





“Formalization of the impact of imbalances in the movement of financial resources on economic growth of countries in Central and Eastern Europe”

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| ARTICLE INFO | Serhiy Kozmenko and Maxim Korneyev (2017). Formalization of the impact of imbalances in the movement of financial resources on economic growth of countries in Central and Eastern Europe. <i>Accounting and Financial Control</i> , 1(1), 48-58. doi: 10.21511/afc.01(1).2017.06 |
| DOI | http://dx.doi.org/10.21511/afc.01(1).2017.06 |
| RELEASED ON | Thursday, 20 April 2017 |
| RECEIVED ON | Monday, 05 December 2016 |
| ACCEPTED ON | Tuesday, 10 January 2017 |
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| JOURNAL | "Accounting and Financial Control" |
| ISSN PRINT | 2543-5485 |
| ISSN ONLINE | 2544-1450 |
| PUBLISHER | Sp. z o.o. Kozmenko Science Publishing |
| FOUNDER | Sp. z o.o. Kozmenko Science Publishing |



NUMBER OF REFERENCES

12



NUMBER OF FIGURES

1



NUMBER OF TABLES

16

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Formalization of the impact of imbalances in the movement of financial resources on economic growth of countries in Central and Eastern Europe

Abstract

The article deals with the impact of financialization on economic growth in countries of Central and Eastern Europe. It determines the impact of imbalances in the movement of financial resources caused by financialization on economic growth of these countries. It proves that the implementation of measures aimed at increasing the openness of the economy and maintaining solvent demand have a positive impact on economic growth of the surveyed countries in the long run. It also proves the importance of developing a set of measures of strategic nature regulating imbalances in the movement of financial resources caused by financialization.

Keywords: imbalances in the movement of financial resources, financialization, autoregressive model, economic growth, growth of per capita gross domestic product, macroeconomic indicators.

JEL Classification: G32.

Introduction

Evolutionary development has an impact on changes in the institutional structure of the economy leading to the transformation of the mechanism of financial resources' movement. Continuous movement of these resources, their effective management has a significant impact on the functioning of the economy. Due to the intensification of globalization and integration processes of particular relevance there is search of the impact of imbalances in the movement of financial resources caused by financialization on economic growth. This study is important because until recently scientists did not have a common opinion on the strength and direction of relationship between financialization and economic growth. Therefore, activation of systemic research on the linkages between imbalances in the movement of financial resources caused by financialization and economic growth is relevant.

Latest research and publications analysis

The establishment of dependencies between financialization and the rate of economic development has been the subject of research for a long time. In particular, some aspects of the analysis of the abovementioned problems can be found in the works of: J. Arcand (2012), J. Assa (2012), R. Batt (2012), T. Beck (2000), G. Caporale (2009), G. Favara, (2003), M. Khan (2000), C. Lapavitsas, (2009), R. Ram (1999), P. Rousseau (2002), R. Sova (2009), N. Van der Zwan (2014) and others.

1. Remaining part of the problem

The impact of financialization on economic growth is an area of scientific interest of foreign scientists (Table 1).

Table 1. The views of foreign researchers on the relationship between financialization and economic growth

| Researchers | Results of identification of relationship between financialization and economic growth |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| M. Khan A. Senhaji | Determining a direct relationship between the development level of financial sector and economic growth |
| P. Sova, A. Sova and others | Determining a positive but marginal impact on economic growth of the indicator of the relationship of the market value of shares on the gross domestic product; proving that the money supply helps stimulate economic growth; determining that interest margin (reflecting the difference between interest rates on deposits and loans) has a negative impact on economic growth |
| P. Russo P. Wachtel | Proving that in countries with high inflation the development of the financial sector does not stimulate economic growth |
| J.-L. Arcand, E. Berks, Y. Panizza | Determining that the growth of per capita real gross domestic product begins to get a negative value when the specific weight of the volume of loans to the private sector in the gross domestic product exceeds a threshold of 80-100% |
| R. Rem | Determining that the relationships between indicators of financialization and economic growth are usually inverse and with weak intensity |

There is a lack of analysis of the relationships between imbalances in the movement of financial resources caused by financialization and economic growth in some countries of Central and Eastern Europe (Ukraine, Moldova, Romania, Latvia, Lithuania, Estonia, Hungary, Slovakia, Czech Republic, Bulgaria, Armenia Azerbaijan, Poland, Kazakhstan, Georgia). Accordingly, formalization

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of the impact of imbalances in the movement of financial resources caused by financialization on the economic growth of these countries obtains a significant theoretical and practical value.

2. Key research findings

First of all, it should be noted that in order to reflect the current level and the process of accumulation of imbalances in the movement of financial resources caused by financialization during the evaluation of their impact on economic growth we use the autoregressive model with distributed lag (ARDL – autoregressive distributed lag model), which: 1) makes it possible to consider time lags of the impact of factor features; 2) makes it possible to analyze short term and long term processes. In addition, ARDL provides a range of methodological approaches to the determination of its coefficients: PMG (pooled mean group), MG (mean group) and DFE (dynamic fixed effect). The choice of these methodological approaches (PMG, MG, DFE) is caused by the following reasons: the possibility of applying longitudinal data with significant number of observations, which is extremely important given the number of countries for which we conduct formalization of the impact of imbalances in the movement of financial resources caused by financialization on economic growth, and time periods of the study; the possibility of taking into account the impact of past values of indicators on their current and future values; the possibility to take into account time lags of implementation of factor features; the possibility to compare the effect of independent variables on dependent variable in the short and long term periods.

