, it should be underlined that neither Basel II nor Basel III's capital adequacy requirements seem to provide strong enough assurance for appeasing markets' concerns over Greek banks' ability to cope with a possible hair cut on Greek Government bonds. This is

clearly evidenced by the banks' market capitalization. Figure 2 shows the extremely negative pricing of the "Big 4" Greek banks' shares after October 2009. Specifically, from the end of 2009 until September 2011, Alpha Bank's, EFG Eurobank's, National Bank's and Piraeus Bank's stock prices have lost 84%, 88%, 79% and 89% of their market value, respectively.

4. Possible Implications of Basel III: What the Case of the Greek Crisis Shows

Even though the new framework can play a crucial role in deterring a new financial crisis, it should not be regarded as a panacea for all the shortcomings of the banking sectors. In the space below the basic drawbacks of the new guidelines are discussed.

The Basel Accord III will become fully effective in 2019, but it is reasonable to expect many financial institutions will start following the new guidelines much earlier. The early adoption of the new capital and liquidity requirements would be a signal to the markets that the bank in question is "healthy enough", enhancing markets' confidence. Nevertheless, as it becomes clear from the analysis of the Greek banking sector, simple compliance with the minimum numerical thresholds does not guarantee the sustainability of a bank and the safety of the system. Wolf (2010) claims that the new capital requirements are still very low and a possible crisis in the future may lead to new bank failures. As he points out *"...equity requirements need to be very much higher, perhaps as high as 20 or 30 per cent...It is only because we have become used to these extraordinarily fragile structures that this demand seems so outrageous"*. The Greek example provides clear evidence that confirms Wolf's point of view: In order to survive, Greek banks need either to proceed to mergers creating disproportionately big (to the size of the Greek banking market) institutions or to ask for governmental help. Hence the available capital, even though adequate according to Basel III, would still not be enough.

More than that, under Basel III banks will have less capital available for their activities, which will lead to more expensive capital for borrowers. In times of fiscal crisis, private investments play a key role for helping an economy to get back on its feet. For example, nowadays Greece is looking for new private investments in order to enhance its poor records, reduce its unemployment rate and increase public revenue. A higher cost of capital

might be a discouraging factor for new investments and consequently might hinder the recovery of the economy.

The basic weakness, however, of Basel III, that the Greek crisis reveals, is the idea that banks should hold more capital for riskier assets than for safer ones. For instance, investing in Western European sovereigns' bonds is safer than giving mortgages to unemployed individuals. Nevertheless, the ongoing debt crisis in Greece and many other member states of the Eurozone reveals that there is actually no risk free asset and hence the risk weighting approach of Basel III is questionable. In addition to that, the risk weighting concept might be proven even more problematic if credit rating agencies are included in the equation. The recent financial crisis revealed that these agencies were unable to recognize the hidden risks behind complicated financial products backed by unreliable mortgages. They gave these products high ratings and equated them with US or German bonds. Under Basel III weighting risk guidelines those products would have been regarded as low risk and hence almost no capital would have been reserved for them. Hence, it can be claimed that Basel III makes no realistic assumptions (i.e. sovereigns do not default and rating agencies do not make mistakes).

Last but not least, it should be pointed out that Basel III came into existence as a response to problems that were revealed by the global financial crisis. The implementation of the new guidelines by itself is not enough to eliminate the problems and the stresses of the global financial system. Additional measures such as better monitoring of the banking system, improved national and international enforcement mechanisms for the new Basel III, clear separation of commercial from investment banks and disincentives for the formation of "too big to fail" financial institutions should have desirable results enhancing the role of Basel III.

5. Summary

The implementation of Basel III will considerably increase the quality of banks' capital and will raise its required levels. In addition it will provide a *"macroprudential overlay"* to better deal with systemic risk. Today the Greek banking sector is under tremendous pressure due to the severe sovereign fiscal crisis. Major Greek banks face a number of serious problems such as low/negative profitability, steep reduction of deposit volume, negative credit growth and an increasing number of non-performing loans. The fact that these

banks fulfill the newly proposed Basel III capital adequacy requirements shows that simply complying with minimum numerical thresholds does not guarantee the sustainability of a bank and the safety of the system. The Greek crisis reveals possible negative implications of the new Basel III: Capital requirements might still be too low, the cost of capital might be increased due to less available capital and the risk weighting approach might prove inadequate. Better banking regulation is critical but not enough. The promotion of financial stability requires a broad policy framework in which Basel III should be just one aspect. A number of suggested reforms could include: better monitoring of the banking system, improved national and international enforcement mechanisms for the new Basel III, clear separation of commercial from investment banks and disincentives for the creation of "too big to fail" financial institutions.

Certainly, the analysis of only one banking system, in our case the Greek banking system, is not enough to prove or deny sustainability and viability of Basel Accord III. Further research on other banking systems can considerably help the discussion of whether or not Basel III is a truly revolutionary reform or just a short run solution to the emergence of a severe crisis. 

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Residential Characteristics of Armed-Forces Personnel and the Urban Economy: Evidence from a Medium Sized City in Greece

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Abstract:

The paper explores the locational and residential decisions of Greek military households. To achieve this, primary data were collected by means of a questionnaire survey addressed to military personnel located in Volos, a medium-sized Greek city in the greater area of which a number of major military facilities are located. The study starts by examining the residential distribution of military households to consider whether clustering or dispersion is evident. Then, an attempt is made to explain the observed pattern with reference to conventional urban economics' determinants of location choice or to other factors related to the social or professional characteristics of the group. Such analysis enables us to draw some preliminary conclusions on the potential effects military facilities have on both the urban spatial structure and the housing market.

Keywords: military households, urban location, housing, Greece

JEL: D12, H56, J15, R23, R31

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1. Introduction

A plethora of links connect directly or indirectly the economy and the defence sector. This relationship has attracted considerable attention, giving rise to a large and growing amount of both theoretical and empirical studies investigating various aspects of it (see Hartley and Sandler 1990 1995, Brauer and Hartley 2000, Brauer and Dunne 2002, Sandler and Hartley 2007). A number of recent studies, departing from the dominant focus on the relationship between defence and the economy on the national level, have addressed the issue of the impact of the defence sector on the regional economy level (see Braddon 1995, Hooker and Knetter 2001, Poppert and Herzog 2003, Andersson, Lundberg, and Sjostrom 2007, Asteris et al. 2007). At its simplest, military camps and bases need goods, services and labour for their operation, most of which are usually drawn from local markets. In addition, employed personnel, and their families, reside and consume in the urban area close to where military

facilities locate, exerting an influence on both its economy and its spatial structure.

In this context, the current study attempts to investigate some of these regional side-effects of the defence sector. In particular, drawing on a questionnaire survey, it explores the residential characteristics of Armed-Forces Personnel (henceforth AFP) households, using Volos - a medium-sized Greek city with a population around 130,000, hosting major military facilities, including an air force base and a marine unit - as

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* We like to dedicate this paper to the memory of our co-author, Dimitrios. Major Dimitrios Skouras was killed during a night exercise on November 5th, 2008 when his Apache helicopter crashed.

a case study. More specifically, the paper first examines the intra-urban locational distribution of the AFP households to consider whether clustering or dispersion is evident and then analyses their housing attributes to assess whether they are affected by economic or by social factors. Such analysis enables us to draw some preliminary conclusions on the potential effects military facilities have on both the urban spatial structure and the housing market. In doing so, the paper is structured as follows. The next section outlines the approaches that have been developed to explain households' residential decisions and location choices. Following this, the methodology, data and empirical findings are presented and discussed in section three, while section four concludes the paper summarising the key points that have emerged from the analysis.

2. Theoretical Background

Two sets of explanations have been put forward when examining the intra-urban location choices and residential decisions of people. The first - the market approach - puts emphasis on the laws of the marketplace, whereas the second - the social approach - focuses on sociological factors.

The central idea behind the market approach is that economic factors determine the location and residential choices of households and, consequently, urban spatial structure. Accordingly, observed patterns are ascribed to the decisions of rational individuals (consumers and producers) who seek to optimise their welfare, given certain restrictions and preferences (Evans 1985, Harvey J. 1996). Welfare optimisation for households is achieved when total costs are minimised or when utility is maximised. Total costs include the rent paid for the housing consumed, plus the direct and indirect costs of transport/travel. As such, their utility function depends on the quantity and qualities of housing occupied and the money and time spent travelling to work and to other activities, such as shopping, entertainment, etc.

A simple version of this market approach stresses the requirements of economic actors to minimise movement costs. Given certain simplifying assumptions with regard to the centrality of economic activity, the structure of transport costs (which vary with distance to the central market) and transportation technology, primacy is attached to the city-centre location, assumed to represent the point of greatest accessibility (O'Sullivan 2003). However, due to space scarcity, costs are higher in

central locations and decrease as the distance from the centre increases. Hence, any rational location decision strikes a balance between the costs of centrality and the advantages of accessibility. On this basis, trade-off models have been developed describing the location decisions of firms and households, and in turn the patterns of urban land use (Alonso 1964, Muth 1969, Mills 1972). Location choice for firms is described as a straightforward trade-off of rent payable against distance from the centre. For households, despite being complicated by non-monetary determinants of utility (such as space and environmental considerations) the key mechanism remains intact: households trade-off transport costs to the centre against extra space or housing qualities offered elsewhere, simultaneously choosing between distance from the centre and the level of housing rent. This is why bigger households (as compared to smaller ones) choose locations at a distance from the city centre where large houses are more affordable (Evans 1973). In turn, social (and spatial) segregation at residential equilibrium is theorised with more affluent households opting to locate either at the city centre (when they value accessibility higher than housing amenities) or at peripheral locations (when they value accessibility lower than housing amenities), depending on the accessibility characteristics of the city (McDonald and McMillen 2007).

These trade-off models of the locational behaviour of firms and households provide the basis for understanding the allocation of urban space to economic activities and, in turn, explain the economic and spatial structure of the city and its dynamic properties (Anas, Arnott, and Small 1998). The monocentric form of urban structure is fundamental to these traditional urban economics theories. This describes a pattern of urban land use with service activities outbidding other uses for central locations, followed by industrial and residential uses in successive zones (Evans 1985, O'Sullivan 2003, McDonald and McMillen 2007). However, technological, economic and social changes can erode the location advantages of central accessibility, providing a new impetus to the location dynamics of specific user groups (Arvanitidis and Petrakos 2006). Taking these parameters into account (and particularly the advances in transportation and (tele)communications technology and the rise of service economy), contemporary studies (Puga and Venables 1996, Lee, Seo, and Webster 2006) have revised and extended their models in an attempt to explain decentralisation and deconcentration of certain

economic activities. On a similar basis, other scholars (Fujita and Ogawa 1982, Mori 1997, Anas, Arnott, and Small 1998) have discussed the emergence of multiple centralities ('subcentres') and the development of the 'polycentric city'.

Drawing on the above conceptual framework, many studies have explored empirically the location and housing choices of households (see Earnhart 2002, Walker et al. 2002, Wang and Li 2004, Kim, Pagliara, and Preston 2005). These have established that such decisions are determined by considerations of accessibility costs, property prices, housing attributes and locational amenities. For instance, Kim, Pagliara, and Preston (2005) have explored the importance of house prices, neighbourhood amenities and movement costs on location preferences and found that such decisions are influenced mainly by the amount of transport costs (monetary and time-related), the local population density, the quality of schools available in the area and the property prices. These results indicate that both accessibility and neighbourhood amenities are significant in location and housing decisions.

