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STATEMENT OF PURPOSE

Journal of Economic and Social Studies (JECOSS) aims to develop scientific knowledge in the areas that include, and are related to Economics, Management, Financial Economics and Banking, Accounting, Marketing, Quantitative Methods and Econometrics, International Relations and Policy Development. As an international social sciences journal with interdisciplinary feature, it will set a ground to bring social science communities across disciplines identified above with a view for sharing information and debate. The journal publishes refereed articles and technical research notes that build on theory and contemporary scientific knowledge. Articles submitted to JECOSS will be peer-reviewed and expected to report previously unpublished scientific work. Submitted manuscripts should follow journal format and referencing guide and should not be under consideration elsewhere.

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CONTENT

Determinants of International Tourism Flows to the Republic of Croatia: An SUR Analysis of Panel Data from 1993-2015

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Abstract: *This paper examines origin-effects of tourist flows into Croatia from 1993-2015, a time period that features several important events: the fragmentation of Yugoslavia, the European recession, and Croatia's accession to the European Union. Applying the seemingly unrelated regression (SUR) approach to a large panel data set with the number of annual arrivals from each origin country as the dependent variable, we identify and analyze the determinants of tourism flows to Croatia. A series of augmented gravity model specifications reveals that inflows can be explained by geographic proximity, GDP per capita, origin country population, and openness. The role of the real exchange rate variable is inconclusive, and in fact problematic for years 1993-95 when hyperinflation plagued the region in the wake of Yugoslavia's dissolution. The results confirm the validity of the models, both for the subset of origin countries and for the subset of non-origin countries for which otherwise complete data are available. Given the importance of tourism to Croatia's national accounts position, implications for tourism policy are discussed, as are suggestions for future research.*

Keywords*: Tourism Origin-Effects, Gravity Model, Croatia*

JEL Classification*: C33, O52, Z3*

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Introduction

International tourism is a mainstay of Croatia's economy, currently representing 12.5% of the country's GDP (WTTC, 2015). Such a heavy reliance on this single industry leaves the country susceptible during times of recession in other European Union economies, which collectively comprise about three quarters of Croatia's tourism exports (Škuflić and Štoković, 2011; WTTC, 2015). Given the importance of tourism revenues for Croatia's balance of payments, it is essential that policymakers understand the drivers of demand for international tourism and hospitality (Baldigara, 2013; Tica and Kožić, 2015). This paper assesses origin-effects of tourist flows into Croatia from 1993-2015, a time period during which several events have impacted Croatia, the Balkan region, and the broader European Union. These include the aftermath of Croatia's independence from Yugoslavia, regional political instability throughout the 1990s, the European recession (from 2007 onward), and Croatia's 2013 accession to the European Union.

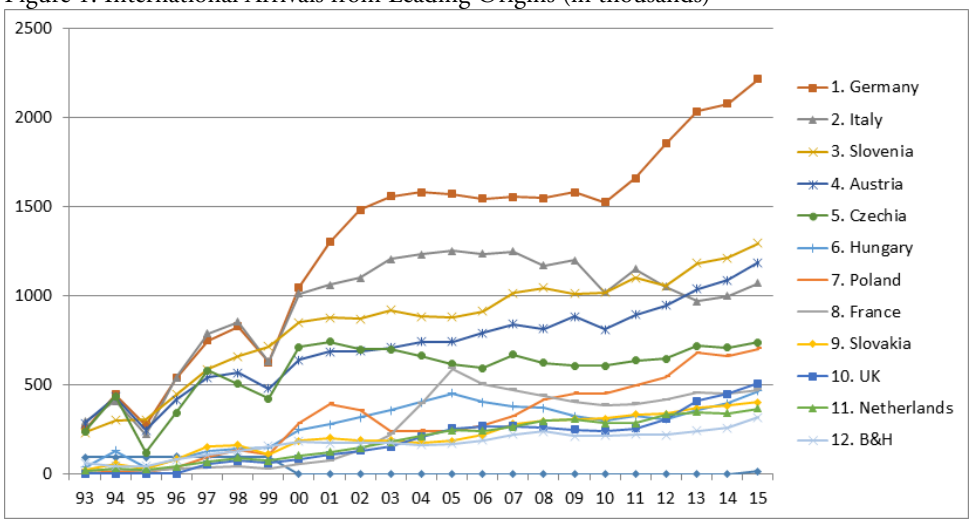
Tourism is hailed as one of the world's most important economic sectors, with the value of international tourism ranking as the third largest category of exports after fuels and chemicals (UNWTOa, 2016; 2). Officially, the World Tourism Organization defines tourism as "the activity of visitors taking a trip to a main destination outside their usual environment for less than a year, for leisure, business or other personal purpose other than to be employed by a resident entity in the place visited." As such, the industry is expansive, and global international tourism alone resulted in receipts of $1.5 trillion in 2015 (UNWTOa, 2016).

For some small countries like Croatia, the industry is even more important as an economic sector and as a means of obtaining foreign revenue that ultimately raises GDP (Pavlic, Svilokos, and Tolic, 2015). Thanks in large part to deliberate and successful policy efforts, Croatia ranks thirty-third globally in the World Economic Forum's (2015) Travel and Tourism Competitiveness Index. Croatia's Ministry of Tourism (2013) provides a thorough analysis of the industry from a policy perspective, and sets forth goals to be targeted for the year 2020, including a top-twenty competitiveness ranking.

A cursory examination of Figure 1 yields the observation that several events have impacted the otherwise steady acceleration of international arrivals to Croatia. See, for example, the falloffs in arrivals approximating 1995, 1999, and additional general languishing from 2007-2010. In an effort to capture the most important facilitators of tourism during this time period, the present research requires the assembly and

assessment of a large data set from sources including the World Bank and Croatia's Ministry of Tourism.

Figure 1: International Arrivals from Leading Origins (in thousands)



Data Source: Ministry of Tourism (2016)

This project employs regression modeling of a panel set of new data through 2015 to advance the existing body of research on international tourism in Croatia. In so doing, it builds upon an array of variables identified by other scholars. For example, Mervar and Payne (2007) note that during the first decade after Croatia's independence, tourism was highly elastic with respect to income fluctuations of origin countries, and that political conflict in the region impacted the industry severely, although at that time they found no evidence of a significant role for exchange rates and transportation costs. As another example, Škuflić and Štoković (2011) discover that income, marketing, quantity, price, and age of hotels are significant drivers for explaining the length of stay nights. It is plausible that the scene depicted in Figure 1 can be explained in part by the differential effects of the European recession (note the increase in German and Austrian arrivals, and decline in those from Italy). Based upon overnights, Galičić (2015, 93) points out that overall, Croatia's tourism sector was protected from the recession, unlike other industries. This may be attributable to the wealthier characteristics of northern European tourists who tend to travel to Croatia, combined with worse economic conditions in other southern European destinations such as Portugal, Italy, Greece, and Spain.

The present paper examines variables such as these by employing data beginning in 1993, during Yugoslavia's war of dissolution, and extending through the global economic crisis as called for by Panagiotou (2010), and Croatia's 2013 accession to the European Union. The results should enlighten scholars and policymakers and enable them to better prepare for and respond to such events in the future. These findings will also have considerable relevance for other tourism-dependent countries.

It is quite straightforward to conceptualize this research approach in terms of the gravity model, borrowed from Newton's Law of Gravity, and pioneered in economics by Tinbergen (1962). Since then, the approach has been widely used to explain flows of migrants (Lewer and Van den Berg, 2008), trade (Ok, 2010), and foreign direct investment (Deichmann, 2013), as well as international tourism (Khadaroo and Seetanah, 2008; Eryiğit, Kotil, and Eryiğit, 2010; Keum, 2010), setting the groundwork for the present research.

> The basic gravity model can be presented as follows:
> $Arrivals_{ij} = \alpha (M_i M_j / D_{ij})$
>
> Where: Arrivals= number of international tourists from each country (in thousands)
> α = constant
> M = mass (GDP or population)
> D = resistance (geographical or cultural distance)

Quite simply, with trans-national interactions being defined as "tourist arrivals," ceteris paribus, we would expect more interaction between large countries and less between smaller ones. Similarly, countries that are near to each other (either geographically or culturally) would be more likely to experience greater flows of tourists than those that are farther away.

In order to contribute to a more robust understanding of contemporary demand issues by stakeholders, the simple model above can be augmented with other variables that have emerged in the scholarly literature, including income at origin (Eilat and Einav, 2005), visa-requirements (Cole and Hall, 2005), transportation costs (Mervar and Payne, 2007), and exchange rates (Tica and Kožić, 2015), all of which have been shown to play a role in explaining "origin-effects", or flows of tourists from different origins.

Literature Review

A large literature focuses upon the international tourism industry in Croatia, highlighting the national economic importance of the industry as well as the necessity of effective forecasting models (Baldigara, 2013; Tica and Kožić, 2015). Research on the topic is expansive due to the commanding and increasing presence of Croatia's tourism industry, especially in coastal areas (Ballinger, 2003). The portion of literature that relates to the war's crippling results of physical destruction and hyperinflation is descriptive (Currie, Skare, and Loncar, 2004; Schőnfelder 2005, Ateljevic and Čorak, 2006), but nevertheless provides an essential backdrop for more recent scholarship on international tourism.

Radnić and Ivandić (1999) embrace Maslow's hierarchy of needs as a starting point to explain the deterioration of overnights and total beds used by foreign tourists during the war years of 1990-1995, focusing specifically on human safety needs as being fundamentally more important than those of self-actualization. The authors employ a combination of quantitative and qualitative data from Croatia's Institute for Tourism to provide an excellent summary of the impacts of conflict, and a very slow recovery in Croatia, comparing a lagging perceived value for money vis-à-vis other destinations in Italy, Spain, and Greece; one that was comparable to Turkey at the time of data collection (1997). They conclude with a series of insightful principles highlighting the need to understand crisis and its impacts on tourism, among other considerations that might inform future crisis-management measures.

Similarly, Hall (2002) calls for brand development and re-imaging throughout former Yugoslavia as a means of helping the region's post-war tourism industry recover. He compares and addresses issues in several countries in the region, and identifies examples of national tourism "straplines" for marketing purposes. In the case of Croatia, the strapline he identifies is "small country for a great holiday" (p. 327). In order for Croatia to both bring back tourists from traditional markets and attract high-income-generating groups, Hall argues that marketing programs should differentiate Croatia as "not Balkan", and reassure tourists that its attractions' traditional quality and value have been restored to pre-war levels.

McKercher and Lew (2003) identify what they designate as an Effective Tourism Exclusion Zone (ETEZ) based upon telephone survey of 952 Hong Kong residents conducted in the year 2000. They argue that this type of zone exists for every tourist market, although it varies according to the nature and size of the voids that exist near the source market. ETEZs might be oceans, unpopulated areas, or product voids. For example, Switzerland has many competing land neighbors, while New Zealand's

nearest destination is between 2000 and 3000km away, representing the latter country's expansive ETEZ.

Currie et al. (2004) examine the effects of Yugoslavia's war of dissolution that took place from 1991-1995 paying special attention to international tourism. They underscore the country's dependence upon tourism with official state statistics showing 5.4% annual growth in arrivals, with a 19.1% yearly acceleration of spending. The authors use ordinary least squares regression to compare models of the Croatian economy during the war with two peaceful time periods: 1960-1990 and 1996-2000. Their model estimates a cumulative economic loss of $5.139 billion in tourism revenues during the war (approximately five percent of national revenue), and they note that tourism actually started to increase toward the end of the war, drawing on earlier work by Weaver (2000) that suggests that conflict can eventually have a positive impact on international arrivals as battle sites are transformed into attractions. Subsequently, the body of literature on "dark tourism" has been extensively and critically reviewed by Stone (2013).

Eilat and Einav (2004) employ a three-dimensional panel data set to survey the determinants of international tourism. They examine flows between all pairs of countries in the years 1985 and 1998. Defining their dependent variable as flows relative to population of the origin country, they find evidence that political risk is a major inhibitor of tourism, while exchange rates are important especially for tourism to developed countries, which exhibit exchange rate elasticity of approximately one.

Schőnfelder (2005) focuses more theoretically and broadly on the war's economic impacts related to run-away inflation, arguing that "the most obvious economic victim of the war was tourism" (page 10). The Croatian dinar was introduced in December 1991, and experienced monthly inflation rates between 21.5% and 31.2% for more than a year. In response, in 1994 the dinar was replaced by the kuna, which was redenominated with the removal of three zeros.

Among the comprehensive historical overviews of the industry is a descriptive chapter by Ateljevic and Čorak (2006) that highlights the evolution of tourism in the region. The authors trace tourism's growth over the past century, during which, as part of Yugoslavia, the Adriatic coast represented a tourist magnet of continental magnitude. Yugoslavia was particularly accessible to travelers because visas were not required for visitors from Western or Eastern Europe. The authors focus upon the social, cultural, and psychological conditions of tourism in the country, which they argue tend to be overshadowed in the regional transition literature by political and

economic considerations. As part of this discussion, the chapter highlights the endurance of gender division in tourism occupations over time.

Jordan (2006) examines the impact of EU Enlargement on tourism in Central Europe, including Croatia. His assertion that 2004 is merely a symbolic date for the gradual integration of much of Central Europe can be extended to Croatia in 2013, when the new republic formally joined the EU. Effectively, the expansion of the EU is a gradual socio-economic process that has occurred over the past quarter century, and one that will continue to unfold as time passes. The author maps and explains tourist flows between the Central European states for 1910, 1937, and 2003, then highlights the major types of tourism that characterize the region. He concludes by speculating on the outlook for the industry in Central Europe, arguing that it depends largely upon improvement in accommodations, infrastructure, and marketing, particularly with regard to negative images of the political and security environment of competing countries. The legacy of war is a consideration particularly relevant to Croatia and its Balkan neighbors.

Colonial ties are explored as a facilitator of tourism flows by McKercher and Decosta (2007). The authors note that lingering effects of colonization can remain strong, especially in the case of French and Dutch tourists. Colonial legacies appear even more important where multiple colonizers had been present, for example in Namibia, where South Africa, Germany, and the UK remain the most important origins of tourists. Moreover, they find evidence that an absence of colonial ties represents an equally strong inhibitor to travel. Although this study is largely descriptive, the authors conduct some rudimentary correlations, and discover that the ties they identify tend to deteriorate with time after destinations become independent. Moreover, markets that are large and diversified tend to rely less on their colonial ties.

Building upon McKercher and Lew's (2003) work on distance decay and ETEZs, the impact of distance on tourism movements is further examined by McKercher, Chan, and Lam (2008). Reporting on 2002 data from 41 source markets to 146 destinations, they find that a classic decay curve is most typical for origin markets, whereby demand peaks at adjacent land neighbors, and declines rapidly as distance to destinations increases. They acknowledge that other variables such as pairwise relationship characteristics might also be at work. The authors note that 80% of all international tourism takes place within 1000km of the origin, whereas negligible tourism takes place between extremely distant countries.

Khadaroo and Seetanah (2008) examine bilateral tourism flows between 28 countries from 1990-2000 using a GMM panel analysis, arguing that transportation infrastructure is a significant determinant of international tourism that is sensitive to other characteristics of origins and destinations. The authors measure several aspects of infrastructure, including roads, ports, airports, and distance itself in a global gravity model. In conclusion, based on their findings, Khadaroo and Seetanah (2008) make the case that governments should refrain from spending cuts that lead to the neglect of infrastructure. Moreover, countries should take advantage of developmental loans and private investment alike to improve accessibility that will lead to greater tourism flows.

Keum (2008) argues that economists have come to value the gravity model not just as an empirical tool but also as a theoretical one. Using a panel data set with tourist flows to Korea, he confirms the gravity model's robustness when applied to international tourism as a form of trade, citing an array of mainstream international trade theories. Highlighting evidence of the importance of geographical distance and GDP measures, he concludes that the gravity model is "indispensable for analyzing the flows of spatial interactions" (2008, 545).

Eryiğit et al. (2010) specify an eight-factor model for explaining the number of tourists to Turkey from the time period 1995-2005. Their expanded gravity model reveals that the most important explanatory variables for Turkey include geographic distance and tourism climate index. In addition, the authors report that GDP per capita, population of the origin country, earthquakes, adjacency, and the September 11th attacks have impacted the magnitude of inflows. Notably, they find no evidence that safety concerns surrounding the nearby Iraq War deterred tourists away from Turkey.

Baldigara (2013) compares five time-series forecasting methods to determine their relative accuracy for predicting international tourism demand in Croatia. Her investigation is based upon the number of tourist nights from five European countries between 2009 and 2012. She concludes that although all of the methods are useful, her double moving average (3x3) method is superior because it yields the smallest mean absolute percentage error. She concludes by calling for additional quantitative analysis of determinants of Croatia's tourism demand.

Employing an expansive list of variables, Tica and Kožić (2015) evaluate drivers of inbound tourism demand in Croatia. The authors find that Polish real GDP and Czech wages are the most important determinants of international tourism overnight stays, and that their impact is realized in a lead time of one year. Some evidence is

also found that favorable exchange rates attract tourists to stay longer at a destination.

Finally, Pavlic et al. (2015) examine the impact of tourism on GDP using a set of mainstream variables, including the independent variable of international arrivals in an interesting twist. They also confirm the importance of an economy's openness (imports plus exports) and real effective exchange rate as drivers of Croatian GDP from 1996-2013. Although their dependent variable is different from the present study, this work by Pavlic et al. (2015) is relevant here because of its examination of causality between variables and the resulting evidence underscoring the role of tourism in the host economy.

Table 1: Summary of Variables in the Literature for Explaining Tourism Flows

Variable	Author(s)	Valence Sign
Population of origin	Eryiğit et al. (2010)	+
Income at origin	Eilat and Einav (2005), Mervar and Payne (2007), Keum (2008), Khaderoo and Seetanah (2008), Škuflić and Štoković (2011), Tica and Kožić (2015)	+
Historical Rule	McKercher and DeCosta (2007)	+
Geographical distance	McKercher and Lew (2003), Eilat and Einav (2005), Keum (2008), McKercher, Chan, and Lam (2008), Eryiğit et al. (2010)	-
Transportation infrastructure	Khaderoo and Seetanah (2008)	+
European Union membership	Coles and Hall (2005)	+
Political Instability or Terrorism	Hall (2002), Currie et al. (2004), Schőnfelder (2005), Mervar and Payne (2007), Eryiğit et al. (2010)	-
Price index or exchange rates of origin to destination	Eryiğit et al. (2010), Tica and Kožić (2015)	+
Visa Requirements	McKercher, Chan, and Lam (2008), Deichmann and Frempong (2016)	-

Taken together, these mainstream variables can provide an elaborate explanation of tourism flows. It is important to remember that these and other variables can have differential impact over time. During the twenty-three years under investigation here, the region has been impacted by war (Hall, 2002), economic recession (Panagiotou, 2010), and most recently the European Union accession process (Coles and Hall, 2005). In the present study, due to data constraints and in an effort to

specify a parsimonious explanation of tourism flows, it is prudent to limit the number of variables included in the models.

Data and Methodology

This section discusses our data set, imputation technique, and methodology. Following supplications from Eilat and Einav (2004), we seek rigorous results by using a large and carefully constructed panel data set. Our data cover 142 countries spanning the years 1993-2015, with a one year lag for the response variable and employing a missing value treatment as explained below. We analyze the results with the approach of seemingly unrelated regression (SUR).

The data set has been constructed and employed to assess the impact of an array of origin country determinants collected from an extensive literature review. The variables include population (POP), gross national product per capita (GDPC), geographic proximity to Zagreb in kilometers (DIST), real exchange rates (EXR), and a binary variable for whether an origin is visa-free (OPEN)[i]. Because the relationship between the independent variables and the response variable is non-linear, a logarithmic transformation is applied to the dependent variable to correct skewness in its distribution. Population (POP), income (GDPC), and geographical distance (DIST) are scaled in order to standardize their weights in the models.

