



THE ROLE OF EUROPEAN PAYMENT INDEX IN GDP GROWTH

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Abstract. This paper investigates the impact of European Payment index (EPI) on annual Gross Domestic Product (GDP) growth. Cross-sectorial stepwise regression analysis shows that EPI can be distinguished among many other social and macroeconomic indicators as it is often a repetitive indicator, adversely affecting economic growth. Investigation of European countries with different levels of development and different rates of economic growth allows generalizing and assessing the country's economic management experience. This study allows modeling a positive business environment in each individual country.

Keywords: Gros Domestic Product (GDP), European Payment Index (EPI), economy growth, late payments, small and medium sized business (SMEs).

JEL classification: O47, E42, E2.

1. Introduction

This paper examines the influence of EPI index on GDP growth (which reflects the growth of the economy), therefore it is necessary to review what problems are mostly centered on the analysis of countries' economic growth. GDP growth is discussed very widely in various aspects. Some of them are reviewed below.

Analysis of research and scientific literature reveals that perhaps the most analyzed and discussed is the influence of government expenditure on economic growth. Also there is considerable attention given to foreign direct investment (FDI), which often depends on the country's growth cycle. Export and businesses (entrepreneurship's) impact on economic growth are discussed.

The relationship between government expenditure and economic growth has long been a subject of analysis and debate. The analysis and debate are essentially about the role of government in the national economic growth. The empirical results generally support that government expenditure has an overall positive impact on economic growth and that it also shows a positive externality effect on economic development (Xiangjie 2003; Afonso, Furceri 2010; Nurudeen 2010; Dutt 2013). However, there are two major hypotheses on the influence of government expenditure on economic growth.

The Wagner hypothesis states that as the economy grows so does the size of the public sec-

tor. This is in contrast to the Keynesian view that the growth of government expenditure results in the growth of output. The Wagner hypothesis was tested for different countries and the results were quite conflicting. For example, Ghali (1997) uses vector autoregressive (VAR) analysis and finds inconsistent results that government spending has a positive impact on Saudi Arabia's per capita growth of output. Landau (1983), using a cross-section study of 104 countries, finds a negative relationship between the growth rate of real per capita GDP and the share of government consumption expenditure to GDP. Ramayandi (2003), using time series data on Indonesia for the period 1969-1999, shows that public investment negatively affects economic growth. Kormendi and Meguire (1985), using post-war data from 47 countries, find no significant relationship between the average growth rates of real GDP and the average growth rate or levels of the share of government consumption spending in GDP. However, Grier and Tullock (1989) extended the Kormendi and Meguire form of analysis to 115 countries, and showed a significantly negative relationship between the growth rate of real GDP and the ratio of government consumption to GDP (Rahman 2012). Conversely, Ram (1986) applied international comparable data of Summers and Heston (1984) for 115 countries to his theoretical model and found that the overall effect of government size on economic growth is significantly positive; Xiangjie Wu (2003) analyzed evidence from China during

1952-2000 and found a positive correlation. Sáez and García (2006) find a positive relationship between government spending and economic growth using data from the EU-15 countries (Rahman 2012).

Export of goods and services represent one of the most important sources of foreign exchange income that ease the pressure on the balance of payments and create employment opportunities (Fouad 2005). The role of exports in the economies of developing countries has been subject to a wide range of empirical and theoretical studies. The argument concerning the role of exports as one of the main deterministic factors of economic growth is not new. It goes back to the classical economic theories by Adam Smith and David Ricardo, who argued that international trade plays an important role in economic growth, and that there are economic gains from specialization. It was also recognized that exports provide the economy with foreign exchange needed for imports that cannot be produced domestically (Fouad 2005).

Research by Baldwin and Forslid (1996), Feenstra (1990), Segerstrom, Anant and Dinopoulos (1990), Grossman and Helpman (1990), and Rivera-Batiz and Romer (1991) show that exports increase total factor productivity because of their impact on economy of scale and other externalities such as technology transfer, improving skills of workers, improving managerial skills, and increasing productive capacity of the economy (Fouad 2005).