Nevertheless, many economists do not agree with the view that location and housing choices should be premised on such narrow monetary and individualistic foundations as neoclassical economics. They have sought alternative ways to explore such choices by using an analytic focus upon non-rational behaviour and social relations or attempting to combine these with mainstream economic explanations. Within this literature, 'housing status' and 'place attachment' appear to be key concepts affecting residential location decisions.

The 'housing status' idea stems from Bourdieu's social theory. Bourdieu (1984) argues that the accumulation of not only economic but also social, cultural and symbolic capital results in socially and spatially differentiated preferences in consumption, including housing consumption. Social capital refers to resources accrual due to group membership, social relationships, and networks of support and influence. In turn, cultural capital refers to forms of education, knowledge, skills, and advantages that a person has, whereas symbolic capital refers to resources available on the basis of recognition, prestige, status or honour. The concept of housing status carries these three forms of capital into housing to add a new perspective in examining locational and housing preferences, demand and supply relations and price formation.

The amount of social, cultural and symbolic capital varies between and within places. In this sense, the qualities, relationships and ties between people have a clear spatial reference. The notions of 'place attachment' and 'neighbourhood identity' are widely used to convey this idea (Low and Altman 1992, Hall and du Gay 1996, Harvey D. 1996, Gustafson 2001). Place attachment describes the bonding developed between residents and their neighbourhood on the basis of the social, cultural and symbolic capital the latter encapsulates. This provides the individual with a feeling of belonging or participating in a community that members matter to one another, have common concerns and share a sense of identity. Identification with a neighbourhood or with a community in general, enhances the individuals' self-esteem and affords them with a sense of support and security (Taylor 1988, Altman and Low 1992, Crow 1994). It is interesting to mention here that the bonding between individuals and their neighbourhood may not be based on real, objective, ties, but rather on perceived connections, collective memories, or subjective feelings of belonging into something that Blokland (2003) calls 'imagined communities'.

The literature identifies four basic elements that define the economic, social, cultural and symbolic capital of people, affecting their location and housing decisions: income, ethnicity, education and social status (Dekker and Bolt 2005). Income has an apparent impact on the economic capital of people, but also exerts an influence on the social relations within a neighbourhood (that is the social capital) (Fischer 1982, Campbell and Lee 1992). At its simplest, low-income residents, as compared to those of high income, are less mobile and more dependent on the social networks and resources provided locally (Campbell and Lee 1992, Lee and Campbell 1999). Closely-integrated social networks are also developed between members of ethnic or racial communities living in a neighbourhood (Bolt 2001). Such people tend to locate close to each other in order to improve information flows with regard to the institutional mechanisms of the host society (Kesteloot 1995, Pacione 1996), or to retain valued elements of their cultural heritage, such as language and religion (Boal 1996, Hugo 1996, Dunn 1998). With regard to education, it is considered to be an important factor determining the quality of cultural and social capital (Fischer 1982). The higher the education level, the broader the social networks of an individual are, at least because such activities extend beyond the place of residence (Guest

and Wierzbicki 1999, Blokland 2000). Finally, social status signifies the symbolic capital someone attains on the basis of recognition or prestige associated with profession or social (or professional) rank, which, in turn is reflected in the location or housing choices of the individual (Dekker and Bolt 2005).

Social/spatial segregation within the above framework is analysed by the theories of place stratification and residential segregation. The place stratification model considers intra-urban space as a hierarchy of places ordered in terms of desirability and the quality of life they provide to urban dwellers (Logan 1978). Dominant social groups occupy the most desirable places, keeping other, less powered, groups (e.g. ethnic and racial minorities) at a distance. Thus, social hierarchy is reflected in space, giving rise to a place hierarchy. This place hierarchy is maintained, with varying degrees of success, through both institutional mechanisms (e.g. redlining, exclusionary zoning, etc.) and discriminatory acts on the part of the dominant groups (e.g. policing, violence against minorities, etc.).

While place stratification envisages social segregation to be imposed on certain social groups, the residential preference theory asserts that this is in fact a conscious decision by them. That is, such members prefer to reside next to each other and to remain spatially segregated, even when they have the financial means or the social status that would enable them to move elsewhere (Freeman 2000). There are many benefits to be gained due to such spatial behaviour. To newcomers, the community's social network would provide not only social and cultural support, but also other vital 'resources', such as housing and valuable information on the host institutional framework and the labour market (Hagan 1998). To all other members, the community represents the stronghold of their own cultural identity; in a sense it constitutes a specific, local, social public good.

The propositions of the social approach to residential preferences have been examined empirically by a number of studies. Gram-Hanssen and Bech-Danielsen (2004) have explored the cultural meanings of home in Denmark to demonstrate that houses and neighbourhoods are associated with symbolic values which differ from place to place and affect the residential choices of people. From a similar perspective, Marvell (2004) studied explicit meanings with reference to a new development area in Swindon (UK), where private housing for upper-class people had been produced in a way heavily influenced by social status considerations.

With regard to other soft or intangible factors that affect the locational and housing behaviour of households, and hence the residential intra-urban patterns that develop, the literature has drawn attention to issues such as tastes, lifestyle and image (Ley 1986, Murie 1998, Galster 2001, Aero 2006, Kauko 2006).

What becomes apparent from the above discussion is that location and housing decisions and the resulting residential patterns can be explained by both market and social approaches. A number of empirical studies have attempted to assess the validity of the arguments set forth, and on these grounds to evaluate the explanatory power of the approaches. Although much work is still to be done in this area, we could conclude that traditional economic factors (such as, land prices, accessibility, etc.) play a substantial role in the households' residential decisions, but in order to account for the great variety in the residential structures observed within urban space, such arguments need to be enriched with soft determinants of housing choices (such as social capital, status, etc.).

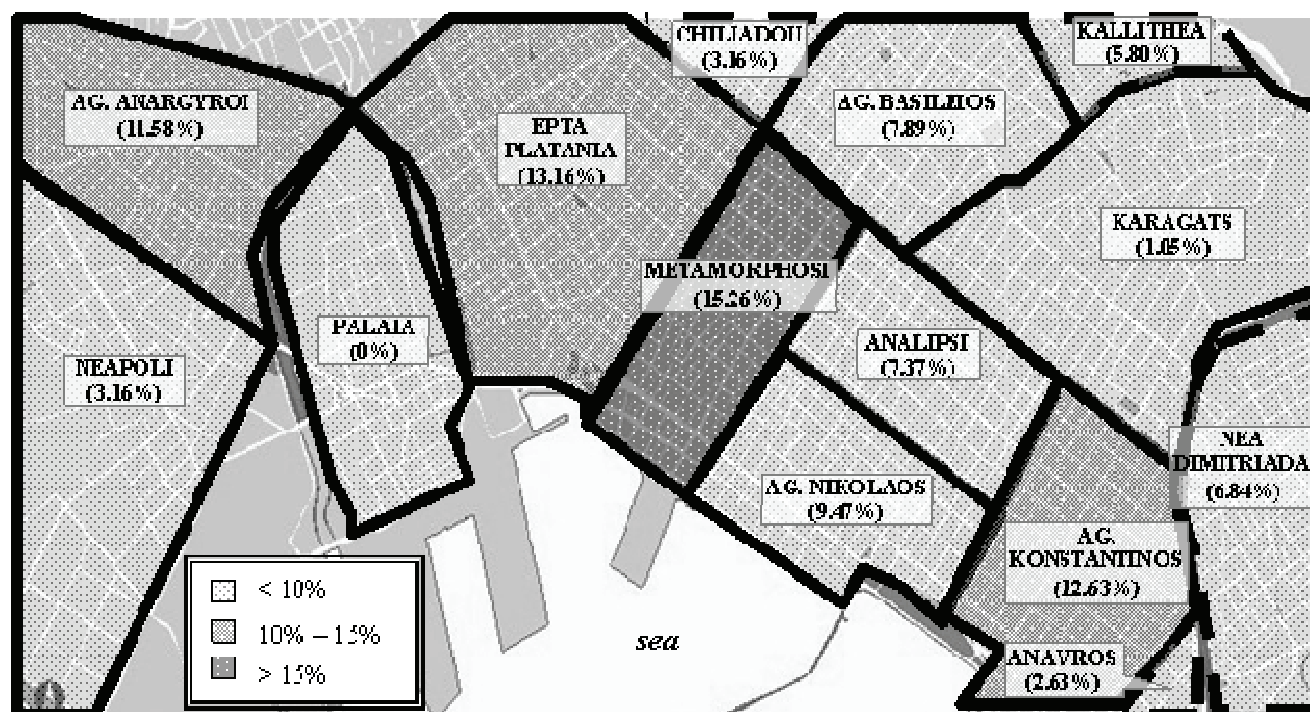
3. Methodology, Data and Analysis

Due to serious external security concerns, Greece allocates substantial human and material resources to defence (Kollias 1995, Kollias and Paleologou 2003). Both in terms of the defence burden (military spending as a share of GDP) as well as in terms of human capital committed to defence, Greece invariably surpasses the corresponding NATO averages (see Table 1). It can reasonably be argued that, irrespective of the reasons for maintaining such a comparatively large proportion of the population in the armed forces (conscripts and professionals), this probably exerts an impact both on the labour market as well as on regional economies and societies given the dispersion of military facilities throughout Greece. Yet, despite the large literature, as comprehensively summarized by Brauer (2002), no attention has been paid to such aspects when it comes to the Greek defence sector. Thus, to the best of our knowledge, there are no previous studies examining the locational and residential aspects of AFP households in Greece. In light of this, the current paper constitutes a first attempt to do so, using the medium-size city of Volos as a case study. The choice of this particular city is due to the fact that a number of important military facilities are located either within or in the vicinity of the city. These include an air force base, a marine unit, the army aviation

		1985	1990	1995	2000	2005	2007
Military spending (% of GDP)	Greece	7.0	4.6	3.8	4.3	3.4	3.3
	NATO	3.5	3.1	2.4	2.1	2.5	2.5
Armed forces personnel (% of labour force)	Greece	5.7	5.3	5.3	4.8	3.0	2.9
	NATO	2.7	2.5	1.9	1.6	1.2	1.2

Sources: SIPRI and NATO

Table 1: The Greek defence sector 1985-2007



Source: own construction

Map 1: Spatial distribution of AFP in Volos (% of households)

brigade headquarters, the army's Main Battle Tank (MBT) maintenance industrial plant, as well as some secondary facilities. As a result the city offers residence to quite a few military households.

The study starts by identifying the intra-urban spatial distribution of AFP households and comparing this with the overall pattern of residential location evident in the city. Following this, an attempt is made to explain the observed AFP distribution with reference to the economic determinants of location choice (that is, minimization of transport costs) or other factors related to the social or professional characteristics of the group.

Due to the lack of official data on the spatial distribution of any professional group within the city, the study obtained such information through primary research. Thus, the location and residential characteristics of AFP were acquired with the use of a questionnaire survey. This was conducted in December 2006 and was addressed to AFP residing in the city of Volos. The

particular information sought was the exact location of residence and tenure status of AFP, as well as their rank in the military hierarchy², their marital status and the size of their household. The data analyzed herein was collected from 190 valid responses out of a total population of 587 AFP that in 2006 resided in Volos. This number exceeds the projected sample size of 186, which is the minimum required (at a 90% confidence level) given the total population in question. The sample size of our survey corresponds to a 4.9% margin of error for the specified (90%) confidence level.

The pattern of residential location for the whole city is reflected on the building (construction) activity that takes place in each neighbourhood. The study acquired such data from the municipality's Urban Planning Directorate. This refers to 561 new buildings (consisting of 5,266

² For national security reasons this dimension could not be incorporated into the analysis that is presented here. For the same reason, certain information on the specific location of AFP has been omitted.