The variables are assembled in an enhanced gravity framework as follows:

$$\ln(\text{Tourists}) = \alpha + \beta_1 POP_i + \beta 2GDPCi - \beta 2DISTij - \beta_4 EXR_i + \beta_5 OPEN_{ij}$$

With the following notations:
α = constant for fitting the equation
β_{1-} β_5 = coefficients for each independent variable explained above

The dependent variable "Tourists" is defined here as the number of tourist arrivals (in thousands) from each origin country each year between 1993 and 2015, reported by Croatia's Ministry of Tourism (2016). As a global authority on the industry, the World Tourism Organization ("UNWTO") defines tourism as "the activities of persons traveling to and staying in places outside their usual environment for not more than one consecutive year" (UNWTO 2016b). Although the dependent variable of tourist arrivals tends to dominate the mainstream literature reviewed above, it is true that the intensity of tourism flows can alternatively be measured using overnight stays (Radnić and Ivandić (1999), Škuflić and Štoković (2011),

Galičić (2015), and Tica and Kožić (2015). In the present gravity approach, arrivals represent the preferred measure because we seek to answer to the question "why did you go to Croatia?" rather than "why did you stay as long as you did?" Moreover, it is possible to work with a more complete dataset for arrivals than for overnight stays; even with arrival data, entries for some origins and years could only be acquired through direct correspondence with Croatia's Ministry of Tourism.

The rationale for the specific timeframe examined here is to perform an analysis that is as thorough as possible, covering inflows of tourists throughout the entire history of the Republic of Croatia. The dataset includes arrivals by most modes of transportation. According to the Croatian Bureau of Statistics (2016) in 2014, the approximate breakdown is road (64.5 million), air (2.84 million), sea (1.33 million), rail (392 thousand) and river (33 thousand). It should be acknowledged that some "arrivals", especially at surface border crossings, were made by individuals such as regular commuters who are not formally counted as tourists according to the UNWTO's (2016b) aforementioned definition.

The sample under investigation includes 142 country observations. There are 62 countries with complete data for the independent variables that are origins of tourists to Croatia. In addition, 80 additional countries with independent variable data that are otherwise complete had no reported visitors to Croatia. Admittedly, the fact that many countries with missing data throughout the years in question tend to be poor and/or unstable (Afghanistan and Iraq, for example) can introduce a bias into the models. Notwithstanding this concession, models will be generated using both sets of data ("origins only" and "full data") in order to capture insights that are as complete as possible. In other words, while we are interested in factors explaining what attracts tourists from each origin to Croatia, we are also concerned with origin-specific factors that inhibit tourism.

The independent variables used here relate to the origin countries alone, and most of them are available from the World Bank's World Development Indicators. As pointed out by Eilat and Einav (2004), exchange rates are an excellent proxy for tourism prices, distances capture transportation costs, and income is considered a plausible enabler because tourism is a luxury good rather than a necessity. Other variables found elsewhere in the literature (such as transportation connectivity as per Khaderoo and Seetanah [2008]) are excluded from the analysis in order to reduce redundancies and or prevent data problems[ii].

Table 2: List of Variables Selected for the Models

Variable	Unit of Measure	Expected Valence	Data Source(s)
Tourists (dependent)	Number of arrivals (thousands)		Ministry of Tourism (2016), Croatian Bureau of Statistics (2016)
POP	Population (persons)	+	World Bank (2016)
GDPC	Gross Domestic Product per Capita (in 2005 US$)	+	World Bank (2016)
DIST	Air distance between capitals (km)	-	www.worldatlas.com
EXR	Real exchange rate index (2010= 100)	+	World Bank (2016), European Union (2016).
OPEN	Visa-free? (1= yes 0=no)	+	www.justlanded.com

The data set required considerable cleaning, and several observations are complicated by changing borders during the time period under consideration. For example, the country that had been Yugoslavia at the beginning of the time period under investigation has gradually devolved into seven distinct political entities: Slovenia, Croatia, Bosnia-Herzegovina, Serbia, Macedonia, Montenegro, and Kosovo. These and other events introduce a great deal of complexity into the construction of a useful database, and dealing with the issues will itself require examining work by other scholars.

Countries converted to the Euro at different dates, so it was useful to consult the European Commission's web site for specific conversion rates (European Union, 2016). There were considerable missing values for both EXR and GDPC in 1992 and 1993, and this resulted in the omission of several country observations. Missing data treatment is particularly necessary for the years of the Yugoslav civil war (through 1995). The empty cells are missing at random (MAR), and the pattern is monotone (vis-à-vis arbitrary). Specifically, missing cell values for GDP and exchange rate are consistent for certain countries during the years 1993, 1994, and in some cases 1995. Based on this condition, it is appropriate to use multiple imputation where only a few values are missing. Some exchange rates in the Balkan region- including those of Croatia itself- remained extremely unstable through 1995. The research plan is therefore to run alternate models comparing the complete time period with the period beginning in 1995, when currencies generally regained stability. In all, the data set includes 22 years, with 62 countries as tourist origins, and another 80 with complete data but without tourists[iii].

The Lagrange multiplier (LM) test, developed by Breusch and Pagan (1980) should be used before applying a panel regression model (Keum, 2008). Using the LM test, this data set shows a high level of cross-sectional dependence as indicated by a p-value of <2.2e-16. As a result, the present methodology employs seemingly unrelated regression ("SUR"). This approach was pioneered by Zellner (1962) for data that are characterized by cross-sectional dependence, and it is used widely in econometric modeling (Egger and Pfaffermayr, 2001). In the present panel data set the number of years under consideration ("T"= 23) is significantly larger than the number of variables (5), and therefore SUR is an appropriate method. The models are run using the R language[iv].

Our analysis covers five models as follows:
Model 1: all years since 1993, only those countries with tourists traveling to Croatia.
Model 2: 1996-2015 only those countries with tourists traveling to Croatia.
Model 3: all years since 1993, all countries with independent variable availability.
Model 4: 1996-2015, all countries with independent variable availability.
Model 5: all years since 1993, all countries with independent variables except EXR.

Models 1 and 2 consider only those countries listed as origins (n=62). These models could have a bias because they leave out the countries from which few tourists originate. As a result, we run Models 3 and 4 for all countries with complete data (n= 107). In an effort to assess the impact of missing values for EXR during the period 1993- 1995, we remove these years in Models 2 and 4. Model 5 includes all years but without the exchange rate, the variable that turns out to be the least effective in explaining arrivals.

Analysis and Results

In this section we discuss the results of the models and compare them to one another, as well as previous findings. Five models are specified in order to make the best use of our large database using seemingly unrelated regression (SUR). The results are summarized in Table 3, with R^2 values ranging from .346-.565. In each case, the conventional gravity variables of population and distance are significant, with the expected valence signs. The results confirm that the larger the population of the origin country is, the greater its tourist flows to Croatia. Conversely, the farther an origin country is from Croatia, the fewer the number of arrivals from that origin. The gravity variables confirm and extend previous findings by Eryiğit et al. (2010) on the importance of population size and the role of geographical distance as highlighted by McKercher and Lew (2003), Eilat and Einav (2005), Keum (2008), Eryiğit et al. (2010).

Table 3: Results from the Five Models

	Model 1 Only Origins 1993-2015	Model 2 Only Origins 1996-2015	Model 3 Full Data 1993-2015	Model 4 Full Data, 1996-2015	Model 5 Full w/o EXR 1993-2015
Intercept	2.59843***	2.85299***	1.046e+00***	1.086e+00***	1.04581***
scale (POP)	.53768***	.58473***	5.8914e+01***	6.327e-01***	.58917***
scale (GDPC)	.26178*	.10129	7.1928e+01***	6.935e-01***	.71942***
scale (DIST)	-1.45916***	-1.40637***	-1.6616e+00***	-1.71e+00***	-1.66155***
scale (EXR)	-.07320**	-.14795*	-2.7936e-08	-7.35883e-05	
OPEN	5.94032***	6.15694***	4.7300e+00	4.97e+00***	4.73067***
R^2	.346	.336	.552	.565	.552
DF	1420	1234	3237	2814	3238

Significance levels: ***=.001, **=.01, *=.05

Table 3 summarizes the results of all five models. The goal of the changing model specifications is to improve the R^2 values through increasingly parsimonious specifications. Moreover, as discussed earlier, the fact that the "non-participant" countries are omitted from Models 1 and 2 subjects the results not only to a sampling bias, but also relatively low R^2 indicators. Because the significance results are similar across most models, it makes sense to discuss each variable generally rather than model-by-model.

Geographical distance, a standard gravity variable, is significant (p=.001) in each generated model, moreover with the expected negative valence sign, reinforcing the notion of distance representing a barrier to spatial interaction. This outcome is in agreement with findings by McKercher and Lew (2003), Eilat and Einav (2005), McKercher, Chan, and Lam (2008), and Eryiğit et al. (2010). The observation that geographic distance inhibits tourism as a form of spatial interaction confirms Keum's (2008) assertion that the gravity model characterizes a robust approach in tourism studies. As an explanatory variable, geographical distance is arguably superior to transportation costs, which Mervar and Payne (2007) argue to be less than significant determinants in Croatia.

Origin country population size, another conventional gravity variable, is positive and significant at the .001 level in all five models, supporting previous findings on this standard gravity variable (Tinbergen, 1962; Eryiğit et al., 2010; Ok, 2010). Intuitively, larger populations are more likely to interact more than smaller ones. Many of the world's largest populations (China, India, Indonesia, Brazil, Pakistan, and Bangladesh) do not rank among the leaders of tourists to Croatia. However, the relatively large European countries such as Germany, Italy, France, and the UK, as well as other large countries such as the USA and Russia that are relatively important

sources of inflows, undoubtedly impact the regression line favorably. The performance of geographical distance and population together provides abundant evidence that the gravity approach is applicable here, even though it is more commonly invoked as framework for understanding trade (Tinbergen, 1962) or foreign direct investment (Deichmann, 2013).

Openness (or lack of visa requirements) is a third significant variable in Models 1, 2, 4 and 5 (p=.001) that has a positive impact on tourism flows to Croatia. Research elsewhere has also unveiled the importance of a liberal visa regime toward origins in facilitating tourism from those countries (McKercher, Chan, and Lam, 2008; Deichmann and Frempong, 2016). One explanation for the lack of significance in Model 3 is that this time period included the years of war within the Balkans, and Model 3 features all 122 countries in the full dataset. In other words, a lack of visa requirements during the war years was not enough to make tourists forget about the dangers of that conflict.

In this study, GDP is divided by population in order to capture the relative wealth of travelers from origin countries. This income level, measured by GDP per capita, is an indication of the ability to afford luxury goods such as international travel. It is therefore unsurprising that the variable appears as a positive and significant determinant in three of the five models. Notably, the variable is only significant at the .05 level in Model 1, which examines only origin countries (not the full data set) from 1993-95, and in Model 2 it lacks significance during the time period starting in 1996. This means that income is less of a determinant for the countries that do provide tourists, especially since Yugoslavia's war of dissolution ended and conditions returned to normal. This distinction also underscores the importance of using the full data set to support conclusions. A cursory examination of the dataset yields the observation that many of the countries that do not supply tourists to Croatia tend to be lower income (as measured by per capita GDP). This lack of personal resources is evidently a deterrent to travel, an activity that Eilat and Einay (2005) rightly consider to be a luxury good. The importance of income mimics results of earlier research by Khaderoo and Seetanah (2008), Škuflić and Štoković (2011), and Tica and Kožic (2015).

The effect of the exchange rate variable is inconclusive based upon evidence found here. Although unexpected, this finding is in harmony with earlier work by Mervar and Payne (2007). In search of a plausible explanation, this result leads to the following observation with regard to real exchange rates (EXR): tourism to Croatia has increased dramatically over the time period under investigation, while the strength of origin currencies has remained stable or increased only moderately. This

absence of a statistically significant relationship does not dismiss observations by Eryiğit et al. (2010) in the context of Turkey, and in Croatia by Tica and Kožic (2015), that exchange rates can be influential at specific times and in certain contexts. However, given the methodology applied here and the strength of other variables, their importance is impossible to confirm.

When we use the full data set of 142 countries, the R^2 improves dramatically, with or without EXR. Model 5 is generated as in an effort to obtain a parsimonious explanation of tourism flows to Croatia without the problematic variable of EXR. We are aware from previous research (Currie et al., 2004; Schőnfelder, 2005; Ateljevic and Čorak, 2006) that hyperinflation during the war clearly distorted the impact of exchange rates. We also note that Eryiğit et al. (2010) removed Belgium and Bulgaria from their 1994-2005 origins analysis due to "chaotic" exchange rate movements. In the present case of Croatia, we believe that the impact of this variable requires further consideration.

Conclusions

The findings of this research on origins of international tourist flows to Croatia are based upon an unprecedented depth and breadth of study. The data base features 16,330 cells, including 142 countries over 23 years, assembled to scrutinize the role of five independent variables. In an SUR application of the gravity model, we find that international tourism is facilitated by geographic proximity and origin country population size, as well as visa openness and income level of the origin country. Our examination of exchange rates is inconclusive. The findings can be useful for scholars and policymakers alike. Scholars may wish to extend this broad-based research into more specific directions such as exchange rates, or replicate the study in other contexts. Policy makers may wish to reconsider a heavy dependency upon this single sometimes-volatile industry. They may also want to consider introducing more liberal visa regimes toward targeted tourist markets, and safeguard against the dubious role of exchange rates as a determinant of holidays in Croatia. Recognizing the factors that govern flows by origin countries should help stakeholders forecast demand based upon changes in other variables. Moreover, the results reported here are certainly relevant for other countries that are similarly tourism-dependent.

The limitations of this study should be also acknowledged. First, the necessity to omit countries with incomplete or problematic data introduces a bias because the excluded observations tend to be poor and/or unstable countries. Arguably, length of stay (rather than tourist arrivals) represents another valid way to capture the appeal of Croatia to tourists. In the present study, however, length of stay data would

prevent construction of a data set as large as the one used here because reported values for that variable are less complete. In addition, the inclusion of Croatia within multi-destination trips would be worthwhile to investigate, but as acknowledged by Eilat and Einav (2005), such complexity would be impossible to track with this sort of quantitative approach. The study plan set out to capture the role of EU membership in tourism flows, but because Croatia joined the EU only in 2013, and unrestricted cross-border movement is not yet permitted, this question remains unanswered. Arguably, the visa requirement variable does capture the role of free movement, but it is not parallel to EU membership. Finally, the direction of causality between transportation infrastructure and tourism remains to be fully understood, and despite infrastructure's existence in the literature (Khaderoo and Seetanah, 2008), we were unable to interrogate it here due to lack of arrival data by origin that are also specific to each mode of transportation. Many of these questions could be better addressed with a qualitative approach to complement the present findings, perhaps by surveying travelers across origin countries about the rationale underlying their complete travel programs and how Croatia fits into the picture in as a destination.

Notwithstanding the contributions enumerated above, the conclusion of this research points to several additional questions. Most of these items can be addressed only as new data become available, following supplications by Baldigara and Mamula (2012), and Galičić (2015). First, this study could be replicated with sub-samples based on the purpose of visit. The World Bank offers such data at http://wdi.worldbank.org/table/6.14, but at the time of writing these are not available for the time period and multitude of countries examined in the present research. It would also be worthwhile to focus upon the impact of cultural linkages between Croatia and its neighbors (as historical provinces of the Austro-Hungarian Empire, Yugoslavia, etc.). This research would certainly benefit from a more regionally-focused approach with greater historical depth. A better understanding of the impact of Croatia's 2013 EU accession will also be possible to glean in the not-too-distant future, given the near-certainty of the country entering the Schengen zone after the year 2018[v]. In the near future, it will also be possible to reflect critically upon the Ministry of Tourism's (2013) Development Strategy for 2020, and whether Croatia was successful at achieving its goal of a top 20 global ranking.

Finally, lest this paper end on the negative note of its finite scope and work that remains to be done, it is worth reiterating the contributions presented herein. This analysis of international tourism origin effects is unprecedented in the combination of time duration under investigation and the large number of 142 countries included, and the extensive degrees of freedom underscore the validity of the

findings. The result is a comprehensive model based upon the past two-plus decades, revealing that the origins of tourism in Croatia are governed by traditional gravity variables of distance and population, as well as Croatia's generally liberal visa regime and income in origin countries. According to the results generated in this paper, the role of exchange rate fluctuations varies with each model specification, but falls short of statistical significance in the context of Croatia.

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[i] Although it was anticipated that variables for proximity to Croatia (DIST) and visa requirements (OPEN) would be overly similar, the simple correlation of .025 allays any concerns.

[ii] Direct flights to Croatia are intuitively an enabler of inbound tourism flows, but the direction of causality is spurious (i.e., do people travel because direct flights exists, or are flights scheduled in order to meet travel demand?). In addition, long distance travelers normally connect in another (non-Croatian) European city. Overall, during 2013-14, less than five percent of passenger border crossings to Croatia were by plane (Croatian Bureau of Statistics 2016, 43).

[iii] In order to complete the data set, several cell entries were imputed, and this was particularly challenging in the case of the exchange rate variable (EXR). Euro exchange rates were first available in the year 1999, three years before the currency emerged in physical form. Prior to 2002, exchange rates were based upon individual currencies and their fixed conversion rates to the euro. Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and Spain joined the euro zone in 1999, followed by Greece (2001), Slovenia (2007), Cyprus and Malta (2008), Slovakia (2009), Estonia (2011), Latvia (2014), and Lithuania (2015). Additionally, Montenegro used the German mark (DM) from 1996 until 2002, and then adopted the euro. Similarly although not a Eurozone member, Kosovo adopted the euro in 2002, abandoning Serbia's dinar. Figures for Montenegro and Kosovo were obtained for years 1992-95 by imputation using the Serbian dinar. Belarus and Ukraine used the Russian ruble until 1997. Russia redenominated its ruble in 1997. Liechtenstein

used to use the Swiss Franc. For further explanation of how missing values were calculated, please contact the authors.

[iv] The R language is a well-established environment for statistical computing, and is widely used among statisticians and data miners for developing statistical software and data analysis. R has been publicly available for over 20 years, and most of its developers are senior academics with expertise in statistical computing.

[v] http://www.schengenvisainfo.com/croatia-could-join-schengen-area-after-2018/

Tourism Demand, Oil Price Fluctuation, Exchange Rate and Economic Growth: Evidence from ARDL Model and Rolling Window Granger Causality for Tunisia

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Abstract: *The paper examines the relationship between tourism demand and its macroeconomic determinants (GDP, oil price, exchange rate) with an aim to test the dynamic interdependence between them in the case of Tunisia. Using yearly data from 1971 to 2014, the output of the ARDL model and the more recent Bootstrap rolling window Granger causality tests show important results with great economic implications for researchers, regulators, investors, … The results substantiate, especially, the following causal relationships, i.e. i) tourism-demand induces substantial increase in both economic growth and oil price, ii) economic growth led tourism demand, iii) increase in oil price affects negatively the tourism demand, iv) tourism demand and exchange rate are not significantly associated.*

Keywords*: Tourism demand, GDP, Oil price, ARDL, Bootstrap Rolling window*

JEL Classification*: O40, L83, P1.*

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Introduction

Tunisia is one of the most important places for European tourists with more than 56% over the period starting the year 2000 of arrivals are European (about 78% in 2009)[i]. The increasing arrival of European tourists is due the diversification in the tourist offers (beach tourism, Saharan tourism, health and thalassotherapy tourism, golf tourism…). Tourism plays a vital role in income and job creation. It weighs 6% of GDP and employs approximately 386,000 jobs, including 96,000 direct and 290,000 indirect jobs in 2009, according to the National Office of Tunisian Tourism[ii]. It represents the first foreign exchange earner (revenue reached 3471.9 million dinars, i.e. about 1928 million Euros). It contributes about 12.9% to cover the trade deficit. This activity creates an economic surplus in the country. The amount tourism investment is estimated to 309.3 million dinars in 2009. The average share of tourism investment in Gross Fixed Capital Formation (GFCF) is 4.4% during the period 2008-2009. In addition, the tourism sector stimulates other vital sectors such as the food industry (10.61%), transport and communication (2.51%).

Backed by a constant effort of the State for the development of a modern infrastructure and a range of measures and fiscal and financial incentives, the accommodation offer has experienced rapid and consistent growth since the beginning of tourism development in Tunisia; the number of establishment spent 226 in 1971 with a capacity of 41 225 beds to 856 establishment with a capacity of 239900 beds[iii]. This evolution took place in parallel with the rise of the category of the hotel establishments. In fact, the classified hotels represent nearly 90% of the accommodation capacity. Other establishments are divided into holiday villages and unclassified hotels (about 5%), and in guesthouses (marginal: around 0.6%)[iv].

However, although the tourism sector's importance is gradually recognized and its positive effect on growth is warranted, its impact on economic development is still unclear. Indeed, the increasing numbers of tourist arrivals need extra amounts of energy either for transport or for air conditioning and heating.

