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IMPACT OF THE EUROPEAN PAYMENT INDEX ON KEY MACROECONOMIC AND SOCIAL INDICATORS OF A COUNTRY

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Abstract. The EPI (European Payment Index) reflects the debt risk of corporations in each EU country. This index is widely used for evaluation of the ability of a business to settle with market participants. This article seeks to identify the impact of the EPI on national macroeconomic and social indicators in order to assess the impact made by late payments among business units on the economy of Lithuania. The findings reveal the macroeconomic and social indicators that are most affected by the EPI. Correlation and regression analysis helps to find causal relationships and allows the risks of financial processes in enterprises to be assessed; to reform the national tax system responsibly; and to find appropriate financial instruments to manage late payment threats.

Keywords: European Payment Index, delayed receivables, late payments, GDP, economic indicators, social indicators.

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JEL Classification: D6, E2, E3.

1. Introduction

As most European national economies struggle to find a way out of the prolonged recession, Europe's embattled business owners are experiencing hard times.

For many businesses in most countries across Europe, the liquidity situation is currently severe, demonstrating a dramatically increased likelihood of a rapid rise in firms that may go bankrupt due to lower sales, accumulating late payments and high costs. Liquidity problems are clearly emerging subsequent to years marked by great losses of income arising from late payments and global recession (Bryan *et al.* 2002; Kaleininkaitė, Trumpaitė 2007; Intrum Justitia 2012).

Every year, *Intrum Justitia* – one of the largest credit management groups in Europe – carries out what is possibly the largest independent pan-European survey to discover the true

extent of late or non-payment of invoices for goods and services and the ability of large and small EU businesses to cope. In 2011, the European Payment Index (EPI) by *Intrum Justitia* measured the business sentiment of 6000 companies in 25 countries and calculated the EPI.

The latest survey revealed the increase in the suffered written-off debt amounting to 2.8% of total receivables, which has reached the unprecedented level of EUR 340 billion and equals to the total debt of Greece or one-third of the total annual healthcare spending across EU-27 or amounts to more than double of 2012 EU budget of EUR 147 billion (Intrum Justitia 2012). Although the EPI of Lithuania is one of the highest in the EU, the impact of late payments on the national economy should be evaluated.

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. Solvency indicates the company's ability to meet its short-term liabilities (Kancerevyčius 2006; Jasienė, Laurinavičius 2009; Morellec *et al*. 2012). 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, its image in public, etc. An insolvent company is unable to maintain normal relations with other market participants. Therefore, it is clear that solvency is a necessary condition for the existence of firms (Jagminas, Kalčinskas 1999; Susnienė, Sargūnas 2009; Šmaižienė, Jucevičius 2009). In broad terms, a company's solvency is defined as a potential ability to pay off liabilities using available instruments (Juozaitienė 2000; Mortensen 2009; Drehmann, Nikolaou 2013). Sometimes, it is defined as the ability to pay taxes (liabilities) (Buračas, Svecevičius 1994; Rutkauskas *et al.* 2009; Rutkauskas *et al.* 2007). This definition of solvency is rather inaccurate as it does not show commitments to be covered by a company and the kind of funds to be used. Therefore, it is better to describe solvency as a company's ability to pay using existing means and its short-term and long-term liabilities to partners, banks, tax authorities and other institutions (Gronskas 2005).

Payment means for businesses are money and their equivalents, such as short term receivables, reserves, consumables, purchased goods for resale, contracts in progress, prepayments and other current assets (short-term investments, fixed deposits, etc.) These means of payment can be used to pay short term and long term liabilities (Mackevičius 2007; Tamošiūnienė, Savčiuk 2007). Solvency management is essential for a company in order to ensure the success of its business and reputation. Companies are rated according to their reputation and financial statements by other market participants, banks and other financial institutions as well as shareholders. Consequently, reputation plays a key role in providing information about a company. In a world full of uncertainty, reputation became the cornerstone (Šmaižienė, Jucevičius 2009; Bryan *et al*. 2002).

Reputation is the entity that generates the reliability of a company and credibility assessment based on the company's actions in the past.

In pursuit of high performance, an organisation tries to follow strategies and objectives aiming to ensure the satisfaction of shareholders (Susnienė, Sargūnas 2009).

It should also be noted that when evaluating a company, other market participants are mostly interested in short-term cash flow. Therefore, an unfavourable situation with unpaid bills can cause distrust in the company.