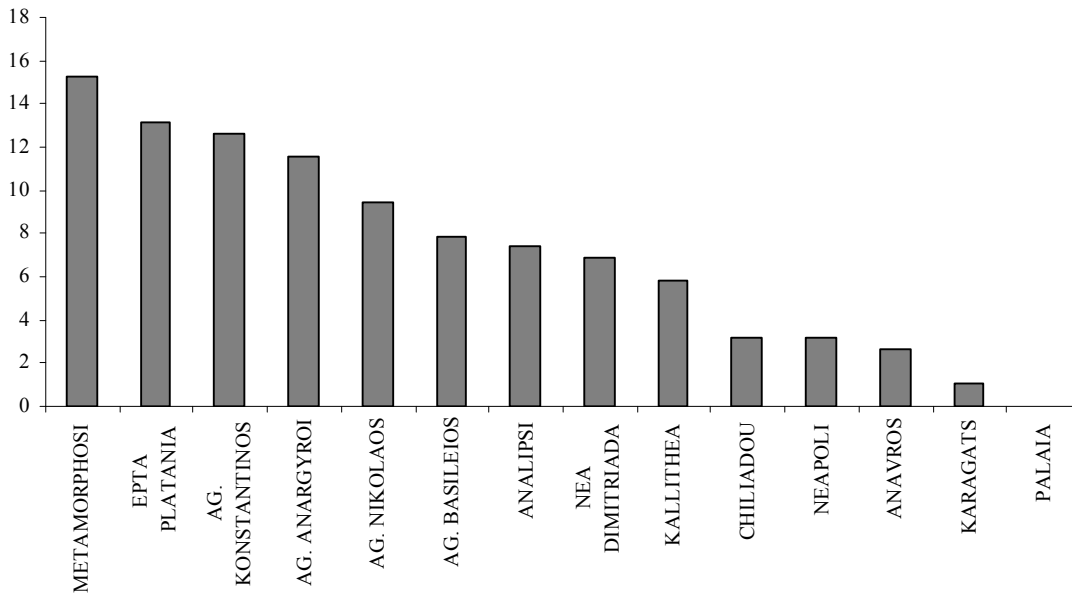


Figure 1: Spatial distribution of the AFPs in Volos (% of households)

apartments on about 400,000 sqm space) constructed in Volos during the period 1999 to 2004. The reason the analysis was restricted to this time frame is due to the high distortions in property development that occurred both before 1998 and after 2005. In particular, there had been a remarkably low level of construction activity between 1992 and 1998, something which has been attributed to the redirection of household investment from housing to the stock market (Arvanitidis and Skouras 2008). In turn, construction activity rocketed between 2005-2007 due to governmental announcements (and subsequent policies put forward) that taxes related to both property transaction and building construction would be substantially increased in the following years (Arvanitidis and Skouras 2008).

Map 1 presents the spatial distribution of the AFP households in Volos. Neighbourhoods are ranked according to the percentage of AFPs they house and the results are provided in Figure 1. As can be seen, AFP households are rather dispersed all over the urban area and there seems to be no high spatial clustering in the city. However, a slight preference for central areas is also identifiable. About 17% of the AFPs take up residence in the traditional urban centre (that is the *Ag. Nikolaos* and the *Analipsi* areas), whereas about 15% and 13% are located in *Metamorphosi* and *Epta Platania*, respectively, which together constitute the extended city-centre (Arvanitidis and Skouras 2008). Overall, we observe that about half of the AFP households (45.26%) are located in central areas. High percentages of AFPs are also found in

Ag. Konstantinos (about 13%), the most prestigious neighbourhood of the city and which houses people of high socioeconomic status, and in *Ag. Anargyroi* in the western side of the city, across *Larisis Street*, which is the main road connecting Volos with two of the main military facilities located outside of the city. In general, these six neighbourhoods (i.e. *Ag. Nikolaos*, *Analipsi*, *Metamorphosi*, *Epta Platania*, *Ag. Konstantinos* and *Ag. Anargyroi*) accommodate about 70% of AFP households. The rest of AFP (30%) take up residence in the remaining neighbourhoods of *Neapoli*, *Anavros*, *Nea Dimitriada*, *Karagats*, *Ag. Basileios*, *Chiliadou* and *Kallithea*.

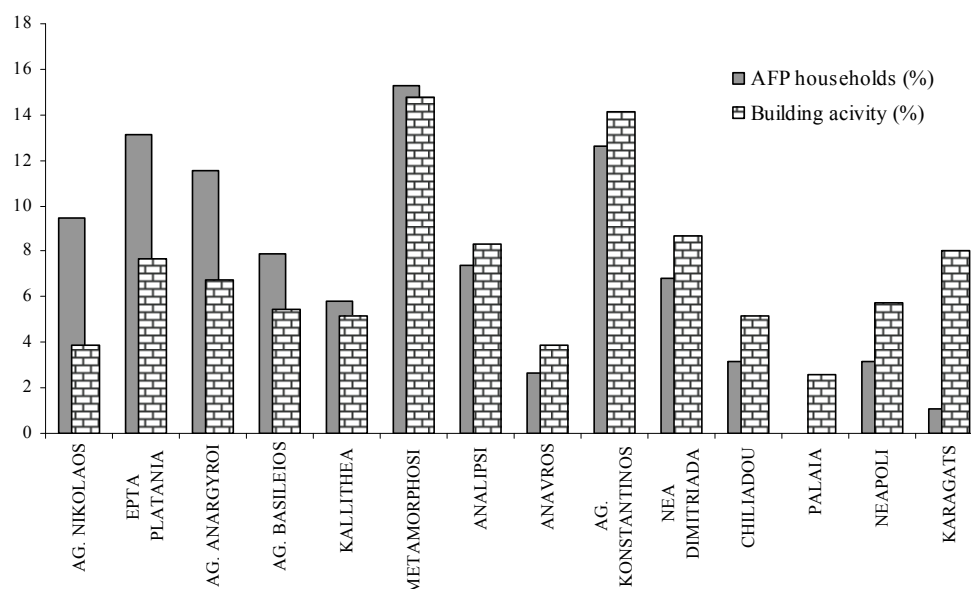
Given the findings described above, we can tentatively conclude that there is no particular characteristic or cultural element related to AFP that may lead to some kind of high residential clustering for this specific professional group. To put it differently, there is no evidence that attributes such as professional status, image, lifestyle or common identity give rise to spatial isolation and clustering of AFP. Consequently we argue that the location and housing decisions of AFP, and the resulting residential patterns, are determined by economic determinants rather than social factors.

An interesting picture emerges when we compare the spatial distribution of AFP with the overall pattern of building activity that took place in the previous years (Table 2 and Figure 2). It seems that AFP tend to locate in those areas where increased construction activity is evident or where new housing stock is provided. This is

Area	Spatial distribution of AFP (% of households in 2006)	Building activity (% of total construction permits during 1999-2004)	Difference between (1)-(2)
	(1)	(2)	(1)-(2)
AG. NIKOLAOS	9.47	3.84	5.63
EPTA PLATANIA	13.16	7.69	5.47
AG. ANARGYROI	11.58	6.73	4.85
AG. BASILEIOS	7.89	5.45	2.44
KALLITHEA	5.80	5.17	0.63
METAMORPHOSI	15.26	14.74	0.52
ANALIPSI	7.37	8.33	-0.96
ANAVROS	2.63	3.84	-1.21
AG. KONSTANTINOS	12.63	14.10	-1.47
NEA DIMITRIADA	6.84	8.65	-1.81
CHILIADOU	3.16	5.13	-1.97
PALAIA	0.00	2.56	-2.56
NEAPOLI	3.16	5.76	-2.60
KARAGATS	1.05	8.01	-6.96

Source: own construction

Table 2: AFP spatial distribution and building activity in Volos



Source: own construction

Figure 2: AFP spatial distribution and building activity in Volos

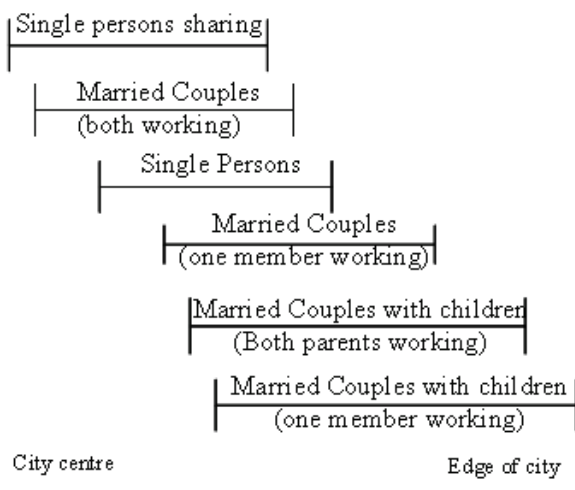
verified by the high correlation coefficient between the two variables, which is equal to 0.67.

The percentage of AFP households located in a neighbourhood, as compared to the construction activity the neighbourhood has experienced, is higher in the areas of *Ag. Nikolaos* (that is, the city-centre), *Epta Platania* (that is, the extended city-centre), *Ag. Anargyroi* and *Ag. Basileios*, and it is about the same in *Analipsi* (again, the city-centre), *Metamorphosi* (the extended city-centre) and

Kallithea (Table 2 and Figure 2). The peripheral neighbourhoods of *Karagats*, *Neapoli*, *Chiliadou*, *Nea Dimitriada*, *Anavros*, *Ag. Konstantinos* and *Palaia* have attracted the attention of developers but not of the AFP households, at least to a comparable degree. Overall, we verify the pattern identified previously: the central locations seem to exert an attraction to many AFP households, though there are some peripheral neighbourhoods (*Ag. Anargyroi* and *Ag. Basileios*) where

AFPs locate, despite the low housing development these areas have exhibited.

The examination of AFP's tenure status reveals another important aspect of their housing preferences. Of the 190 people surveyed, more than three quarters (77.37%) live in rented housing. The rest, 22.63%, are owners-occupiers, indicating an owner-occupation rate for AFP which is much lower than that of the whole Greek population, standing firmly above 80% (Eurostat 2004, EMF 2007). This low incidence of AFP owner-occupation can be justified on the basis of established professional practices and the consequent features of servicemen's lives. Due to organisational and operational reasons all military personnel in Greece have to serve in different bases and so they are relocated every three to four years to different regions across the country. This results in a highly mobile lifestyle discouraging home ownership and establishing rented housing as the normal tenure practice among AFP.



Source: adapted from Evans (1973)

Figure 3: Family type and intra-urban location choices

When it comes to the factors giving rise to the above pattern of AFP spatial distribution, conventional urban economics suggest that household size plays an important role. In particular, it is argued that the larger the family, the farther it resides from the city centre (see discussion in Section 2; also portrayed in Figure 3). We examined whether this is the case for AFP in Volos. Table 3 presents the household structure of AFP that participated in the survey. As it can be seen most of these are small households (62.6%), that is, married couples with no children or single persons, whereas only 37% are larger families comprising two spouses and children. This is not something unexpected, since operational military

units, such as those located in the greater Volos area, are staffed largely with personnel which is young and with no family commitments. Such servicemen are expected to show a preference for central locations. Apparently, this is because (as informal discussions with the participants revealed) they highly value specific urban facilities which are available in the city-centre (for entertainment, shopping, etc.), but are not willing to incur the high travel costs (monetary and time related) attached to peripheral locations. As such, they settle for smaller houses of higher rent (per sqm) which are available in the centre, instead of larger, lower-rented (per sqm) properties in the periphery.