The factors that affect the demand for tourism are diverse, ranging from international politics, energy price, and diplomatic relations to national policies. It is necessary to identify the key factors that influence tourism demand in order to effectively understand changes and trends in the tourism market, and create competitive advantages for the tourism. The tourist destinations are increasingly associated to the role played by the price for visitors in different market segments. Indeed, Price is an important factor to determine the tourism costs and tourism demand (Davis and Mangan, 1992; Lim et al., 2008). Tourism is clearly dependent

on oil, because of its inherent transport component (Becken, 2008). Additionally, there is a range of particular vulnerable tourism activities, such as recreational activities that depend substantially on fossil fuels (Becken and Simmons, 2002).

The linking between tourism demand and macroeconomic indicators has been analyzed in earlier studies under various aspects. Some studies have analyzed the relationship between tourism and energy consumption (Zaman et al. 2016; Lei Zhang and Gao 2016; Nepal, 2008; Katircioglu 2014). Other studies have analyzed the impact of the energy price fluctuation on tourism (Becken et al., 2003; Kelly and Williams, 2007). Some others have investigated the effect of tourism on economic growth (Min, 2013; Lee and Chang, 2008; Chang et al. 2012; Çağlayan et al., 2012). The social effect of tourism is analyzed through the relationship between tourism and health expenditures (Harrick, 2007; Smith and Forgione, 2007). Finally, the environmental requirements and climate changes are analyzed in several studies (Zaman et al. 2016; Kuo and Chen, 2009; Lin, 2010; Mayor and Tol, 2010; Berrittella et al., 2006; Köberl et al., 2015; Cai et al., 2011; Amelung and Moreno, 2012; Tapsuwan and Rongrongmuang, 2015).

The relationship between tourism demand and the economic fundamental such as the economic growth, oil price fluctuations and exchange rate is with greater importance for practitioners and government policy decision. However, analysis of the interrelation between these variables gives mixed results. Energy plays an important and strategic role in the structure of the economies. In fact, oil is considered the main driver of economic activity in the developed and developing countries. The increase in the tourism demand positively affects the economic growth. In the same way, economic growth requires more and more the energy for the transport, air conditioning and heating. On the other hand, the fluctuation in oil price affects negatively the tourism demand. In fact the fluctuation in oil price affect oil demand, since oil price increases induce substantial increase in the cost of service (transport, heating, …). Also, the increase in the value of the local currency against the foreign currency negatively affects the tourism demand. Moreover, price constitutes another important factor in tourists' destination choice (Crouch, 1994; Lim, 1997; Witt and Witt, 1995).

The aim of this paper is to examine the dynamic long-run and short-run linkages between the tourism demand and the macroeconomic fundamental based on the ARDL model and to test for the dynamic causality using the more recent Rolling window Granger causality tests for the case of Tunisia. Empirical findings show that tourism demand is highly sensitive to the economic development and oil price shocks. We find also that increases in tourism demand lead to the improvement of the economic development but at the same time to an increase in the total oil costs.

The remainder of this paper is organized as follows. In the second section, we provide a brief review of the related empirical literature. Section 3 provides the data description and the methodology. In section 4 we summarize the main results and their discussion. Finally, section 5 concludes.

Literature Review

The tourism sector has attracted the interest of a growing number of economists. Indeed, tourism revenues are considered as an alternative form of export that can contribute to improving the balance of payments of a country, promote employment and generate additional tax revenues (Durbarry 2002; West 1993; Uysal and Gitelson, 1994; Archer 1995).

Çağlayan et al. (2012) have analyzed the relationship between tourism and economic growth using the panel Granger causality analysis for 11 groups of countries. The results obtained by the authors are mixed. The causal relationship is bidirectional in Europe, while it is unidirectional going from GDP to tourism in America, Latin America & Caribbean and the rest of the World. In the East Asia, South Asia and Oceania countries, unidirectional causality going from tourism to the GDP is detected. However, no causal links are confirmed in Asia, Middle East & North Africa, Central Asia and Sub Saharan Africa. Lee and Chang (2008) analyzed the causal relationship between tourism and economic growth of OECD and non-OECD groups. Their study confirms a unidirectional causality from tourism development to economic growth in OECD countries and bidirectional causality in non-OECD countries.

Li et al. (2016) have examined the role of tourism in reducing regional income inequality in China from 1997 to 2010. To analyze this relationship, the authors used a spatiotemporal autoregressive model to capture spatial and temporal dependence as well as spatial heterogeneity between the variables. They concluded that tourism contributes more significantly to the economic growth of China. The authors have also provided evidence that domestic tourism can accelerate regional economic convergence faster than international tourism. According to Bowden (2005), "it is domestic, not international, tourism in china that is fueling support for small-scale, labor-intensive forms of tourism that lead directly to poverty alleviation in some areas" (Li et al., 2016). Domestic tourism is, therefore, more efficacious in promoting regional balanced development.

We note also the despite its positive impacts, the tourism sector has negative effects on several other sectors. Several empirical studies have examined the implications of tourism regarding environmental issues, such as its contribution to greenhouse gas emissions and global warming (Becken et al., 2001; Gössling, 2002, Becken, 2005;

Bode et al., 2003). In this perspective, Katircioglu (2014) has analyzed the effect of arrival tourism on energy consumption and environmental pollution in Turkey. He concluded that Tourism in Turkey exerts positive and statistically significant effects on CO2 emissions in the long- and the short-term. His results show that tourism development leads to significant increases in CO2 emissions and energy consumption, especially in the long-term. The CO2 emissions converge to the long-term equilibrium path significantly by a 91.01 percent speed of adjustment, owing to tourism development, energy consumption, and aggregate output.

Zaman et al. (2016) have examined the dynamic linkages between tourism, energy consumption and the EKC hypothesis in three diversified World's region, including thirty-four countries, during the period of 2005–2013. The empirical results show that the environmental hazards associated with the expansion of tourism sector are growing high. So, Tourism sector development should not be the cost of environmental degradation. Therefore, the policy makers should have to device ecotourism policies in the region.

As regards the energetic balance, the positive effect of tourism on energy consumption explains its negative effect on the deficit of the energy balance in the country. Particularly, the increase in energy demand together with the sharp increase in prices in 2008 have lead to extreme raise in operating costs for airlines. The global airline industry recorded consequently unprecedented losses increasing to nearly US$ 5.2 billion (International Air Transport Association, 2008). Due to these events induce substantially higher airfares and "lead likely to reductions in travel and cause tourists to shift from more distant to closer destinations" (Gillen, 2004).

The negative relationship between tourism and oil price is justified in the previous literature (Becken and Lennox, 2012; Becken, 2011; Yeoman et al., 2007). In testament to that, the United Nations World Tourism Organization (UNWTO) has expressed its concern regarding the negative effects of oil prices on tourism[v]. In fact, the UNWTO has concluded that high oil prices are affecting certain tourism industry segments (e.g. airlines, cruise lines, etc.) disproportionately more than others. In the same perspective, Becken (2011) analyzed the combined effect of oil price, namely the macroeconomic and microeconomic effect. The author concluded that the use of higher oil prices generally leads to higher inflation, while they negatively influence the country's income. From a microeconomic perspective, positive oil price shocks lead to a decline in disposable income. These developments will have an immediate and negative impact on tourism, mainly due to the fact that tourism is regarded as a luxury good (Lim et al., 2008; Nicolau, 2008; Dritsakis, 2004).

Becken and Schiff (2011) have analyzed the impact of transport prices on tourists' travel choices within New Zealand, finding that travel patterns are rather price-insensitive, but differ significantly between market segments based on tourist origins and other characteristics. A related study on price elasticities established quite different values for 18 international tourist market segments. This research also highlighted the importance of exchange rate both for arrivals to New Zealand and consumption of tourism products and services within the country (Schiff and Becken, 2011). It can therefore be assumed that an increase in prices (due to oil or other factors) will affect both the market composition and tourist behavior.

Data and Methodology

Data Description

To examine for the tourism demand impact of the economic growth, oil price and exchange rate, we use annual data over the period spanning 1971 to 2014. The following variables are used, i.e. the tourism demand consists in the number of tourist arrivals, the economic growth is measured in term of per capita GDP (in natural logarithm), the oil price is expressed in term real national price. The real national price is computed as the product of the nominal oil price and the exchange rate deflated by the consumer price index. The UK Brent nominal price is used as a proxy for the nominal oil price. Finally, the exchange rate proxy by the nominal exchange rate expressed in the number of national currencies for one USD unit. The data for the oil price and the oil production are obtained from the Energy Information Administration (EIA) database and the International Financial Statistics (International Monetary Fund). Finally the data for the macroeconomic data (producer price index, consumer price index, exchange rate) are compiled by the "Central Bank" of Tunisia.

Estimate Specification

In this section we try to enumerate the various steps required in order to perform the ARDL regression model. In a first step we are used to investigate the stationary properties of the variables. We employ the mostly used classical unit root tests, namely the ADF, PP, and KPSS. We investigate, in a second step, the existence of co-integration relationship between variables applying the Bounds test developed by Peseran et al. (2001). Once, the hypothesis of the existence of co-integration relationships is confirmed, the following step consists to investigate the long and short-run causality between the variables applying the ARDL model. The use of the ARDL model is motivated by at least four reasons. Firstly, it is applied irrespective whether the variables included in the model are I(0) or I(1). Secondly, it allows

investigating simultaneously the short-run and the long-run sensitivity of the dependent variable to the independent variables. The ARDL approach has in addition superior results in analyzing small samples compared to other classical co-integration approaches. The fourth advantages of applying ARDL approach is that it eliminates the endogeneity problems associated with the Engle-Granger technique (see. Al-Mulali et al., 2015 and Seker et al. 2015) since it assumes all the variables as endogenous.

The ARDL model specification for the impact of the independent variables (GDP, Oil price, Exchange rate) on the dependent variable (Tourism demand) is as follows:

$$TD_t = \alpha_0 + \sum_{i=1}^{q_1} \alpha_{1i} TD_{t-1} + \sum_{i=1}^{q_2} \alpha_{2i} GPD_{t-1} + \sum_{i=1}^{q_3} \alpha_{3i} OP_{t-1} + \sum_{i=1}^{q_4} \alpha_{4i} ExR_{t-1} + \varepsilon_t \qquad (1)$$

where TD is the tourism demand used as the dependent variable, GDP is the economic growth taken in natural logarithm and used as a first independent variable, OP is a oil price, taken in natural logarithm, used as a second independent variable, ExR is the nominal exchange rate expressed in the number of national currencies for one USD unit, and $\alpha = (\alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4)$ is a vector of long run parameters to be estimated.

To examine for for the bounds test, the equation 1 can be formed in Unrestricted Error Correction model specification as indicated in equation 2.

$$\Delta TD_t = \alpha_0 + \alpha_1 t + \beta_0 TD_{t-1} + \beta_1 GDP_{t-1} + \beta_2 OP_{t-1} + \beta_3 ExR_{t-1} + \sum_{i=1}^{p} \gamma_i \Delta TD_{t-i} + \sum_{i=1}^{q} \theta_i \Delta GDP_{t-i} + \sum_{i=1}^{s} \varphi_i \Delta OP_{t-i} + \sum_{i=1}^{k} \delta_i \Delta ExR_{t-i} + \mu_t \qquad (2)$$

where all variables are as defined above, p, q, s, and k are lag orders and β_1, the aforementioned long-run impacts of the lagged GDP on the Tourism Demand, β_2 the aforementioned long-run impacts of Oil Price and β_3, the aforementioned

long-run impacts of Exchange Rate on tourism demand. $\sum_{i=1}^{q} \theta_i$ measures the short-run impacts of the GDP on the Tourism Demand, $\sum_{i=1}^{s} \varphi_i$ measures the short run influences of Oil Price on the Tourism and finally, $\sum_{i=1}^{k} \delta_i$ captures the short run influences the Exchanges Rate on the tourism demand.

For testing the existence of co-integration relationship, we estimate, in a first step, the equation 2 using the OLS method. We apply the general to specific procedures to define the final specification of the estimated model. In a second step we to test for the presence cointegration using the F-bounds test (Pesaran et al. 2001; Shin et al., 2014). The F-bounds approach consists to test for the null hypothesis that $\beta_0 = \beta_1 = \beta_2 = \beta_3 = 0$ using the Wald F-test.

Empirical Results and Discussion

From one hand, the estimates of the ARDL model require that no I(2) variable is involved. From the other hand, the rolling window Granger causality approach requires that the variables are I(1). For these two reasons, we are used to perform conventional unit root tests. The outcome of ADF, Phillips-Perron and KPSS unit root tests in level and in the first difference of the tourism demand, the national oil price, the GDP and the exchange rate are presented in Table 1. Based on these results we show that all variables included in our model are I(1). We are therefore able to continue our estimation process.

Table 1: Conventional Unit Root Tests

	ADF	PP	KPSS
In level			
Tourism demand	-2.0119	-1.9024	0.7998***
Oil price	-2.5099	-2.5107	0.6210**
GDP	-1.2841	-1.3376	0.8353***
Exchange rate	0.4978	0.3843	0.8180***
In difference			
Tourism demand	-6.5580***	-8.7381***	0.2931
Oil price	-6.1506***	-6.1506***	0.2017
GDP	-9.5966***	-9.0860***	0.1715
Exchange rate	-5.3933***	-5.3346***	0.1483

Since all variables included this analysis are I(1), we are used to start with the second step of our analysis and proceed by testing for the F-Wald test of cointegration. Table 2 reports the outcome of the ARDL lag length selection as well as the F-bound testing. The selection of the lag length order is based on the AIC information criterion. The F-bound statistic shows a Wald statistic significant at the 1% level.

Table 2: ARDL Lag Length Selection and F-Bound Test.

ARDL Model	AIC	SC	F Wald test	Lower-bound	Upper-bound
ARDL(4,5,3,2)	-1.134945	-0.229963	6.568856***	10% ----> 2.72 5% ---- > 3.23 1% ---- > 4.29	10% ----> 3.77 5% ---- > 4.35 1% ---- > 5.61

Note : Lower and Upper bound are selected from the Table CI(iii) Case III: Unrestricted intercept and no trend in Pesaran et al. (2001, p. 300). The ARDL lag length is selected based on AIC information criterion.

The results of the ARDL model estimates are reported in Table 3. Before analyzing the results of the estimates model, we are used to judge the adequacy of the dynamic specification on the basis of various diagnostic tests. We control therefore for the error normality, the serial correlation and the autoregressive conditional heteroskedasticity, and the structural stability using the graphs of the Cusum and Cusum of squares statistics. The diagnostic statistics are given in the lower of the Table 3. Based on these results, we show that our model surpass all diagnostic tests for error normality, serial correlation, arch effects. The Cusum and Cusum of the squares statistics graphs (Fig. 1 and 2) show also that the model surpasses the test of stability of parameters. There are no omitted variables in the model specification.

The next step, then, consists to discuss the results of the long- and short-run relation. A negative long-run impact of oil price on tourism demand is detected. While the long-run tourism demand impact of the GDP appears to be significant and positive. The exchange rate appears to have no significant long-run impact on tourism demand. In the short-run, the results indicate significant negative tourism impact of both lagged oil price and lagged exchange rate. The lagged economic growth appears to exert a significant and positive short-run impact on the tourism demand. This dynamic long-run and short-run relation between tourism demand from one hand and the macroeconomic fundamental, namely oil price, GDP, and exchange rate, from the other hand, are confirmed by the results of the full sample Granger causality tests (Table 4), the rolling window regression based causality tests (Figure 2).

Table 3: ARDL Estimates.

	Coefficient	t-Statistic
C	2.1521	0.7171
TD_{t-1}	-0.5468***	4.8930
GDP_{t-1}	0.6385***	3.7296
OP_{t-1}	-0.5006**	-2.6333
ExR_{t-1}	0.3200	1.1508
ΔTD_{t-4}	0.4133***	2.9263
ΔGDP_{t-1}	1.7949*	1.8595
ΔGDP_{t-2}	1.6991*	1.8764
ΔGDP_{t-3}	2.4521**	2.0877
ΔOil_{t-3}	-0.3051***	-3.9903
ΔOil_{t-5}	-0.2505***	-3.0869
ΔExR_{t-2}	-1.1116***	-3.2353
Diagnostic test		
R-square	0.6683	
Adjusted R-squared	0.5279	
DW	2.3571	
J-B (p-value)	0.7978 (0.6710)	
LM(1) (p-value)	2.5787 (0.1083)	
LM(2) (p-value)	5.3586* (0.0686)	
Arch(1) (p-value)	0.0963 (0.7562)	
Arch(1) (p-value)	2.8792 (0.2370)	

Figure 1: CUSUM for ARDL Model Estimates

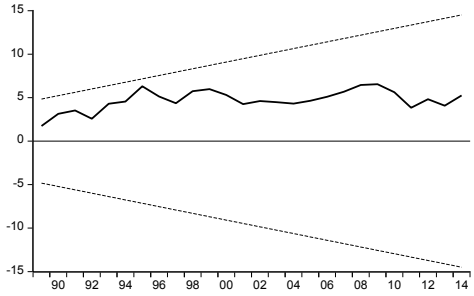


Figure 2: CUSUM of SQUARED for ARDL Model Estimates

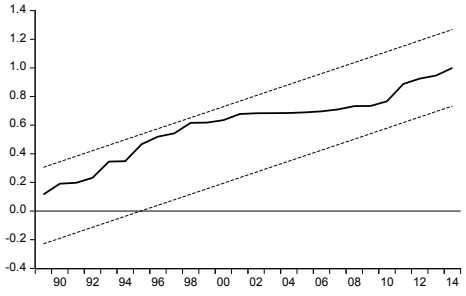


Table 4: Full Sample Bootstrap Granger Causality Test Between Oil Price, Gdp, Exchange Rate and Tourism Series

Equation for series: iv			Equation for series: dv		
Null hypothesis	LR-statistic	Bootstrap p-value	Null hypothesis	LR-statistic	Bootstrap p-value
GDP→ TD	11.049**	0.0100	TD →GDP	10.711**	0.0100
OP→TD	6.216***	0.0000	TD →OP	6.2785*	0.0813
ExRe→ TD	2.1008	0.3060	TD →ExR	3. 7024	0.2309

The results of the full sample Granger causality test between tourism demand and each of the macroeconomic fundamental included in our model (oil price, GDP, Exchange rate) show high important evidence. Bidirectional Granger causality is significantly detected between oil price and tourism demand and between GDP and tourism demand. We fail, however, to confirm the hypothesis of bidirectional or unidirectional Granger causality between tourism demand and Exchange rate.

The parameter stability tests appear to confirm and support the aforementioned results we obtained based on the dynamic regression (ARDL) and the Bootstrap Granger causality for the two bivariable relations: oil price – tourism demand and GDP-tourism demand. The Exchange rate-tourism demand appears to be unstable.

In the rest of the analysis we perform the more recent bootstrap rolling window Granger causality tests to examine for the causality between tourism demand and

each of its macroeconomic determinants we included in our analysis namely the GDP, the Oil Price and the Exchange rate[1].

In order to illustrate the bootstrap LR Granger causality between the Tourism Demand and each of the independent variables we included in the analysis, let's consider the following process of bivariate VAR(p):

$$Y_t = \phi_0 + \phi_1 Y_{t-1} + \phi_1 Y_{t-2} + \cdots + \phi_1 Y_{t-p} + \varepsilon_t, \qquad t = 1, \cdots, T \qquad (3)$$

where $\varepsilon_t = (\varepsilon_{1t}, \varepsilon_{2t})'$ represents a zero mean independent white noise process with nonsingular covariance matrix. The lag length (p) is determined based on the AIC information criterion. Y_t of the equation (3) can be divided in the two subvectors y_{1t} and y_{2t} that are related respectively to the dependent variable and for each independent variable. The equation (3) can be written as follows (equation 16):

$$\begin{pmatrix} y_{1t} \\ y_{2t} \end{pmatrix} = \begin{pmatrix} \phi_{10} \\ \phi_{20} \end{pmatrix} + \begin{pmatrix} \phi_{11}(L) & \phi_{12}(L) \\ \phi_{21}(L) & \phi_{22}(L) \end{pmatrix} \begin{pmatrix} y_{1t} \\ y_{2t} \end{pmatrix} + \begin{pmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \end{pmatrix} \qquad (4)$$

where $\phi_{ij}(L) = \sum_{k=1}^{p} \phi_{ij,k} L^k$, i,j=1,2 and L is the lag operator defined as $L^k x_t = x_{t-k}$. Let consider in this setting, y_1 the tourism demand and y_2 each of the independent variables included in the analysis (GDP, OP, and ExR). The null hypothesis that y_2 does not Granger cause y_1 can be tested, accordingly, by imposing zero restrictions $\phi_{12,i} = 0$ for i=1,…,p. In the same way, the null hypothesis that y_1 does not Granger cause y_2 can be tested, accordingly, by imposing zero restrictions $\phi_{21,i} = 0$ for i=1,…,p.