Characterizing incoming statistical data to build an ARDL is expedient to note that as a dependent (effective) variable (an indicator that reflects the level of economic growth in the country) it was quite natural to choose the growth of per capita gross domestic product (GDPG). In turn, the array of control variables includes the following: economic openness index (Trade), which describes the significance of the impact of international factors on economic activity in the country; indicator of specific weight of state consumption expenditures in the gross domestic product (GCE), which is essential in assessing the importance of fiscal policy in the provision of private persons and businesses with public goods, and making it possible to conclude whether an increase in public spending leads to slower economic growth; indicator of gross capital formation in GDP (*GFCE*), which is selected to characterize the activity of investment processes.

The procedure for selecting an independent (factor) variable is more complex, because today there is a number of foreign publications aimed at identifying an optimal indicator of financialization. It is worth noting that many researchers suggest using the depth of financial sector as an indicator, which is calculated as the ratio of specific monetary aggregates (M2, M3) to gross domestic product. However, M. Khan and A. Senhaji (Khan, 2000) note that such an indicator as the ratio of monetary aggregate M2 to gross domestic product is not an adequate indicator of financial sector development for the following reasons: 1) significant monetization may be a sign of financial underdevelopment; 2) monetary aggregate M2 mainly reflects the ability of the financial sector to provide transaction services than its ability to effectively redistribute financial resources between different groups of economic agents. Therefore, such indicators as the ratio of monetary aggregate M3 to gross domestic product is more acceptable, which is also defined in the works of T. Beck, R. Levin (Beck, 2000), J. Favara (Favara, 2003), J. Assa (Assa, 2012) and others. A very common indicator of the level of development of the financial sector is the ratio of volume of loans to the private sector to gross domestic product substantiated in the writings of T. Beck and R. Levine (Beck, 2000), J. Favara (Favara, 2003), J.-L. Arcand, E. Berks and Y. Panizza (Arcand, 2012) and others. This indicator is important for the characteristics of the level of imbalances in the movement of financial resources caused by financialization. This is explained by the fact that credits granted to the private sector contribute to the efficient use of resources and their reallocation to more productive activities. Another indicator often used by foreign scientists is an indicator of the ratio of the financial sector assets to gross domestic product (Lapavitsas, 2009). This indicator shows the importance of the financial sector in economic growth.

In the context of formalization of the impact of imbalances in the movement of financial resources caused by financialization on economic growth it is proposed to determine the index of financialization (*IFD*). It includes the following ratios: 1) monetary aggregate M3 to gross domestic product (*BM*) that defines the depth of the financial sector and its ability to produce financial services; 2) the volume of loans to private sector to gross domestic product (*DC*), which determines the orientation towards stimulation of investments in the real sector; 3) assets of the financial sector to gross domestic product (*FSAs*), which determines the provision of the economy with financial resources to generate added value.

Aggregation of the above indicators into one was made by using the method of principal components. The use of this mathematical instrument is caused by the following reasons: 1) between indicators characterizing the level of imbalances in the movement of financial resources caused by financialization there may exist multicollinearity, which, in turn, will result in inadequate results. The method of principal components, in fact, allows to level the problem in question; 2) the pluralism of scientific positions to solving the aforementioned problems does not allow to choose among the presented set of indicators the most appropriate one for aggregation. Using the capabilities of the software complex Stata/SE 12.0 the following results were obtained by applying the method of principal components to the presented indicators (Table 2).

Table 2. Results of using the method of principal components to determine the indicator of financialization

| Component | Eigenvalue | Difference | Proportion | Cumulative |
|-------------|------------|------------|------------|------------|
| Component 1 | 2.3025 | 1.8565 | 0.7675 | 0.7675 |
| Component 2 | 0.4459 | 0.1945 | 0.1487 | 0.9162 |
| Component 3 | 0.2515 | 0.0000 | 0.0838 | 1.0000 |

Based on the data in Table 2 it can be noted that the analysis has made it possible to determine three main components, which account for 100% of the total variance of features. And the most significant of them is the first major component (the share of total variance is 76.75%). Next in importance is the second principal component for which the corresponding value of total variance is 14.87%. As shown in Table 2, the smallest share of the total variance is explained by the third principal component (8.38%). Given the importance of the first principal component an index of financialization will be built by using its statistical characteristics. The next stage in the method of principal components in determining the index of financialization is to build a factor loading matrix (Table 3).

Table 3. A factor loading matrix of principal components

| Parameters | Component 1 | Component 2 | Component 3 |
|--------------|-------------|-------------|-------------|
| <i>BM</i> | 0.5985 | -0.2656 | -0.7558 |
| <i>DC</i> | 0.5841 | -0.5010 | 0.6386 |
| <i>FSAss</i> | 0.5483 | 0.8237 | 0.1448 |

Given the previously presented results it can be noted that to determine the index of financialization, factor loadings of the first principal component will be used. It should be noted that the chosen principal component is quite balanced, as all three variables have an almost equal specific weight in its formation.

Based on the data of Table 3 to determine the index of financialization (*IFD*) the following dependence equation is used (1).

The results of calculation of the index of financialization for the period 1991-2014 are presented in Table 4 (see Appendix).

$$IFD = 0.5985BM + 0.5841DC + 0.5483FSAss \quad (1)$$

It can be noted that the smallest index of financialization is typical for Azerbaijan and Georgia. Low indices are also observed for such countries as Moldova and Armenia. High values of *IFD* are observed for such countries as Estonia and Bulgaria. In some countries there is a mixed dynamics of the calculated index of financialization. Analyzing the dynamics of the *IFD* index for Ukraine it is worth noting that during the study period its gradual growth was observed. This led to an increase of the index by more than 6 times compared with 1991.

A summary of variables (dependent, independent, control) which were used to formalize the impact of imbalances in the movement of financial resources caused by financialization on economic growth, are presented in Table 5.