There are also many studies analyzing the role of exports in the economic growth specifically for developing countries. Most of these studies conclude that there is a positive relationship between exports and economic growth, for example, Balassa (1978 and 1985), Jung and Marshall (1985), Ram (1985 and 1987), Chow (1987), Shan and Sun (1988), Bahmani-Oskoei, Mohtadi and Shabsigh (1991), Bahmani-Oskoei and Alse (1993), Jin (1995), Levin and Raut (1997), and Khalifa Al-Youssif (1997). Also, there are large numbers of empirical studies that confirm the strong association between exports and economic growth, Shamsuddin (1999), Ngoc, Phuong Anh, Nga (2003) Crespo-Cuaresma and Wörz (2003), Srinivasan and Bhagwati (2001) (Fouad 2005).

Foreign direct investment has dramatically increased in the past several decades to become a major force in the worldwide allocation of funds and technology (Ekanayake *et al.* 2010; Reyes, Jimenez 2012).

However, many previous empirical studies on inward foreign direct investment (FDI) and economic growth in developing countries generate mixed results. But it is certain that foreign direct

investment makes several contributions to the economies of host countries. Such contributions include: (a) foreign firms are making important contributions to the technological capacity of host countries; (b) the competition, standards and knowledge of foreign markets that foreign firms bring to the domestic market can have important spillover effects; and (c) many firms in developing countries have increased their access to cutting-edge technology by purchasing technologically sophisticated firms domiciled in high-income countries (Bose *et al.* 2007; Ekanayake *et al.* 2010).

The main mechanisms for these externalities are the adoption of foreign technology and know-how, which can happen via licensing agreements, imitation, employee training, and the introduction of new processes, and products by foreign firms; and the creation of linkages between foreign and domestic firms. These benefits, together with the direct capital financing it provides, suggest that FDI can play an important role in modernizing a national economy and promoting economic development. When financial markets are developed enough, the host country benefits from the backward linkages between the foreign and domestic firms with positive spillovers to the rest of the economy (Alfaro *et al.* 2006; Iradian 2007).

Much research confirms that foreign direct investment may promote economic growth significantly in the process of development. Also increase of foreign direct investment quantity enhances economic growth only under some conditions. A less distorted market system, more stable macroeconomic environment, better human resources, export-oriented strategy, diversified economic and export structure will improve the relationship between growth and foreign direct investment in developing countries (Bengoa *et al.* 2003; Carkovic, Levine 2005; Wang 2009; Ekanayake *et al.* 2010).

How is entrepreneurship good for economic growth? This question would seem to have a simple answer: Entrepreneurs create new businesses, and new businesses in turn create jobs, intensify competition, and may even increase productivity through technological change. High measured levels of entrepreneurship will thus translate directly into high levels of economic growth (Zoltan 2006).

Depending on where a country is in its path of general economic development, it might need to strengthen the conditions for and improve the quality of entrepreneurial environment for major established firms, including the rule of law, labor market flexibility, infrastructure, financial market efficiency and management skills. Most of these

conditions are necessary to attract foreign direct investment that will provide employment, technology transfer, exports and tax revenues. A strong commitment to education at both the secondary and tertiary levels is necessary (Zoltan 2006).

Less developed countries need to strengthen their small and medium sized sector, before focusing on the entrepreneurial framework conditions, since this is the first step toward development (Parker 2004, 2013; Zoltan 2006).

Underdeveloped countries should be focused on bringing in foreign direct investment that would employ people leaving agriculture and self-employment. A strong commitment to education and training, both at the elementary and secondary levels are important (Parker 2004; Zoltan 2006).

Developed economies need to strengthen technology transfer, make early-stage funding available, and support entrepreneurial activity at the state, corporate and educational levels, especially at the university level. Entrepreneurial activity in developed countries needs to focus on high value-added, high technology, innovation and technology commercialization (Carree *et al.* 2002; Zoltan 2006).

Empirical evidence surveyed in the research of Carree (2002) suggests that those countries that have experienced an increase in entrepreneurial activity have also enjoyed higher rates of growth. Entrepreneurship generates growth because it serves as a vehicle for innovation and change, and therefore as a conduit for knowledge spillovers. Thus, in a regime of increased globalization, where the comparative advantage of modern economies is shifting towards knowledge-based economic activity, not only does entrepreneurship play a more important role, but also the impact of that entrepreneurship is to generate growth (Wenneker, Thurik 1999; Audretsch, Thurik 2001; Carree 2002).

