INDUSTRIES LEVERAGE AND STRUCTURAL DEVELOPMENT OF THE BALTIC STATES' ECONOMIES

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Abstract

Sustainable economic development is based on the favourable and stable business environment that promotes business competitiveness. Commercial banks have an important role on the growth and successful functioning of the state's economy. Development of any industry is not possible without the raised debt capital, most popular forms of which are bank loans and leases. Commercial banks facilitate the capital flow from the less efficient sectors of the economy and businesses to more competitive industries and enterprises. Additionally credits have another significant role in the economy of each country, because they substantially increase the purchasing power of consumers and industries, which leads to the GDP growth. Baltic countries' GDPs grew faster than in Central and Eastern Europe (CEE) countries and in Europe could only be matched by Iceland and Spain, before the crisis of 2009. Volume of loans - including loans from foreign creditors have increased in average of 20 percent over the previous year in the period from 2000 to 2007. Still the debt was low compared to the average level in euro area but was above the level of most CEE countries.

The purpose of the research is to analyze the dynamics of Baltic States' GDPs during the years 2005 - 2010 and to test the GDP correlation with domestic commercial banks issued loans to the businesses. The principle results of analysis provide evidence about the leading and influencing factors in GDP and issued loans mutual relations and develop proposals for faster recovery of Baltic States' economies after meltdown in 2008. Empirical research provides the facts that the leading factor between the two variables – GDP and lending is GDP, because the changes in the lending follow after changes in GDP. Granger test analysis, performed for aggregate GDP and lending figures, as well as for 6 industries, which comprises more than 50% of GDP in each Baltic State: Agriculture, Manufacturing, Construction, Wholesale/Retail, Transportations/Logistics and Operations with Real Estate, provides controversial results and indicates that some industries output has mutual relationship with availability of financial resources, but business sector development leads to the increase of credits granting by this insuring particular sector future development.

Authors conclude that the lending in Baltic States restarts only when its economy shows growth in some consecutive quarters, not vice versa. As another option to restore the credit granting would be by support of government to encourage banking sector to antagonize the effects of the previously found correlation - to ensure lending to the economy also during periods of recession, in this way supporting the credit granting to the businesses. The availability of credit resources is essential for successful growth of companies, industries and GDP overall. These industries with better development pace have better access to credit resources.

The methods of the research are systematical, logical and comparative analysis, analysis of statistical data, expert method and generalization as well as econometric method of Granger causality test.

Keywords: Loans, GDP, Granger causality test, loans and output.

1. INTRODUCTION AND RESEARCH OBJECTIVES

Sustainable economic development is usually based on the favourable and stable business environment that promotes business competitiveness. Commercial banks have a significantly role on the growth and successful functioning of the state's economy. Commercial banks facilitate the capital flow from the less efficient sectors of the economy and businesses to more competitive industries and enterprises.

Additionally credits have another significant role in the economy of each country, because they substantially increase the purchasing power of consumers and industries, leading to the GDP growth. Without availability of additional financial resources growth of economy becomes challenging and therefore credits have the key influence on it (Romanova, 2006).

Baltic countries' GDPs before the crisis of 2009 grew faster than in other Central and Eastern Europe (CEE) countries and in Europe could only be matched by Iceland and Spain. Volume of loans - including loans from foreign creditors have increased in average of 20 percent over the previous year in the period from 2000 to 2007. As a result, for example Latvian debt reached 116% of GDP in 2007, compared to 35% of GDP in the 2000th. Still the debt was low compared to the average level in euro area - 135 %, but was above the level of most CEE countries (Erbenova, 2006).

Baltic States, like many other countries in the CEE region has experienced substantial capital inflows in the years preceding the crisis. In countries with floating exchange rates (Czech Republic, Poland, Romania, Slovak Republic and Ukraine), monetary policy was strengthened by allowing exchange rates to fluctuate. However, in countries with pledged exchange rates (Bulgaria, Estonia, Lithuania and Latvia) capital inflows caused lower interest rates and significant acceleration in credit growth. In many of these countries, including Latvia, Lithuania and Estonia, most of the loans were granted in foreign currency, due to the lowest rates (Brunner, 2006).