Household structure	No. of households	Percentage
Married couples with children	71	37.4
Married couples without children	77	40.5
Single persons	42	22.1

Source: own construction

Table 3: Household structure of AFP living in Volos

Indeed, the aforementioned trend is verified when the spatial distribution of both the small and large households of the AFPs is examined (see Table 4). It becomes evident that small households prefer the central areas of *Ag. Nikolaos* and *Analipsi* (traditional city-centre) or *Metamorphosi* (extended city-centre) to take up residence, whereas the peripheral neighbourhoods of *Kallithea*, *Chiliadou* and *Ag. Basileios* house mainly large AFP households. *Neapoli* and *Ag. Anargyroi* are the only peripheral neighbourhoods that accommodate high percentages of small households. In fact, in *Neapoli* all AFP households are small, whereas in *Ag. Anargyroi* small households are 2.14 times higher than large ones. We presume that this is due to two reasons. First because these areas are highly accessible since they in front of *Larisis Street*, which is the road that connects Volos with those military facilities located outside the city, and second, because they are rather degraded areas with cheap housing stock, accommodating mostly low-income servicemen.

What becomes apparent from the discussion up to now is that accessibility issues and the associated costs (in terms of both money and time spent on travelling) play an important role in the location decisions of AFP in Volos. A considerable part of these expenses concerns everyday travelling from home to work and back, especially given the fact that 'work' (i.e. most of the

<i>Area</i>	<i>Small households (%) (1)</i>	<i>Large households (%) (2)</i>	<i>Difference (1)-(2)</i>	<i>Ratio (1)/(2)</i>	<i>Ratio (2)/(1)</i>
NEAPOLI	100.00	0.00	100.00	-	0.00
AG. NIKOLAOS	83.33	16.67	66.66	5.00	0.20
METAMORPHOSI	79.31	20.69	58.62	3.83	0.26
AG. ANARGYROI	68.18	31.82	36.36	2.14	0.47
ANALIPSI	64.28	35.72	28.56	1.80	0.56
AG. KONSTANTINOS	54.16	45.84	8.32	1.18	0.85
KARAGATS	50.00	50.00	0.00	1.00	1.00
NEA DIMITRIADA	46.15	53.85	-7.70	0.86	1.17
ANAVROS	40.00	60.00	-20.00	0.67	1.50
EPTA PLATANIA	36.00	64.00	-28.00	0.56	1.78
AG. BASILEIOS	35.71	64.29	-28.58	0.56	1.80
CHILIADOU	33.33	66.67	-33.34	0.50	2.00
KALLITHEA	27.27	72.73	-45.46	0.37	2.67

Source: own construction

Table 4: AFP's household size and spatial distribution

military facilities) is located outside of the city of Volos. This home-to-work trip consists of two routes: one from home to the bus-stop where the military bus collects AFP, and another from the bus-stop to the military facility. The latter route is common to all AFP at the expense of the Hellenic Armed Forces. Thus, it is the former travel costs that burden each one of the servicemen individually and should affect their location decision. In other words, we expect AFP house location to be as close as possible to these bus stops. This indeed seems to be the case. In fact, 131 out of 190 AFP households (68.95%) are located within two blocks of the closest bus-stop.

4. Concluding Remarks

The paper set out to examine the locational and residential decisions of Greek military households. To achieve this, primary data were collected by means of a questionnaire survey addressed to a number of servicemen located in Volos, a medium-sized Greek city with a number of military facilities located in the area. On the basis of the preceding analysis, a number of tentative conclusions may be reached.

First, military households are rather dispersed all over the urban areas and there seems to be no considerable spatial concentrations for this specific professional group. On these grounds, we assume that there are no strong social, cultural or symbolic attributes (such as professional image, status or common identity) bonding these people that may lead to a kind of spatial clustering and isolation. Put differently, the location and housing decisions of the military households, and the resulting

residential patterns, are determined by conventional urban economic determinants rather than specific socio-cultural factors which are particularly relevant to this professional group.

Second, military households seem to show a slight preference for central locations. This is mainly due to the fact that the majority of AFP households are small, comprised of one to two persons. In accordance with arguments put by conventional urban economics, they highly value specific urban facilities which are available in the city-centre (e.g. entertainment, shopping, etc.) and are not willing to pay the high travel costs (measured in terms of both money and time spent) associated with living in peripheral locations. As such, they settle for smaller houses which are available in the centre, instead of larger properties in the periphery.

Third, general accessibility issues and the associated travel costs play an important role in AFP location decisions. This is why more than two thirds of the military households examined are located close to the bus-stops from where AFP are collected in order to be transferred to the respective military facilities where they serve.

Finally, in terms of their residential attributes, the households of servicemen seem to show a preference for new buildings, since they tend to locate in those areas where increased construction activity is evident or where new housing stock has been provided. In addition, their highly mobile lifestyle seems to discourage home ownership and to establish rented housing as a typical practice among them.

Concluding this paper, it must be pointed out that the current research is preliminary in its nature. It constitutes

a first attempt to shed light on the effects residential decisions of military households have on the spatial structure and housing market of the cities that accommodate them. Further research is needed where additional case studies would scrutinise such patterns to verify and refine the conclusions drawn here. 

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Corruption, Licensing and Elections – A New Analysis Framework

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Abstract:

This paper analyses corruption and licensing in conjunction with elections in Albania. The paper develops an analysis framework utilizing datasets of two types of national licenses, namely licenses for media and notaries about which there have been concerns of transparency in Albania. In the months preceding elections, a higher number of both types of licenses are issued. One possible explanation for the “intensification of licensing” during pre-election months may be corruption, given that licensing is widely perceived as related to corruption in countries with high levels of corruption such as Albania.

Keywords: Corruption, Election

JEL: D72

DOI: 10.2478/v10033-012-0009-3

1. Introduction

Previous research has identified many factors that are deemed to stand behind corruption. Factors that reduce corruption are democratization and trade liberalization (Tavares, 2005), fiscal decentralization (Fisman and Gatti, 2000), a greater degree of international integration (Sandholtz and Gray, 2003), openness to foreign trade and competition (Treisman, 2000; Ades and Di Tella, 1999), freedom of the press (Lederman et al, 2001), the efficiency and quality of judicial and legal systems (Herzfeld and Weiss, 2003). Among factors that positively affect corruption are low wages in public administrations (Van Rijckeghem and Weder, 1997) and low economic development (Treisman, 2000).

Corruption is often blamed for poverty, low investment and economic growth as well as poor services and infrastructure. It causes lower investments and economic growth (Mauro, 1995), and lowers the quality of (public) investments (Lambsdorff, 2007). Corruption also affects the allocation of human resources and entrepreneurial skills –companies need more “middlemen” to facilitate acquiring licenses rather than investing in improving productivity (Murphy et al, 1991).

While there is a rich literature about the possible causes and consequences of corruption, there has been limited research on the inter-relations between elections and corruption. Krause and Méndez (2009), based on empirical cross-country analysis, suggest that a perceived rise in corruption in public office is effectively punished by voters in the general elections, and that the increase in perceived corruption is punished more severely in countries with relatively brief exposure to democracy, which are typically more corrupt than more consolidated democracies. Peters and Welch (1980) found that corruption charges of candidates in U.S. House of Representatives contests result in the loss of votes. On the other hand, Fackler and Lin (1995) show that the higher the amount of information about corruption, the lower the electoral support for the party which has the presidency in the USA. In addition, Chang and Golden (2004), and Ferraz and Finan (2005), report similar

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findings in Italy and Brazil, respectively.

Causality should be questioned – do voters punish the government for higher levels of perceived corruption in corrupt countries, or do governments increase “corruption/bribe income” before elections when they expect to lose elections (or vice-versa)? Should not a corrupt, “rational” government in a corrupt country seek to maximize its income before leaving power? And if the incumbent is aware that corruption is a/the determinant factor of success in elections, is it not more rational to always combat corruption before elections?

The focus of this paper is Albania, a country characterized by relatively high levels of corruption. During the time span of the analysis, parliamentary elections¹ took place in June 2001, July 2005 and June 2009 (the previous parliamentary elections of 1996 and 1997 are not included in this analysis as they were not credible and heavily manipulated and especially in 1997, Albania was in complete socio-economic chaos)². Election outcomes in 2005 and 2009 were foreseen to be very tight^{3 4}, while there were no polls for 2001 to the best of the author’s knowledge.

Only two general (parliamentary) elections were held since the Corruption Perception Index (CPI) of Transparency International was calculated for Albania (the CPI method is explained in the following section). The two election years 2005 and 2009 were characterized by a worsening of corruption in Albania (Table 1).

Year	Rank	Score
2002	81	2.5
2003	92	2.5
2004	108	2.5
2005	126	2.4
2006	111	2.6
2007	105	2.9
2008	85	3.4
2009	95	3.2
2010	87	3.3

Source: TI

Table 1: CPI ranking and score of Albania⁵

¹ Albanian is a parliamentary republic, and therefore the parliamentary elections are by far the most important elections.

² <http://www.freedomhouse.eu/nitransit/2005/albania2005.pdf>, Last accessed in October 2011

³ http://www.mjaft.org/pdf/final_report_wave%202_EN.pdf, Last accessed in October 2011

⁴ <http://www.zogby.com/news/2009/06/29/zogby-international-albanian-election-exit-poll-projections/>, Last accessed in October 2011

⁵ The CPI should be interpreted as a ranking of countries with scores ranging from 0 (highly corrupt) to 10 (highly clean).

One could tend to associate worsening levels of corruption with elections. When the incumbent foresees losing elections, or when elections predictions are tight, increasing “bribe income” may become a priority – government (ministers) may decide to raise as much money as possible for the following years of “unemployment” or in the opposition. In a corrupt country, with corrupt institutions (i.e. courts), money brings a certain level of “immunity”, and facilitates political activity (in a corrupt country, there are segments of media, civil society etc. which are corrupted).

There are several weaknesses, however, in basing the analysis on CPI in Albania. First, the time series is too short to measure the statistical significance of such a change. Second, elections fall in the middle of the respective years, and therefore may not be judged based on CPI if the worsening of corruption took place in the quarters before, or after elections or was constant throughout the year.

Therefore, it is necessary to develop proxies of measuring corruption in more detailed dynamics, namely at the monthly level. In this paper, monthly proxies (or potential indicators) of corruption are analyzed in conjunction with elections.