Although scientists analyze a broad range of issues related to economic growth, most of them, as can be seen from the analysis of literature, agree that a successful businesses with a good health may be particularly important for economic development.

There are no studies that are carried out on influence that EPI index has to GDP growth. The main goal of this article is to test influence of EPI index on GDP growth. In the analysis the growth of GDP in EU countries during period 2001-2012 will be used.

2. EPI index and its importance to EU businesses

The European Union is becoming more homogeneous and new countries are joining. It is very important to understand all the factors that influence the growth of GDP in EU countries. One of the factors having an influence on GDP is the position of the business market countries, especially small and medium sized business (SMEs). Good health of SMEs is important and it is revealed by EPI index.

Intrum Justitia, Europe's leading provider of Credit management services, carries out a written survey in 28 European countries on an annual basis involving several thousand companies. The results of the survey are published in European payment Index report and the country reports. This independent pan-European survey discovers the true extent of late or non-payment of invoices for goods and services and how EU businesses, large and small, are coping. Called the Intrum Justitia European Payment Index (EPI) 2011, the survey measures business sentiment among 6000 companies in 25 countries and calculates the payment index (EPI) (Intrum Justitia 2012).

The index is based on assessments from the companies surveyed. The data forming the basis of the index is generated yearly using a standardized written panel survey. The list of basic data includes: Contractual payment terms (in days); Effective payment duration (in days); Age structure of receivables (DSO); Payment loss (in %); Estimate of risk trends; Characteristics of the consequences of late payment; Causes of late payment.

The European Payment Index (EPI) is calculated by Intrum Justitia every year from eight differently weighted sub-indices, which are based on a total of 21 individual values. The index express payment risk between business units in particular countries.

Values of the European Payment Index is as follows:

100 – No payment risks, cash on delivery, prepayment, no credit

101-129 – Low risk profile, stay alert to keep this profile

130-149 – Medium risk profile, intervention necessary, take action now.

150-169 – High risk profile, take immediate actions to lower the risk

170-200 – Emergency risk profile.

High EPI index (and high payment risk between business) shows that there are many delayed (late) payments in the businesses of the country. Such situation is most dangerous to

small and medium businesses, which encounter liquidity problems. Europe's small and medium sized businesses (SMEs) are the lifeblood of the European economy. According to the European Commission, SMEs provide two out of three jobs and serve as the driving force for growth, job creation and innovation by providing 85 % of net job growth across Europe (Intrum Justitia 2012). Situation of EPI index in EU countries in 2012 is shown in Fig. 1.

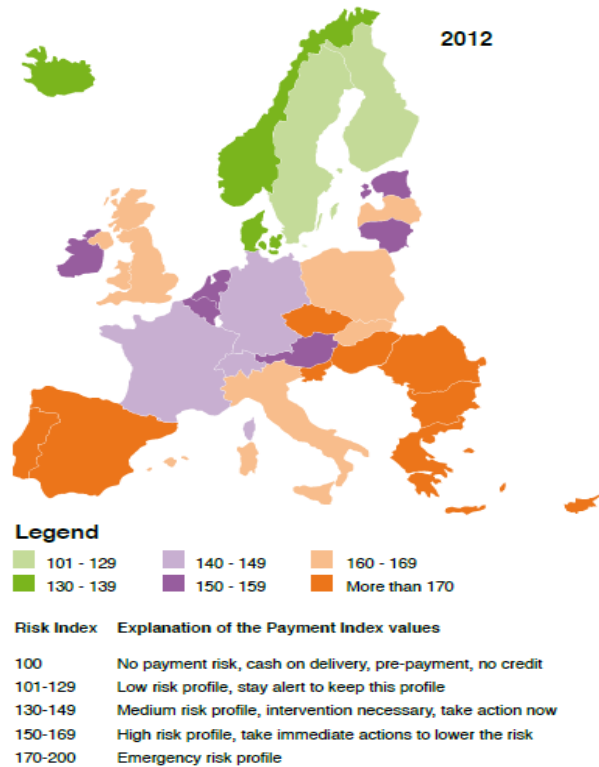


Fig. 1. EPI index in European Union countries (source: Intrum Justitia 2012)

Gross domestic product (GDP) growth rate in the Euro Area is reported by the Eurostat. From 1995 until 2013, Euro Area GDP Growth Rate averaged 0.4 percent reaching an all time high of 1.3 percent in March of 2000 and a record low of -2.8 percent in March of 2009.