After determining key characteristics of variables to formalize the impact of imbalances in the movement of financial resources caused by financialization on economic growth, it is appropriate to identify the optimal structure of time lags. Such identification is due to the fact that to determine the relationship between imbalances in the movement of financial resources caused by financialization and economic growth an autoregressive model with distributed lag is applied.

Table 5. Characteristics of the dependent, independent and control variables to formalize the impact of imbalances in the movement of financial resources caused by financialization on economic growth

| Variable | Indicator | Indicator characteristics | Source |
|-------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| <i>GDPG</i> | Indicator of GDP per capita growth | Characterizes the annual growth rate of GDP per capita | Official website of the World Bank |
| <i>GCE</i> | Indicator of general government final consumption expenditures as % of GDP) | Government consumption expenditures include all current expenditures on the purchasing of goods and services (including compensations for employees) and account for most of the spending on national security and defense with the exception of state military expenditures | Official website of the World Bank |

Table 5 (cont.). Characteristics of the dependent, independent and control variables to formalize the impact of imbalances in the movement of financial resources caused by financialization on economic growth

| Variable | Indicator | Indicator characteristics | Source |
|----------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| GFCF | The share of gross capital formation in GDP | The indicator was selected to characterize the activity of investment processes | Official website of the World Bank |
| Trade | Indicator of economic openness (Trade as % of GDP) | Calculated as a ratio of the value of exports and imports of goods and services to GDP | Official website of the World Bank |
| BM | The ratio of the monetary aggregate M3 to GDP (Broad money as % of GDP) | Calculated as the ratio of the amount of money outside banks, demand deposits, term deposits, foreign currency securities to gross domestic product | Official website of the World Bank |
| DC | Domestic credit to private sector as % of GDP | Characterizes the amount of financial resources given to the private sector by other depository corporations (via consumer, trade credits, purchase of non-mutual securities, etc.) | Official website of the World Bank |
| FSAss | Total assets of the financial sector to gross domestic product | Calculated as a ratio of financial sector's assets (assets of banks, insurance companies, etc.) to gross domestic product | Official data of the Organization for Economic Cooperation and Development |

Table 6 shows the results of identification of the optimal structure for time lags for the variables of the autoregressive model with distributed lag according to different information criteria.

Table 6. The results of the VAR-test for identification of the optimal structure of time lags for the variables of the autoregressive model

| Lag | LL | LR | FPE | AIC | HQIC | SBIC |
|-----|---------|--------|---------|--------|--------|--------|
| 0 | -56.961 | - | 58.070 | 6.884 | 6.918 | 7.131 |
| 1 | -53.447 | 7.026* | 44.430* | 6.605* | 6.646* | 6.902* |
| 2 | -53.214 | 0.466 | 49.196 | 6.690 | 6.738 | 7.036 |
| 3 | -52.049 | 2.330 | 49.445 | 6.672 | 6.726 | 7.067 |
| 4 | -51.956 | 0.184 | 56.469 | 6.772 | 6.834 | 7.218 |

Symbol «*» in Table 6 marks the most suitable time lag for further formalization of the impact of imbalances in the movement of financial resources caused by financialization on economic growth. Thus, we can conclude that for the selected set of variables the most appropriate is a time lag of 1 year. That is, the structure of lags will be ARDL (1;1;1;1) for the following order of variables: GDPG, GCE, GFCF, FSAss ra IFD.

After determining the optimal structure of time lags for ARDL variables it is advisable to make an

evaluation of the nature of the relationship between imbalances in the movement of financial resources caused by financialization and economic growth for each of methodological approaches (PMG, MG, DFE).

The results of the PMG approach to determining short-term and long-term coefficients of autoregressive model of the relationship between imbalances in the movement of financial resources caused by financialization and economic growth for the total sample of the surveyed countries in Central and Eastern Europe in the period 1991-2014 are presented in Table 7.

Table 7. The results of the PMG approach to determining short-term and long-term coefficients of autoregressive model (for the total sample of the surveyed countries)

| Parameters | Value of coefficient | Standard error | Z | P> z |
|-----------------------------------|----------------------|----------------|-------|-------|
| Long-term dependency coefficient | | | | |
| Trade | 0.0246765 | 0.0144551 | 1.71 | 0.088 |
| GCE | 0.3074869 | 0.1498151 | 2.05 | 0.040 |
| GFCF | 0.1073232 | 0.0737391 | 1.46 | 0.146 |
| IFD | -0.0153522 | 0.0056029 | -2.74 | 0.006 |
| Short-term dependency coefficient | | | | |
| Trade | -0.0230439 | 0.0362932 | -0.63 | 0.525 |
| GCE | -0.4336025 | 0.2619954 | -1.66 | 0.098 |
| GFCF | 0.5561521 | 0.1443145 | 3.85 | 0.000 |
| IFD | -0.0271977 | 0.0879842 | -0.31 | 0.757 |
| Constant | -2.5680283 | 0.7873482 | -3.26 | 0.001 |
| Number of countries | 15 | 15 | 15 | 15 |
| Number of observations | 330 | 330 | 330 | 330 |

Based on the obtained results we can note that in the long term there is an inverse weak relationship between the index of financialization and economic growth (at the confidence interval of 99%), that is, an increase of IFD slows the growth rate of per capita GDP. In turn, it should be noted that according to other indicators that were controlling variables, there is a weak in intensity, but direct long-term relationship. Exploring the value of the relevant coefficients in the short term, we can see that the growth of the index of financialization has a negative impact on economic growth, while with GCE and Trade this tendency changes, in particular, there is an inverse relationship as opposed to direct one at significant time periods. Thus, the obtained data indicate an inverse proportional dependence of economic growth on imbalances in the movement of financial resources.