2. MATERIAL AND METHODS

Works related to the effect of financial development on economic growth are controversial. Some results do not indicate the existence of causality (Favara, 2003) and, depending on the period in consideration, even show a negative relationship, while others found a two-way causality between finance and growth (Shan and Jianhong, 2006). The relationship between per capita GDP growth rate and the private sector credit / GDP ratio, used as a proxy for financial development, is estimated in a work for 77 countries (Beck, 2000). They find that more developed levels of financial intermediary can improve resource allocation and accelerate long-run economic growth. The reported elasticity is 1.443, meaning a rise of one percentage point in GDP growth rate per year when doubled the credit ratio.

European Central Bank (ECB) research has provided empirical evidence for the existence of a bank lending channel of monetary policy transmission in the euro area. In addition, and in contrast to recent findings for the US, ECB find that in the euro area changes in the supply of credit, both in terms of volumes and in terms of credit standards applied on loans to enterprises have significant effects on real economic activity (Cappiello, 2010).

J.C.Driscoll discovered that there is a long tradition in the literature on monetary policy, beginning with Brunner and Meltzer (1963) and revived more recently by Bernanke (1983) and many others, that banks may play a special role in the propagation of economic fluctuations. The first is the reverse-causality or endogeneity problem: one must determine that correlations between output and money are due to output responding to money and not money demand to expectations of future output. J.C.Discroll points, that the positive correlation between output and lending is statistically stronger for constructions and investment loans and in the microeconomic level, there appear to be substantial evidence that the impact of a change in bank lending is the most severe on small firms (Gertler and Gilchrist, 1994). This research concludes that state-specific money demand shocks have economically and statistically significant effects on the quantity of loans made by banks in that state. After using those shocks as instruments, he found slight evidence against the contention that shocks to the supply of bank loans raise output. These results are robust to changes in sample size and choice of cross-sectional unit. The second finding adds to the negative results found at the aggregate level by Miron et al. (1994), Oliner and Rudebusch (1996) and others that the lending channel has little or ambiguous macroeconomic impact.

European Central Bank (ECB) in its paper indicates, when evaluating the impact of credit growth on output there are a number of issues that need to be addressed. One of the most pertinent issues concerns the endogeneity, or reverse causality, problem, since one cannot distinguish whether loan supply affects output or, vice versa, if the demand for (and supply of) loans is determined by future expected output. ECB found, that in the euro area changes in the supply of credit, both in terms of volumes and in terms of credit standards applied on loans to enterprises have significant effects on real economic activity. In other words, a change in loan growth has a positive and statistically significant effect on GDP. But it cannot be taken for granted that such changes in credit supply in turn have significant effects on real economic activity. Indeed, for the US

neither Driscoll (2004) nor Ashcraft (2006) found compelling evidence for a strong causal relationship between credit supply and real output. But contrary to the US experience, other researches document that changes in credit supply also exert a non-negligible impact on real economic activity in the euro area. The difference between the results for the euro area and the US-based studies (Driscoll, 2004; Ashcraft, 2006) probably stems primarily from the greater dependence on bank credit of the euro area private sector.

P.L.Tecles and B.M.Tabak estimated empirical relationship between credit and GDP using a Vector Error Correction model applied to Brazilian data. The study of the effect of GDP on demand for credit was carried by the assumption that better economic conditions increase the consumers and investors optimism. With higher expectations on future income, they tend to smooth consumption by increasing borrowing. Their findings indicate a significant impact of credit supply on future income, which corroborates the credit view hypothesis that financial development has an important role in economic growth. Also, the inverse direction causality is verified. Expectations of higher productivity, measured as future GDP, implies in higher individual income prediction and consequently in larger demand for credit. Both results highlight the importance of monitoring aggregate economic activity and the financial sector. The association between credit booms and financial instability, with the consequent depreciation of assets quality and bank crisis supports financial control to assure the output of economy (Tecles and Tabak, 2008).

L.Gambacorta and P.E.Mistrulli investigated the existence of cross-sectional differences in the response of lending to monetary policy and GDP shocks owing to a different degree of bank capitalization. They indicate that all theories, which explain how bank capital could influence the propagation of economic shocks, suggest the existence of market imperfections that modify the standard results of the Modigliani and Miller theorem. Broadly speaking, if capital markets were perfect, a bank would always be able to raise funds (debt or equity) in order to finance lending opportunities and its level of capital would have no role (Gambacorta and Mistrulli, 2005).

3. THE RESEARCH RESULTS

Comparing annual credit index, which is calculated as the volume of granted loans in current year versus volume to the granted loans in previous year, with annual GDP index it can be observed that both indexes have similar trends till year 2008, except Latvia, where already in 2007. GDP index were below 100%. In all other cases, during the time period from the year 2005 till year 2008 both indexes were above 100%, which means that the volume of the granted loans and GDP rose year over the year.