[1] For more details on the bootstrap Rolling windows Granger causality tests the readers can refer to Balcilar, et al. (2010) (to save space due to the large details on the technical analysis and the complete results reported hereafter, we tried to not report additional details but they still available upon request the authors.)

Table 5: Parameter Stability Tests

	Equation for series: iv		Equation for series: dv	
	Statistics	Bootstrap p-values	Statistics	Bootstrap p-values
GDP				
Sup-LR	7.85671**	0.0440	3.695630**	0.0115
Exp-LR	1.99238*	0.0830	6.50210***	0.0070
Mean-LR	3.91565*	0.0750	6.50210**	0.0271
OP				
Sup-LR	7.82265***	0.0032	3.659756**	0.051
Exp-LR	3.10030**	0.0155	5.72130**	0.0350
Mean-LR	6.14631*	0.0510	7.26750***	0.0060
ExR				
Sup-LR	1.485809	0.1750	1.340820*	0.0934
Exp-LR	2.49558*	0.0820	1.366630	0.2000
Mean-LR	0.83122	0. 3780	0.720374	0.32000

Figure 3 plots the p-value of the Bootstrap Granger causality tests for the bivariable relation between oil price and tourism demand (a and b) and the rolling window regression based on the causality test for the same variables (c and d). The Figure 4: (a) and (b) plot the p-value of the Bootstrap Granger causality tests for the bivariable relation tourism demand-GDP, while Figure 4: (c) and (d) plot for the same variables the bootstrap of the sum of the rolling coefficients for the impact of the GDP on tourism demand for the impact of tourism demand on GDP, respectively. At the same way, Figure 5 plots the p-value of the Bootstrap Granger causality tests for the bivariable relation between exchange rate and tourism demand (a and b) and the rolling window regression based on the causality test for the same variables (c and d).

The results of the rolling window Granger causality tests indicate a significant negative predictive power of oil price on tourism demand over the sub-period till 2002. The impact becomes insignificant after this date. The tourism impact of oil price was insignificant till 1994 and becomes significant and positive over the rest of the sample period. The negative impact of oil price on tourism demand is obviously due to the fact that oil price acts as inflationary factor. When the oil price increases dramatically, the costs of transportation heating and air conditioning increase accordingly. This negatively affects the tourism demand due to the increase in service delivery costs. The insignificant impact of oil price on tourism demand over the sub-

period starting the end 2002 is due to the fact that tourism has become cultural, medical and that the informational, cultural and health benefit that draw the visitor outweighs the additional costs generated by a positive change in oil prices.

The GDP appears to have significant positive predictive power on tourism demand over the period from 1994 to 2010. While the GDP impact of tourism demand is significant and positive over the whole period 1986-2015 with the exception to the years of the Arab spring revolution (i.e. 2010 to 2014) in which some turbulence in tourism demand accrued due to the terrorism effect. The Tourism represents thus a driver of economic growth. It constitutes in fact an economic development tool since it stimulates economic growth by generating income, employment, investment and exports. The positive impact of the GDP on Tourism demand is explained in terms of increases in infrastructure, investment cultural expenses and grants that require higher GDP and stimulates and spurs the Tourism demand.

The bidirectional effect of tourism demand and exchange rate remains unstable over the whole sample period. This is due to the government regulations and the local as well as international economic conditions and circumstances that impact the exchange rate. No evidence of global significant correlation is detected. Only some rare causal effects without important significance are detected. This finding confirms the results of the NARDL estimates and full sample Granger causality tests.

Overall, these results are with great economic implications for researchers, regulators, investors, … The results substantiate, especially, the following causal relationships, i.e. i) tourism-demand induces substantial increase in both economic growth and oil price, ii) economic growth led tourism demand, iii) increase in oil price affects negatively the tourism demand, iv) tourism demand and exchange rate are not significantly associated. Policy makers are accordingly incited to enhance the tourism service to spur the economic growth. In the opposite side, they are incited to spur the tourism infrastructure by spending more expenditure (increasing the share of GDP in tourism investment) to help investor in this pivotal sector in the economy, improving the quality of their service and thus attracting more arrivals.

Figure 3: Rolling Window Estimation Results for the Oil Price-Tourism Demand Relation.

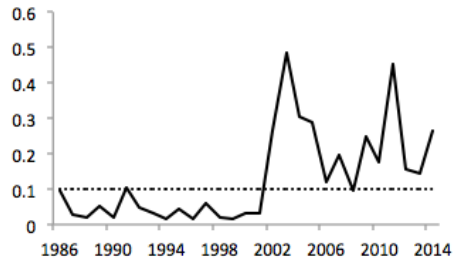
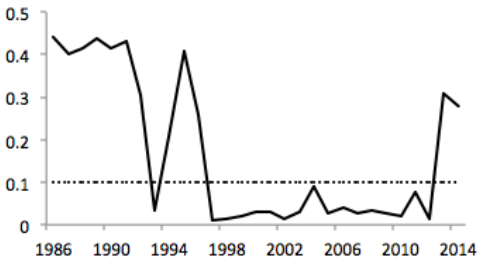
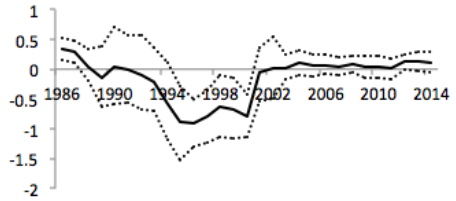
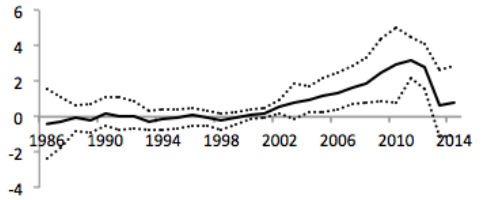
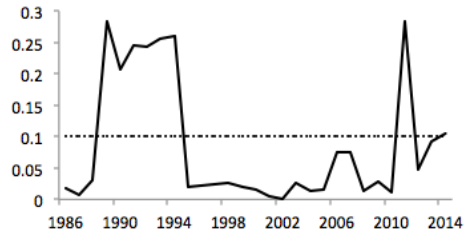
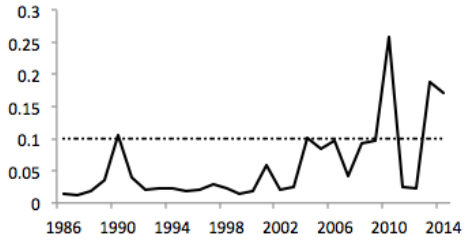
(a) Bootstrap estimate of the sum of the rolling coefficients for the impact of oil price on tourism demand	(c) Bootstrap estimate of the sum of the rolling coefficients for the impact of tourism demand on oil price
	
(b) Bootstrap p-value of LR test statistic testing the null hypothesis that oil price does not Granger cause tourism demand	(d) Bootstrap p-value of LR test statistic testing the null hypothesis that tourism demand does not Granger cause oil price
	

Figure 4: Rolling Window Estimation Results for the GDP-Tourism Demand Relation.

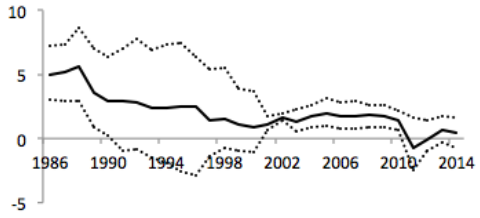
(a) Bootstrap p-value of LR test statistic testing the null hypothesis that GDP does not Granger cause tourism demand



(c) Bootstrap p-value of LR test statistic testing the null hypothesis that tourism demand does not Granger cause GDP



(b) Bootstrap estimate of the sum of the rolling coefficients for the impact of GDP on tourism demand



(d) Bootstrap estimate of the sum of the rolling coefficients for the impact of tourism demand on GDP

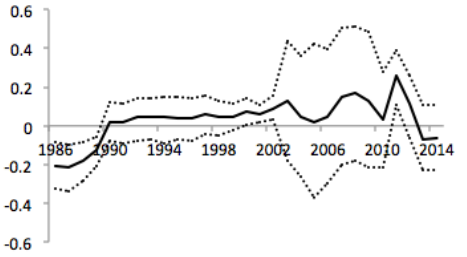
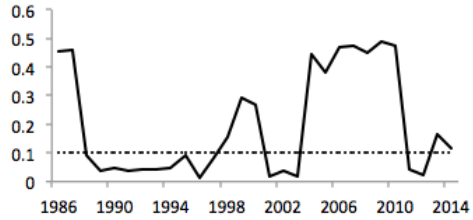
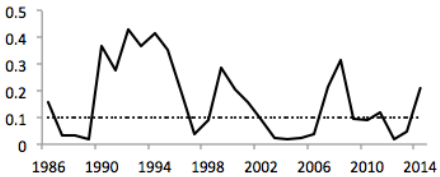
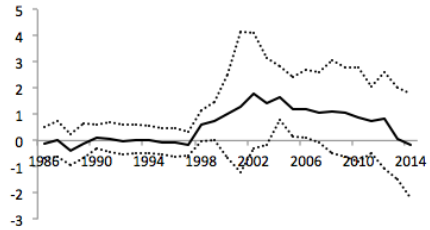
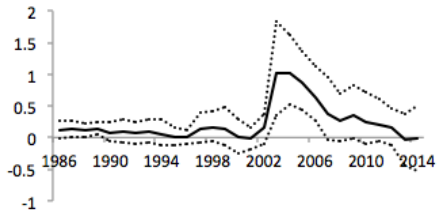


Figure 5: Rolling Window Estimation Results for the Exchange Rate-Tourism Demand Relation.

(a) Bootstrap p-value of LR test statistic testing the null hypothesis that Exchange rate does not Granger cause tourism demand	(c) Bootstrap p-value of LR test statistic testing the null hypothesis that tourism demand does not Granger cause Exchange rate
	
(b) Bootstrap estimate of the sum of the rolling coefficients for the impact of Exchange rape on tourism demand	(d) Bootstrap estimate of the sum of the rolling coefficients for the impact of tourism demand on Exchange rate
	

Concluding Remarks

The present paper investigates the dynamics between tourism demand from one hand and GDP, oil prices, and exchange rate from the other hand using monthly data for Tunisia. One of the contributions of our analysis to the existing literature on tourism demand and its macroeconomic determinants relationship consists in using cointegration approach termed as Autoregressive Distributed Lag (ARDL). This approach allows to examine the possible asymmetry in the short-run as well as long-run. The study has employed data for the period of 1971 to 2014.

The results of the ARDL estimation as well as those of the Bootstrap Rolling Window Granger causality converge to confirm the significant causal effect of GDP

and Oil price to Tourism demand. Overall, our findings serve as confirmation that the tourism demand is highly sensitive to the economic development and the oil price shocks from one hand. From the other hand, the tourism demand increases lead to the improvement of the economic development but at the same time increase the total oil costs due to the increase in oil based services.

Our findings confirm also that with the new development of the tourism industry and the governmental strategic orientation to medical and cultural tourism, the positive impact of tourism demand on the oil costs smoothen slowly and the positive impact on the GDP is enhanced.

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The EU Cohesion Policy's Impact on Regional Economic Development: The Case of Bulgaria

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Abstract: *The EU cohesion policy has been a major driver of change in the Member States, leading to positive effects as growth in employment, economic development and modern infrastructure. Since its EU accession in 2007, Bulgaria has been benefiting from the Union's investment and structural funds at an increasing speed. Research shows that not only these funds contribute significantly to the Bulgarian economy, but they seem to be its major driver. Without them, the country would have recorded a zero growth in the EU's financial framework 2007-2013, and could be dumped in an economic and social crisis. This paper explores the informational sources that assess the influence of the EU cohesion policy and its effects on Bulgaria. The goal of the paper is to make objective conclusions about the impact of the EU cohesion policy on the Bulgarian economy and how it has affected the level of economic and social cohesion between the country's regions and the most advanced EU regions. For that purpose, the method of comparative analysis is applied, as well as a historical analysis..*

Keywords*: EU Cohesion policy, Bulgaria, regional economic development*

JEL Classification*: 05, F36, H77*

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Introduction

Overview of the EU's Cohesion Policy

The cohesion policy of the European Union aims to support the job creation, business competitiveness, economic growth, sustainable development, and overall quality of life in the European regions and cities. It is implemented through three main funds: the European Regional Development Fund, the Cohesion Fund and the European Social Fund. Together with the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund, they make up the European Structural and investment funds. These funds invest in different areas with the common objective to reduce the economic and social disparities among the EU Member States. The cohesion policy complements the other EU policies dealing with education, employment, energy, research and innovation, the environment, the single market and the like.

The budget of the Cohesion Policy for 2014-2020 is 351.8 billion euros - one third of the EU's total budget, which puts it on the second place after the Union's Common Agricultural Policy.

The EU's regions (on NUTS2 level[i]) are classified as "less developed" (in which the GDP per capita is less than 75 percent of the EU average), "in transition" (in which the GDP per capita is 75-90 percent of the EU average) and "more developed" (in which the GDP per capita exceeds 90 percent of the EU average). The European Union can provide 50-85 percent of the total financing of a project, with the poorest regions getting the highest co-financing rates. The potential beneficiaries of the funds include public institutions, companies, universities and nongovernmental organizations.

For 2014-2020 the largest portion of the funds - 182 billion euros - will be used for the "less developed" regions, which represent 27% of the population in the EU. These include the bigger part of Poland, the Baltic States, the Czech Republic, Slovakia, Hungary, Romania, Croatia, Slovenia, Bulgaria, Portugal, as well as southern Italy and northern Greece. For many of these countries, the cohesion instruments are a key part of their economies (especially Poland, Romania, the Czech Republic, Slovakia and Hungary).

The EU's cohesion policy is very important because it is the investment framework needed to meet the goals of the Europe 2020.

Strategy for smart, sustainable and inclusive growth in the Union. It is the EU's major investment tool for creating growth and jobs, tackling climate change and energy dependence, and for reducing poverty and social exclusion.

This policy underpins the European solidarity, because the bigger part of its funding is concentrated on less developed countries and regions to help them catch up and its goal is to reduce the economic, social and territorial disparities in the Union. In addition to that, the EU's cohesion policy cushioned Member States from the worst effects of the economic and financial crisis. It also was of critical importance at a time of sustained fiscal consolidation and according to estimates, without it the much-needed public investment in the less developed Member States would have collapsed by an additional 45% during the crisis (European Commission, 2014a). The EU's cohesion policy is also considered as a catalyst for further public and private funding, because it obliges Member States to co-finance the projects with funds from their national budgets, and also provokes investors' confidence.

The EU's cohesion policy is also criticized. The main argument for its existence is that the funding it provides would eventually raise the different regions in the EU to the same level of economic development. But it seems like after decades of integration and billions of euros' worth of EU investment, a very modest level of economic cohesion in Europe is achieved.

The reasons for the limited positive impact of the EU's cohesion funds on the economic and social coherence of the Union are different. A major problem in numerous of the Member States is the high level of corruption, which prevent cohesion funds from being exploited exactly where they would be most useful. Besides that, Member States in many countries, particularly those in Southern and Eastern Europe, still experience difficulties in absorbing these funds. In some cases, the national and local authorities lack the know-how and institutional framework to successfully apply for these funds, while in others the countries lack the capacity to co-finance the projects supported by the European Union.

Some experts think that the EU's cohesion policy is too complex and lacks clear goals, and that the monitoring of the absorption of these funds has been controversial, because a full control of the use of the money is impossible (Stratfor, 2015). There are often cases of corruption, where state officials in Member States are bribed to award EU-financed contracts. In other cases, firms report inflated costs. There are also cases when infrastructure projects are undertaken just because money is available, and they are consequently abandoned for lack of use.

The future development of the EU's cohesion is unknown, as due to the expected Brexit, the estimated budget of the Union is going to be decreased significantly, and the discussions between the Member States are likely to lead to a decision towards cutting particularly the cohesion policy's budget. Taking other conditions as equal, the biggest challenge would be to ensure that its resources are used in the most efficient way, helping the Member States to emerge from the continuing crisis and the least developed countries to catch up faster with the others. With a budget of over €450 billion (including national co-financing) for 2014 - 2020, the European cohesion policy is expected to continue to be the main investment tool of the Union and to make the largest contribution for supporting the SMEs, R&D and innovation, education, low carbon economy, the environment, the fight against unemployment and social exclusion, the infrastructure and Europe 2020 Strategy's objectives for smart, sustainable and inclusive growth.

Several sources provide information on the European cohesion policy's effects and the extent to which it is successful in achieving these objectives. Firstly, there is quantitative information on the direct outcomes of the projects and measures monitored by the Managing Authorities responsible for the programs. These indicators are in the form either of the output produced (f.e. number of new businesses supported to start up) or the results which they brought to (f.e. the time/travel costs saved as a result of a new road opened). Secondly, there are evaluations of particular programs, which assess the effectiveness of the funding provided in achieving both the immediate objective of the measure and the wider aim of strengthening the development potential of the places concerned. Thirdly, there is an empirical evidence from the macroeconomic models that simulate how the economies function to estimate the effect of the Cohesion Policy, mainly in terms of main economic indicators, f.e. GDP, employment and trade. This they do by simulating the way the economy would have developed in the absence of the Cohesion Policy. There is also research (mainly econometric models) of independent organizations.

Key Effects of the EU Cohesion Policy in the Period 2007 - 2013

The European Commission has analyzed the effects of the EU cohesion policy for the programming period 2007 - 2013 and concluded that it has substantially contributed to the investments in growth and employment in the Member States, especially when they cut spending in order to balance their budgets in times of crisis.

The Commission's estimates show that without the EU Cohesion policy the investments in the most-affected by the economic crisis Member States would have

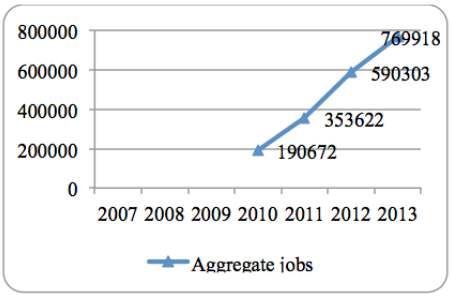
fallen by additional 50%, particularly in the Member States, which count significantly on the EU financing. In some of them the cohesion funding represents more than 60% of their public investment budget – Slovakia (over 90%), Hungary (less than 90%), Bulgaria (over 80%), followed by Lithuania, Estonia, Malta, Latvia, Poland and Portugal (European Commission, 2014b). Therefore in 2013, the Commission acted on the crisis by redirecting some of the cohesion funds - more than EUR 45 billion, to support measures against unemployment and social exclusion and in favor of research, business support, sustainable energy, social and education infrastructure.

The empiric evidence suggests that the Cohesion policy funds have had a significant positive impact on the economic and social development of the EU Member States and brought to numerous positive effects in the programming period 2007-2013.

In the first place, the cohesion policy of the EU has led to the creation of jobs and economic growth. The income has increased in the poorest EU regions with GDP per capita growing in these areas from 60.5 % in 2007 to 62.7 % of the EU average in 2010 (European Commission, 2016a).

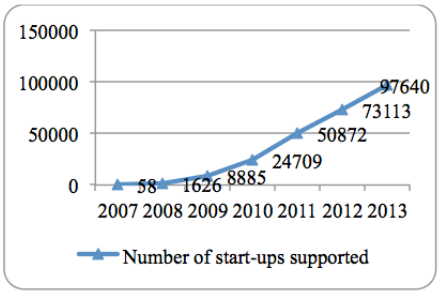
As a direct result of the cohesion policy, 769,900 new jobs were created in 2007-2013 (Figure 1), and 2.4 million participants in ESF actions supporting access to employment found a job within 6 months in 2007-2010 (European Commission, 2014b). In addition to that 225,560 small and medium-sized enterprises received direct investment aid and more than 274,000 jobs were created in SMEs. 97,640 start-ups were supported (Figure 2).