Having identified the values of coefficients that illustrate the intensity and direction of relationships between the factor and efficient features for all

surveyed countries it is particularly important to compare these results with those of Ukraine. The possibilities of methodical PMG approach allow a comparison based on the coefficients of dependence between imbalances of the movement of financial resources caused by financialization and economic growth in Ukraine in the short run (Table 8).

Table 8. The results of PMG approach to the definition of short-term coefficients of autoregressive model (for Ukraine)

| Parameters | Value of coefficient | Standard error | Z | P> z |
|------------|----------------------|----------------|-------|-------|
| Trade | 0.0637806 | 0.1309214 | 0.49 | 0.626 |
| GCE | -0.0777568 | 0.6141309 | -0.13 | 0.899 |
| GFCF | 1.6678712 | 0.4822577 | 3.46 | 0.001 |
| IFD | -0.2832975 | 0.1280534 | -2.21 | 0.027 |
| Constant | -0.6454231 | 2.245998 | -0.29 | 0.774 |

According to Table 8 it can be noted that Ukraine, just like the group of analyzed countries, is characterized by the same nature of relationships between the rates of economic growth and GCE, as well as the index of financialization. It should be noted that an increase in IFD leads to slower rates of economic growth. However, an increase of GFCF has a significant positive effect on short-term economic growth. An increase of Trade has also a positive impact on economic growth.

The next step is formalization of the impact of imbalances in the movement of financial resources caused by financialization on economic growth by using the second methodological approach, namely, MG (Table 9).

As a result of MG approach for the entire group of surveyed countries in Central and Eastern Europe it is possible to make the following conclusions:

in the long-term perspective an increase in the index of financialization has a negative impact on the dynamics of economic growth, namely the growth of factor indicator would reduce effective indicator; inverse relationship found between the growth of per capita GDP and Trade; positive character of dependence established between an increase of GFCF indicator and GDPG indicator; an increase of GCE will lead to the acceleration of economic growth;

in the short term perspective there is an inverse relationship between effective variable and such factor variables as IFD, GCE, Trade, while a positive impact on economic growth increases GFCF indicator.

Table 9. Results of MG approach to determining short-term and long-term coefficients of autoregressive model (for the entire sample of surveyed countries)

| Parameters | Value of coefficient | Standard error | Z | P> z |
|-----------------------------------|----------------------|----------------|-------|-------|
| Long-term dependency coefficient | | | | |
| Trade | -0.1764671 | 0.3036656 | -0.58 | 0.561 |
| GCE | 2.6682213 | 2.5143287 | 1.06 | 0.289 |
| GFCF | 0.9354398 | 0.8435198 | 1.11 | 0.267 |
| IFD | -0.3781076 | 0.3722795 | -1.02 | 0.310 |
| Short-term dependency coefficient | | | | |
| Trade | -0.0789767 | 0.0398492 | -1.98 | 0.047 |
| GCE | -0.4184082 | 0.3370143 | -1.24 | 0.214 |
| GFCF | 0.5501100 | 0.1390603 | 3.96 | 0.000 |
| IFD | -0.0120393 | 0.0728423 | -0.17 | 0.869 |
| Constant | -12.7389800 | 12.5120400 | -1.02 | 0.309 |
| Number of countries | 15 | 15 | 15 | 15 |
| Number of observations | 330 | 330 | 330 | 330 |

We have conducted the comparative characterization of the results of the MG approach for Ukraine and other countries (Table 10).

Table 10. The results of MG approach to the definition of short-term and long-term coefficients of autoregressive model (for Ukraine)

| Parameters | Value of coefficient | Standard error | Z | P> z |
|-----------------------------------|----------------------|----------------|-------|-------|
| Long-term dependency coefficient | | | | |
| Trade | 0.4391074 | 0.1252565 | 3.51 | 0.000 |
| GCE | 1.0983110 | 1.2004840 | 0.91 | 0.360 |
| GFCF | 0.7099744 | 0.9730444 | 0.73 | 0.466 |
| IFD | 0.0120574 | 0.0509733 | 0.24 | 0.813 |
| Short-term dependency coefficient | | | | |
| Trade | -0.1520805 | 0.1538811 | -0.99 | 0.323 |
| GCE | -0.9275201 | 0.5725976 | -1.62 | 0.105 |
| GFCF | 1.5061260 | 0.4603416 | 3.27 | 0.001 |
| IFD | -0.1192733 | 0.1407257 | -0.85 | 0.397 |
| Constant | -54.103040 | 24.549730 | -2.20 | 0.028 |

In the long term perspective Ukraine is characterized by direct relationships between effective and all factor variables. Changes in the index of financialization have insignificant impact on economic growth. We can summarize that the direction of influence according to individual factor variables varies for Ukraine and different countries as a whole. In the short term perspective, only an increase in GFCF indicator has a positive impact on the effective variable leading to the acceleration of economic growth. The remaining independent variables are characterized by inverse relationship with the effective variable, while an increase in GCE has the strongest negative effect.

The results of the use of DFE approach to determining short-term and long-term coefficients of autoregressive model for the dependence between imbalances in the movement of financial resources caused by financialization and economic growth for all surveyed countries in Central and Eastern Europe in the time range 1991-2014 are presented in Table 11.

In the long term perspective direct relationships have been established between all factor indicators except the index of financialization and effective indicator. In the short term perspective, traditionally, only GFCF indicator has a positive impact on economic growth. The remaining factor variables adversely affect GDPG. It should be noted that in the short term perspective an increase in IFD leads to slower economic development; an increase in GCE causes the reduction of effective indicator; an increase in Trade leads to the reduction of per capita GDP.