Staring from the year 2008 the situation was different - in 2009, annual GDP index was 82% in Latvia, 85% in Lithuania and Estonia, which means that GDP decreased by 15-18%, while the annual index of loans was 93% in Latvia, 91% in Lithuania and 95% in Estonia, which means that commercial banks stopped to grant the loans. During next year - 2010, both indexes have the opposite trend (except Latvia) – GDP index was above the 100% level which means that economy started to recover, but the volume of granted loans continued to decrease as credit indexes were below 100% level.

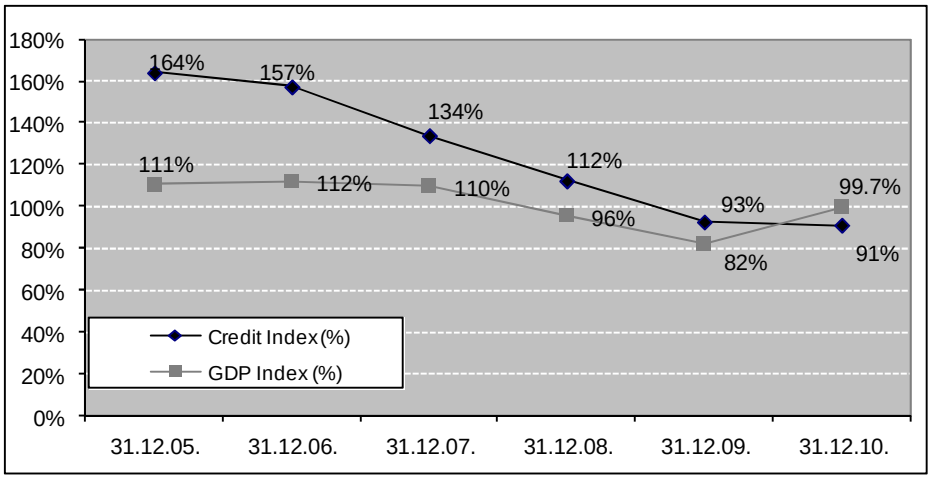

Figure 1. Annual Credit Index and GDP Index in Latvia
Source: www.fktk.lv and www.csb.gov.lv

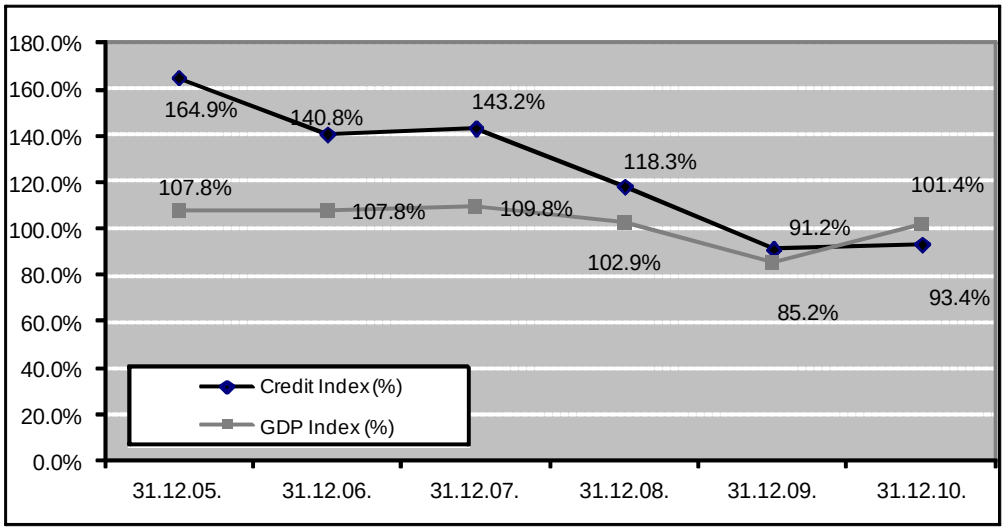

Figure 2. Annual Credit Index and GDP Index in Lithuania
Source: www.lb.lt and www.stat.gov.lt