The general consensus is that 2.5-3.5% per year growth in real GDP is the range of best overall benefit; enough to provide for growth of corporate profit and jobs yet moderate enough to not incite undue inflationary concerns.

GDP is the most important macroeconomic indicator that reflects the state of economic growth. This is the most popular economic indicator for economists, investors, and politicians. GDP refers to the total economic value created. It includes all of private and public consumption, government outlays, investments and exports less imports that occur within a defined territory.

GDP is defined as follows:

$$GDP = C+G+I+NX$$

where:

"C" is equal to all private consumption, or consumer spending, in a nation's economy;

"G" is the sum of government spending;

"I" is the sum of all the country's businesses spending on capital;

"NX" is the nation's total net exports, calculated as total exports minus total imports. (NX = Exports - Imports).

3. Selected factors

We choose GDP for the analysis in this study, because it is commonly used as an indicator of the economic health of a country, as well as to gauge a country's standard of living. Critics of using GDP as an economic measure say the statistic does not take into account the underground economy – transactions that, for whatever reason, are not reported to the government. Others say that GDP is not intended to gauge material well-being, but serves as a measure of a nation's productivity. However, as an aggregate measure of total economic production for a country, GDP represents the market value of all goods and services produced by the economy during the period measured. The GDP is an extremely comprehensive and detailed report. It is by far the most followed, discussed and digested indicator out there – useful for economists, analysts, investors and policy makers.

Influence. All the earlier research has shown that late payments (and EPI index) have strong influence on business competitiveness. It is crucial for every company to be able to meet its obligations. Otherwise, it loses credibility and the ability to compete in the market (Kancerevicius 2006). A company's financial condition and operating results depend on solvency, furthermore, solvency also determines the company's further development, prospects, tactics, strategy, investment decisions and its image in public. A company that is insolvent is unable to maintain healthy relations with the other market participants (Jagminas, Kalčinskas 1999; Susnienė, Sargūnas 2009; Šmaižienė, Jucevičius 2009).

Furthermore, companies do not function in a vacuum. Every company interacts with other business participants – clients, creditors, suppliers, etc., and has influence on other market participants. If late payment situation is critical in a certain amount of companies in the country, it could affect the whole economy and its growth. Earlier research and experience of the credit management companies shows that almost all companies in

growing economic countries have late debts that must be trusted to professional debt collection companies or courts (Grigonytė 2012).

Also previous research and practice of credit management companies show that delayed receivables impede a payment cycle in businesses, because small and medium sized companies cannot pay fully to their suppliers and partners if payments from clients are not received. Consequently there is a chain reaction that increases insolvency of market participants.

After logical comparative analysis it is clear that theoretically the EPI index can have an influence on the GDP and its growth almost through all arguments of the GDP function shown above, directly or indirectly. Bad late payment situation in the market, especially for small and medium business, can have negative impact on country's business spending on capital. Also high EPI index can influence exports and imports. And finally, critical situation in the business market can indirectly affect private consumption.

These insights leads to this study, which has to estimate the influence of EPI index on GDP growth in European Union countries. Earlier research revealed that EPI index has influence on certain macroeconomic and social indicators in the economy of Lithuania.

Also, in the step wise analysis the macroeconomic and social factors that strongly influence the growth dynamics of the EU countries are used.

The macroeconomic factors selected for the analysis are:

- Harmonised Index of Consumer Prices (HICP) (2005 = 100) - annual data (average index and rate of change). HICP is a consumer price index which is compiled according to a methodology that has been harmonised across EU countries. It measures changes in the price level of a market basket of consumer goods and services purchased by households.

- export unit value index (2000=100). Export influence was described earlier in this chapter.

- international investment position - annual data. International investment can lead to sustained economic growth and has an influence on GDP

Social factors selected for the analysis are:

- people at risk of poverty or social exclusion. Abbreviated as AROPE, refers to the situation of people either at risk of poverty, or severely materially deprived or living in a household with a very low work intensity. At risk-of-poverty are persons with an equivalised disposable income below the risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income (after social transfers). This ratio directly shows social welfare.