Table 11. The results of DFE approach to the definition of short-term and long-term coefficients of autoregressive model (for the entire sample of surveyed countries)

| Parameters | Value of coefficient | Standard error | Z | P> z |
|-----------------------------------|----------------------|----------------|-------|-------|
| Long-term dependency coefficient | | | | |
| Trade | 0.1501564 | 0.0562245 | 2.67 | 0.008 |
| GCE | 0.0010300 | 0.5618182 | 0.00 | 0.999 |
| GFCF | 0.2488019 | 0.2795586 | 0.89 | 0.373 |
| IFD | -0.0329001 | 0.0182415 | -1.80 | 0.071 |
| Short-term dependency coefficient | | | | |
| Trade | -0.0755653 | 0.0381081 | -1.98 | 0.047 |
| GCE | -0.4958330 | 0.2345546 | -2.11 | 0.035 |
| GFCF | 0.2966679 | 0.3193678 | 0.93 | 0.353 |
| IFD | -0.1049616 | 0.0300373 | -3.49 | 0.000 |
| Constant | -5.2647040 | 4.6768310 | -1.13 | 0.260 |
| Number of countries | 15 | 15 | 15 | 15 |
| Number of observations | 330 | 330 | 330 | 330 |

The methodical DFE approach does not allow making a detailed breakdown for each country included in the sample. Therefore, it is not possible to get similar calculations for Ukraine.

It is also expedient to implement the next phase of studying the impact of imbalances in the movement of financial resources on economic growth, namely, determining the most efficient of methodological approaches (PMG, MG, DFE). This involves a pairwise comparison of the effectiveness of these approaches based on the Hausman test. The results of comparison of such approaches as PMG and MG are shown in Table 12. Based on the data presented in Table 12 it is possible to make a conclusion that

given the high value of the indicator «Prob> chi2», which is 0.705 (the maximum possible value is one), more effective methodical approach to determining coefficients of autoregressive model with distributed lag is PMG.

Table 12. The results of the Hausman test to compare the effectiveness of PMG and MG approaches

| Parameters | Values of coefficients | |
|-------------------|------------------------|------------|
| | MG | PMG |
| Trade | -0.1764671 | 0.0246765 |
| GCE | 2.6682213 | 0.3074869 |
| GFCF | 0.9354398 | 0.1073232 |
| IFD | -0.3781076 | -0.0153522 |
| Prob>chi2 = 0.705 | | |

The results of comparing the effectiveness of such methodical approaches as PMG and DFE are presented in Table 13.

Table 13. The results of the Hausman test to compare the effectiveness of PMG and DFE approaches

| Parameters | Values of coefficients | |
|-------------------|------------------------|------------|
| | DFE | PMG |
| Trade | 0.1501564 | 0.0246765 |
| GCE | 0.0010300 | 0.3074869 |
| GFCF | 0.2488019 | 0.1073232 |
| IFD | -0.0329001 | -0.0153522 |
| Prob>chi2 = 0.965 | | |

The results shown in Table 13 demonstrate that PMG is the most effective approach to determine the coefficients of autoregressive model with distributed lag.

In general, we can conclude that PMG approach is the most effective compared to MG and DFE approaches presented above. Therefore, the results obtained through PMG approach should be principal.

Given the higher efficiency of PMG approach we conducted a detailed study of relationships of dependence between the indicator of economic growth and each individual indicator included in the index of financialization. We use only PMG methodical approach to determining the coefficients of autoregressive model with distributed lag. The results of the corresponding calculations are presented in Tables 14-16.

According to the data of Table 14 we can conclude about the importance of such factor feature as DC indicator. It should be noted that there is a negative relationship between long-term indicator DC and indicator of growth of per capita gross domestic product. That is, an increase of factor indicator leads to reduction in the rate of economic growth.

Table 14. The results of PMG approach to determining short-term and long-term coefficients of dependency between imbalances in the movement of financial resources (according to DC indicator) and economic growth for all surveyed countries

| Parameters | Values of coefficients | Standard error | Z | P> z |
|-----------------------------------|------------------------|----------------|-------|-------|
| Long-term dependency coefficient | | | | |
| Trade | 0.0283689 | 0.0122907 | 2.31 | 0.021 |
| GCE | 0.2573053 | 0.1371145 | 1.88 | 0.061 |
| GFCF | 0.1931520 | 0.0681913 | 2.83 | 0.005 |
| DC | -0.0646818 | 0.0131107 | -4.93 | 0.000 |
| Short-term dependency coefficient | | | | |
| Trade | -0.0204249 | 0.0284229 | -0.72 | 0.472 |
| GCE | -0.06830362 | 0.2279992 | -3.00 | 0.003 |
| GFCF | 0.60841180 | 0.1285135 | 4.73 | 0.000 |
| DC | 0.11706450 | 0.1061375 | 1.10 | 0.270 |

The remaining factor indicators, in turn, have a significant positive effect on economic growth in the long-term perspective. In the short-term perspective only factor indicators such as GCE and GFCF have an impact on effective feature, when the first of them is characterized by negative dependence, while the second reflects the positive effect on economic growth. For DC indicator there is a positive relationship, although this relationship is insignificant.

The results of PMG approach to determining short-term and long-term coefficients of dependency between imbalances in the movement of financial resources (BM indicator) caused by financialization and economic growth for the sample of surveyed countries in Central and Eastern Europe are given in Table 15. According to the table's data, we can conclude that coefficients of long-term elasticity of effective and factor features are significant.

Detailing the impact of factor features on effective features it is appropriate to note that there is a long-term inverse relationship between the indicator of growth of per capita gross domestic product and BM indicator. The growth of indicator of relationship of monetary aggregate M3 to gross domestic product causes a slowdown in economic growth.