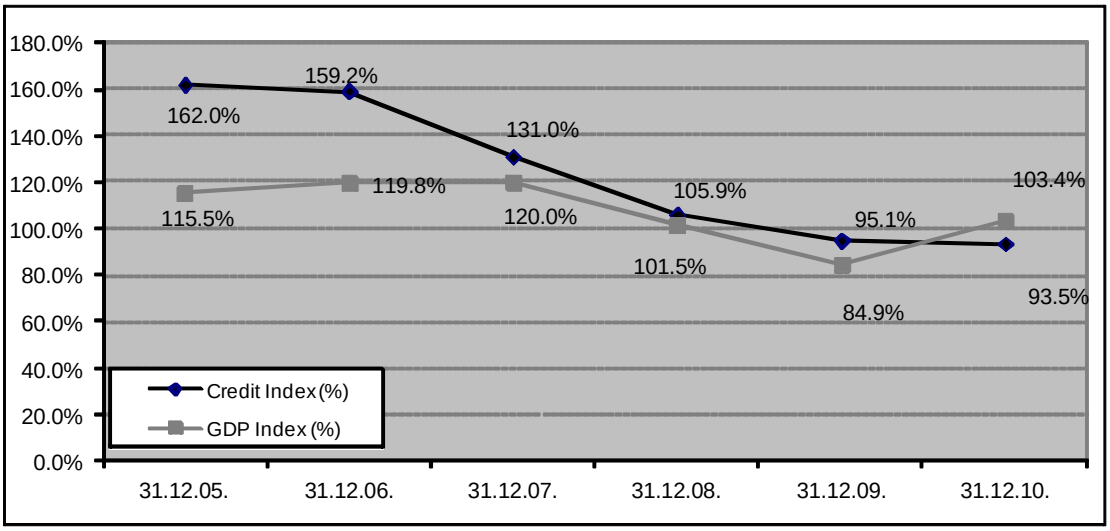

Figure 3. Annual Credit Index and GDP Index in Estonia
Source: www.eestipank.ee and www.stat.ee

As authors observed in all three Baltic countries, GDP decrease actually stopped in 2010 and economies started to increase. In same time period (year 2010) crediting volume continued to decrease and comparing with previous year credit volumes dropped from 9% – 6%. GDP already moved to the next level of the business cycle, but crediting still stayed in the previous one.

Obtained data indicates that there is a relationship between the changes in GDP and the volume of granted loans and the leading factor between these two variables are GDP as the changes in the volume of granted loans follows the fluctuation of GDP.

Government can influence structural development of economy by providing necessary financial resources to the sectors important for country's development. This kind of support is especially important during low business activity cycle of economy, when private financial institutions restrict credits availability.

As an option to provide necessary financial resources, governments could develop commercial banks in Baltic countries, which would be able to react against the previously found correlation - to ensure lending to the economy also during periods of recession, in this way supporting the credit granting to the businesses. As state owned banks usually have more reliability in the eyes of consumers during the economy meltdown period, state owned banks will have an access to the consumers' savings, which can be used as necessary resources for crediting of the economy.

4. DISCUSSION

Authors, in order to clarify the mutual relations between GDP development and industries lending capability, tested the correlation between the industry development pace and its access to financial resources (leverage). Authors draw a hypothesis that if the industry develops more quickly, then more credit resources are available to particular industry.

In order to test the hypothesis authors performed the Granger causality test analysis between 6 industries growth temps and leverages dynamics during the period of time 2005 -2010.

According to the data from Baltic Statistical Bureaus - Statistics Estonia, Statistics Lithuania and Central Statistics Bureau of Latvia, 6 industries – Agriculture, Manufacturing, Construction, Wholesale/Retail, Operations with Real Estate, Transportations/Logistics contributed more than 60% of total Latvia GDP in year 2010.

Table 1

Industries output and contribution to GDP in 2010

Industry	Proportion in GDP, %		
	Latvia	Estonia	Lithuania
Agriculture	4,50%	2,87%	3,5%
Manufacturing	13,40%	14,31%	19,9%
Construction	5,90%	4,98%	6,3%
Wholesale and Retail	16,70%	10,39%	19,5%
Transportation and Logistics	12,10%	7,72%	12,3%
Operations with Real Estate	8,30%	9,50%	6,9%
Total:	**61%**	**50%**	**68,4%**

Source: www.fktk.lv, www.csb.gov.lv, www.lb.lt, www.stat.gov.lt, www.eestipank.ee, www.stat.ee

Granger causality test is a statistical method based on prediction – i.e. it estimated if one variable is a signal to predict the value of another variable. This method by its mathematical formulations was introduced by C.Granger in 1960s and is widely used in economics since then. To analyse similar concepts as are examined in this paper Granger causality test was used by I.Sendeniz-Yuncu et al. (2008) and R. Bebczuk et al. (2010).