- total expenditure on social protection, Euro per inhabitant. Total expenditure on social protection is one of the main statistics in social protection. Expenditure on social protection contains: social benefits, which consist of transfers, in cash or in kind, to households and individuals to relieve them of the burden of a defined set of risks or needs; administration costs, which represent the costs charged to the scheme for its management and administration; other expenditure, which consists of miscellaneous expenditure by social protection schemes (payment of property income and other).

- GINI coefficient. It measures the extent to which the distribution of income or consumption expenditure among individuals or households within an economy deviates from a perfectly equal distribution. Gini coefficient is commonly used as a measure of inequality of income or wealth.

- Income quintile share ratio. It is the ratio of total income received by the 20 % of the population with the highest income (top quintile) to that received by the 20 % of the population with the lowest income (lowest quintile). Income must be understood as equivalised disposable income.

- Unemployment rate, annual average, %. Unemployment and GDP are closely related indicators: the more workers, the more products and services the economy can produce.

4. Cross-sectorial stepwise regression analysis

For investigation of EPI impact on GDP growth we used eurostat.eu annual data for the years 2001-2012. Stepwise regression analysis was performed using *RkWard* statistical program.

Our aim was to investigate all countries of the European Union, however, there are some problems to get all the data from one source according to a unified methodology. Bulgaria, Romania and Slovenia have only one EPI value. The level of regression equation significance is $p < 0.1$. Significant equation was not found for Slovakia, Belgium and Italy.

First, in order to avoid collinearity, correlation coefficient matrix is obtained by *RkWard* for data of each country and the condition of correlation coefficients ($r_{x_{ij}} < 0,7$) is checked.

After this check is performed, all the necessary conditions have been investigated for the 19 countries.

In the first step, the linear equations are found between GDP and each factor separately. The factor k with lowest p -value is selected. In the second step regression equations are found between the GDP, factor k and the each other factor. Again element with smallest p is selected. The action se-

quence is repeated until the equations $p < 0.1$ and the equation remains significant.

Stepwise regression analysis made for each separate country produces the result – linear equations for each country.

$$Y = a_0 + b_1 x_1 + b_2 x_2 + \dots + b_n x_n + [\quad (1)$$

where:

a_0 – intercept of equation;

b_i – coefficient of liner equation, representing factor i

x_i – variation of factor i ;

[– random variable, the deviation from real value.

Linear regression equations for several countries leads summarize separate factors and find regularities.

Multiple regression equations list the set of factors that most strongly influence the growth dynamics of a single country. Different countries have different sets with different number of factors. Coefficients of equations are presented in Table 1. An empty box means that no significant factor is found.

Multiple regression equations significance level p , F statistic, degrees of freedom and Determinant R square are presented in Table 2.

Analyzing the multiple regression equations we can see that for almost all countries, the main set of factors includes the EPI factor. This index is very new – the data is only available from year 2004. It reflects the business environment in the country. EPI relevance with GDP growth is shown in Fig. 1. But impact is not very significant.

Table 1. a - intercept of equation; b1 - people at risk of poverty or social exclusion; b2 - total expenditure on social protection, Euro per inhabitant; b3 - GINI coefficient; b4 - Income differentiation ratio (20/20); b5 - Unemployment rate, annual average, %; b6 - HICP (2005 = 100) - annual data; b7 - export unit value index (2000=100); b8 - international investment position - annual data; b9 – European payment index.

Country	a	b1	b2	b3	b4	b5	b6	b7	b8	b9
Latvia	28.27		-0.06			-1.05	-1.93		0.45	-0.57
Estonia	80.17	-1.86	-0.05			0.70	-1.06	1.53		-0.85
Lithuania	-34.99		-0.02					0.56	1.05	0.03
Poland	251.40				-10.31	0.92	-1.32	0.04	0.00	-1.23
Austria	178.30		0.01				4.68	-1.46		-0.80
Sweden	95.05			-13.71	21.85			0.14	0.00	1.04
Germany	-120.60						3.92	-0.54	0.00	0.96
Ireland	49.00				-5.82	33.37		0.82		-0.18
United Kingdom	-22.64	3.63	0.00		-4.69				0.00	-0.40
Denmark	-35.99	-1.45			-17.44	2.22	-1.86		0.00	0.81
Finland	128.42	5.73			-74.89	-7.03				0.82
Czech Republic	-19.70	1.89				-1.18				
Netherlands	224.70	3.20	0.00		-24.33	-1.99				-1.04
Spain	-128.00	5.91		0.20		-2.29	-2.70	0.16	0.00	-0.05
Hungary	278.70			4.02	-14.21		0.22	1.23	0.00	-3.13
Cyprus	-17.73	1.37				-1.18	1.32	-0.08	0.00	
Portugal	-64.84	0.69				0.00	2.34	-0.39	0.00	0.38
Greece	-65.82		0.00	2.63			-0.84	-0.44	0.00	-0.09