For the remaining factor indicators direct relations are effective. One should pay attention to the dependence that can be described as follows: the growth of GCE leads to intensification of economic growth rates. The coefficients of short-term elasticity are significant. Specifically, there is a significant direct relationship between the effective indicator and GFCF indicator.

Table 15. The results of PMG approach to determining short-term and long-term coefficients of dependency between imbalances in the movement of financial resources (BM indicator) and economic growth for the sample of surveyed countries

| Parameters | Values of coefficients | Standard error | Z | P> z |
|-----------------------------------|------------------------|----------------|-------|-------|
| Long-term dependency coefficient | | | | |
| Trade | 0.0438480 | 0.0122035 | 3.59 | 0.000 |
| GCE | 0.4088587 | 0.1281113 | 3.19 | 0.001 |
| GFCF | 0.1515939 | 0.0608929 | 2.49 | 0.013 |
| BM | -0.1308529 | 0.0247157 | -5.29 | 0.000 |
| Short-term dependency coefficient | | | | |
| Trade | -0.0533026 | 0.0354217 | -1.50 | 0.132 |
| GCE | -0.4751986 | 0.2534311 | -1.88 | 0.061 |
| GFCF | 0.6758134 | 0.1483603 | 4.56 | 0.000 |
| BM | 0.0184398 | 0.0968018 | 0.19 | 0.849 |

There is also a significant inverse relationship between economic growth and GCE. The remaining short-term coefficients of dependency between imbalances in the movement of financial resources caused by financialization and economic growth are insignificant.

The results of PMG approach with the use of the main factor indicators, that is, the indicator of a ratio of total assets of the financial sector to gross domestic product, are reflected in Table 16. Analyzing the data of the table we can note that the use of factor indicator FSAs means less significant results. Thus, within the study of dependency of coefficients in the long-term perspective it should be necessary to emphasize the importance of relationship between effective indicator and GCE indicator. The relationships with other factor features are insignificant.

The majority of short-term dependency coefficients are significant. The study has found: 1) a negative impact of GCE on economic growth; 2) a positive impact of GFCF on the growth indicator of per capita gross domestic product (Table 16).

Summarizing the results of the study we can conclude that the PMG approach identified by the Hausman test as the most effective makes it possible to obtain significant results at confidence intervals, namely: 1) positive long-term relationships between factor indicators Trade, GCE, GFCF and effective variable; 2) negative dependency of the index of financialization and economic growth.

It should be noted that all models allow to identify the nature of long-term dependence, including a positive impact on the effective indicator of control variables and a negative effect of the main factor feature. Only the relationship of GFCF indicator and the growth indicator of per capita gross domestic product is significant in the short-term perspective.

Table 16. The results of PMG approach to determining short-term and long-term coefficients of dependency between imbalances in the movement of financial resources (FSAss indicator) and economic growth for the sample of surveyed countries

| Parameters | Values of coefficients | Standard error | Z | P> z |
|-----------------------------------|------------------------|----------------|-------|-------|
| Long-term dependency coefficient | | | | |
| Trade | 0.0012655 | 0.0145582 | 0.09 | 0.931 |
| GCE | 0.3536193 | 0.1555907 | 2.27 | 0.023 |
| GFCF | 0.0820398 | 0.0715512 | 1.15 | 0.252 |
| FSAss | -0.0031640 | 0.0043185 | -0.73 | 0.464 |
| Short-term dependency coefficient | | | | |
| Trade | -0.0334508 | 0.0337727 | -0.99 | 0.322 |
| GCE | -0.5502894 | 0.2505416 | -2.20 | 0.028 |
| GFCF | 0.6480215 | 0.1397330 | 4.64 | 0.000 |
| FSAss | 0.0101330 | 0.0488416 | 0.21 | 0.836 |

In the short term perspective the dependence between imbalances in the movement of financial

resources and economic growth is inversely proportional, but cannot be considered significant, which is quite natural, because with insignificant time period it is difficult to determine an adequate nature of relationships, especially with such a complex factor variable as the index of financialization. Analyzing separately the impact of IFD components on economic growth it is useful to note that relations between effective and factor features are the same as for the index of financialization in general. These relationships are significant only for DC and BM indicators. This is quite natural, since these two indicators characterize the activity of the process of financialization.

The scheme of formalization of the impact of imbalances in the movement of financial resources caused by financialization on economic growth is shown in Fig. 1.