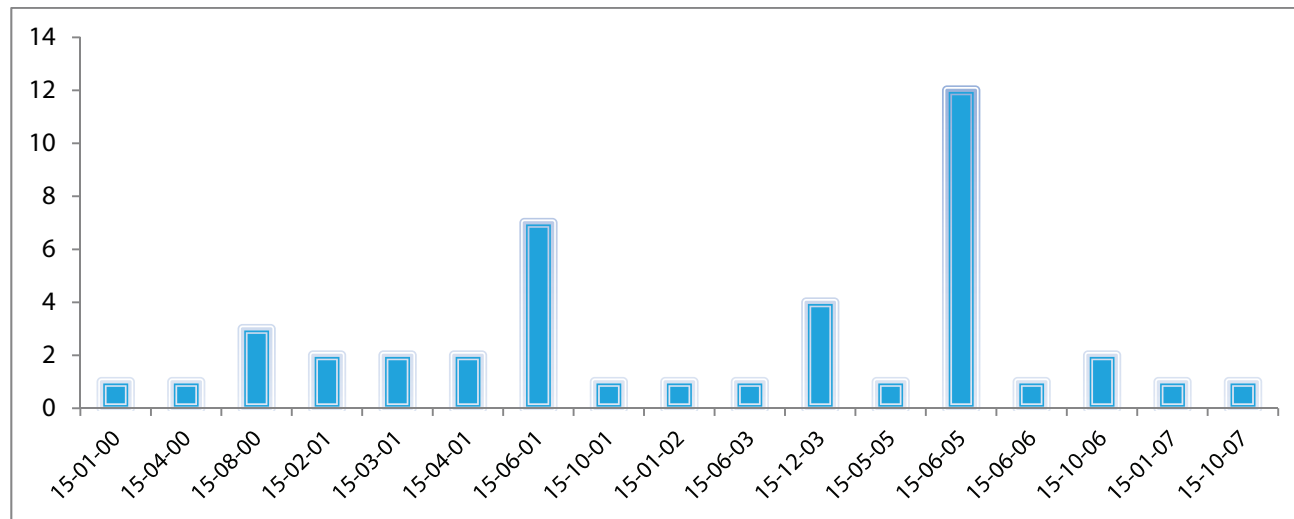
2. Research Questions and Hypotheses

Before elections there is a strong incentive to intensify corrupt activities, especially if it is likely that a rotation may take place (already assuming legal impunity⁶). Even if the same political party/coalition is re-elected, often government composition is subject to change for various reasons, which implies that not all the same politicians will run the same institutions/ministries as a new government is formed. Therefore there are additional incentives for government constituents (ministers) to increase income from corruption before elections and also before leaving power.

The main hypothesis: Before elections corruption increases in order to increase income, on the one hand to prepare for possible loss (future unemployment), and/or to finance a number of activities and stakeholders in regard to elections campaign (be it media or even

⁶Note: In Albania so far there has not been a single politician found guilty on corruption charges despite being one of the most corrupt countries worldwide.

<http://www.gazeta-shqip.com/politike/53befedd4025b0736b06b5d48d006f9d.html>, Last accessed in November 2011



Year	2000	00	00	01	01	01	01	01	02	03	03	05	05	06	06	07	07
Month	1	4	8	2	3	4	6	10	1	6	12	5	6	6	10	1	10
Frequency	1	1	3	2	2	2	7	1	1	1	4	1	12	1	2	1	1

Source: QKL (National License Registration Center)

Figure 1: Granting of notary licenses during 2000 – 2007

average voters⁷). Assuming that corruption affects various types of national licenses that have economic value, an alternative hypothesis would be: Before elections a higher number of licenses are issued. Both versions of the hypotheses hold particularly when the elections predictions/polls are tight or even more when the incumbent foresees to lose elections.

Data related to corruption are mostly generated through surveys which tend to measure perceived levels of corruption. One of the most common corruption indexes is the Transparency International Corruption Perceptions Index (CPI). CPI ranks countries in terms of the degree to which corruption is perceived to exist among public officials and politicians⁸. CPI is issued once a year, while there are no monthly proxy indicators used to assess corruption.

This paper analyzes the time series of licenses at the monthly level as a proxy (potential indicators) of corruption dynamics. Licensing activities are highly related to corruption. Government officials often collect bribes for providing permits and licenses (Shleifer and Vishny, 1993).

For that purpose, all of the time series of licences that were granted within a certain time span (a time series of several years) were checked that were available in public statistical databases (namely the QKL – Albanian National Licensing Centre for licenses and the Ministry of Finance for income from privatizations). The only datasets that have a relatively long time series are licenses for mining, TV and notaries. This paper analyzes all of these variables, except for mining licenses, which are subject to another research analysis.

There is no formal evidence of corruption for all the types of licences analyzed in Albania for the given period; however there are concerns about the transparency of the process of granting for both types of licences that are the object of this paper. The licensing process for private televisions and radios done by the National Council of Radio and Television in Albania has often been “labelled” as biased⁹. Regarding notary licensing, the OSCE (2004) has expressed concerns on the quality and transparency of testing.

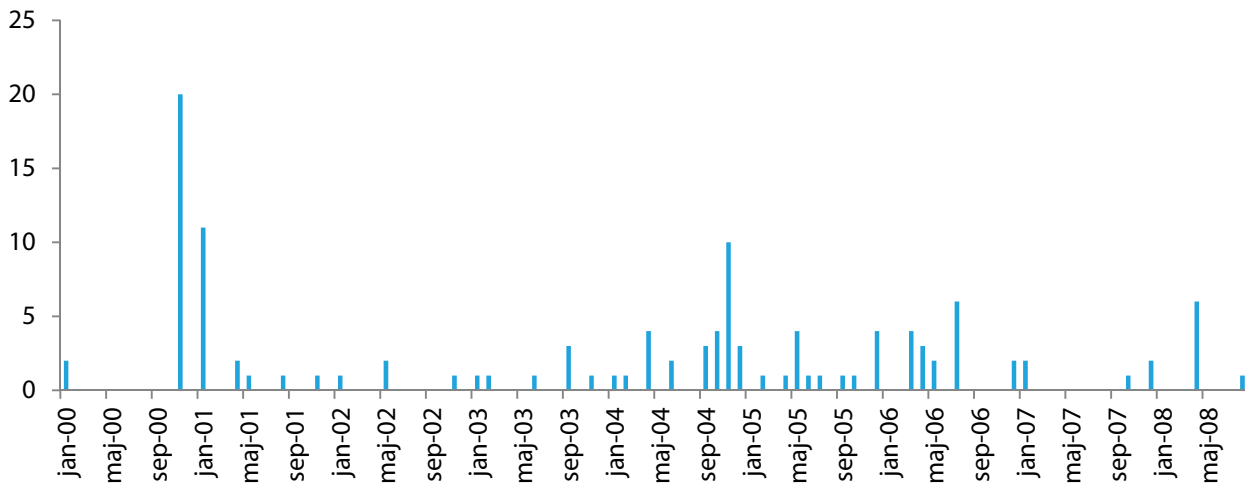
This paper analyzes the time series of TV and notary licences relying on descriptive statistics, since the respective time series on one hand are not long and on the other hand, the descriptive analysis results are so

⁷ In Albania it is reported that it is common that political activists pay voters in exchange for their votes.

<http://www.revistamapo.com/lexo.php?id=2937>, Last accessed in November, 2011.

⁸ http://cpi.transparency.org/cpi2011/in_detail/, Accessed in May 2012

⁹ <http://www.institutemedia.org/newsletter2007.html>, Last accessed in October 2011



Source: QKL (National License Registration Center)

Figure 2: Granting of TV licenses during 2000 – 2008¹⁰

obvious that it is not necessary to apply complex econometrical analysis.

3. Case Study: Licenses and Elections in Albania - A Descriptive Analysis

In the QKL (National Licensing Centre) licenses database, there were available data about notary licenses up to 2007. During 2000 - 2007, there were recorded 43 notary licenses, and in that time-span fall the elections of 2001 (June) and 2005 (July). A total of 19 licenses were granted within a month from both election dates. Within the range of 6 months before elections, there were 25 licenses granted, or almost 60% of the total for the given period (Figure 1).

Regarding TV licenses, in the QKL database data were reported until July 2008. Within the last 12 months from the election date of both elections, 61 TV licenses were granted out of a total of 120 for the given period 2000 - 2008, or more than half.

From the examples stated above, it is obvious that the licensing for such economically important activities intensifies drastically before elections, supporting the hypothesis of this paper – the closer to the elections, the more licenses are issued and the higher the corruption.

4. Discussion of The Results and Conclusions

Incumbents may engage more intensively in corruption, to increase “corruption income” before

leaving power, especially when their re-election is not very likely. Alternatively, money may be needed to finance campaigns in a highly corrupted country, where corruption has affected most parts of the society, and therefore there is an incentive to expand corruption before elections.

This paper analyzed the issuing of licences for private TVs and notaries in conjunction with elections – there are clear indications that in the months or year before elections significantly more licenses are issued than during the other months or years. One explanation for the intensification of licensing may be corruption. These findings are in line with the findings of Imami et al. (2011) who analyzed monthly income from privatization in conjunction with the last three parliamentary elections in Albania, and found a statistically significant increase of income from privatization before elections, which leads to the conclusion that one of the reasons of “a more intensive privatization process” before elections may be corruption, as privatization is often linked to corruption in transition countries (Kaufmann and Siegelbaum, 1997).

Other reasons may be behind such behaviour related to licensing or privatization, but it is difficult or impossible to measure and control for “true” motivations. 

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¹⁰ The dataset is available in appendix.

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Appendix

Year and Month	Frequency	Year and Month	Frequency
Jan-00	2	Nov-04	10
Nov-00	20	Dec-04	3
Jan-01	11	Feb-05	1
Apr-01	2	Apr-05	1
May-01	1	May-05	4
Aug-01	1	Jun-05	1
Nov-01	1	Jul-05	1
Jan-02	1	Sep-05	1
May-02	2	Oct-05	1
Nov-02	1	Dec-05	4
Jan-03	1	Mar-06	4
Feb-03	1	Apr-06	3
Jun-03	1	May-06	2
Sep-03	3	Jul-06	6
Nov-03	1	Dec-06	2
Jan-04	1	Jan-07	2
Feb-04	1	Oct-07	1
Apr-04	4	Dec-07	2
Jun-04	2	Apr-08	6
Sep-04	3	Aug-08	1
Oct-04	4	Grand	120

Source: QKL (National License Registration Center)

Table A1: List of TV and Radio licenses issued in Albania by month and year

Evaluating the Impact of the Informal Economy on Businesses in South East Europe: Some Lessons from the 2009 World Bank Enterprise Survey

John Hudson, Colin C Williams, Marta Orviska, Sara Nadin *

Abstract:

The aim of this paper is to evaluate the variable impacts of the informal economy on businesses and employment relations in South East Europe. Evidence is reported from the 2009 World Bank Enterprise Survey which interviewed 4,720 businesses located in South East Europe. The finding is not only that a large informal sector reduces wage levels but also that there are significant spatial variations in the adverse impacts of the informal economy across this European region. Small, rural and domestic businesses producing for the home market and the transport, construction, garment and wholesale sectors are most likely to be adversely affected by the informal economy. The paper concludes by calling for similar research in other global regions and for a more targeted approach towards tackling the informal economy.

Keywords: informal economy; workers' wages; underground economy; World Bank Enterprise Survey; South-East Europe

JEL: E26, M26, O17, K42

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1. Introduction

To what extent do businesses in South East Europe witness competition from the informal economy? And what types of business are adversely affected by the existence of the informal economy? Over the past millennium, and more recently due to the financial crises in South-East European countries such as Greece, the issue of combating the informal economy has moved up the public policy agenda in the European Union and beyond (European Commission 2003a, 2003b, 2007; European Industrial Relations Observatory 2005, 2007; Ghinararu 2007; Ignjatović 2007; ILO 2002a; Loukanova and Bezlov 2007; OECD 2002). It is now widely recognised that the informal economy is growing (ILO 2002b; Schneider 2008; Schneider and Enste 2002), that it results in unfair competition and a race to the bottom in terms of labour conditions, and that it hinders the achievement of wider societal goals such as fuller-employment and social cohesion (European Commission 2007; Small Business Council 2004). Until now, however, informed discussion about whether legitimate businesses do indeed witness competition from the informal economy and whether it

has an impact on the formal economy has not been evaluated. There has been even less discussion on the impact of the informal economy on the labour market in general and upon employment relations in particular,

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both inside the informal economy itself and those competing against it. The intention in this paper is to begin to fill this gap by reporting a 2009 World Bank Enterprise Survey of 4,720 firms in South East Europe.