Table 2. Main data of GDP growth, EPI and regression equation significance

Country	GDP growth rate	EPI	Regression equation coefficient b(EPI)	Degrees Of freedom	P	F statistic	R square
Latvia	5	160	-0.568	6--1	0.0861	78.6387	0.9979
Estonia	3.9	153	-0.8519	6--1	0.0093	6861	1
Lithuania	3.7	159	0.02655	4--4	0.0454	9.8013	0.9289
Poland	1.9	164	-1.232	6--1	0.0239	1028.485	0.9998
Austria	0.9	153	-0.7969	4--1	0.0157	2291.499	0.9999
Sweden	0.9	129	1.043	5--3	0.0683	7.1379	0.9225
Germany	0.7	147	0.9606	4--4	0.008	18.0356	0.947
Ireland	0.2	154	-0.1825	4--4	0.0472	20.4148	0.9761
United Kingdom	0.1	161	-0.396	5--1	0.037	419.5088	0.9995
Denmark	-0.4	137	0.805	6--2	0.0451	21.508	0.9847
Finland	-0.8	126	0.8231	4--4	0.0615	5.6236	0.849
Netherlands	-1.2	153	-1.036	5--1	0.0029	68628.33	1
Spain	-1.6	170	-4.87E-02	7--1	0.0425	327.8536	0.9996
Hungary	-1.7	170	-3.134	6--1	0.0893	73.0336	0.9977
Cyprus	-2.4	175		5--2	0.0394	24.6817	0.9841
Portugal	-3.2	190	0.3784	6--2	0.0826	11.4273	0.9717
Greece	-6.4	190	-8.59E-02	6--1	0.0079	9357.18	0.9999

More informative are the coefficients b₉ (EPI). In Fig. 2 we can see that in many countries, the EPI growth has negative influence on GDP growth. And only Sweden, Germany, Denmark and Finland – countries with a long tradition of business and a good business climate, are able to avoid a negative impact. These countries did not experience rapid GDP growth and did not undergo

recession, their GDP growth was contained in an interval (-0.5; 0.5). Rapidly growing countries, such as Latvia, Estonia and Poland, have negative EPI impact. A better business environment in these countries can lead to even more rapid GDP growth. Countries with big economic problems, such as Hungary, show large negative impacts of EPI dynamic.

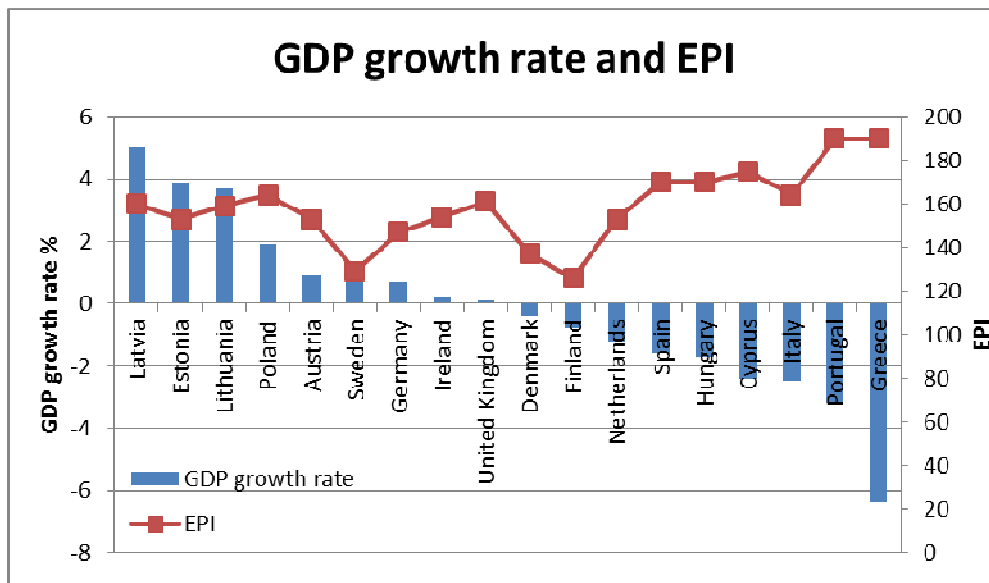


Fig. 2. GDP growth rate and EPI in 2012 (source: compiled by authors)