Figure 1: Number of EU Aggregate Jobs Created by the Cohesion policy



Source: European Commission, Regional Policy, http://ec.europa.eu/regional_policy/en/policy/what/key-achievements/

Figure 2: Number of Start-Ups Supported by the Cohesion policy

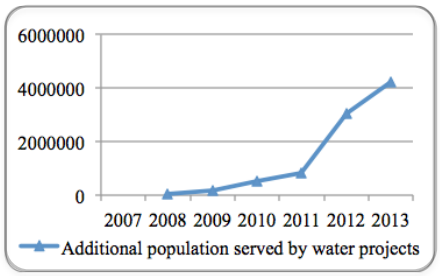


Source: European Commission, Regional Policy, https://cohesiondata.ec.europa.eu/en/dataset/Core-Indicators-2007-2013-EU-Start-ups-supported-C/cik5-x94n

Positive effects were also created by the 72,920 research projects that were supported, and the 35,125 new long-term research jobs that were created. 27,800 co-operation projects were financed, and 5 million more EU citizens were covered by broadband connectivity. Concerning the environment, 11,050 projects connected with the cities' sustainability were financed. Water supply systems were modernised, benefiting 4.2 million citizens (Figure 3).

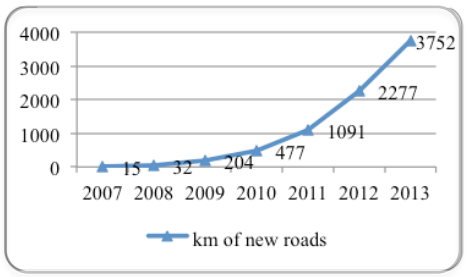
In terms of transport infrastructure, 3,752 km new roads were built (Figure 4) and 20,104 km were reconstructed. Also 335 km of railways were built and 3,128 km were reconstructed. In addition to that, more than 5.5 million citizens were served by waste water projects.

Figure 3: Number of People Served by Water Projects Financed by the Cohesion Policy



Source: European Commission, Regional Policy, https://cohesiondata.ec.europa.eu/en/dataset/Core-Indicators-2007-2013-EU-Water-projects-Chart/vziv-5wz2

Figure 4: Km of New Roads Built by the Cohesion Policy



Source: European Commission, Regional Policy, https://cohesiondata.ec.europa.eu/en/dataset/Core-Indicators-2007-2013-EU-new-roads-Chart/kb97-pmsd

Monfort, Piculescu, Rillaers, Stryczynski, and Varga (2017), cited by the latest European Commission's paper assessing the EU cohesion and rural development policies during the period 2007 - 2013 and their impact on the European economy[ii], provide further evidence that the cohesion and structural funds brought significant gains and contributed to the achievement of a more balanced structure of the Member States' economies. The effects have resulted in increased GDP, which was on average 4.1% higher in the countries that joined the EU after 2004. The highest impact was found in Hungary (+ 5.3%), Latvia (+ 5.1%) and Poland (+4.3%)[iii]. Other positive effects in the long-term are associated with a significant positive impact on the factors' productivity, as a result of the direct investments in technology but also because of the improved business conditions encouraging investment in tangible and intangible assets.

Economic and Social Cohesion of the Bulgarian Regions

Even though the EU's cohesion policy is contributing to the growth goals of the Europe 2020 Strategy by creating jobs and reducing disparities across Europe, it is far from reaching its goals and the case of Bulgaria is an example that illustrates this policy's low efficiency.

Even though the legislative framework of Bulgaria's regional policy is harmonized with the Europe's ten years after the country became an EU member, it hasn't shown a big progress in reaching even the EU average levels. The comparison covers both – the economic development in terms of GDP and the social development measured by the Social Progress Index (SPI).

The comparison of the Bulgaria's six NUTS 2 regions to the EU28 average in terms of generated GDP as purchasing power per inhabitant shows that the poorest region in Bulgaria (and in the whole EU), Severozapaden region (Northwest region), is under one third of the EU average, and almost 7 times less than the richest one – the region of Hamburg, Germany (Table 1).

Table 1: GDP by Selected NUTS 2 Regions in the EU in 2014

Country	Code	Gross domestic product at current market prices (Purchasing Power Standard per inhabitant, Euro)	Gross domestic product at current market prices (Purchasing Power Standards per inhabitant in percentage of the EU average)
Severozapaden	BG31	8,200	30
Yuzhen tsentralen	BG42	8,700	32
Severen tsentralen	BG32	9,300	34
Severoiztochen	BG33	10,800	39
Yugoiztochen	BG34	10,800	39
Yugozapaden	BG41	20,600	75
European Union (28 countries)	EU28	27,500	100
Wien	AT13	43,500	158
Noord-Holland	NL32	44,300	161
Praha	CZ01	47,500	173
Île de France	FR10	49,000	178
Hamburg	DE60	56,600	206

Source: Eurostat, 2016

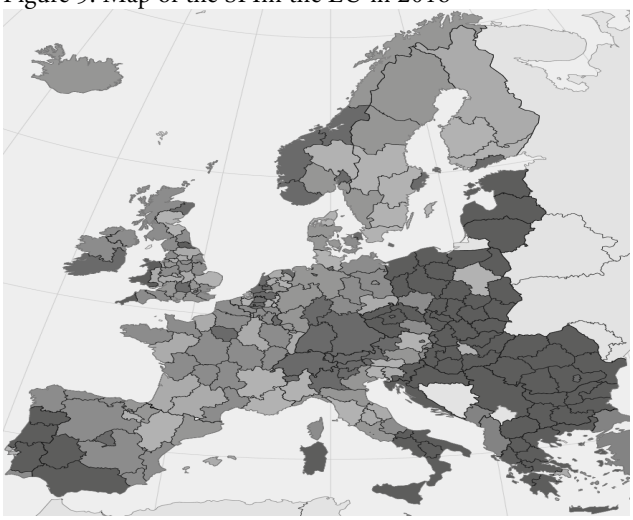
At the same time, the draft version of the regional Social Progress Index[iv] shows significant variations within and between EU Member States in terms of access to

health care, quality and affordability of housing, personal safety, access to higher education, environmental pollution, etc.

The SPI is an aggregate index of 50 social and environmental indicators that capture three dimensions of social progress: Basic Human Needs, Foundations of Wellbeing, and Opportunity. The index framework is identical to the one of the global SPI. It includes all 272 European regions and scores absolute performance on a 0-100 scale for each of the indicators included to measure the twelve social and environmental (not economic) indicators[v].

The Southeasteuropean states, among which the Bulgarian ones are, are among the most undeveloped in social terms (Figure 5).

Figure 5: Map of the SPIin the EU in 2016



Source: European Commission, 2016b.

The SPI is the lowest in Bulgaria and Romania. The Bulgarian Southeast region has the lowest SPI value (38,7), less than half of the highest value of 81,3 in Övre Norrland, Sweden (Table 2).

Table 2: Social Progress Index in selected EU regions (NUTS2) in 2016

Region's ID	Region's name	Basic	Foundation	Opportunity	EU SPI
BG34	Yugoiztochen	42.5	45.8	28.8	38.7
BG31	Severozapaden	44.7	47.0	28.0	39.4
RO31	Sud - Muntenia	43.9	43.3	35.8	40.9
RO22	Sud-Est	43.3	45.5	37.2	41.9
RO21	Nord-Est	43.4	42.3	41.8	42.5
BG42	Yuzhen tsentralen	47.9	49.7	32.7	43.1
BG33	Severoiztochen	46.3	46.7	40.4	44.4
BG32	Severen tsentralen	47.3	49.3	38.7	45.0
RO41	Sud-Vest Oltenia	47.9	45.9	42.2	45.3
RO11	Nord-Vest	49.1	47.9	45.6	47.5
RO12	Centru	51.2	50.1	44.0	48.4
ITF3	Campania	62.0	48.1	37.3	48.6
RO42	Vest	51.9	49.4	45.5	48.9
ITG1	Sicilia	62.0	49.6	37.1	49.1
BG41	Yugozapaden	52.7	54.8	41.3	49.4
.....					
FI20	Åland	88.6	72.8	79.8	80.3
DK04	Midtjylland	87.6	73.2	80.3	80.3
FI1B	Helsinki-Uusimaa	84.6	74.0	82.6	80.4
DK01	Hovedstaden	86.6	71.9	84.6	80.9
SE33	Övre Norrland	89.4	73.9	81.0	81.3

Source: European Commission, 2016b

It is also evident that all six Bulgarian regions are among the 15 least developed regions in the EU in terms of social progress. This is an indisputable empirical proof that the EU's cohesion policy goals are far from achieved. On the other hand, its role as a major factor for regional development should not be exaggerated. The initial low level of economic and social progress and still ongoing transition to modern economy in Bulgaria is another reason why the positive progress of the country towards EU average levels remains almost invisible.

Estimated Effects of EU's Cohesion Policy in Bulgaria

There are several different sources providing information about the effects of the European cohesion policy on Bulgaria. Even though the analyses made by different official instuitutions and organizations show overall dominating positive impact of the EU funds on the Bulgarian economy, it cannot be claimed with certainly that the EU's cohesion policy has achieved its main goal aim in Bulgaria – to support the country in overcoming the enormous economic and social underdevelopment that differentiates the Bulgarian regions from the other European regions.

The allocation from the Cohesion Policy funding for Bulgaria in the 2007 - 2013 period was €6.9 billion. According to the European Commission, it has helped the country to: create more than 1,300 jobs; serve over 280,000 more people by waste water projects; enable more than 137,000 persons to acquire or upgrade their vocational qualification and over 178,000 persons to acquire key competencies; implement many transport infrastructure projects (incl. Sofia metro extension, Sofia Airport); improve urban transport for 1,289,744 citizens, mainly in the 6 biggest cities (Sofia, Plovdiv, Varna, Burgas, Pleven, Stara Zagora); improve educational infrastructure for over 30,000 students; enable more than 398,000 m² of renovated parks, pedestrian areas, bicycle lanes, playgrounds; provide scholarships to 172,000 students; provide social services in a family environment for more than 51,000 persons; modernise 20 cultural facilities; invest in energy saving measures in public buildings and schools (European Commission, 2015).

A trustworthy model to estimate the effects of EU's cohesion policy in Bulgaria is the macroeconomic model SIBILA - a SImulation model of the Bulgaria's Investment in Long-term Advance[vi] ("long-term" because it evaluates the effects of the investment in human capital, ICT, R&D, infrastructure and physical capital, which are factors for long-term economic growth). It is based on the EU approaches to modeling of the impact of structural instruments, as well as on modern macroeconomic theory and it is adapted to the Bulgarian specifics. It consists of 170 equations, including econometric estimates, macroeconomic identities and calibrated dependencies (based on historical links and applying existing knowledge (ECORYS – CPM – NEW i", 2011).

The main objective of the model is to assess the net effects of the Structural and Cohesion Funds (SCF) on the Bulgarian economy (key macroeconomic indicators), as well as to support the decision-making process concerning the allocation of funds in the next programming period. It examines the economic development in two scenarios: baseline scenario in which there is no SCF, and an alternative scenario that

considers the SCF funding. The difference between the results of these two scenarios in terms of economic indicators' performance measures the net impact of SCF.

In 2017, the Ministry of Finance of Bulgaria presented a report with detailed calculations of the SIBILA model, encompassing the period of Bulgarian membership in the EU from 1 January 2007 till the end of 2016. It showed that the overall effect of the EU investments on the added value of the Bulgarian economy is highly positive:

- A cumulative increase of 11.5% of GDP by the end of 2016 in comparison to the baseline scenario with no EU funds (mainly through the positive effects of government spending on the production, and hence on the induced changes in private consumption and investments);
- A cumulative increase in the volume of private investment by 22.3% by the end of 2016 compared to a scenario without EU funds (a large part of the measures under the operational programs are intended for investment; they also lead to additional investments by the business);
- Reducing unemployment and boosting employment (as a result of the absorption of the EU funds by the end of 2016 the unemployment rate in the country was 6.5 percentage points lower than it would have been without the inflow of these funds.) At the same time, the number of employees in the economy increased by 15.2% towards the end of 2016 compared to the scenario in the absence of EU funds (almost 390 thousand employed people more);
- Higher wage levels in the country - by the end of 2016 the cumulative increase in average wages compared to the scenario without EU funds was expected to reach 14.9%;
- Increased export potential of the Bulgarian enterprises (By the end of 2016, Bulgaria's exports would be by 1.7% higher compared to the scenario without EU funds. The growth of the export potential is a long-term effect and is related to the improvement of the quantity and quality of the production factors, which in turn leads to an increase of the economic growth of the country);
- A positive impact on the state of public finances (increased tax revenues outweigh the spending related to the absorption of EU funds, such as providing co-financing for some of the projects). By the end of 2016, the cumulative positive effect on the budget balance was 2.1 percentage points of GDP. The positive impact is expected to be sustained in the longer term as the increased production potential, higher employment and higher income imply higher values of the tax base, and hence higher tax revenues).

The positive impact of the EU funds on the the country's economic development has been highlighted by eminent NGOs working in the economic field in Bulgaria. They stress on the fact that in the period between the start of the EU's membership talks in 1999 and the country's accession to the EU in 2007, the GDP per capita in terms of purchasing power has increased from 27% to 40.8% of the EU average, and in 2016 it reached 48.1%. The EU's cohesion policy has also helped to minimize the weight of the global crisis and has kept the unemployment rate in Bulgaria low, while labor productivity continued to increase. Positive effects are also identified in terms of improvements in various aspects of the business and civil infrastructure in the country constructed with the support of EU funding. In general, for the 10-year period of membership, the average annual net transfer from the EU to Bulgaria is about 4% of the country's GDP and this influx of funds is assessed to be of great macroeconomic importance given the unfavorable conditions of the global environment (Center for Liberal Stragtegies, 2017).

However, the effects from the EU Cohesion policy on the Bulgarian economy and budget are also criticized by economists, arguing that the European funds in the country are widely considered as a gift or free money, which is not the case (Ganev, 2016). The data from recent years show that the European projects swallow an increasing share of the national resource and actually worsen the fiscal position of the country. The costs of the European programs in the country have been increasing steadily - in 2008 they were less than 1 billion BGN, in 2010 - 2 billion BGN, in 2014 they reached 4.5 billion BGN and in 2015 they boomed to 6.3 billion BGN. These costs are not funded only by the EU, as annually the state makes transfers from the national budget to the European programs. This is in practice the participation of the taxpayers in the European funding.

In 2011 and 2015 the national transfers to the EU funds increased markedly and reached about 40% of the costs of the European programs. From almost 6.3bn BGN spent on EU programs in 2015, 2.5 billion BGN were paid by the Bulgarian taxpayer. And the share of national financing in the EU aid has been increasing at a high speed. This is a real cost, and when, in some cases, useless projects are implemented, or projects' costs are inflated only to increase the absorption rate, this inevitably leads to a wastage of national resources (Ganev, 2016).

Other deficiencies stemming from the EU funds' absorption process also led to the lower efficiency of the EU's cohesion policy in Bulgaria. The absorption of financial resources of the SCF in Bulgaria in the first for the country programming period 2007-2013 was accompanied by numerous problems. The absorption rate of Bulgaria in comparison to the other Member States was low and a major reason for

that was the lack of administrative capacity and experience in the procedures of the operational programs' project management. Even though the pre-accession programs included education and training of the employees in national administration, the administrative capacity was not satisfactory. One of the causes for the initial strong ineffiency of the Bulgarian administration, responsible for the EU funds absorption, is associated with its structure that is ineffectively organized into numerous operational programmes, which leads to the management of the same types of programmes in a different way and with varying effectiveness. The result is that many functions are duplicated and there is an increase in the budget costs (Nozharov, 2016).

Another important factor was the comparatively small competence of the staff in the Bulgarian body managing the EU funds' absorption. At least one third of the staff in the public administration responsible for this activity is appointed without a competition, and a big part of them is not highly-qualified, which leads to additional government costs for employees' re-qualification and support of their work through outsourcing. In addition to that, there are considerable variations in the wages of staff responsible for the management of EU funds and the other staff with the same qualifications and fulfilling the same tasks (the former receiving five times more than the latter), which leads to a lack of motivaton and ineffectiveness of the financial processes at the public administration (Nozharov, 2014).

The unpreparedness of the Bulgarian state administration in the EU funds' absorption process is acknowledged in the latest report of the Bulgarian Academy of Sciences (BAS), which blames the Bulgarian institutions for the lower-than-expected results achieved by the country's membership in the EU. The public administration was not ready and was unable to learn for a long time to apply the modern management style of the European Commission. It turned to be inadequately trained professionally, unsufficiently expeditious and unable to defend its independence from other state institutions and corporate interests, a part of which was due to the low remuneration of its employees that made them susceptible to corruption (Economic Research Institute of the Bulgarian Academy of Sciences, 2017). BAS has also criticized the European institutions for their policies and requirements to the Bulgarian authorities that have not always been tailored to the specific characteristics and traditions of the country, as well as to its citizens' preferences. Namely the Institute has criticized the international institutions and European Commission for the full opening the single European market to Bulgaria, which at that moment has been an unsustainable and low-competitive economy. The result of that is a total decline in a number of economic sectors, including a collapse of production, exports, employment, income, consumption, as well as other

negative trends as emigration, social polarization, decline in budget revenues and others. However, this part of the analysis has not been supported by any econometric model or other mathematical or statistical tool that correlate the above-mentioned negative trends in the Bulgarian economy after 2007 with the country's EU membership, which makes the report's conclusions unreliable. After all, even the author of this part confesses that it is difficult to define exactly which of the Bulgarian economy's weaknesses are a result of the EU membership or represent the deteorating consequences from the country's unsuccessful transition to market economy after 1989[vii].

Kaneva (2015) identifies four different groups of problems that hinder the EU funds' absorption process on the Bulgarian side – problems of the beneficiaries, a human capital problem, organizational problems, and specific for the respective Operational program problems. Her analysis proves that there are unsolved issues for both - the beneficiaries and the state administration. Many of the problems discussed are not reserved to Bulgaria only and could be addressed successfully by researching and applying other Member States' best practices.

Another serious problem was that the absorption process in Bulgaria was implemented in contrary to the main principle of the European cohesion policy, because instead of supporting the country's underdeveloped regions, it concentrated on the richest Bulgarian region. During 2007-2013, the EU allocated more than 81.56% of the its budget to the less favored regions, while in Bulgaria 40% of the available resources were invested in the most developed one – the Southwest region (incl. the capital Sofia), and only 7.5% in the least developed (Galabinova, 2015).

The Bulgarian Operational Programs in the 2014 - 2020 period follow the same logic – the country did not choose to create regional Operational Programs, which could support the underdeveloped regions, but seven national programs[viii]. There is a risk that the investment funds continue to be concentrated primarily in the Southwest region, which, instead of convergence of the level of development of the six NUTS 2 regions, will lead to even bigger regional disparities. The city of Sofia could be differentiated as a separate planning region, while the remaining of the current Southwest region could merge with the South-Central region. In order for greater socio-economic effect to be achieved, an analytical unit to assess the socio-economic impact in terms of defined goals, not in terms of the funds utilized and activities implemented, could be established (Hadjinikolov, 2015).

Besides that, some sectors of the Bulgarian economy still have not been restructured and even when the absorption of the EU funding followed the common policies, it

was not efficient. The SMEs' low awareness of the operational programs in the country was also a hinder and made it necessary to promote further the European funds' opportunities (Nikolova, 2014).

Conclusion

Econometric research has showed that the EU Cohesion Policy funding has been an important driver for the reforms and economic development of Bulgaria since its accession to the EU. It will continue to play this role, and for the programming period 2014 - 2020 Bulgaria has been allocated around €7.6 billion in Cohesion policy funding. The investment priorities have been set out in a Partnership Agreement with the European Commission and include the raising of the competitiveness of the economy, research and innovation, transport infrastructure, urban development, improved water and waste management, employment, raising the share of persons with higher education, strengthening the capacity of public administration and the judiciary and promoting good governance (European Commission, 2015).

However, in general the EU Cohesion policy has failed to achieve or still has not achieved its main goal: creating a more homogeneous Europe in economic and social terms. A proof of that are the vast economic gaps between Southern and Northern, and between Eastern and Western Europe. The record high unemployment levels, especially among the youth, the vast emigration from Eastern to Western Europe and the rise of political parties that criticize the European Union and propose to reverse the process of European integration, is another symptom of the lack of cohesion (Stratfor, 2015). However, analyses show that this unsuccessful story is tightly connected with the poorest Member States' initial economic situation, which is the case with Bulgaria, and their inability to make most of these development funds on a later stage.

The result of the analysis shows that the scientifically-proved (through econometric model) positive effects of the EU cohesion policy on the Bulgarian economy prevail over the negative, which remain quite hypothethic. The EU cohesion funds are a very important source of financing for the Bulgarian economy, the possibilities of which should be used to the fullest to support the economic growth and employment in the country. For their absorption rate and efficiency to be enhanced, however, further steps are necessary towards state admnistration's strengthening, project management's improvement, fight against corruption and others.