To commence, therefore, the extant literature on the informal economy will be reviewed. This will display that despite many studies measuring the variable prevalence of the informal economy and unravelling the heterogeneous nature of informal work in various populations and places, few have sought to understand whether businesses do indeed witness competition from the informal economy and whether it has an impact on the formal economy, and also the impact on workers in both the formal and informal sector. To start to bridge this gap in the evidence base, the second section introduces the survey data, whilst the third section will report its findings in relation to South East Europe. This will reveal the variable level of competition witnessed by formal businesses and the different impacts of the informal economy on various types of business. It will also indicate an adverse impact of the informal economy on employees' remuneration at the level of the regional economy. The concluding section then reviews the implications both for public policy and future research on this topical issue.

At the outset, however, the informal economy needs to be defined. Despite numerous adjectives and nouns being used to denote this work, including 'cash-in-hand work', 'informal employment', 'undeclared work', the 'shadow economy' and the 'underground sector' (Thomas 1992; Williams and Windebank 1998), the strong consensus is that the informal economy is remunerated activity that is in every respect legal besides the fact that it is unregistered by, or hidden from, the state for tax and social security purposes (European Commission 1998, 2007; OECD 2002; Renooy et al 2004; Sepulveda and Syrett 2007; Williams 2004; Williams and Windebank 1998). If other differences prevail, such as that it is not paid or the goods and services are illegitimate, then the activity is not defined as the 'informal economy' but rather as 'unpaid' or 'criminal' activity.

2. Literature

2.1 Previous research on the informal economy

There is a growing body of literature on the variable prevalence of the informal economy and the heterogeneous character of the informal labour market in

South Eastern Europe. Studies have been conducted in Bulgaria (Centre for the Study of Democracy 2008; Chavdarova 2002; Loukanova and Bezlov 2007), Cyprus (Christofides 2007), Greece (Danopoulos and Znidaric 2007; Karanitos 2007; OECD 2005; Lazaridis and Koumandraki 2003; Liaropoulos et al 2008; Lyberaki and Maroukis 2005; Tatsos 2001), Romania (Ghinaru 2007; Kim 2005; Neef 2002; Stanculescu 2002), Serbia and Montenegro (Benovska-Sabkova 2002) and Slovenia (Ignjatović 2007). These are often small-scale surveys and of particular population groups and/or places. The only known nationally representative cross-national survey so far conducted in relation to South-Eastern Europe has been the 2007 Eurobarometer survey which comprised 4,544 face-to-face interviews conducted in Bulgaria, Cyprus, Greece, Romania and Slovenia which finds that 4% of the population surveyed engage in undeclared work, although this varies significantly socio-spatially (Williams 2010a,b).

Previous studies on the informal economy in South-East Europe and beyond have so far largely concentrated on analysing how participation in such work varies either across socio-economic groups (e.g., Leonard 1994; Pahl 1984), men and women (e.g., Leonard 1994; Williams 2004; Williams and Windebank 2006), migrant groups (Lyberaki and Maroukis 2005; Reyneri 1998 2001), cross-nationally (e.g., Bajada and Schneider 2005; ILO 2002b; Schneider and Enste 2002) or locally and regionally (Renooy 1990; Williams and Windebank 1998). Throughout this literature, a common tendency can be discerned away from universal generalisations and towards more socially, culturally and geographically embedded appreciations. It is increasingly recognised, for example, that although women might be the principal participants in the informal economy in some places and socio-cultural contexts, this is not universally the case (Williams 2004). There is also a growing appreciation that the informal economy is growing in some places but declining in others due to how economic, environmental, social and institutional factors combine together in various 'cocktails' in different places (e.g., Renooy et al 2004; Sepulveda and Syrett 2007; Williams 2006; Williams and Windebank 1998).

A deeper appreciation is also emerging of the nature of informal labour and how this varies socio-spatially (e.g., by gender, migrant group, sector, occupation, location). Context-bound and embedded understandings are therefore emerging. Despite this, and as Williams (2006a) reveals, many commentators have continued to adopt a

fairly narrow conception of informal labour, focusing upon those particular aspects of the informal economy that reinforce their perspective and ignoring or disregarding those aspects which do not reinforce their views.

In the conventional structuralist literature, as Castells and Portes (1989) point out, informal work is commonly represented as waged employment conducted under degrading, low-paid and exploitative 'sweatshop-like' conditions by marginalised populations who do this work out of necessity (Davis 2006; Sassen 1996). Viewing informal waged work as emerging in late capitalism as a direct result of the advent of a de-regulated open world economy, the argument has been that the processes of economic globalization, namely a dangerous cocktail of de-regulation and increasing global competition, are causing an expansion of such work (e.g., Sassen 1996). It is thus seen as a new facet of contemporary capitalism. This 'globalization thesis' thus views the informal economy, which it perceives as waged work or false self-employment, as existing at the bottom of a hierarchy of types of employment with its workers sharing similar characteristics to 'downgraded labour': they receive few benefits, low wages and have poor working conditions (e.g., Castells and Portes 1989; Gallin 2001; Portes 1994; Sassen 1996). As Davis (2006: 186) puts it, the informal economy marks the re-emergence of 'primitive forms of exploitation that have been given new life by postmodern globalization'. The role of public policy from this perspective is therefore to eradicate such work from the economic landscape by detecting and punishing non-compliance (Williams 2008b).

However, as the Eurobarometer survey of five South-East European nations highlights, informal waged employment constitutes just 24% of all informal work (Williams 2010a,b). On the one hand, other kinds of waged informal employment have been identified and on the other hand, a multiplicity of more autonomous forms of informal work. Each is considered in turn along with their consequences for public policy.

The conventional assumption that the informal economy is low-paid waged work and jobs either informal or formal, has come under increasing scrutiny. Informal wage rates have been shown to be as polarised as those in the formal labour market (Fortin et al 1996; Thomas 1992; Williams 2004; Williams and Windebank 1998). Some literature has also begun to question whether jobs are either formal or informal. Revealing how some formal employees receive two wages, a declared

official wage and an unofficial undeclared ('envelope') wage (Neef 2002; Round et al 2008; Williams 2007, 2008a, 2009; Woolfson 2007; Žabko and Rajevska 2007), such 'quasi-formal' employment reveals how jobs can be simultaneously both formal and informal.

Until recently, one of the only data sources in South Eastern Europe on the prevalence of such quasi-formal employment was hearsay evidence from a 2006 survey in Bulgaria. This finds that 90% believe that formal employers only pay social security contributions on the minimum income, not on the entire salary (Loukanva and Bezlov 2007). However, the 2007 Eurobarometer survey reveals that in the five South East European countries surveyed, namely Bulgaria, Cyprus, Greece, Romania and Slovenia, 16% of all employees receive envelope wages, that the undeclared wage component is an average of 60% of their total wage and that such quasi-formal employment is not confined to low-paid informal waged employment (Williams 2010a).

There is also now widespread evidence that much informal work is conducted on a self-employed or autonomous basis (ILO 2002b; Perry and Maloney 2007; Renooy et al 2004; Sepulveda and Syrett 2007; Williams 2004; Williams and Windebank 1998). Indeed, the 2007 Eurobarometer survey reveals in the five South East European nations surveyed that three-quarters (76 percent) of all informal work is conducted on an own-account basis rather than as waged work. Although structuralist commentators have depicted such self-employment as largely low paid 'false self-employment' with little employment protection and poor working conditions (Hudson 2005; Sassen 1996), and a by-product of the growth of sub-contracting and outsourcing arrangements under de-regulated global capitalism, this reading has been challenged by both neo-liberal commentators (de Soto 1989, 2001) and studies revealing how informal self-employment is often conducted out of choice and in preference to formal waged work (Cross and Morales 2007; Perry and Maloney 2007). The outcome has been the depiction of a 'hidden enterprise culture' of informal entrepreneurs who engage in such entrepreneurial endeavour in preference to formal employment (Evans et al 2006; Small Business Council 2004; Williams 2006). Indeed, the Eurobarometer surveys reinforce this, displaying that 52% of those participating in informal work are willing rather than reluctant participants (Williams 2010a).

An array of post-structuralist, critical and post-modern commentators have yet further re-read the

heterogeneous nature of informal labour. They have drawn inspiration from a wider literature on exchange that transcends the conventional 'thin' depiction of monetary exchanges as universally market-like and profit-motivated, by adopting 'thicker' representations that unpack the complex and messy characters and logics of monetised transactions (Bourdieu 2001; Gibson-Graham 2006; Slater and Tonkiss 2001; Zelizer 1994, 2005). The outcome has been to re-read some monetary transactions in the informal economy as embedded in closer social relations and logics other than profit (Williams 2004). Reinforcing this, several surveys in North European nations such as Sweden and the UK reveal that informal work is often conducted for and by kin, neighbours, friends and acquaintances and for reasons other than purely financial gain (Persson and Malmer 2006; Williams 2004). The only known study to investigate this in South-East Europe has been the 2007 Eurobarometer survey which reveals that 46% of all informal work is conducted on an own-account basis for closer social relations, including kin, friends, neighbours and acquaintances (Williams 2010a).

In sum, until now, the vast majority of studies both in South-East Europe and beyond have evaluated only the variable prevalence of the informal economy and the heterogeneous nature of informal labour. Much less has been written from an organisational perspective on the characteristics of businesses engaged in the informal economy and the drivers that led them to operate in such a manner.

2.2 Characteristics and drivers of businesses operating in the informal economy

Examining what is known about the characteristics of individual businesses operating in the informal economy, a common finding has been that the commonality of participation in the informal economy is related to: firm size in that smaller firms are more likely to participate in the informal economy than larger firms (Rice 1992; Hanlon, Mills, and Slemrod 2007; Tedds 2010; Williams 2006b); the legal form of the business, with sole trader businesses engaging to a greater extent than other legal forms (Tedds 2010; Williams 2006b), and the age of the business, with younger firms being more likely to participate than more established firms (Tedds 2010; Williams 2006b).

Turning to the drivers that result in businesses operating in the informal economy, the most common

issues identified are those related to various aspects of the quality of governance in relation to the tax system (Dreher *et al.* 2005; Johnson *et al.* 2000; Lacko 2000; Torgler and Schneider 2009; Friedman *et al.* 2000), the level of corruption in the wider society (Friedman *et al.* 2000; Dreher and Schneider 2006; Buehn and Schneider 2010) and tax rates (Kamdar 1997; Tedds 2010; Lacko 2000).

A multiplicity of drivers regarding the quality of governance regarding the tax system has been identified. Nur-Tegin (2008), in an analysis of transition countries, for example, argues that the greater participation of younger smaller businesses in the informal economy is a result of tax administrators targeting larger enterprises due to the larger potential revenue payback in the sense that the revenue-to-cost ratio for tax offices is greater with larger than smaller businesses. Using an earlier wave of the World Bank Enterprise Survey than the one reported below, he also identifies the importance of social norms, trust in government and the complexity of the tax system. Other aspects of the governance of the tax system identified as driving businesses into the informal economy include the quantity and complexity of regulations (Lacko 2000), the degree of discretion of tax administrators (Lacko 2000), the high levels of bureaucracy/red tape (Dreher *et al.* 2005; Johnson *et al.* 2000; Lacko 2000; Torgler and Schneider 2009; Friedman *et al.* 2000), the absence of the rule of law (Schleifer 1997) and issues related to the perceived fairness and justice of the tax system and administration. Fairness refers to the extent to which individuals believe that they are paying their fair share compared with others, justice refers to whether citizens receive the goods and services they believe that they deserve given the taxes that they pay, and procedural justice to the degree to which people believe that the tax authority has treated them in a respectful, impartial and responsible manner (Williams 2006a). As Murphy (2005) finds, people who feel they have been treated in a procedurally fair manner by an organisation will be more likely to trust that organisation and more inclined to accept its decisions and follow its directions.