The scientific literature suggests that value maximization should be one of the most important goals for a company. Value of a company is particularly interesting to researchers and economists. In scientific literature, it is defined as the best indicator of company's performance and includes factors reflecting both the internal situation of the company and its external environment (Kazlauskienė, Christauskas 2008).

Therefore, the value of a company is closely related to its solvency and reputation. Empirical studies confirm that financial indicators – especially liquidity and solvency – are remarkably informative measures that can predict the collapse of a company (Boussanni 2008; Ponikvar *et al.* 2009; Vatavu 2013; Fall, Viviani 2013). Consequently, the ability to pay suppliers and partners in time is of utmost importance. Otherwise, a company may become insolvent, which may lead to distrust by market participants, thus damaging the situation of the company even further.The need to determine payment risk when assessing the solvency of the entire market is evident.

On the international level, the European Payment Index (EPI) is one of the most widely used means for determining the ability of a business to pay other market participants in time. The index is calculated by *Intrum Justitia OY*, one of the largest credit management groups in Europe.

The EPI is calculated on the basis of a survey of market participants in Europe. Various market participants use the index for market evaluation on national and international levels. The EPI shows the amount of delayed receivables in the market together with the risk of late payments in the country. However, there are no researches made concerning the influence of the EPI on specific macroeconomic or social indicators.

This particular research hypothesises that the growth of the EPI makes unfavourable impact on macro-economic and social indicators of the country.

Although data on the EPI are limited, they are sufficient to obtain a reliable result.This study aims to identify the impact of the EPI on macro-economic and social indicators of the country in order to assess the impact made by late payments among business units on the economy of Lithuania.

2. European Payment Index, macro-economic and social indicators

The harsh reality of doing business in today's austerity-driven environment is reflected in the 2012 European Payment Index (EPI) by *Intrum Justitia*, which includes three new EU member states, Bulgaria, Romania and Slovenia. Compared to last year's survey, the latest *Intrum Justitia* EPI reveals a 4% leap in debt write offs to 2.8% of total receivables. If we include the three new countries added to the 2012 survey, the pan-European

write-off percentage increases to a total 3%, an 11% rise over the 2011 figures (Intrum Justitia 2012).

Some 57% of the respondents to the Intrum Justitia EPI survey of business sentiment admit to suffering liquidity problems due to late payment. Representing the entire spectrum of European business activity, a vast majority – 70% – of the 7,800 respondents believe they are not getting the legislative support they need to protect their business from the risk/harm of late payment. The threat posed by late payments is not just about the survival of tens of thousands of firms and hundreds of thousands of jobs across Europe, it also touches the social fabric of the European continent.

Most at risk from liquidity problems are Europe's small and medium sized business (SMEs), which 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).

The payment index is used to compare the magnitude of bad debt in different regions and economies. Alongside technical financial figures, 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. Every year, *Intrum Justitia* calculates the European Payment Index (EPI) from eight differently weighted sub-indices, which are based on a total of 21 individual values. The index expresses the payment risk between business units in particular countries.

The values of the European Payment Index are as follows:

− 100 – no payment risks, cash on delivery, pre-payment, 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.

Each country surveyed has been given an individual risk profile. The profile shows the basic criteria for the overall assessment of payment risks (Payment Index). The EPI has been calculated for Lithuania as well. According to Fig. 1, the risk profile of Lithuania dropped slightly during the last year. However, it still remains high in terms of payments made among business units. As already mentioned, late payments can affect small and medium business, which can negatively influence the whole economy. Therefore, it is important to estimate the potential influence of the EPI on the economy of the country.

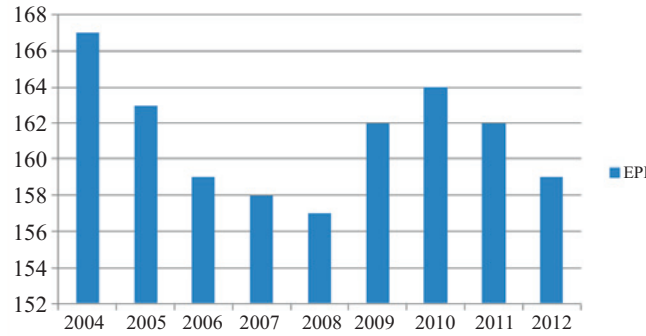

Fig. 1. EPI of Lithuania for last five years
(Source: created by the authors based on *Intrum Justitia* 2004–2012)

Since Gross Domestic Product (GDP) is the main indicator that shows the level of economic development and growth, it was selected as the main factor influenced by the EPI. The influence of the EPI on Lithuanian GDP is shown using the main macroeconomic indicators. In addition, the main social indicators were chosen for analysis to determine the influence of the EPI on social welfare of the country.