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[i] See Nomenclature of territorial units for statistics (NUTS).

[ii] Based on a set of simulations conducted with QUEST, a dynamic stochastic general equilibrium model with endogenous growth and human capital accumulation.

[iii] In the EU-15, the impact is more modest but it remains substantial for some Member States like Greece (+2.2%), Portugal (+1.8%) and Spain (+0.7%) which benefited from support of the Cohesion Fund.

[iv] The index is the result of cooperation among the Directorate-General for Regional and Urban Policy of the European Commission, the Social Progress Imperative and Orkestra-Basque Institute of Competitiveness. It follows the overall framework of the global Social Progress Index, customised for the EU using indicators primarily drawn from Eurostat data. It isn't created for the purpose of funding allocation and doesn't bind the European Commission.

[v] There are three dimensions of the SPI: 1) Basic Human needs incl: nutrition and basic medical care; water and sanitation; shelter; personal safety; 2) Foundations of Wellbeing, incl: access to basic knowledge; access to Information and Communications; Health and Wellness; Ecosystem Sustainability; 3) Opportunity, incl: Personal rights; Personal Freedom and Choice; Tolerance and Inclusion; Access to Advanced Education.

[vi] The development of the econometric model for impact assessment of the Structural and Cohesion Funds of the EU called SIBILA is implemented under project № 0018-ЦИО-3.2 „Development of a model for impact assessment of SCF", financed by Operational Programme Technical Assistance.

[vii] The authors of the Bulgarian Academy of Sciences' report have also reached the conclusion that "Bulgaria's membership in the EU has no other alternative".

[viii] "Good Governance", "Transport and Transport Infrastructure", "Regions in Growth", "Human Resources Development", "Innovation and Competitiveness", "Environment", "Science and Education for Intelligent Growth".

Hiring a High-Quality Auditor and Debt Maturity Structure: Evidence from Iranian Firms

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Abstract: *The current research is an attempt to offer new insights into the association between hiring high-quality audit firms and corporate debt maturity structure. To this end, 94 firms listed on the Tehran Stock Exchange were scrutinized for the period 2011-2015. To test the research hypotheses, multiple regression and data panel were employed. The findings confirm that a high-quality audit firm can enhance the debt maturity. The results of testing the research hypothesis point to a significant correlation between the hiring of a high-quality audit firm and corporate debt maturity structure, in that short-term debt and quality audit are two alternative mechanisms used to mitigate information asymmetry and monitor managerial behavior. Therefore, in firms audited by high-quality audit firms, due to the effective monitoring imposed by auditors on debt convent, creditors experience information asymmetry and less agency costs, thereby desiring to extend the debt maturity. The findings of current study not only fill existing gaps in the field, but also contribute to decision-making practices in stock exchange.*

Keywords*: high-quality auditor, debt maturity structure, panel data*

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Literature Review

New corporate theories are premised on the assumption that the separation of ownership and management causes serious conflicts of interest, which, in turn, result in agency problem, which can be traced to the information asymmetry between managers and owners (Watts and Zimmerman, 1986). Asymmetric information is characterized as the information provided to two or more individuals. In the capital market, information asymmetry typically takes place when some insiders (often managers), in comparison to some outsiders (investors), have access to privileged information about the current condition and future outlook of the business. The presence of information asymmetry in the marketplace may bring about adverse individual and collective consequences like minimum participation of the investors, high transaction costs and liquid markets (Bathacharia et al, 2008). The overwhelming amount of theoretical literature seems to suggest that short debt can trigger a reduction in information asymmetry and agency costs between managers and creditors. Flannery (1986) stated that firms with profitable projects prefer debts with short-term maturity to reduce information asymmetry.

In the presence of information asymmetry, creditors are inclined to believe that adopting short debt will ensure effective monitoring of the firm, rather than long debt. Furthermore, short-term maturity of debts facilitates better controlling of managerial performance by persuading managers to negotiate with creditors. Under such circumstances, creditors frequently meet managers, track the firm performance during the early periods of debt covenant, and thus deciding whether to extend their covenant or change its conditions. Therefore, short debt is expected to reduce information asymmetry and agency costs between managers and creditors (Ghoul et al, 2014). On the other hand, a need to resolve the agency problem together with the rise of information symmetry sheds light on the importance of the monitoring role of an external auditor in improving the information about financial conditions, performance and flexibility of a firm, and reducing information asymmetry. That is because external auditors promote transparency and accuracy in the financial disclosures made by a firm. Information risk and creditors' uncertainty will diminish as information quality increases, resulting in a decrease in the information asymmetry of the market (Francis et al, 2004). Hence, on these grounds, the research has provided ample support for the assertion that short-term debt maturity and quality audit play pivotal roles in controlling managerial opportunistic behavior and reducing information asymmetry. As a result of such strict controls, creditors confront with less information asymmetry and agency costs in the firms audited by high-quality audit firms and thus desire to extend their debt maturity. Nevertheless, most of the Iranian accounting research has ignored such an important issue. Therefore, the present research sets out to figure out whether hiring a high-quality

audit firm is significantly related to corporate debt maturity structure or not? If so, how?

Theoretical Framework and Research Hypotheses

The term structure of corporate debt, which has already attracted considerable attention among economists and financial experts, points up the disciplinary role of debt in restraining the opportunistic behavior of managers. Recent global financial crises have underlined the importance of term structure of the corporate resource in financial stability (Ball et al, 2009).

Current research appears to validate the view that the maturity of corporate resource seems to provoke future global crises. Most companies use debt in their capital structure. Debt structure is considered as one of the most important indicators of firm success, which stimulates corporate sustainable growth. Therefore, decisions made on debt structure is of paramount significance to the business survival of company (Ghoul et al, 2014). Greater debts prevent managers from making value-reducing decisions for company. Additionally, Jensen (1986) propounds the view that constant payment of debts will attenuate corporate free cash flow, thereby preventing managers from wasting firm resources to their own interests. On the other hand, creditors prefer short debt to long debt due to more opportunities they have for monitoring their company, and they recommend such debts to their firms in the presence of information asymmetry and agency costs. This is because short debt impedes managers' efforts to undertake ambitious and risky projects (Ghoul et al, 2014). The importance of short-term debt and high-quality audit in lowering the information asymmetry and monitoring the purposes has assisted creditors to experience less information asymmetry and agency costs in firms audited by 4 big audit firms due to the effective control over debt covenant by auditors, and thus desiring to extend the debt maturity. Given this argument, Chung et al (2009) put forward the view that firms audited by 4 big audit firms employ debt with longer maturity in their financial decisions. Similarly, Ghoul et al (2014) also presented evidence confirming a significant relationship between high-quality auditor choice and debt maturity structure. On this logical arguments, the research hypothesis is developed as follows:

Research hypothesis: Hiring a high-quality audit firm is significantly associated with debt maturity structure.

Review of Literature

Huag et al (2016) in a study entitled "CEO overconfidence and corporate debt maturity" sampled 4309 firm-year observations during the years 2006-2012 and then examined the impact of CEO overconfidence on debt maturity structure. Their findings lent support to the claim that overconfident CEOs make use of short-term debts to finance their firm. Deramadi (2016) investigated the relationship between family ownership and ownership concentration with audit choice for a sample of 787 firm-year in the firms listed on the Indonesian Stock Exchange. The results of their study demonstrated that increasing ownership concentration may increase the likelihood of choosing a big audit firm. Having studied the correlation between hiring a high-quality audit firm and debt maturity structure for a sample of 42679 firm-year in 42 firms throughout the world, Ghoul et al (2014) concluded that firms audited by big (high-quality) audit firms enjoy long-term debt. Kirch et al (2012) addressed the issue of the factors affecting South-American corporate debt maturity structure and reported that variables like firm size, business risk and fixed tangible asset ratio exert significant influence on corporate debt maturity structure. Ge et al (2012) examined the effect of corporate governance on corporate debt maturity structure on a sample of firms from 22 countries during the years 2003-2007 and discovered that firms with stronger corporate governance experience long-term debt. In an article named "The effect of auditor choice on financing decisions", Chung et al (2009) employed firm size as a measure of audit quality and examined the effect of hiring a high-quality audit firm on Chinese corporate debt maturity structure. They documented that firms audited by high-quality audit firms use long-term debt in their financing decisions.

Goodarzi and Babazadeshirvan (2015) provided confirmatory evidence for the positive and significant association between the quality of financial statements and debt maturity, and investment efficacy. Rahimian and Tiregari (2013) studied the effect of modified audit opinion on the debt maturity structure of 102 firms listed on the Tehran Stock Exchange during the years 2006-2011. Their findings nullified the effect of modified audit opinion on corporate debt maturity structure.

Methodology

As an applied, quasi-experimental and ex post facto research, this study is conducted in the domain of positive accounting using multivariate regression method and econometric models. The statistical population is composed of all firms listed on the Tehran Stock Exchange during the years 2011-2015, among which 94 firms meeting the following conditions were selected:

1- They have been listed on the Tehran Stock Exchange from 2011 to 2015.

2- To increase comparability, their fiscal years end March 31.
3- They have been engaged in the same business during the proposed fiscal year.
4- They are not classified as investment companies or financial intermediaries.

Data Analysis

In this research, there is one dependent variable, one independent variable, and four control variables that are used to test the research hypotheses.

Dependent Variable

The corporate debt maturity structure serves as the dependent variable in the research model, which, following Ghoul et al (2014) and Chang et al (2009), is calculated using long-term debt-to-total debt ratio.

Independent Variable

The independent variable used to test the research hypothesis is hiring a high-quality audit firm. To do so, audit firms were divided into two groups, namely big and small firms. Audit organization and Private audit firms affiliated with Society of CPAs were selected as big and small audit firms, respectively. Accordingly, if the auditor is the audit organization, it is a big and high-quality audit firm and thus valued 1, otherwise 0. Theoretically speaking, previous literature has confirmed that audit firm size is directly associated with audit quality since big audit firms have experienced auditors and better monitoring system, and refused to lose their reputation due to low-quality audit. Hence, the bigger the audit firm is, the higher the quality of the information of the audited firm is. Many other attempts like those made by Banimahd (2012), Namazi et al (2011) and Saghafi and Motamedifazel (2011) have employed this method to conduct their research.

Control Variables

The present study considers the following control variables as the most important variables affecting debt maturity structure:

- Firm size: Following Johnson (2003), Bilt et al (2007) and Ghoul et al (2014), firm size is calculated through natural logarithm of firm's net sales.
- Financial leverage: Similar to Ghoul et al (2014) and Chang et al (2009), financial leverage is computed by dividing total debt by total assets.
- Profitability: following Ge et al (2012) and Chang et al (2009), return on owner's equity is used to calculate the corporate profitability.

- Firm growth: Similar to Ghoul et al 92014), firm growth is computed with respect to annual sales change.

Table 1: Summarizes the Measurement of Variables Used in This Paper.

Variables	Measurement
Dependent Variable	
MATURITY	long-term debt-to-total debt ratio.
Independent variable	
AUD	if the auditor is the audit organization, it is a big and high-quality audit firm and thus valued 1, otherwise 0
Control Variables	
SIZE	Firm size measured as natural logarithm of firm's net sales.
LEV	Leverage measured as the total debts divided by total assets.
ROE	Profitability measured through dividing net income by market value of the corporate equity.
GWTH	Firm growth measured as the annual sales change.

To test the research hypothesis, the model proposed by Ghoul et al (2014) was adopted and then modified based on the Iranian context. The model is as follows:

$$MATURITY_{it}=\beta_0+\beta_1 AUD_{it}+\beta_2 Size_{it}+\beta_3 Lev_{it}+\beta_4 ROE_{it}+\beta_5 GWTH_{it}+\varepsilon_{it} \quad (1)$$

Where:

MATURITY_it: is debt maturity structure of firm i in year t.

AUD_it: hiring a high-quality auditor for firm i in year t.

Size_it: the size of firm I in year t.

Lev_it: financial leverage of firm i in year t.

ROE_it: net income-to-market value of equity for firm i in year t.

GWTH_it: annual salegrowth rate for firm i in year t.

Since the panel data are superior to time-series, cross-sectional models with respect to the number of observations, low probability of collinearity among variables, bias reduction in estimation and heterogeneity of variance (Gujarati, 2009), the multivariate regression model based on panel data was employed to test the research hypothesis.

Results/Findings

Descriptive Statistics

Table 2 presents the descriptive statistics of the research variables for a sample of 470 firm-year during the years 2011-2015.

Table 2: Descriptive Statistics

Variables	N	Mean	Median	Minimum	Maximum	Std. Deviation
MATURITY	470	0.185	0.161	0.071	0.644	0.139
AUD	470	0.383	0.000	0.000	1.000	0.466
SIZE	470	12.023	11.934	9.912	14.563	0.746
LEV	470	0.618	0.605	0.091	1.714	0.238
ROE	470	0.131	0.128	-1.820	3.754	0.308
GWTH	470	0.211	0.189	-0.436	2.041	0.681

As can be seen, the audit organization has audited about 38% of the sampled firms on average. The mean and median for the variable of firm size were obtained 12.023 and 11.934, respectively, for which the minimum and maximum values are 9.912 and 14.563, respectively. Likewise, about 62% of the assets of the sampled firms used debt to finance their assets. The net income calculated for the sampled firms equals to 13% of the market value of the firm's equity.

The Results of Testing the Research Hypothesis

Regarding the panel data analysis, F- limer needs to be tested to distinguish the usage of pool or panel data method, and Hausman test was also used to determine the fixed effect or random method usage. Additionally, Jarque-Bera test is performed to examine whether residuals show normal distribution or not, and to identify heteroscedasticity and serial autocorrelation, the Likelihood Ratio (LR) test and Wooldridge test were employed, respectively. The results of the tests are represented in table 3.

Table 3: The Results of Tests Used for the Research Model

Test	Statistics	Result
F-limer test	9.018**	The efficacy of panel data
Hausman Test	17.844*	The efficacy of fixed effects method
Jarque-Bera test	2.215	Normality of residuals
LR test	375.06**	Heteroscedasticity
Wooldrige test	2.139	Lack of autocorrelation
Notes: ** and * denote significance at the 0.01 and 0.05 levels, respectively .		

As can be seen, F-limer test and its level of significance suggests the use of panel data method. The results of Hausman test and its level of significance indicate that the model has to be estimated using fixed effects method. Since the significance level of Jarque-Bera test is greater than 0.05, the normal distribution of residuals is confirmed. The results of LR test reveal that the research model suffers from heteroscedasticity, which can be removed by estimating the model using Generalized Least Square method. The level of significance for Wooldridge test points to the lack of serial autocorrelation in the model. In addition, to ensure the lack of multicollinearity among explanatory variables, the multicollinearity was assessed using Variance Inflation Factor (VIF). As indicated in Table 4, the values of this statistics for the explanatory variables are less than 10, thereby confirming the lack of multicollinearity. The results of testing the research hypothesis are presented in Table 4.

Table 4: Results of Testing Research Hypotheses

$MATURITY_{it} = \beta_0 + \beta_1 AUD_{it} + \beta_2 Size_{it} + \beta_3 Lev_{it} + \beta_4 ROE_{it} + \beta_5 GWTH_{it} + \varepsilon_{it}$					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	VIF
C	1.633	0.454	3.591	0.000	-
AUD	0.085	0.027	3.055	0.002	1.181
SIZE	0.084	0.060	1.391	0.165	1.214
LEV	-0.099	0.038	-2.588	0.010	1.163
ROE	0.067	0.025	2.655	0.008	1.233
GWTH	0.068	0.051	1.309	0.191	1.218
F-statistic (prob)	13.850 (0.000)	Durbin-Watson stat		1.930	
R^2	0.640	Adjusted R^2		0.619	

Considering F-statistics and level of significance, one can come to the conclusion that the fitted regression model is significant at 95% level. Given the value of adjusted R2, the researchers reached the conclusion that independent and control variables explain about 62% of changes incorporate debt maturity structure. As indicated in the above table, the estimated coefficient and t-statistics of the variable of AUD are positive and significant at 0.05 levels, thereby confirming the existence a positive and significant relationship between hiring a high-quality audit firm and debt maturity structure of the sampled firms. Therefore, the research hypothesis is accepted at 0.05 level. Previous research carried out by El-Ghoul et al (2014), Pittman & Fortin (2004), Stohs & Mauer (1996) and Sweeney (1994) concurred with the findings of this research.

Conclusion

This study is primarily concerned with investigating the relationship between hiring a high-quality auditor and corporate debt maturity structure. To do so, a sample of 94 firms listed in Tehran Stock Exchange during the years 2011-2015 was selected. The results of testing the research hypothesis indicated that hiring a high-quality audit firm is significantly correlated with corporate debt maturity structure, i.e. short-term debt and quality audit are two alternative mechanisms to reduce information asymmetry and monitor managerial behavior. Therefore, in firms audited by quality audit firms, owing to the effective monitoring imposed by auditors on debt convent, creditors experience information asymmetry and less agency costs, thereby desiring to extend the debt maturity. Indeed, audit quality by larger-scale audit firms show that corporate accounts and liabilities are more orderly, and this can increase the transparency of corporate financial statements and reduce the asymmetry of information between Shareholders and corporations. The findings of the current research corroborate those reported by Chang et al (2009) and Ghoul et al (2014). According to the results, investors and market activists are recommended to consider the audit firm as an important factor influencing the corporate debt maturity structure. Moreover, general assembly of shareholders and CEOs are also suggested to choose big audit firms to promote their audit quality and achieve debt with long-term maturity.

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Financial Monitoring of Medication Consumption in Bosnia and Herzegovina

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Abstract: *Healthcare spending is nowadays one of the key issues of healthcare system practice as its share in GDP has constantly increased during past decades, which is now above 10% of GDP in developed countries. However, very often it is more of an issue related to the current political and socio-economic situation in a country rather than the one managed by experts. Although one might expect that the increase in healthcare spending contributes to better health of the population, relevant indicators show that high healthcare spending in Bosnia and Herzegovina (BiH) does not result in better health of its population. Due to this reason, special attention needs to be paid to the economic analysis of healthcare spending. Irrational use of medications is just one of many problems associated with an inefficient health system, but one that heavily impacts on the health economics. In situations where it may not be easy to change the existing financing models, we should explore how to be more effective in spending within the existing structure. Better control of medication consumption could be one of the actions that helps improve the effectiveness of the available budget. Therefore, the general aim of the paper is to determine the effect that financial monitoring of medication consumption has on the control of increase in healthcare spending, which in turn might help establishing a financially sustainable healthcare system. Bearing in mind that irrational usage of medications influences the access to healthcare services, destabilizes country's budget, and endangers the margin of social sustainability (endurance), the constant financial monitoring of medication consumption is important as it can help us recognize those segments where consumption deviates from standard and where prevention activities are needed. All this can result in the limitation of further increase in medication consumption.*

Keywords*: healthcare spending, healthcare spending control, (irrational) medication consumption, financial monitoring*

JEL Classification*: I-11, I-15, I-18*

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Introduction

Health is an economic potential, a segment of human capital that increases productivity and reduces treatment costs. However, in no way is health a free resource and it cannot be maintained without incurring costs. High quality healthcare protection is the most cost effective investment into human capital.

The need for healthcare is unpredictable, sudden and unexpected, and it is in society's interest to recognize the real need for healthcare services. The characteristic of healthcare spending is that the consumer of healthcare goods, as a rule, is incapable of assessing their value. Unlike other goods, healthcare protection is specific, primarily due to the basic economic laws acting in the field of healthcare. The laws of demand and supply of healthcare services function in a specific market that includes several mutually related markets such as the market for various types of insurance (compulsory, additional) or different levels of treatment (outpatient clinics, polyclinics, hospitals), labor market for healthcare workers, market for medications, medical equipment, and so on. On the demand side, there are indicators of population health while on the supply side there are indicators of healthcare resources. When establishing the efficiency of healthcare market aimed at providing efficient healthcare protection for every citizen, the key role is given to the economic effects of deciding on the rational usage of ever limited financial resources.