The evidence on the impact of taxation is mixed. Some argue that higher tax rates push firms to the formal sector (Kamdar 1997; Tedds 2010; Lacko 2000), but others find that the informal economy is generally higher in poorer countries with lower per capita incomes where tax rates are less, and is lower in affluent countries with higher per capita incomes and where tax rates are higher

(Bird and Zolt 2008; Friedman *et al.* 2000). Furthermore, findings show that the more developed the financial system, including capital markets and the banking sector, the lower the overall magnitude of the informal economy (Dabla-Norris and Feltenstein 2005; Eilat and Zinnes 2002; Straub 2005) since it increases the opportunity cost of being excluded from this system.

A final key driver of businesses into the informal economy identified in the literature is corruption (Friedman *et al.* 2000; Dreher and Schneider 2006; Buehn and Schneider 2010) and the desire of businesses to avoid corrupt government officials (Schleifer 1997; Round *et al.* 2008; Tedds 2010) or extortion by criminal gangs (Johnson *et al.* 2000; Tedds 2010).

The bulk of the empirical literature, as indicated above, has therefore focused on 'push factors', such as bad governance, corrupt officials and high tax rates, together with firm characteristics, such as size and sector. There has been relatively less work done analysing deterrence factors, although implicitly the quality of public administration is linked to the ability to police the informal economy. Eilat and Zinnes (2002) in their policy conclusions also emphasise the importance of enforcement to minimise informal economy activity. The literature, moreover, has paid relatively little attention to locational differences in informal sector activity. Arguments can be made that it is easier for firms to hide in large towns, where there are many firms, or in rural communities, where regulatory presence is low.

Furthermore, there has been little research so far conducted on whether firms witness competition from the informal economy and whether businesses witness adverse impacts from the existence of the informal economy. Although a 2004 UK survey finds that 14% of UK small businesses report that they are negatively affected by the informal economy (Williams 2006b), there has been little further research to evaluate the impact of the informal economy on businesses. It is to filling this gap in the literature, especially in relation to South-East Europe, that attention now turns.

3. Equation Specification

Hibbs and Piculescu (2010) and Nur-Tegin (2008) used an earlier version of the World Bank Enterprise Survey data to analyse the informal economy. Here, we focus on a more recent wave of the survey and focus on two questions that evaluate the degree to which businesses are (i) competing against the informal economy and (ii) its

impact on these businesses, which we here refer to as 'informal competition' and 'informal impact' respectively. The first asks whether the (*i*'th) firm competes against informal or unregistered firms. We assume that informal competition (K_i) will depend upon (i) the actual proportion of firms operating, at least partially, in the informal sector in the firm's industry and region, (Ψ_{RS}) and (ii) the firm's characteristics (X_i):

$$K_i = f(\Psi_{RS}, X_i) \quad (1)$$

We also assume separability between regions and sectors and a linear functional form:

$$K_i = \beta_R R_i + \beta_S S_i + \beta_X X_i + \varepsilon_i \quad (2)$$

ε_i is a white noise, normally distributed IID error term, $\varepsilon_i \sim N(0, \sigma^2_\varepsilon)$. K_i is a continuous variable representing the extent of informal competition. However the variable we are analysing is a binomial one and hence we will use binomial probit to estimate (2).

R_i is a vector of regional variables relating to factors the literature suggests impact on the size of the informal sector including corruption, the courts, the regulatory burden, represented by the problems posed by licensing and permits, and taxation problems. We will also include variables reflecting official attempts to police or regulate firms, in particular the number of inspections to which they are subject. Finally, we include regional infrastructure variables. These will relate to bank credit and transport. The inclusion of these regional variables does not necessarily mean we assume that all informal sector activity which affects a firm is from its own region, merely some of it. S_i will be a vector of dummy variables for the sectors. X_i will be a vector of firm specific factors. These will capture the characteristics of firms competing against the informal sector. It is possible too that they share the same characteristics as informal sector firms. Apart from the variables discussed in the literature such as size and ownership, we also anticipate that competing against the informal sector will be more likely for firms producing for the domestic market. This is because of the added documentation involved in exporting, which will make evasion amongst competing firms more difficult.

A second dependent variable is based on a question which asks to what extent informal activity is an obstacle to the firm's operations so as to measure its impact on the business. This provides information upon both the size of the informal sector and the damage it does to other firms.

The dependent variable is discrete covering 5 values, and hence we estimate the equation using ordered probit. We assume that the firm's response will depend upon (i) whether it is in competition with firms from the informal sector or (ii) whether it is supplied by firms who may be in the informal sector themselves or compete against those who do. This will potentially provide a broader measure of informal sector activity than informal competition. In addition, the impact of informal sector activity depends not just on the number of informal sector firms, but the extent of their informal activities. This will depend upon the efforts and success of governance in policing the informal sector in the firm's locality, if not by removing informal sector firms altogether, then at least by reducing the size of informal activities. Finally, the impact of informal sector activity on a specific firm will depend on that firm's characteristics and the sector within which it operates. For these reasons, the responses to this second question will be determined by potentially the same factors as on the right hand side of equation (2), but the nature and extent of that impact may be different.

A third and final equation will analyse workers' wages. This is more straightforward to estimate and can be done using OLS. The dependent variables will include firm characteristics as well as regional variables. Included in these will be variables reflecting informal sector activity.

4. The Data

Here, we analyse the data from the 2009 World Bank Enterprise Surveys based on 4,720 firms.¹ The data has been used by, for example, Beck, Demircuc-Kunt and Maksimovic (2004) in analysing access to credit across a range of countries including those in transition, as well as the studies already cited which look at the informal economy. Here, we adopt a wide definition of South East Europe, in part based on the membership of certain treaties, as including Albania, Bosnia and Herzegovina, Bulgaria, Croatia, FYR Macedonia, Hungary, Kosovo, Moldova, Montenegro, Romania, Serbia, the Slovak republic, Slovenia and Ukraine. For more detailed information about the surveys see Batra, Kaufmann, and Stone (2003).

Firms were asked a variety of questions in addition to those relating to the informal sector. These included ones related to perceived problems with bribery, the courts,

regulation, transport, access to credit and so forth. There is also data on firms' characteristics. Information on all variables is given in more detail in the appendix. As well as the responses of the firms, we were able to calculate from the data, regional variables, which for the i 'th firm give the average response of firms in the region, and other than the i 'th, on specific issues – for example, the average response of other firms than the i 'th with respect to bribery². This is based on 67 regions, an average of almost five per country. Their use allows us to capture the impact of the variable, provided it differs between regions of individual countries. If it does not and it is the same throughout each country, then the country dummy variables will pick that up and the variable will not be significant. However, much that impacts on firms, particularly in federal systems, is done at the regional level and differs between regions. This includes regulatory enforcement, possibly the courts and local offices of national bodies. This regional variability is borne out by the data. The proportions of the variation in the regional variables explained by between country differences are: courts (52.2%), bribery (50.2%), tax problems (68.8%), inspections (38.4%), political instability (73.3%), permits (66.7%), bank credit (61.6%) and transport problems (44.8%). The remaining variations relate to intra-national regional differences. We later show that there are also considerable differences between regions with respect to the two variables relating to the informal sector.

We believe that this approach is to be preferred to using individual responses because with individual responses we may well get substantially different responses for different firms in the same region. If it is the impact of governance on informal market activity we are seeking to capture rather than individual perceptions, the averaged view of all other firms in the region is preferable. Of course these variables are based on the regional averages of *subjective views*, but this is not unusual in analysing the literature on governance.

Table 1 summarises the data. The country correlation between the two measures of the informal economy is quite high at 66%, but clearly there are differences between the two. Both measures suggest Slovenia, Montenegro and Slovakia have low levels of informal economic activity and that Macedonia, Kosovo and Serbia have high levels. There are also substantial differences

¹ This is also known as the Business Environment and Enterprise Performance Survey (BEEPS). More information is available and the data accessible at <http://www.enterprisesurveys.org/>.

² This approach to constructing regional variables within the context of survey data has previously been used by Hudson *et al.* (forthcoming) and Sivak *et al.* (2011).

Country	Informal:		Characteristics	Informal:	
	Competition %	Impact Average		Competition %	Impact Average
Albania	48.7	2.06	Young	41.9	1.57
Bosnia & Herzegovina	48.8	1.35	Not Young	45.4	1.57
Bulgaria	48.7	1.67	Small	50.8	1.69
Croatia	40.0	1.48	Medium	42.8	1.60
Fyr Macedonia	69.6	2.08	Large	39.0	1.35
Hungary	51.6	1.45	Foreign	36.0	1.17
Kosovo	63.2	1.55	Group	43.4	1.37
Moldova	37.5	1.69	Rural	45.4	1.54
Montenegro	32.7	0.95	Town	44.8	1.57
Romania	34.3	1.40	Large Town/City	45.0	1.61
Serbia	53.6	1.61	High exports	26.6	1.06
Slovak Republic	37.4	1.29	Medium exports	41.9	1.45
Slovenia	24.2	1.06	Low exports	47.6	1.65
Ukraine	41.5	1.78	All firms	45.1	1.57

Notes: Calculated from World Bank Enterprise Surveys 2009. 'Informal competition' shows the proportion of firms indicating that they compete against firms in the informal economy. 'Informal impact' is the average response to the adverse impact on the firm of the informal economy. Responses ranged from no obstacle (coded 0) to a very severe obstacle (coded 4). A value of 2 corresponds to a 'moderate obstacle'.

Table 1: Comparing Measures of the Informal Sector

between regions. For example, in regions with a minimum of 20 firms responding, an average of 40% of firms said they competed against the informal sector, with it being 0% in the best of the regions and 82% in the worst. There are also substantial variations within countries, such as from 28% to 51%, respectively, in Slovakia. In terms of individual characteristics, informal competition and informal impact decline with firm size and export focus. Both are low for foreign firms, but there is not that much variation with respect to location and firm age. However, the regression analysis may reveal more complex patterns and it is to this that we now turn.

5. The Results

The regression results are shown in Table 2. We have used the robust or sandwich estimator of the standard errors. This estimator is robust to some types of misspecification so long as the observations are independent³. We initially modelled all the regional variables in a quadratic form, i.e. including both the variable and its square. The results shown omit variables which were not significant in at least one equation.

³An alternative is to use a cluster-robust estimator. But with a small number of clusters, e.g. less than 50, or very unbalanced cluster sizes, this can create more problems than it solves (Nichols and Schaffer 2007). In our case the first criterion mitigates against using countries as the base for the cluster and the second precludes the use of regions. For information, we note that the results correcting for regional based clusters are similar to those reported. The main difference is the reduced significance of the regional variables with respect to transport and political stability.

Informal competition is inversely related to regional inspections and bank credit. However, the regional variables have a much stronger influence on informal impact. Apart from inspections and bank credit, increases in political instability, transport problems and problems linked to permits all tended to increase the problems caused to firms by the informal sector.

The regional incidence of tax rate problems was also significant. The results suggest that as these increase, the problems posed to the firm by the informal sector declined⁴. This was counter to some of the literature, but consistent with the analyses of Bird and Zolt (2008) and Friedman *et al.* (2000) who link higher taxes to a stronger legal environment and thus a smaller informal sector. However, we have already included the former in the analysis, and found it not significant⁵. Thus it may be that high regional tax rate problems are reflective of greater efforts by government to enforce tax compliance. Interpretation problems may affect regional bank credit. Is this being low a factor driving firms to the informal sector, or could it be that high informal sector activity deters bank lending? In the latter case, this is an indicator of informal sector activity and in the former a cause of such activity⁶.