The macroeconomic indicators selected for research are:

− real GDP growth rate – volume;

− HICP (2005 = 100) – annual data (average index and rate of change);

− export unit value index (2000 = 100);

− international investment position – annual data.

Gross domestic product (GDP) is the most important macro-economic 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.

The *Harmonised Index of Consumer Prices (HICP)* is a consumer price index 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 influences GDP and economic welfare on a high level. The greater the export activity, the more business the country is receiving from other countries. When export activity is rising, it is likely to drive real GDP growth.

International investment can lead to sustained economic growth and has an influence on GDP. International investments can help to find complex solutions to economic, social, political and environmental problems.

Used by economists and politicians, these main economic indicators show the economic situation and growth in Lithuania. It is important to understand the influence of the EPI on these indicators.

However, macro-economic indicators do not necessarily reflect the quality of life of the population. For this purpose, the authors of the article have also considered social indicators. The chosen indicators are important in today's world as they show social welfare as well as reflect the economic conditions of life. Social indicators selected for research are as follow: people at risk of poverty or social exclusion; total expenditure on social protection, Euro per inhabitant; GINI coefficient; income quintile share ratio; unemployment rate, annual average, %.

At risk of poverty or social exclusion (AROPE) refers to the situation of people either at risk of poverty, or severely materially deprived and 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 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 index* 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, 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.

The *unemployment rate* and GDP are closely related indicators: the more workers, the more products and services the economy can produce (Eurostat 2013).

To understand the strength of impact made by late receivables on the Lithuanian market, it is important to understand the extent of impact the EPI has on the main social indicators mentioned above.

The following chapter will continue to describe methods and data used during the research.

3. Data and methods used

The authors of the article chose the method of stepwise regression analysis because its parameters have a clear economic interpretation. In general, the linear regression model can be written as

$$Y = a + bx + \varepsilon, \quad (1)$$

Where Y is the dependent variable; x – explanatory variable; a and b –parameters to be found; ε – random variable, the deviation from real value.

Once the regression equation was defined, the authors tested its significance and validated the equation ant its parameters. Fisher's F-test was used. It was considered that the significance level of 0.05 indicated a very significant dependence, 0.1 – significant dependence and $p > 0.1$ – negligible dependence.

The study was carried out in several stages:
− the analysis of relations between EPI end macro-economic indicators;
− the analysis of relations between EPI and social indicators;
− testing of significance and validation.

Data on economic and social indicators was taken from www.eurostat.eu and covers the period 2005–2012.

4. Influence of the EPI on macroeconomic and social indicators of Lithuania

With the help of *RkWard* statistical program, the stepwise regression analysis was performed between separate macro-economic and social indicators and the European Payment Index.

The Fig. 2 below presents the correlation matrix plot made using *RkWard* statistical program.

Variations: var – GDP Growth rate; var 1 – People at risk of poverty or social exclusion; var 2 – Total expenditure; var 3 – Income differentiation (20/20); var 4 – GINI coefficient; var 5 – Average annual unemployment rate; var 6 – HICP (2005 = 100) – annual data; var 7 – export unit value index (2000 = 100); var 8 – International investment position – annual data; var 9 – European Payment Index (***: $p < 0.001$; **: $p < 0.01$; *: $p < 0.05$; ',": $p < 0.1$).