From the macroeconomic point of view, the healthcare system creates a significant burden on any economy – rich or poor, so limiting the increase in healthcare spending is very important for everyone. Growing costs, irrational behavior, and dissatisfaction in the healthcare system are self-evident, with the main reasons for increased spending being: increased share of the elderly persons in the entire population, increased number of patients with chronic diseases, introduction of new medications (which, as a rule, are more expensive), influence of the pharmaceutical industry, growing pressure exerted by patients, and easy access to medications. Establishing the financial sustainability of healthcare system is by no means an easy task, which is why the healthcare system needs to be perceived from the economic perspective (the so called health economics). On the one side, some authors believe that the financing of healthcare needs to be changed so that the system becomes sustainable in the long run, while others think that the reduction of healthcare costs is needed. When it comes to the efficient functioning of the healthcare system, the economic analysis is given prominence over other types of analysis specific for the market of healthcare services.

Health economics always starts with the assumption that healthcare services can be analyzed as any other market activity. However, the process often ends in the explanation why the market activity fails to lead to the efficient resource allocation in healthcare. Economic analyses of healthcare spending in BiH are poorly represented partly due to the lack of full scale data and their transparency and partly due to a relative lack of economic experts' interest in the research on health economics. The increase of financial resources in the healthcare sector cannot be expected and the room for savings which will not negatively affect the quality of healthcare protection needs to be identified. The starting point of discussion in BiH is the aspiration that the access to healthcare is universal, just, equal for all, and basically "free". However, healthcare costs are constantly on the increase and in the last ten years they have been growing at an unsustainable rate. For example, in 2003, the total per capita healthcare spending in BiH Federation was BAM 345 while the amount per an insured person was BAM 417.[1] According to the latest available data, in 2012 the total per capita healthcare spending reached the level of BAM 714 while the amount per an insured person was BAM 825 (Health Insurance and Reinsurance Fund of BiH Federation, 2013). The average spending per an insured person in Republic of Srpska in 2012 was BAM 714 (Health Insurance Fund of Republika Srpska, 2013).

The problem of monitoring healthcare spending in BiH is rather serious as there is no centralized system of monitoring spending on the state level. Monitoring is additionally complicated by the current administrative organization of the healthcare system. The data on healthcare are scarce and they are not systematized and unified. This is supported by the fact that BiH was first included in the European Health Consumer Index in 2014 and was positioned last due to an enormous lack of data on its healthcare protection, receiving 420 out of 1,000 points, less than Albania, Serbia, and Montenegro (Björnberg, 2015).

Medications are one of important items in the total healthcare spending. With limited financial resources, increasing medication consumption directly influences the access to healthcare services, destabilizes country's budget, and endangers the margin of social sustainability (endurance). Medication consumption in world's total healthcare spending is placed third, with 17%.

This paper brings the analysis of potential control of medication consumption and the financial aspect of medication consumption monitoring aimed at the reduction of healthcare spending. The main research hypothesis is postulated as follows: "Financial monitoring of medication consumption can contribute to the

[1] The International Banking Code for BiH currency is BAM.

rationalization of medication consumption, reduction of healthcare spending, and the efficiency of the entire healthcare system." Although the paper focuses on the healthcare system in BiH, some results and recommendations can be generalized and are potentially universal, taking into consideration the recent global socio-economic events (increased share of the elderly persons in the entire population, increased number of patients with chronic diseases, increased public expenditure following the crisis in 2008, slow economic growth, and so on).

Review of Previous Research on Health-Related Spending

Medications are third most common cause of mortality in the USA and Europe, following heart diseases and cancer. Patients trust their physicians and physicians trust the pharmaceutical industry although these relations are not free from difficulties (medication testing is sometimes inadequately conducted, for example). It is expected that medication allocations are to increase in the comming years. The USA data indicate that direct costs of cardiovascular diseases would triple between 2010 and 2030, from USD 273 billion to 818 billion, while indirect costs would increase in the same period by 61%, from USD 172 billion to 276 billion (Vitezić, 2013, p. 246-251). The annual number of deaths in the European Union (EU) resulting from patients' not taking medication correctly or not cooperating with their physicians was 194,500, which costs the EU the amount of EUR 125 billion a year (Pharmaceutical Group of the European Union, 2012).

Decreased spending in healthcare requires the checks and controls of executed interventions and diagnostic and therapeutic services as well as the checks of whether they are really needed. That is why a unified system of expense list needs to be made that would include five important categories: hospitals, prescription-only medicines, diagnostic procedures, treatment costs, and home treatment costs (Ott et al., 2000).

Polić-Vižintin, Tripković, Štrban-Štok, Štimac, and Čulig (2006) analyzed healthcare indicators and non-hospital medication consumption by using the data gathered from the vital statistics and healthcare-statistics research. They concluded that in order to rationalize medication consumption, treatment should be focused on primary healthcare protection, which is why constant education of family doctors needs to be made regarding proper therapy based on professional guidelines. As specified by the EU/WHO Working Group (2008), the primary healthcare protection, as a rule, should be able to solve at least 80% of all health problems. Gajski (2009), for example, stated that most medications prescribed for the treatment of cardiovascular diseases in Croatia are actually unnecessary and serve for the medicalization of the society and the profit of pharmaceutical company with

pharmaceutical therapy costs in Croatia amounting to some HRK 7 billion, which is a waste of money.

Vlahović-Palčevski (2000) stated that the analysis of medication consumption gives us the data on the rationality of their use, indicates the segments where efforts should be made so as to improve the current situation, and tells us about therapy tradition, irrationalities, and abuse. Monitoring and analyzing medication consumption was the main reason for the development of the so called ATC (Anatomical, Therapeutic, and Chemical)/DDD (Defined Daily Dose) methodology. It was proved useful for the comparison of medication consumption at a national and international level as well as for long-term evaluation of consumption. A study conducted some 20 years ago by the Drug Utilization Research Group (DURG) showed the lack of universal methodology of medication consumption monitoring, which preceded the establishment of a unique Anatomical Therapeutic Chemical (ATC) classification system. This resulted in the introduction of defined daily dose as a statistical unit for medication consumption monitoring instead of packages, prescriptions, and financial units, which allowed for a detailed analysis of medication consumption (Čulig, 2004).

Polypragmasy (i.e. parallel application of three or more medications) is recognized as an increasingly serious problem in the existing systems of healthcare protection. It can increase the complexity of healthcare protection and its costs. Apart from the elderly persons, some groups of patients have a higher risk of polypragmasy, such as psychiatric patients and patients who constantly take five or more types of medications, patients treated by several physicians, recently hospitalized patients, patients with concurrent comorbidity, patients with lower education, visually impaired patients or those with decreased physical activity and ability in daily activities. Polypragmasy is indicated as one of the main problems in modern world pharmacotherapy and its solutions require the education of both physicians and patients.[2] Regular analysis of prescription issuance practice proved to be efficient in reducing unnecessary medications. A study in which the patients brought all the medications they use, with their physicians being given directions on polypragmasy, resulted in 42% of the patients being under the risk of polypragmasy, for 20% of them the medication use was suspended and for 30% of them the medication dose was changed. In addition, pharmacists sent the list of medications to the physicians whose patients use potentially harmful medications, which reduced the issuance of prescriptions by 12.5%. Furthermore, consulting a clinical pharmacologist reduced

[2] http://www.genera.hr/hr/36/propisivanje-lijekova/#.VbN3Z8vsZdg

polypragmasy and the number of medications from 7.9 to 4.1/1000 cases (Kašuba Lazić, 2015).

Monitoring and control of medication consumption is also important from the aspect of environment protection as medication residues are often found in the environment in small concentrations. During the procedure of authorization of a medication, most regulatory agencies specify the assessment of potential risk that a medication can make on the environment (Čogelja Čajo et al., 2010).

The amount pharmaceutical companies spend on physicians is still not precisely known. However, according to the financial reports of nine leading US medication manufacturers, this amount is estimated to be dozens of billions of US dollars a year. This actually means that the pharmaceutical industry strictly regulates the ways their medications are prescribed and this includes not only physicians but also university professors that affect research results, medical practices, and even disease definition (Angell, 2009). The research conducted by Consumers International, the international organization for consumer protection, showed that pharmaceutical companies spend twice as much on persuading physicians to prescribe their medications than on researching new medications (Republic of Serbia Anti-Corruption Agency, 2012).

In 2011, with the assistance of the World Bank (WB), aimed at increasing transparent prices of medications in BiH, a survey was made into the retail sale prices at pharmacies for 36 frequently used medications. The selected medications included essential medications used for frequent diseases (cardiovascular diseases, nerve diseases, diabetes, and respiratory diseases). The data were collected from 82 pharmacies randomly selected in eight cantons/regions in the entire BiH. It became evident that brand name medications are not common in BiH as they were registered in only 27% of the cases, which is why the data refer primarily to generic medications (WB, 2012).

Good practice in creating and managing sustainable healthcare system is evidenced by Singapore with excellent results in high quality of its healthcare system and in control of healthcare protection costs. The per capita cost of healthcare protection in that country or the cost of healthcare protection presented as the GDP percentage is lower than in all high income countries in the world. There are three crucial reasons for achieving available excellence – first of all, long-term political unity, then the ability to recognize and establish national priorities, and finally constant aspiration for collective welfare and social harmony in the country (Haseltine, 2013).

The importance of reliable data and information is confirmed by Benković (2009), who aimed at checking whether the results of the research conducted by the Croatian Health Interview Survey (CHIS) were used in planning the resources at the level of country's public health institutes. The usage of reliable data and information that serve as the basis for making fiscal and strategic decisions is the main support in healthcare management. It is also the key to strategic management that uses necessary information needed for setting the focus, selecting priorities, and establishing good "macro policy at the micro level". The results showed that only 32% of the subjects used the results of the CHIS in their plans, which led to the conclusion that such a percentage would make efficient local level planning and planned budget savings difficult to achieve. Recognizing the importance of using data such as those collected by the CHIS is an extremely important factor in local and national healthcare planning and the factor that enables significant budget savings in healthcare.

Ott, Kesner-Škreb, Bajo, Bejaković, and Bubaš (2000) underlined that even though healthcare and health insurance reform is not easy to implement, potential changes aimed at the improvement of health and healthcare are multiple while costs would be significantly lower than potential savings. The reform of the existing health insurance system directed towards higher reliance on private insurance and strengthening market elements is required for the long-term sustainability of the system. Consequently, it might reduce the excessive role of the state, limit its paternal behavior, and create the conditions for income increase.

Theoretical Framework of Medication Consumption Monitoring and its Financial Aspect, with the Focus on Bosnia and Herzegovina

Healthcare is one of the most complex systems in every country and it is a sub system of the entire socio-economic system. Its organization functionally consists of (Salihbašić, 2009):

- Primary healthcare that includes outpatient clinics;
- Polyclinics, general and specialized hospitals, specialized institutes, medical centers;
- Other institutions including public health institutes, emergency rescue teams, and pharmacies.

The main problem in this field is financing. Several models of financing are used in the world, the most known being (Salihbašić, 2009):

- The Bismarck model, which functions on the principle of solidarity and reciprocity, as is the case with BiH;

• The Beveridge model by which healthcare is financed through taxes paid by citizens (for example, Great Britain, Norway, Sweden, Ireland);
• The Semaškov model emerged in the Soviet Union and was provided for the entire population. Insurance is financed from the central state budget whereby the government is responsible for making decision on the rights and obligations of the insured persons. As a rule, this means that healthcare protection is free although there is the problem of users having excessive expectations without additional payments. Nowadays, this model is present is some Asian countries (China, Mongolia, North Korea, Vietnam) and in Cuba;
• Private financing that includes the basic insurance with the payment of additional insurance according to individual needs and purchasing power.

The cost assocated with the healthcare sector is significant from the macroeconomic point of view, so the limitation of increase in healthcare spending is particularly important as the increasing healthcare spending is a burden to both developing and developed countries. Growing costs, irrational behaviour, and dissatisfaction within the healthcare system are self-evident and the main reasons for increased spending are: increased share of the elderly persons in the entire population, increased number of patients with chronic diseases, introduction of new medications (which, as a rule, are more expensive), influence of the pharmaceutical industry, growing pressure exerted by patients and easy access to medications.

It is important to note that, while medication consumption is one of the main generators of healthcare spending, it is also the item that could be more easily controlled and rationalized. The increase in pharmaceutical costs raises the issue of possibile need for financing healthcare systems in the future. Every country should be be interested in protecting itself against uncontrolled increase of medication spending, aiming to reduce it and make it more rational. Providing the population with high quality, safe, and efficient medications that would be rationally used is only one of the basic goals of every healthcare system. Hence, one of the measures for rational spending on medications is a systematic (national) policy of medication consumption monitoring as well as creation of a unique information system that would integrate all the data relevant for medication consumption, from both hospitals and non-hospital institutions, including the data on individual medication consumption.

However, BiH has a fragmented internal organization with centralized Republic of Srpska (RS), decentralized BiH Federation (F BiH), and Brčko District, which further complicates successful conduct of fiscal policy. This leads to an unsatisfactory level of efficiency in improving country's economic growth. As reported by the WB

(2014), the potentials of BiH economy for mid-term growth are limited by poor business environment that still requires essential reforms and prevents investment and growth, with the fiscal policy still focused on the distribution of revenue rather than growth.

Healthcare and health insurance system in F BiH is, pursuant to the Constitution and legal regulations, based on the principles of shared competence between the federal and cantonal authorities. Pursuant to the provisions of Law on Healthcare[3], Law on Health Insurance[4], and other acts based on these laws, the federal government is in charge of creating the policy and adopting laws while the cantonal government implements laws and establishes and adapts cantonal healthcare policy with the policy at the level of F BiH. Cantonal public health institutes function with difficulties, healthcare spending increases while the structure of the insured persons is unfavorable.

Similar to other South East European countries, BiH has the model of social insurance with employees and employers paying contributions to the public health funds which finance the majority of healthcare services. That is why healthcare financing heavily relies on salary taxation and the capacities of tax authorities to collect payments[5]. The existing model of healthcare financing in BiH is based on the past times as the remnants of the Bismarck model. Healthcare insurance contributions were never a part of the state budget but were directly paid to health insurance funds. The contributions for compulsory health insurance are based on the taxation of the amounts registered in the pay sheet rather than by health insurance premium or general taxation.

The healthcare sector in BiH does not function on economic prices but on the solidarity system that implies that the rich show their solidarity with the poor, the young with the old, the healthy with the sick, and individuals with the family. This is what makes the total income of the Health Insurance and Reinsurance Funds which stand for the main source of funding for healthcare protection in both BiH entities. What is evident in the healthcare system is a rather non-transparent flow of resources between different non-budget funds that are supposed to pay contributions on behalf of their users (pensioners, registered unemployed persons) and the limited government contributions on behalf of some users exempt from paying contributions. Consequently, the state invests, or is supposed to invest, extreme efforts to provide as efficient healthcare protection as possible for its users with the

[3] Official Gazette of BiH Federation No. 46/10

[4] Official Gazette of BiH Federation No. 30/97, 07/02, and 70/08

[5] http://www.fmoh.gov.ba/index.php/projekt-jacanja-zdravstvenog-sektora

available resources. Even though it sounds easy, it is very difficult to implement this in practice.

Looking at the data on some financial indicators in BiH, one can notice a very high share of healthcare spending in GDP when observed in the context of the economic development of the state. Healthcare-related public spending is constantly on the increase; in 2002 it was 62.5% while in 2012 it was 71.1% of the total healthcare spending. On the other hand, social health insurance has a downward trend while private health insurance, present since 2009, has a very low percentage of 0.8% to 1% of the total health insurance. The very fact that some ten years ago, per capita spending was USD 122 and that the number increased to USD 447 in 2012 indicates that healthcare system becomes more expensive year after year.

From the traditional aspect of efficiency, safety, and quality as well as from the aspect of financial cost effectiveness, medication consumption monitoring in developed countries started 40 years ago, mainly due to the fact that the funds for these purposes are always limited and the needs are increasingly higher. A constant lack in financial resources is registered in all spheres of life and in the healthcare protection system in particular. New medications, development of medical technology, new methods of treatment, constant education and training of healthcare workers, introduction of information systems, and so on, all require additional resources that are almost always limited. The country is given a serious task – to provide additional resources when the current ones are insufficient even for the present costs of healthcare protection.

In addition, increased number of patients suffering from various diseases of modern times (such as cardiovascular diseases, cancer, diabetes) results in increased need for medications. Medication consumption has been rapidly growing for years, which is a problem threatening sustainable and stable financing of the healthcare system. A systemic approach to this problem is not evident in practice since mentioning finances in the context of health and treatment is considered inappropriate and unethical. Besides, the issue of pharmacotherapy has escalated recently, when it reached the level the society cannot bear. Moreover, medication manufacturers that are highly influential in the medical science, education, politics along with the media have no interest in putting this topic in the discussion focus (Gajski, 2009). Prescribed medications cover 10% to 20% of the total healthcare costs and are the fastest growing segment of the total spending, which raises concerns over medication consumption. In order to resolve this issue, we must first discuss the potential causes of the increase in medication consumption.

One of the reasons of increased medication consumption is definitely medication abuse which can cause various side effects, resulting in the need for additional treatment and reflecting on the increase in healthcare spending. According to the World Health Organization (WHO, 2008), in some countries the costs of medication side effects, including hospitalization, surgeries, and lost productivity, are higher than medication costs.

Also, the studies conducted on the territory of the EU showed that some 200,000 people die every year due to nonadherence (not taking the prescribed therapy or taking it inappropriately). Annual nonadherence costs in the EU amount to EUR 125 billion and they include the treatment of chronic disease complications as a consequence of not taking medications. Low adherence for the patients suffering from hypertension correlates to the increased risk of vascular diseases, hospitalization, and increased costs of healthcare protection, while a higher level of adherence for the patients suffering from hypertension results in better health of individuals and net economic profit (Dragomir, 2010). Adherence reduces the total annual healthcare spending for the patients with chronic vascular diseases by the lower number of hospital days and lower hospital costs. The effects of adherence are more evident for the patients over the age of 65 (Roebuck et al., 2011).

Very often, influenced by marketing activities of the pharmaceutical industry, patients purchase medications on their own and increasingly use alternative medicine. Consequently, medication becomes a merchandise article and medication prescription becomes a routine activity made in silence with very little written or oral information provided (Stević et al., 2011). Besides, inappropriate package of certain medications can result in increased financial spending, mainly due to the package content which does not correlate with the length of treatment. This could be easily overcome if physicians prescribed the exact quantity needed for therapy treatment and if pharmacies would supply medications per piece.

One of the specific features of BiH medication market is related to the conditions under which pharmacies function. The legal regulations, among other things, cover pharmacy margins – maximum up to 8% for wholesale and up to 25% in retail sale[6]. Very often, retail sale margins go above the highest limit and are as much as 30%. It seems that this is still not enough for pharmacists as they mainly dealt with this issue at the meeting held at the beginning of 2016. One of the suggestions was that the margin increases to the record high 40%, which is not in accordance to the legal regulations.

[6] Rulebook on Medication Wholesale and Retail Sale Margin, Official Gazette of BiH Federation No. 40/02, 50/02, 15/06, and 9/08

The Rulebook on Price Monitoring, Calculating Medication Prices and Reporting on Medication Prices in BiH[7] would be an excellent instrument for monitoring medications in BiH, which seems to be inoperative in practice. As recommended by the WB, the new rulebook on regulating medication prices is under preparation, which, if strictly followed, could lead to significant savings. Medications are cheaper in RS than in F BiH, mainly due to the centralized system of medication procurement, which allows for lower prices. Although the F BiH Government is under pressure to reduce medication costs, pharmacists are of the opinion that the government should "cut the costs" in other segments, such as waiving the value-added tax (VAT) on medications instead of reducing pharmacy margins. It was stated that some reductions would amount from 25% to 30%, which, as claimed by the pharmaceutical chambers, pharmacies would not be able to bear. Major dissatisfaction was expressed as the representatives of professional associations were not given the opportunity to comment the proposed wording of the rulebook. They clearly rejected to support the proposal that Serbia be the reference country for establishing the prices of pharmaceutical services as the prices in that country are specified through administrative procedures. The representatives of professional pharmaceutical associations agree that the medication market needs to be regulated but not by replicating the experiences of other countries without taking into consideration the specific characteristics of the medication market in BiH.[8]

Many European countries introduced a series of measures to combat the growth of pharmaceutical spending. Some of these measures include reduction of prices of pharmaceutical products, which can be achieved through negotiations with pharmaceutical manufacturers, reduction of pharmaceutical margins, introduction of quotation price, application of obligatory discount, reduction of VAT on pharmaceutical products, centralized public procurement of pharmaceutical products, promotion of usage of generic medications, increase of obligatory contribution for households, and so on. For example, as of 2010 Spain has introduced a general discount applicable to all the medications prescribed, after which it introduced the mandate for the reduction of generic medication prices, which is certainly one of the factors that explains the increase in the consumption of generic medications in that country. In Germany, the obligatory discounts for manufacturers were raised in 2011 and the prices were frozen until 2013. As of 2011, pharmaceutical companies are obliged to negotiate with health insurance

[7] Official Gazette of BiH No. 82/11

[8] The minutes of the meeting of the presidents of cantonal pharmaceutical chambers, the Pharmaceutical Association in BiH Federation, and general managers of larger pharmaceutical healthcare institutions in BiH Federation. Retrieved from http://www.farmaceutisarajevo.ba/index.php/25-obavijesti/89-sastanak-farmaceuta-u-sarajevu dan posjete

funds about innovative medications, which ended the former free pricing regime. The reduction of consumption in Italy can be attributed to a rather reduced budget for pharmaceutical products per Italian regions as well as to the reduced pharmaceutical wholesale margins and lower prices of generic medications based on quotation prices. The introduction of new obligatory public offer procedures for medication procurement in Hungary resulted in reduced costs, while in Denmark, as in many other countries, the negative trend can be explained partly due to the expiration of patents for large scale protected medications and very expensive medications (OECD & the European Commission, 2014).