In order to statistically determine what is the causality between loans and output Granger causality test was used. Quarterly data for the period 2005-2010 for GDP and its components and loans by sectors were used. Because of the quarterly dataset, four lags were used so the equations evaluated are as follows:

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + ... + \alpha_4 y_{t-4} + \beta_1 x_{t-1} + ... + \beta_4 x_{t-4} + \varepsilon_t$$
$$x_t = \alpha_0 + \alpha_1 x_{t-1} + ... + \alpha_4 x_{t-4} + \beta_1 y_{t-1} + ... + \beta_4 y_{t-4} + \varepsilon_t \quad (1)$$

where y_t - output in the period t,

x_t - loans at the period t.

Loans are outstanding loans at the end of the period. Both output and loans are measured at nominal prices. In further analysis we will examine both aggregate numbers (total GDP, total loans) and GDP and loan components split by NACE1 sectors.

Granger causality test shows that aggregate GDP and loan data do show causality effects; except for Lithuania where it seems that total outstanding loans influence the value of GDP (results for the aggregate GDP and total loans outstanding can be seen in Table 2).

Results summary of Granger test for all three Baltic countries in more detailed split by sectors can be found in attachment in Table 3. There are some interesting results when looking more deeply at particular sectors. With 95% confidence it can be said that in wholesale and retail sector loans influence output and vice-versa output influences the amount of outstanding loans both in Latvia and Estonia. Data for Lithuania for this sector can't be split separately and are shown together with data on transport, logistics and

accommodation. Probably that is the reason why there appear no causality effects for wholesale and retail loans and output in Lithuania.

Table 2

Results of Granger test for all three Baltic countries

Null Hypothesis:	**Latvia**	**Estonia**	**Lithuania**
GDP does not Granger Cause LOAN_TOTAL	0,392	0,7742	0,6412
LOAN_TOTAL does not Granger Cause GDP	0,8982	0,1696	0,0327

Source: the authors' calculations

In transport and logistics sector the only causality that can be found is between loans to transport and logistics sector and total GDP in Latvia. As there is no Granger causality between loans to this sector and output of transportation, there is no direct impact, though may be some indirect because of the possibilities to develop some other sectors of economics. No connections between loans and output in transport sector are found also in Estonia.

In operations with real estate there is a clear causality by loans to real estate sector influencing the output of this sector in all Baltic countries, but we should note that till 2008 data for operations with real sector in Latvia and for the first two quarters of 2005 in Estonia and the whole period in Lithuania included data also on loans to some additional subsectors like rent and other business activities, that could leave some impact on results, though as the amount of these extra sectors are small, this impact should not be significant.

For agriculture we don't find causality effects meaning that the increase of loans does not influence output of agriculture much. That could be explained because there are seasonal factors and good or bad weather can have an influence on the output regardless the amount of loans outstanding. Another factor is that loans for agriculture could be long term investments that don't give full payback in one year so the impact of the loans is not so apparent. In Estonia and Lithuania it seems that there is an opposite effect as output in agriculture influences the value of outstanding loans to this sector.

In manufacturing, though there are no strong connections observed, the effect is in opposite direction than in the sectors previously mentioned. With 90% confidence for Latvia and 99% confidence for Estonia we can say that output in manufacturing industry influenced the loans for this industry. That could suggest that banks are more eager to credit already developed enterprises and lend money for other purposes than further development. This connection in Lithuania is less pronounced.

For construction in Latvia we don't find causality effects in any of the tested directions meaning that in the period of 2005-2010 construction was motivated by other factors than the availability of loans (that could be internal demand, loans issued for other sectors (e.g. operations with real estate) or some other factors). In Lithuania and Estonia we can say that the situation is a bit different as the loans to construction sector influence the output of this sector.

5. CONCLUSIONS

The Loan Index - the changes in Credit granting volume over the previous year, showed a positive growth until 2007th (inclusive), and this ratio correlated with changes of GDP, whereas in 2008th the Credit granting volumes continue to grow, despite the fall of real GDP.

Based on empirical research, the leading factor between the two variables – GDP and Lending is GDP, because the changes in the lending follow after changes in GDP. Accordingly authors conclude that the lending in Baltic will restart only when Baltic states economy will show growth in some consecutive quarters, not vice versa - the renewal of lending will lead to the GDP growth.

By testing the causality between loans and output in Baltic countries by exploiting the Granger causality test, authors conclude that there is controversy in results and some industries supports the hypothesis, but some not. The results can diverse even in the same industries between the countries.