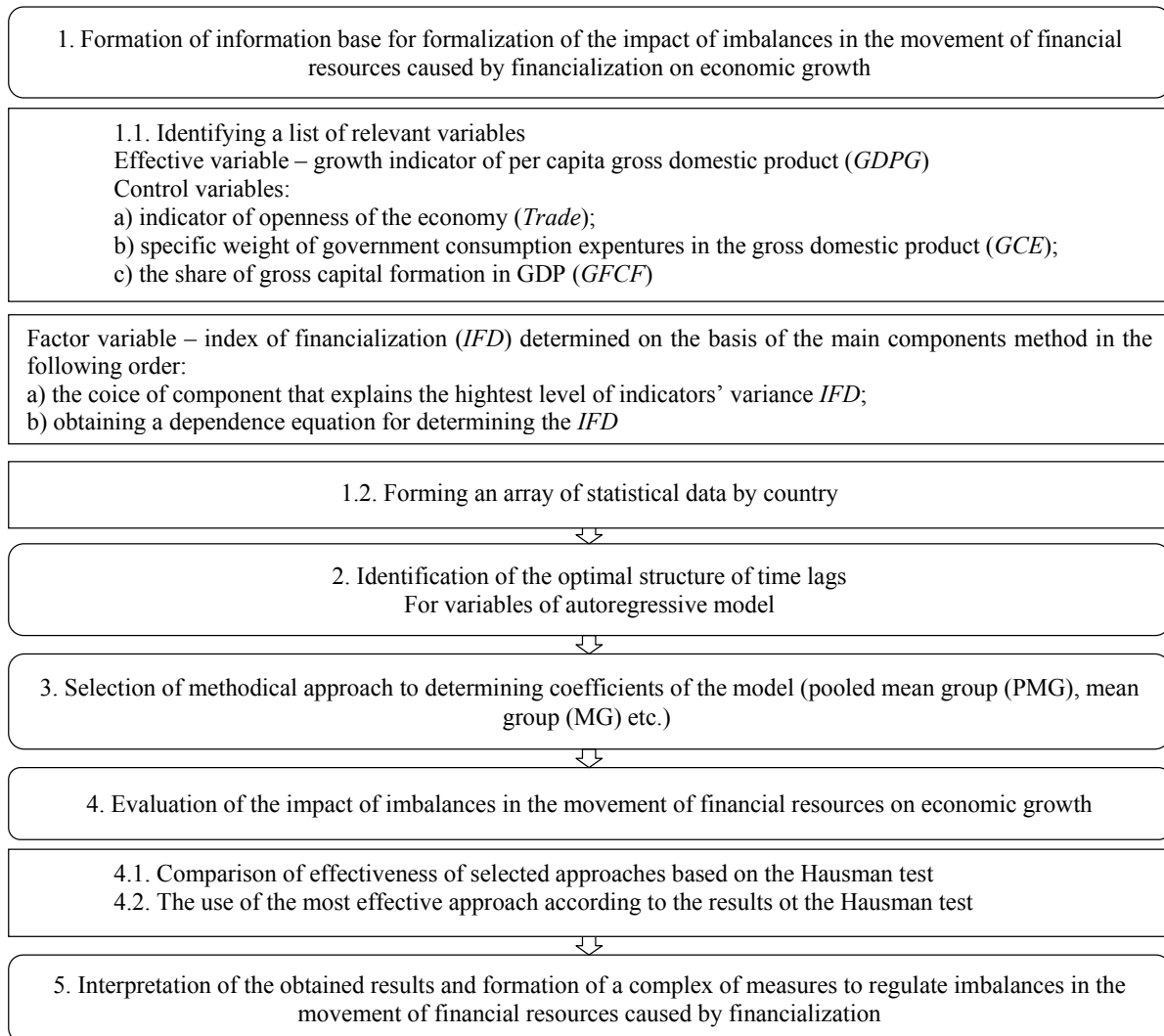


Fig. 1. A Scheme of formalization of the impact of imbalances in the movement of financial resources on economic growth

The main stages of such formalization include: formation of information base; identification of the optimal structure of time lags for ARDL variable and the choice of methodological approach to the determination of coefficients; direct assessment of the impact of imbalances in the movement of financial resources caused by financialization on economic growth; interpretation of the obtained results and development of a regulatory complex.

Conclusion

We have discovered ambiguous relationships between financialization and economic growth. International experience of studying the relationship between financialization and economic growth reveals the lack of a unified algorithm for their assessment. This is explained primarily by the ambiguous choice of effective and factor variables and leading to the research of the impact of imbalances in the movement of financial resources caused by financialization on economic growth in some countries of Central and Eastern Europe. An indicator of growth of per capita gross domestic product was used as effective variable. The assessment of factor variables is to be conducted based on the index of financialization, the determination of which is based on the method of principal components. It includes the following ratios: 1) monetary aggregate M3 to gross domestic product, which determines the depth of the financial sector and its ability to produce financial services; 2) the volume of loans to the private sector to gross domestic product, which determines the orientation towards stimulation of investments in the real sector; 3) assets of the financial sector to gross domestic product, which determines the provision of the economy with financial resources to generate added value.

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The results of formalization of the impact of imbalances in the movement of financial resources on economic growth of Ukraine coincide with the results for the sample of some European countries (Moldova, Romania, Latvia, Lithuania, Estonia, Hungary, Slovakia, Czech Republic, Bulgaria, Armenia, Azerbaijan, Poland, Kazakhstan, Georgia). Overall, the impact of imbalances in the movement of financial resources caused by financialization on economic growth is negative in the short-term and long-term periods. A balanced development of economic sectors in countries of Central and Eastern Europe is important. The growth of the index of financialization in the surveyed countries in Central and Eastern Europe reduces the growth of per capita gross domestic product in the short-term and long-term perspectives.

It is proved that the implementation of measures aimed at increasing the openness of the economy and maintaining effective demand have a positive impact on economic growth of the surveyed countries under conditions of financialization of their economies only in the long-term perspective, which indicates the importance of developing a set of strategic measures regulating imbalances in the movement of financial resources. Strategic steps of regulating imbalances in the movement of financial resources caused by financialization are aimed at creating a reliable system of investors' protection, protection of economic interests of households as consumers of financial services, strengthening the transparency in the activity of players in financial and real sectors of the economy.