Methodology of the Empirical Research: The Case of Tuzla Canton, Bosnia and Herzegovina

The sources used for this paper include the publications and statistical data of the relevant international and domestic organizations (WHO, WB, EUROSTAT, OECD, Agency for Medicinal Products and Medical Devices of BiH, Agency for Statistics of BiH, Health Insurance and Reinsurance Fund of F BiH, Health Insurance Fund of RS, Health Insurance Fund of Brčko District, Institute for Public Health of F BiH, Institute for Public Health of RS, and Health Insurance Fund of Tuzla Canton). Based on these sources, the paper presents selective and relevant macroeconomic and healthcare indicators for BiH as well as the basic indicators of healthcare financing and healthcare spending in BiH. More specifically, the focus is made on the elaboration of detailed parameters of medication related spending in the most populated BiH canton – Tuzla Canton – so as to obtain a clear view of medication consumption and its potentially influential factors. In order to achieve this, we opted for using the ten year period data (2004-2013), which allowed for the summary of the data and their comparison with the previous periods.

Results and Discussion

The medication market in BiH is worth over BAM 500 million, out of which 18% belongs to domestic medication manufacturers. The data on the leading medications in the total turnover cannot be regarded as relevant as it is known that medication consumption in BiH is not monitored by the standardized ATC/DDD methodology. Since medication prices vary and are rather different when compared to the neighboring countries, we do not have the appropriate data on the actual consumption of medications but rather the amount specified in the budget. Medication consumption in RS is monitored by the ATC/DDD methodology, which is not the case in F BiH. For example, "Pantoprazol" is the leading medication in the total turnover in BiH (some BAM 11 million) and its price in F BiH is

around BAM 15 while at the same time its price in the neighboring Serbia is BAM 3.5. The similar situation is with the frequently prescribed medications such as those for the treatment of cardiovascular diseases.

The WB (2014) also pointed to the unbalanced prices of medications in BiH in comparison to the neighboring countries, which is particularly evident for the medications for frequent diseases (see Table 1). For example, the medications for cardiovascular diseases are up to 200% more expensive than in Croatia and even more than in Serbia. The main reasons for such situation are the inefficient system of pricing and purchasing medications, a non-transparent system of pricing for individual medications as well as rather fragmented system of medication procurement which results in different prices in cantons. As stated in the report, the Ministry of Health of F BiH is not able to force the cantons to follow the regulations when they create the positive lists of medications.

Table 1. Prices of Sampled Medications in FBiH and Serbia in 2016

Ordinal number	Medication	Manufacturer	Package	Price in BAM		Price higher by %
				Serbia[9]	F BiH[10]	
1	Vesicare - *symptomatic treatment of immediate incontinence*	Astelles Pharma Europe B.V Holland	5 g (30 pills)	59	79	33.90
2	Nimulid – *painkiller*	PANACEA BIOTEC LTD. India	100 mg (20 pcs)	3.3	7	112.12
3	Letrox -*thyroid hormone*	BERLIN-CHEMIE AG Germany	100 mg (100 pcs)	5.2	8.5	63.46
4	Atoris -*cholesterol lowering medicine*	KRKA dd Slovenia	20 mg (30 pills)	8.5	14.6	71.76
5	Pantoprazol - *gastric distress treatment*	Hemofarm doo Banjaluka	40 mg (28 pcs)	3.6	15.5	330.56
6	Tritace - *ACE inhibitor*	Sanofi-Aventis S.p.A. Italy	5 mg (28 pills)	3.4	10.5	208.82
7	Lorista – *hypertension treatment*	KRKA dd Slovenia	50 mg (28 pills)	5	11	120.00
8	Roswera - *cholesterol lowering medicine*	KRKA dd Slovenia	40 mg (28 pills)	16	35	118,75
9	Truspot eye drops - *ocular hypertension treatment*	Laboratories Merck Sharp&Dohme-France	2% (5 ml)	12	20	66.67
10	Plavix – *prevention of atherothrombotic events*	Sanofi Winthrop Industrie France	75 mg (28 pills)	10.5	32.5	209.52

[9] Prices as indicated in the price list of the pharmacy "Zdravlje 2", Mali Zvornik, Serbia, May 15-June 15, 2016
[10] Prices as indicated in the price list of the pharmacy "Ibn Sina", Tuzla, on June 16, 2016

11	Trimetakor –*prevention of angina pectoris attacks*	Cipla Limited India	35 mg (60 pcs)	4.5	19.8	340.00
12	Byol – *hypertension treatment*	Lek dd Slovenia	5 mg (30 pills)	3.5	13.2	277.14

Source: Authors' research based on selected BiH and Serbian pharmacies price lists

There is no unique, state-level system of medication consumption monitoring (including commercial medications as well as those prescribed in the compulsory health insurance), except for the health spending data created by the national health accounts methodology. It is known that in 2013, the costs of medicinal devices for non-hospital patients (including medications) were BAM 711,221 million, of which public expenses amount to 43.2% and private expenses amount to 56.68%, which indicates rather high payments made by citizens for this type of medicinal devices. Analytically speaking, it is not known how much of this amount is spent on medications charged to health insurance, be they commercial or those given on prescription.

Healthcare spending of F BiH makes 10.2% of GDP, out of which a quarter, somewhat over BAM 416 million, is used for medications. Over BAM 182 million was spent on medications charged to health insurance, which makes around 11% of the total healthcare spending. On average, a citizen of F BiH spends around BAM 178, while the insured person spends BAM 90 on prescribed medications, somewhat less than in RS where an insured person spends BAM 99. The average consumption of prescribed medications per cantons in F BiH in 2013 ranged from BAM 46 in Posavina Canton to BAM 167 in Sarajevo Canton, which implies huge cantonal differences in the rights of insured persons to prescribed medications. The average consumption of prescribed medications is a relative indicator for F BiH as it is highly influenced by a huge average consumption in Sarajevo and Tuzla Cantons. Although the prices of most prescribed medications show a downward trend, the increased consumption of prescribed medications is partly caused by the facts that cantonal medication lists are harmonized with the federal essential list of medications and that some cantons have more medications on their lists than on the one made by F BiH. Although Sarajevo Canton has by 78% higher consumption of medications per insured person than Tuzla Canton, when the total healthcare spending per cantons is observed, consumption of medications as a part of healthcare spending is the highest in Tuzla Canton as it is the most populated one.

The leading cause of death in Tuzla Canton is essential hypertension (86/100,000 people). Stroke, cardiomyopathy, acute myocardial infarction, essential hypertension, cardiac arrest, and chronic heart ischemic disease make 71% of the ten leading causes of death in Tuzla Canton. In total, the population in 2013 suffered

from acute infections of upper respiratory tract, hypertension, acute bronchitis and bronchiolitis, diabetes, and spinal diseases. Diseases in the primary healthcare follow hospital treatment data in Tuzla Canton, where five leading diseases make for 56.79% of the total number of hospital days. Some of the most often prescribed medications by the ATC classification are those for cardiovascular diseases, digestive tract and metabolism, nervous system, and medications for the treatment of system infections and respiratory system, which indicates that cardiovascular diseases, metabolic disorders, and respiratory diseases are the major health problems in Tuzla Canton. In the last ten years, there has been an increase in the number of patients suffering from circulatory system diseases, diabetes, cancer, and mental disorders (Table 2). This increased number of patients causes higher healthcare costs and consequently increased medication consumption. The treatment of these diseases, except for cardiovascular diseases, requires the medications that belong to a group of more expensive medications, which is why the growth of financial spending does not come as a surprise.

Table 2. Types of Diseases and Number of Patients in Tuzla Canton

Number of patients in Tuzla Canton since	Year		Increase in %
	2004	2013	
Circulatory system diseases	47,705	75,234	57.7
Diabetes	7,488	16,952	126.4
Malignant neoplasms	1,947	4,194	115.4
Mental disorders	11,552	19,207	66.3

Source: Authors' research based on Institute for Public Health of Tuzla Canton database

Generally speaking, medication consumption increases year after year, including both commercial as well as prescribed medications charged to health insurance. The increased costs of commercial medications point to the fact that citizens invest more of their personal resources to purchase medications, even though essential lists of medications for cantons have been expanded.

Medication consumption monitoring in Tuzla Canton is administered by the Health Insurance Fund and it includes the data basis that includes the information on insured person (national ID number), medication, authorized physician, outpatient clinic where the prescription was issued, prescription, contracting pharmacy where medication was taken, date of prescription issuance and individual invoice for

medication/prescription issued by the number and date of invoice,[11] but not the ATC/DDD methodology, as recommended by the WHO.

In the period 2004-2013, health insurance expenditures constantly increased. By analogy, expenditures grew in all segments of healthcare protection, especially for the program of medications charged to the Health Insurance Fund of Tuzla Canton (HIF TC), as it is shown in Table 3. The total health insurance expenditures grew over the period of ten years by 85.55%, from BAM 244 to BAM 439 per insured person.

Table 3. Review of Financial Expenditures for the Program of Medications in Compulsory Health Insurance in the Period 2004-2013

Year	Total expenditures of HIF TC	Number of prescriptions	Expenditures for the Program of medications charged to the HIF TC	Expenditures for the Program of other medications [12]	Expenditures for the Program of prescribed medications (positive list+other medications)	Total medication expenditures (including those paid by citizens)
2004	105,790,488	1,731,657	13,393,726	355,890	13,749,616	16,664,912
2005	112,669,255	1,852,401	15,095,216	309,165	15,404,381	18,924,608
2006	126,318,607	2,328,082	22,212,764	476,627	22,689,391	28,292,882
2007	148,000,043	2,389,473	24,524,035	789,677	25,313,712	31,712,336
2008	174,941,709	2,521,478	28,227,413	955,415	29,182,828	36,078,863
2009	178,171,804	2,226,677	32,888,217	1,339,930	34,228,146	35,663,778
2010	184,048,334	2,363,402	32,881,082	1,219,381	34,100,463	37,650,112
2011	192,099,520	2,556,079	37,137,026	633,554	37,770,580	44,845,199
2012	195,954,753	2,359,443	37,863,086	869,901	38,732,987	42,403,147
2013	196,299,420	2,377,010	38,768,888	1,109,749	39,878,637	40,150,397

Source: Authors' research based on HIF TC database

Over the ten year period observed, it is evident that the largest financial expenditures refer to the medications for cardiovascular diseases (35%), digestive tract and metabolism medications (26%), and medications affecting the nervous system (16%). As specified by the second level of the ATC classification, almost 84% of the

[11] Report on the Realization of Medication Program for the period January-June 2015 (p. 4), Health Insurance Fund of Tuzla Canton

[12] Program of other medications includes: medications applied within or under the control of hospital, ampoule medications, special food for children, and priority medication program for pain relief therapy.

total expenditures on medications cover the ten leading groups of medications (Table 4), including those for the treatment of hypertension, diabetes, asthma, and so on.

Table 4. Financial Costs for Medications in the 10 Leading Groups by ATC Classification in 2013

Year 2013			
ATC	Group of medications	Amount in BAM	%
C09	Agents acting on the rennin-angiotensin system	8,766,544	22.61
A10	Drugs used in diabetes	7,328,994	18.90
R03	Drugs for obstructive airway diseases	3,407,972	8.79
N06	Psychoanaleptics	3,051,384	7.87
A02	Drugs for acid related disorders	2,209,906	5.70
J01	Antibacterial drugs	2,178,272	5.62
C07	Beta blocking agents	2,091,092	5.39
N05	Psycholeptics	1,326,363	3.42
C08	Calcium channel blockers	1,118,142	2.88
N03	Antiepileptics	1,053,397	2.72
	Ten leading groups of medications in total	32,532,066	83.91
	Year total	38,768,888	100.00

Source: Authors' research based on HIF TC database

The ten leading medications in terms of the resources charged to HIF TC make 42% of the total value and 27% of the total number of prescriptions. The most frequent medication prescribed by family doctors in Tuzla Canton is "Enalapril" for hypertension treatment with the average value per prescription of BAM 18 (Table 5). Out of ten leading medications in terms of financial expenditure, the most expensive is "Insulin glargin" (BAM 126 per prescription), which is prescribed for all types of diabetes. Within all the medications in the positive list, the medication with the highest financial value per prescription is "Ciklosporin", prescribed to patients for the prevention of transplant rejection (BAM 283 per prescription on average). These facts depend primarily on medication prices which is why the real consumption cannot be specified.

Table 5. Ten Leading Medications in 2013 Per Their Total Value Charged to HIF TC

Group	Medication	Disease	BAM charged to HIF TC	%	Number of prescriptions	%	BAM /prescription
C09	Enalapril-hidrohlortiazid	Hypertension	2,574,774	6.64	140,153	5.90	18
C10	Lizinopril-hidrohlortiazid	Hypertension	2,076,581	5.36	112,219	4.72	19
R03	Salmeterol+flutikazon	Obstructive airway diseases	1,842,592	4.75	21,715	0.91	85
A10	Inzulin aspart	All types of diabetes	1,822,633	4.70	18,286	0.77	100
A02	Pantoprazol	Gastric and duodenal ulcers	1,402,931	3.62	60,428	2.54	23
A10	Inzulin glargin	All types of diabetes	1,382,965	3.57	11,011	0.46	126
N06	Paroksetin	Depression	1,346,954	3.47	46,563	1.96	29
C07	Karvedilol	Hypertension	1,295,488	3.34	100,546	4.23	13
A10	Inzulin humani	All types of diabetes	1,214,310	3.13	18,606	0.78	65
A10	Metformin	Diabetes	1,176,392	3.03	119,034	5.01	10
	Ten leading medications		16,135,618	41.62	648,561	27.28	25
	TOTAL		38,768,888	100.00	2,377,010	100.00	16

Source: Authors' research based on HIF TC database

In 2013, the medications for the cardiovascular system made somewhat less than a half (46.81%) of all the prescriptions issued during that year and they cost almost BAM 14 million. The increased consumption is further confirmed by the fact that the expenditures for these medications in 2013 were by BAM 400,000 higher that the expenditures for the entire program of medications charged to HIF TC ten years ago. Among the ten most often prescribed medications there are seven of them for the treatment of hypertension. Some 40% of all the prescriptions realized in 2013 were for these medications, which makes 34% of the total value charged to HIF TC.

Medications for the treatment of diabetes are also an important segment of the financial consumption of medications charged to HIF TC. This is confirmed by the fact that the value of these medications grew on average by 15.5% in the period 2004-2013. These medications make 10% of the total amount charged to HIF TC and 19% of the total number of prescriptions realized in 2013. On average, every patient uses 15 prescriptions a year, with the average value of BAM 470 per patient, which is significantly higher than in 2004 when this amount was BAM 267 per patient. On the whole, medication consumption matches the morbidity data for the territory of Tuzla Canton.

Concluding Remarks

Besides a number of problems evident in the inefficient healthcare system and public spending control, irrational use of medications that directly reflects on the financial burden of healthcare system economy is one of the burning issues if not the most important one. When health spending reaches a certain level, it is difficult to return it to the previous values as it increases year after year. It is difficult to reduce health spending but it can be constantly monitored and gradually controlled.

The analysis of the data presented in the paper leads to the conclusion that the key problem of the healthcare sector in BiH is its sustainable financing which is primarily evident in the lack of appropriate system of collection of financial resources and in the lack of a transparent system for monitoring health spending. The core of the problem might be found in the way BiH is organized as a state and in its fragmentation to centralized RS, decentralized F BiH, and Brčko District, with various legal regulations that complicate successful conduct of fiscal policy. The situation is even more complicated by the fact that every entity has its own health insurance fund that operates with difficulties due to the finance-related problems but also due to accumulated arrears. In addition, serious problems of BiH healthcare system are certain inequalities in terms of exercising the right to healthcare. In the long term, the healthcare system organized in this way shall not survive; the collected resources are almost always limited while the demand for healthcare services surpasses the available funds. There are no new sources of financing and the collection of regular revenue is problematic, which means that the time has come to implement whole scale reforms aimed at improving the conditions under which the healthcare system functions. It is not yet known when these changes might happen but something can be done regardless of the fact that there is no political will at the moment for any changes. In the situations when we cannot change the existing financing models, we can start with a better control of the ways in which the collected resources are spent and medication consumption is precisely the segment of health spending which can be controlled and rationalized in a simple way.

The rational consumption of medications means giving a patient the appropriate medication in the dosage defined by the clinical and individual needs so that the patient and the society as a whole pay the lowest possible price. It is not known to what extent these principles are followed in terms of dosage specification based on patient's clinical and individual needs but the research results indicate that in BiH both the society and the patients pay medications at a too high price. Sometimes, the state itself contributes to over consumption of medications through its inactive and bad decisions in legislation and executive power. Instead of serving solely to limit the

unnecessary consumption, the laws regulating manufacture, trade and price of medications, their additions on health insurance lists, sales regime, patients' participation in the price, and marketing often stimulate consumption. The pharmaceutical industry might be seen as one of the main drives of medication consumption and its constant growth. The role of pharmaceutical industry has changed over history – while in the past the cure was sought for as many diseases as possible, it seems as if today the goal is to find as many diseases as possible for the cure.

Primary healthcare is also the segment where increased medication consumption emerges. Although the concept of primary healthcare is as a rule devised so as to unburden secondary healthcare, this seems not to be the case. Physicians in primary healthcare face crowd at their practices, work under pressure, and so on. Also, consulting clinical pharmacologists reduces over issuance of medication prescription, which consequently results in reduced expenditure for medications. Drug abuse seems to be one of the reasons for the increased medication consumption. Nowadays every home obviously has certain medications in stock, which are used at one's own opinion.

Increased financial expenditure on medication is affected by medication selling prices. While some of the surrounding countries have zero VAT rate on medications, with 17% VAT rate BiH is one of the most expensive countries in terms of medication prices. This is caused by a small market, many levies, rigid law on medicinal products and medical devices, and high pharmacy margins which directly affect patients' budgets. The Rulebook on Price Monitoring, Calculating Medication Prices and Reporting on Medication Prices in BiH would be an excellent instrument of medication control in BiH. The VAT rate is not the only reason for expensive medications in the country as medication prices generally vary in the entities, which is probably caused by the decentralized system of medication procurement. However, some medications are as much as 400% more expensive than in the neighboring Serbia, where many BiH citizens buy medications, which confirms the allocation of financial resources outside BiH borders and the potential grey market (medication smuggling). What is equally important is the need for the establishment of the unique system of medication consumption monitoring on a state level based on the ATC/DDD methodology, with the aim of gaining the real insight into medication consumption so as to identify the causes and consequences of irrational consumption. Also, constant education in the field of health economics is needed as raising awareness of the budget limitations in the healthcare system is an extremely long and difficult process for both patients and healthcare workers. This can only be

done by appropriate education of the general public, healthcare workers, creators of healthcare policies, and so on.

The presented theoretical elaboration of the problem as well as the empirical research conducted in BiH and Tuzla Canton, as the most populated BiH canton, indicate that the central research hypothesis is accepted. Future research interest might focus of monitoring medication consumption within hospital capacities, since it is not monitored analytically, in order to establish the real consumption and define potential causes of (non)increase in the use of medications charged to health insurance. Besides, it would be interesting to conduct a research into the usage of medications from the aspect of physician habits related to medication prescription, with a particular emphasis on the problems they face in their practice. One might find useful to investigate the perception and habits of the patients as those who consume medications, in order to detect important factors that influence increased demand for medications and establish the actual financial burden imposed on citizens by healthcare costs, and so on.

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