Pairwise correlation analysis using Pearson method was made using *RkWard* statistical program. Fig. 2. shows the correlation matrix plot for each parameter pair. Highly significant correlation ($p < 0.001$) was found between GDP growth rate and the total expenditure – 0.930; export unit value index (2000 = 100) – 0.952 and international investment position annual data – 0.967. Also, the total expenditure had a highly significant correlation with export unit value index (2000 = 100) – 0.883 and international investment position annual data – 0.964. Export unit value index (2000 = 100) correlated with International investment position annual data (2000 = 100) (0.914). For a fast-growing country as Lithuania, a significant correlation between these indicators

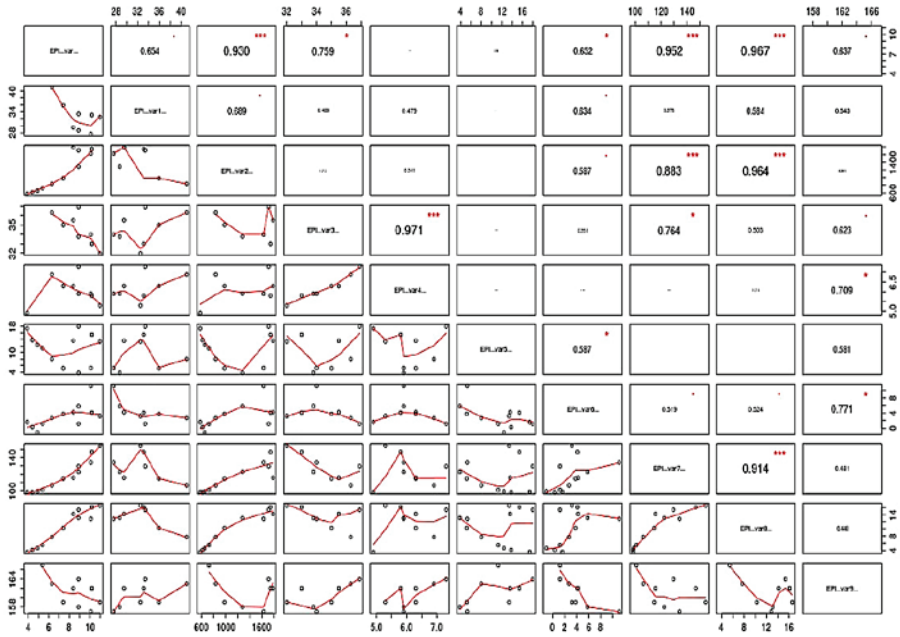

Fig. 2. Correlation matrix plot, made using *RkWard* statistical program
(Source: created by the authors)

looks very natural. Increasing exports and increasing foreign investment could be the key growth factors. While the relationship between GDP growth rate and social spending reflects the Government's desire to use the budget increase for social purposes. The strong relationship between income differentiation (20/20) and GINI coefficient (0.971) is self-explanatory because it reflects social differentiation and social inclusion of people.

Significant correlation ($p < 0.05$) was found between GDP growth rate and income differentiation (20/20) (0.759) and HICP (2005 = 100) annual data (0.652). Correlation between income differentiation (20/20) and export unit value index (2000 = 100) was 0.764; and between unemployment rate annual average and HICP (2005 = 100) annual data – 0.587. The European Payment Index correlated with GINI coefficient (0.709) and HICP (2005 = 100) annual data (0.771). A detailed explanation of these relationships requires a deeper study.

RkWard statistical programme calculates the coefficients a and b, assesses their standard error, performs the F-test and assesses the probability with which this result is significant (Table 1).

If parameter $a > 0$, the result of the explanatory variable becomes significant more slowly than the factor of change. In other words, the variation (coefficient of variation) of result is less than the variation factor. In this particular research, all macroeconomic indicators – GDP growth rate, HICP, export unit value index, international investment position – have parameters $a > 0$, which means that this index changes more slowly than the EPI. Social indicators, on the contrary, have the parameter $a < 0$, except for the total expenditure.

Table 1. Regression analysis of the EPI impact on macro-economic and social indicators (Source: created by the authors)

Rate or index	a	b	Std. error (degrees of freedom) regressions	Durbin Watson statistic	P value for equation	F stat (degrees of freedom)
Real GDP growth rate – volume	67.5973	–0.3665	1.5337(7)	0.82	0.0652	4.7709 (1 and 7)
People at risk of poverty or social exclusion	–115.05	0.92	3.938(6)	0.56	1.64E–01	2.5133 (1 and 6)
Total expenditure, Euro per inhabitant	7519.99	–38.29	454.25(6)	1	0.4847	0.5543 (1 and 6)
GINI	–30.5098	0.4054	1.4082(6)	0.08	0.0987	3.8133 (1 and 6)
Income differentiation 20/20	–22.22	0.17717	0.4873(6)	0.78	0.0487	6.0808 (1 and 6)
Unemployment rate, annual average, %	–136.41	0.9109	4.4051(7)	0.60	0.1006	3.5729 (1 and 7)
HICP (2005 = 100) – annual data (average index and rate of change)	119.1225	–0.7132	2.0377(7)	0.26	1.51E–02	10.2347 (1 and 7)
Export unit value index (2000 = 100)	557.19	–2.681	16.8699(7)	0.88	1.90E–01	2.1103 (1 and 7)
International investment position – annual data	98.8117	–0.5359	3.6968(7)	0.53	0.2267	1.7562 (1 and 7)