⁴ For all the quadratic form variables, the results are such that the squared terms moderate but do not reverse the impacts of the first term, e.g. informal impact continually increases as political instability increases, although at a declining rate.

⁵ Specifically we included a regional variable relating to the quality of the courts.

⁶ Given our dependent variables, which relate to individual firms' views on informal activity, there is no reason for endogeneity to be a problem.

	Informal: competition 2.1	impact 2.2	Log of Average Wages 2.3		Informal: competition 2.1	impact 2.2	Log of Average Wages 2.3
Regional Variables				Legal form variables			
Taxation	-0.9948 (1.04)	-2.042** (2.65)	-1.024 (1.38)	Partnership	0.0281 (0.19)	-0.0429 (0.35)	-0.0167 (0.15)
Taxation2	2.481 (1.21)	4.492** (2.68)	1.340 (0.81)	Private Ltd. Co.	0.2658** (3.33)	-0.0246 (0.39)	0.1154 (1.50)
Inspections	-0.03 (1.43)	-0.0391* (2.25)	-0.0155 (0.94)	Publicly listed Co.	0.334** (3.34)	0.0612 (0.74)	0.1271 (1.32)
Inspections2	0.0013* (2.21)	0.00079 (1.66)	0.00001 (0.03)	Sole proprietor	0.3516** (3.85)	0.0281 (0.38)	-0.0037 (0.04)
Political instability	0.6972 (1.30)	0.9615* (2.41)	-0.6304 (1.69)	Sector Variables			
Political instability2	-0.0981 (1.11)	-0.1478* (2.27)	0.1227 (2.02)	Food	-0.0165 (0.21)	0.064 (0.97)	-0.191** (3.02)
Transport problems	0.0146 (0.16)	0.1778* (2.30)	0.170* (2.42)	Textiles	0.0263 (0.13)	-0.2502 (1.57)	-0.2201* (2.30)
Permits	0.0724 (0.69)	0.3083** (3.87)	0.0968 (1.24)	Garments	0.2716** (2.99)	0.2198** (2.80)	-0.4899** (6.09)
Credit	-0.7522** (3.18)	-0.4192* (2.21)	0.2878 (1.56)	Construction	0.1637* (2.07)	0.1248* (1.96)	0.0836 (1.45)
Firm specific variables				Other services	0.2191 (1.88)	0.0201 (0.22)	0.0583 (0.64)
Young	0.1368* (2.02)	-0.0669 (1.15)	-0.1336* (2.53)	Wholesale	0.1489 (1.90)	0.1223* (2.00)	0.0979 (1.75)
Small	0.1731** (2.99)	0.1362** (2.85)	-0.0539 (1.14)	Retail	0.0671 (1.14)	0.0765 (1.59)	-0.0603 (1.42)
Medium	0.0143 (0.26)	0.1048* (2.25)	-0.0192 (0.41)	Hotels & restaurants	0.0844 (0.74)	-0.0078 (0.09)	-0.0831 (1.04)
Rural	0.1878** (3.37)	0.0952* (2.07)	-0.226** (5.32)	Transport	0.3503** (3.54)	0.2752** (3.31)	-0.0281 (0.35)
Town	0.0519 (0.95)	0.0166 (0.37)	-0.1273** (2.95)	Regional informal competition			
Foreign	-0.1249 (1.65)	-0.2165** (3.47)	0.264** (4.17)				
Group	0.0394 (0.54)	-0.112 (1.82)	0.0676 (1.10)	Observations	4192	4354	3790
Exports	-0.006** (6.78)	-0.0047** (6.58)	0.00078 (1.24)	Log likelihood	-2679	-6561	-5068
			X ² /R ²		380	381	0.47

Note: Regression 2.1.estimated by probit, 2.2 by ordered probit and 2.3 by OLS; (.) denotes t statistics, */** significance at the 5% and 1% levels, respectively. Standard errors have been corrected for heteroskedasticity. Variables defined in data appendix, country fixed effects included. X² are reported for 2.1 and 2.2 and R² for 2.3

Table 2: Regression Results

In terms of firm characteristics, informal competition declines with firm size and is less for young firms. Small firms appear more likely to be aware of informal activity than medium sized firms and both are significantly more likely to be adversely impacted by it, at the 1% level, than large firms. Firms in rural⁷ areas are more likely to face informal sector competition than other firms, this despite little obvious difference in Table 1. Legal form is also significant, with sole proprietors and publicly listed firms most likely to face informal sector competition. Finally,

amongst the firm characteristics, informal sector competition declines with the extent to which the firm is focused on export markets. This is a linear impact, rather than nonlinear, and is consistent with the hypothesis that exporting firms face more documentation and hence are less likely to face informal competition. With respect to the sector variables, the transport, garment and construction sectors are particularly likely to face informal sector competition. We tend to get the same pattern of results for informal impact, although there are differences. Foreign firms are less likely to be adversely impacted than domestic ones. None of the legal form variables are now significant, nor are there any

In any case, the results with respect to the other variables are essentially unchanged if regional bank credit is omitted from the regression.

⁷ The term rural refers to firms in localities with less than 50,000 people.

differences between young firms and others. In addition, firms in the wholesale sector are more likely to be adversely impacted by the informal sector.

Finally, in this section we seek to analyse the impact of the informal economy on employees' wages. The dependent variable is the log of the cost of labour, primarily wage costs, per worker and its derivation is discussed in the appendix. The independent variables are those we have been using to analyse the informal economy, although of course their rationale will be different. For example we would expect rural firms to pay less than firms in larger cities. In addition, we include individual answers to the questions on the informal economy, plus regional averages of the responses. This will allow us to distinguish between the impact of informal competition on individual firms and upon the region as a whole.

The results are shown in 2.3 in Table 2. Neither of the individual response variables relating to informal competition or impact are significant at the 5% level of significance, nor is the regional variable relating to impact. But Regional informal competition is significant at the 1% level. The results suggest that if the level of regional informal competition increases from 0.4 to 0.5, e.g. from 40% to 50% for regional firms indicating they compete against the informal sector, then wages will fall by approximately 2.4%. The higher the level of regional informal competition, then the greater will be the impact in dampening down wages. Of the other variables young, rural and small town firms tend to pay relatively low wages and foreign firms relatively high wages. This equation was estimated on the full sample. If we restrict the regression to firms only employing full time staff, regional competition remains significant at the 5% level, although young firms and regional transport are no longer significant. In another regression there was no evidence that firms' employment of temporary staff is linked to the informal sector.

6. Conclusions

Emerging economies face not simply an evolving set of institutional actors, but also actors or institutions driven by the free market. The impact of the informal economy is one example. The informal sector is often high in emerging economies and to analyse labour markets or employment relations from solely the perspective of the formal sector is analogous to judging a town from its business district whilst ignoring the slums.

Our analysis suggests that the informal sector has an adverse impact on workers' wages. It is also possible, indeed probable, that they impact upon the non-pecuniary aspects of worker employment. The evidence suggests, however, that it is not individual firms who respond to the informal sector but rather all firms in the region. This was expected as market forces should ensure that individual firms pay 'the going rate'. It is this 'going-rate' which the informal sector impacts upon. This finding is new to the literature. It adds to the adverse impacts of the informal economy and raises the question as to what institutional factors can do to limit the evolution of the informal sector. Here too our analysis has provided answers.

In providing these answers we have sought evidence from the 2009 Bank Enterprise Survey, which interviewed 4,720 businesses in South East Europe. This has also allowed us to provide some of the first estimates of the impact of the informal economy on businesses in South-East Europe. The analysis has revealed that regional differences in South East Europe in the impact of the informal economy on legitimate businesses are linked to differences in regional governance, particularly differences in political instability and permits. However, the evidence also suggests that the impact this has on legitimate businesses can be reduced by public sector action to regulate firms, such as through regular inspections. The quality of regional transport infrastructure also impacts on the informal economy. This can impact on the efficiency of public sector policing of informal activity, just as it can impact on the efficiency of many other public and private sector activities. Transport quality will also be related to the level of development of the region, but other variables which will also reflect this, such as regional email usage by firms, were not significant, which suggests it is the impact of transport communications on public sector efficiency in controlling the informal sector which is important. In terms of characteristics, it is the small, rural, domestic firm producing for the home market which is most adversely impacted by the informal sector.

What are the implications of this for our understanding of the nature of the informal economy in South-East Europe? Firstly, it suggests the informal economy relates more to people in rural areas and in specific sectors (construction, garments, transport and wholesale), and thus presumably occupations, than others. Secondly, globalisation, as proxied for individual firms by export activity, would appear to be negatively

associated with informal activity in this set of countries. Of course it may be different in other parts of the world. We have also provided information that the informal sector is a common feature across many regions of these countries in South-East Europe, but also differs substantially across regions within each country. The suggestion, therefore, is that if the informal economy is to be tackled, then rather than adopt a scatter-gun approach, efforts need to be more targeted at domestic businesses producing for the home market in rural areas. If this paper, therefore, leads to further research on the differential impacts of the informal economy on businesses, the labour market and employment relations in South-East Europe and beyond, as well as further discussion of where public policy interventions need to be targeted when tackling the informal economy, then it will have achieved its objectives. 

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Appendix: Definition of variables:

Endogenous variables

Informal Competition: Binary variable, coded 1 if the respondent indicated their firm competed against informal or unregistered firms.

Informal Impact: The extent to which competition from the informal sector was an obstacle to the firm's current operations. Responses ranged from no obstacle (coded 0) to a very severe obstacle (coded 4)

Average Wages: The total annual cost of labour (including wages, salaries, bonuses, social payments) divided by the number of full time workers plus half the number of temporary workers.

Exogenous variables (binary, unless otherwise stated)

Young: Coded 1 if firm has been established five years or less.

Small: Coded 1 if the number of full time employees is less than 20.

Medium: Coded 1 if the number of full time employees is between 20 and 100

Group: Coded 1 if the firm is part of a larger group.

Foreign: Coded 1 if the share of the company held by foreign individuals or companies > 49%.

Rural: Coded 1 if firm's location has less than 50,000 people

Town: Coded 1 if firm's location has between 50,000 and 1 million people and is not a capital city

Exports: The proportion of a firm's sales which are for the export market, it is thus inversely related to domestic focus.

Legal status: 4 variables: Coded 1 if the firm has the legal status of (i) a sole proprietor, (ii)

Variables: partnership, (iii) private limited company or (iv) publicly listed company

Regional Variables. For the i'th firm these represent the (unweighted) average perception of other firms in the region, but excluding the i'th firm. There are 67 regions

Inspections: The number of inspections which took place in 2007.

Permits: The extent to which business licensing and permits presented a problem to the firm, responses ranged from no obstacle (coded 1) to very severe obstacle (coded 5).

Political: The extent to which political instability presented a problem to the firm, responses

Instability: ranged from no obstacle (coded 1) to very severe obstacle (coded 5).

Transport: The extent to which transport presented an obstacle to the firm, responses ranged

Problems: from no obstacle (coded 1) to very severe obstacle (coded 5).

Taxation: Coded 1 if tax rates presented a very severe obstacle to the firm.

Credit: Coded 1 if the firm had either an overdraft facility or a line of credit from a bank.

Courts: Response to a question on the problems posed by courts to the firm. The regional average for this was insignificant.

Bribery: The proportion giving bribes to officials to 'get things done'. The regional average for this was insignificant.

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