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Appendix

Table 4. The results of calculation of the index of financialization for the countries of Central and Eastern Europe in the period 1991-2014

| Year | Moldova | Romania | Latvia | Lithuania | Estonia | Hungary | Slovakia | CzechRepublic | Bulgaria | Armenia | Azerbaijan | Ukraine | Poland | Kazakhstan | Georgia |
|------|---------|---------|--------|-----------|---------|---------|----------|---------------|----------|---------|------------|---------|--------|------------|---------|
| 1991 | 52,40 | 108,56 | 60,02 | 50,22 | 21,80 | 69,22 | 482,83 | 387,24 | 133,38 | 47,69 | 28,98 | 18,33 | 120,32 | 37,01 | 9,17 |
| 1992 | 36,70 | 107,63 | 60,85 | 52,24 | 47,06 | 69,35 | 439,41 | 351,08 | 141,33 | 78,40 | 44,66 | 42,80 | 125,07 | 40,81 | 9,40 |
| 1993 | 21,67 | 124,31 | 71,24 | 58,88 | 76,13 | 66,24 | 390,51 | 321,26 | 157,49 | 52,43 | 56,39 | 32,28 | 135,55 | 78,62 | 10,63 |
| 1994 | 19,18 | 107,94 | 72,99 | 81,92 | 96,97 | 62,03 | 315,53 | 295,82 | 163,26 | 21,90 | 54,03 | 44,34 | 130,17 | 58,26 | 12,05 |
| 1995 | 24,00 | 121,93 | 63,02 | 76,82 | 110,99 | 63,42 | 251,85 | 260,51 | 149,35 | 16,93 | 33,29 | 41,42 | 119,17 | 47,64 | 12,28 |
| 1996 | 26,58 | 132,98 | 66,52 | 77,64 | 127,11 | 60,97 | 238,81 | 241,43 | 197,65 | 16,57 | 42,26 | 42,31 | 114,73 | 48,01 | 10,32 |
| 1997 | 29,72 | 145,17 | 75,64 | 82,63 | 146,70 | 60,45 | 244,36 | 233,56 | 153,91 | 17,54 | 52,92 | 45,89 | 118,98 | 49,40 | 12,72 |
| 1998 | 32,49 | 191,95 | 70,53 | 90,07 | 154,92 | 62,49 | 223,33 | 243,99 | 164,95 | 19,52 | 61,13 | 52,20 | 130,06 | 50,79 | 13,86 |
| 1999 | 33,40 | 180,10 | 67,31 | 111,67 | 150,34 | 77,18 | 211,33 | 228,27 | 191,35 | 21,17 | 64,68 | 54,32 | 133,96 | 56,65 | 15,38 |
| 2000 | 36,72 | 173,63 | 75,48 | 116,08 | 159,92 | 99,10 | 211,13 | 239,65 | 204,21 | 24,18 | 69,31 | 58,96 | 139,74 | 61,15 | 18,23 |
| 2001 | 40,87 | 157,10 | 84,56 | 119,54 | 159,99 | 114,59 | 203,12 | 232,92 | 217,39 | 21,80 | 50,84 | 63,24 | 143,30 | 67,17 | 18,31 |
| 2002 | 46,69 | 147,07 | 92,03 | 131,79 | 189,08 | 112,83 | 214,38 | 229,55 | 227,92 | 23,33 | 49,24 | 76,98 | 157,04 | 72,48 | 19,92 |
| 2003 | 50,75 | 144,41 | 98,66 | 142,52 | 200,27 | 116,36 | 201,83 | 223,65 | 273,09 | 22,56 | 52,06 | 90,39 | 161,18 | 76,21 | 21,26 |
| 2004 | 57,19 | 153,43 | 115,67 | 159,15 | 238,58 | 113,27 | 199,95 | 227,17 | 305,12 | 23,66 | 69,46 | 94,45 | 182,23 | 94,60 | 24,52 |
| 2005 | 65,07 | 171,23 | 136,73 | 188,77 | 251,50 | 128,24 | 190,33 | 210,37 | 320,59 | 25,42 | 63,66 | 93,23 | 165,81 | 110,85 | 30,70 |
| 2006 | 70,11 | 186,38 | 162,01 | 207,20 | 306,46 | 151,61 | 207,89 | 230,46 | 330,79 | 27,36 | 29,01 | 96,19 | 190,20 | 149,95 | 40,30 |
| 2007 | 85,00 | 223,19 | 159,78 | 227,71 | 317,60 | 181,83 | 211,74 | 248,64 | 332,22 | 35,13 | 34,13 | 128,93 | 212,41 | 163,10 | 54,18 |
| 2008 | 85,52 | 228,90 | 156,66 | 216,59 | 305,16 | 191,28 | 205,74 | 217,97 | 348,62 | 39,95 | 36,07 | 143,80 | 175,55 | 145,67 | 59,06 |
| 2009 | 89,64 | 257,44 | 185,04 | 255,55 | 352,26 | 221,76 | 230,91 | 252,71 | 364,21 | 54,51 | 43,71 | 148,76 | 220,85 | 158,93 | 59,77 |
| 2010 | 82,55 | 229,87 | 190,05 | 252,83 | 326,55 | 209,31 | 229,07 | 254,76 | 374,57 | 58,49 | 42,94 | 137,48 | 218,75 | 129,77 | 65,21 |
| 2011 | 81,15 | 228,36 | 162,02 | 235,03 | 274,62 | 198,63 | 214,25 | 238,72 | 378,79 | 70,30 | 41,24 | 127,48 | 197,44 | 121,49 | 66,11 |
| 2012 | 92,11 | 226,45 | 143,35 | 230,24 | 300,04 | 209,15 | 234,46 | 275,83 | 378,12 | 81,29 | 48,33 | 115,33 | 222,03 | 123,04 | 69,74 |
| 2013 | 90,56 | 220,25 | 135,75 | 224,21 | 310,42 | 212,35 | 236,27 | 290,68 | 380,57 | 85,65 | 50,65 | 126,49 | 250,35 | 120,36 | 65,44 |
| 2014 | 87,13 | 215,11 | 124,92 | 218,54 | 316,21 | 218,27 | 239,11 | 298,05 | 381,24 | 87,32 | 51,38 | 125,08 | 278,45 | 121,87 | 61,05 |