Largest effect of connection between loans and output are in wholesale and retail sector where the causality observed is in both directions both in Latvia and Estonia.

Loans available to operations with real estate influences output in this sector. Loans for this sector should be issued with caution and carefully examining the economic situation and possibilities of further

development as recent experience in the Baltic countries showed that exaggerated crediting of operations with real sector was one of the factors leading to economic recession.

Output of agriculture has influenced the value of outstanding loans to agriculture in Lithuania and Estonia, but no causality for this sector was found in Latvia. Similarly also the output of manufacture influence the value of outstanding loans to manufacturing sector in Latvia and Estonia, but the connection is shown to be weaker in Lithuania.

The availability of credit resources is essential for successful growth of companies, industries and GDP overall.

These industries which better development pace have better access to credit resources.

There is a need to improve the statistical data methodology in Baltic States in order to gather more accurate data on Transportation and logistics industry performance.

As another option to restore the credit granting would be by support of government to encourage banking sector to antagonize the effects of the previously found correlation. This support could ensure lending to the economy also during periods of recession, in this way endorsing the credit granting to the businesses.

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Appendix 1

Table 3

Results of Granger test for all three Baltic countries split by sectors: Wholesale, Transport and Operations with real estate.

	3Probabilities[1]		
Null Hypothesis:	**Latvia**	**Estonia**	**Lithuania**
Wholesale/Retail[2]:			
LOAN_SALES does not Granger Cause OUT_SALES	0,0102	0,0177	0,1723
OUT_SALES does not Granger Cause LOAN_SALES	0,0013	0,0455	0,9692
GDP does not Granger Cause LOAN_SALES	0,0105	0,0034	0,2269
LOAN_SALES does not Granger Cause GDP	0,1598	0,0803	0,0556
Transport/Logistics:			
LOAN_TRANSPORT does not Granger Cause OUT_TRANSPORT	0,3951	0,5522	0,1723
OUT_TRANSPORT does not Granger Cause LOAN_TRANSPORT	0,2417	0,2016	0,9692
GDP does not Granger Cause LOAN_TRANSPORT	0,008	0,3222	0,2269
LOAN_TRANSPORT does not Granger Cause GDP	0,0189	0,31	0,0556
Operations with real estate:			
LOAN_REAL_ESTATE does not Granger Cause OUT_REAL_ESTATE	0,0126	0,0394	0,0387
OUT_REAL_ESTATE does not Granger Cause LOAN_REAL_ESTATE	0,4499	0,5988	0,4082
GDP does not Granger Cause LOAN_REAL_ESTATE	0,8115	0,4023	0,1398
LOAN_REAL_ESTATE does not Granger Cause GDP	0,4407	0,2523	0,0178

[1] If probability <0.05, null hypothesis is rejected with 95% confidence.

[2] For Lithuania Wholesale/Retail sector data combined with Transport/Logistics and Accomodation sectors.

Table 3, continued

	Probabilities		
Null Hypothesis:	**Latvia**	**Estonia**	**Lithuania**
Agriculture:			
LOAN_AGRICULTURE does not Granger Cause OUT_AGRICULTURE	0,9196	0,7407	0,1452
OUT_AGRICULTURE does not Granger Cause LOAN_AGRICULTURE	0,8647	0,0042	0,0629
GDP does not Granger Cause LOAN_AGRICULTURE	0,5338	0,0448	0,002
LOAN_AGRICULTURE does not Granger Cause GDP	0,0787	0,0683	0,0021
Manufacture:			
LOAN_MANIFACTURE does not Granger Cause OUT_MANIFACTURE	0,6522	0,1899	0,7615
OUT_MANIFACTURE does not Granger Cause LOAN_MANIFACTURE	0,0845	0,0098	0,1264
GDP does not Granger Cause LOAN_MANIFACTURE	0,1601	0,0014	0,0646
LOAN_MANIFACTURE does not Granger Cause GDP	0,1773	0,0407	0,0758
Construction:			
LOAN_CONSTRUCTION does not Granger Cause OUT_CONSTRUCTION	0,1209	0,0191	0,0826
OUT_CONSTRUCTION does not Granger Cause LOAN_CONSTRUCTION	0,3852	0,2074	0,3
GDP does not Granger Cause LOAN_CONSTRUCTION	0,3641	0,1759	0,4784
LOAN_CONSTRUCTION does not Granger Cause GDP	0,8607	0,127	0,2344

Source: the authors' calculations