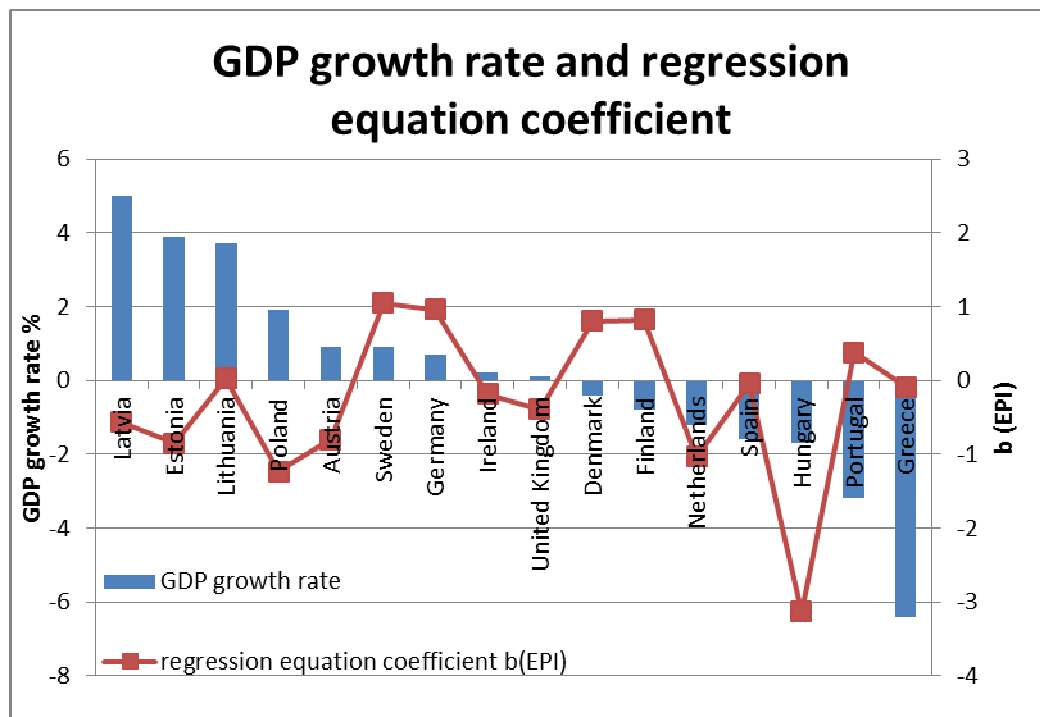


Fig. 3. GDP growth rate in 2012 and regression equation coefficient for EPI factor (source: compiled by authors)

5. Conclusions

The EPI index measures the risk of late payments in business, and is very important to investors and foreign newcomers to the business market, as well as for creditors and the reputation of the business market as a whole. The EPI index (and late payments) has a huge influence on small and medium businesses, which is the lifeblood of EU economies. Situation in businesses market can affect economic growth through employment, technological change and innovation, its production, finance market.

The situation of late payments in different EU countries varies depending of the stage of economic development. In the EU economies where EPI index is high, almost every small and medium business company has bad debts that need professional supervision. It affects whole business market, and good health of the businesses is important in order to maintain good economic results.

European payment index is an important factor in the set of factors that influence the growth of GDP. Of the 18 countries for which we have found a significant regression equation, 16 have EPI as one of their significant factors.

For many European countries EPI index change is opposite to the change in GDP growth rate (9 against 16). Problems with payment between companies negatively impact the economics of the country. Countries, which has low EPI – 101-129 and 130-149 – has environment of business, which has positive impact to growth of GDP rate. EPI index that is this low shows good

debt situation in businesses and good businesses health.

Reasonably we can conclude, that governments of the countries that has high EPI index should pay more attention to business environment and especially to the situation of bad debts in businesses.

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