The calculated b parameters reveal that with the growth of the EPI, all economic indicators fall except for indicators of poverty and social exclusion, and the unemployment rate, which are rising.

4.1. Testing of significance and validation

RkWard software provides a number of reliability parameters of the regression equation: standard error, residual standard error, multiple R squared, adjusted R squared, F statistics, P value, degrees of freedom. The program also provides individual coefficients and the accuracy of the parameters: standard error, t value and P value. The authors of the article used the equation parameters and the assessment of the overall equation. As the EPI has been calculated only since 2004, there isn't much data available; however, it is sufficient to obtain a reliable regression equation with one variable.

According to Fisher's F-test, when the significance level is 0.05, the dependence of HICP and income differentiation (20/20) on the EPI is very significant; while with significance level of 0.1, the dependence of GDP, GINI and unemployment rate on the EPI is significant. Dependence of the poverty rate, total expenditure on social protection, export unit value index and international investment position on the EPI is negligible, because $p > 0.1$.

The Durbin Watson statistic was calculated: when it is in the range between 0.5 and 3.5, the serial correlation is indeterminate. These conditions are not satisfied with the regression equation of the GINI coefficient.

The P value of HICP rate of change and EPI regression line is the most significant – 0.0151; its validation is shown in Fig. 3 b). In Fig. 3 a), the authors of the article show the validation of calculated regression line and real dynamic of income differentiation quintile share ratio.

In Figs. 4–5, the authors of the article show the validation of regression lines, when P value is less than 0.1. A very important macro-economic indicator GDP growth rate has a negative dependence on the EPI with P value 0.0652. The indicator of income differentiation GINI and unemployment rate have a positive dependence on the EPI with P values 0.099 and 0.1, respectively.

This research reveals that the EPI has a strong influence on the main macro-economic indicators and GDP in Lithuania. Since the EPI expresses the payment risk faced by mostly small and medium businesses in the market (i.e. the greater is the amount of late payments in a business, the higher is the EPI), it can be stated beyond reasonable doubt that the amount of late payments in a small or medium business is one of the main elements that should be considered.

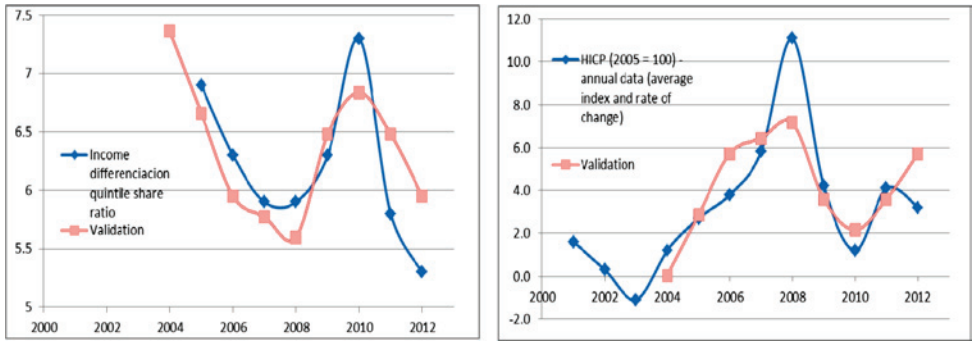

Fig. 3. Validation of regression equations:
a) EPI and income differentiation quintile share index,
b) between EPI and HCPI, significant with 95% of confidence
(Source: created by the authors)

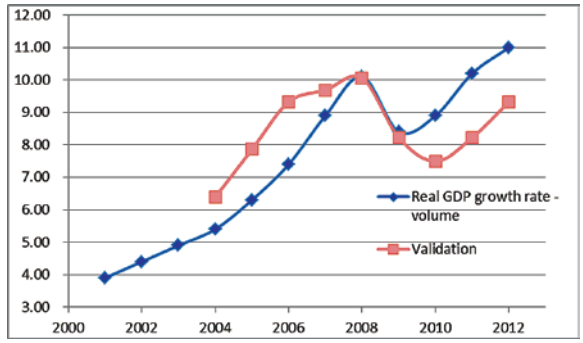

Fig. 4. Validation of regression equations between the EPI and GDP growth rate, significant with 90% of confidence (Source: created by the authors)

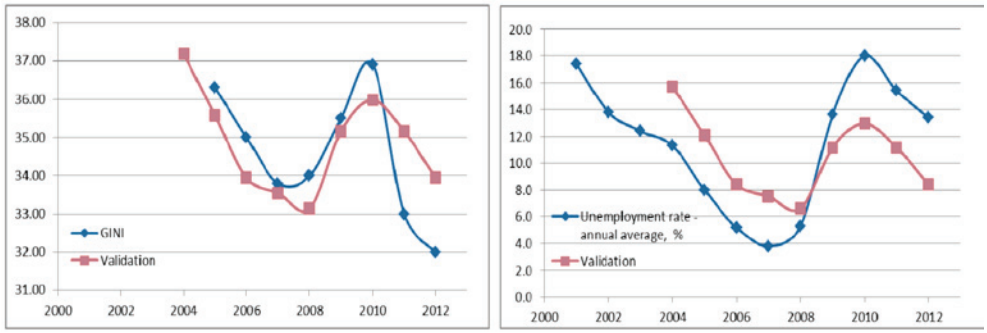

Fig. 5. Validation of regression equations:
a) the EPI and GINI coefficient
b) between the EPI and unemployment indicator, significant with 90% of confidence
(Source: created by the authors)

In terms of small and medium businesses, a critical situation with late receivables can result in an economic decline. Thus, it is of utmost importance to ensure an active circulation of assets and as few delayed receivables as possible.

There are various tools or measures that can help to control delayed receivables. Among the most popular tools are letters of credit, factoring, overdraft and promissory notes. Some of these tools are used by small and medium businesses in Lithuania; however, a previous research indicates (Grigonytė, Sūdžius 2010; Grigonytė 2013) that their use is very rare. The previous research also reveals that small and medium businesses suffer from the lack of knowledge of tools that could help to control delayed receivables effectively.

There is a need of knowledge, new tools and measurements to help manage late debts in small and medium businesses. Also, various government support and incentive programmes and instruments can be used in order to improve the national situation.

It should be noted that delay of receivables can also be caused by social behaviour. Behavioural norms that are customary to a given country can influence delays on a particular scale.

However, these issues should be considered in a subsequent research.

5. Conclusions

Previous research and practice of credit management companies shows that delayed receivables impede the payment cycle in businesses. Small and medium companies cannot fully pay their suppliers and partners before they payments from their clients are received. Consequently, there is a chain reaction that increases insolvency of market participants. Absence of delayed receivables is the main factor that allows SMEs to compete successfully, thus enabling to maintain a healthy market environment.

The stepwise regression analysis of the EPI impact on the macroeconomic indicators revealed that the EPI influences HICP with confidence level of 0.05 and GDP – with confidence level of 0.1; negatively – the growth of the EPI results in a decline of macroeconomic indicators. The EPI impact on export unit value index and international investment position is insignificant. These results confirm that the EPI has unfavourable impact on macroeconomic indicators.

The EPI also impacts on social conditions of a country. Income differentiation is measured by income share index and GINI coefficient. These two indicators increase with growing EPI. The influence of the EPI on unemployment rate of a country is also positive. The impact of the EPI on the parameter of poverty (people at risk of poverty or social exclusion) and total expenditure on social protection is insignificant. These results confirm that the EPI has an unfavourable impact on social indicators.

Causal relationships between the EPI and macroeconomic and social indicators allow the risks of financial processes in enterprises to be assessed and appropriate financial instruments to be found for management of these threats. The information of this study could help make decisions for responsible reforming of the tax system.

A market with a high EPI slows down economic growth. Therefore, it is necessary to find the most effective means for reduction of the amount of late payments and shorten the period within which they are paid. This will lower the risk of late payments, decreasing the EPI. However, this topic should be addressed in a subsequent research.

Further research studies could undertake a comparative analysis, taking into account different sectors of the economy or the effect of the EPI on selected economic values in different countries.

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