Economic Performance and Financial Stability: Case of the Eurasian Economic Union

Vít POŠTA – Aziya MUKUSHEVA** – Nurilya KUCHUKOVA***

Abstract

The paper presents an empirical evaluation of the relationship between some of the financial stability indicators and economic performance. It is focused on the sample of the members of the Eurasian Economic Union. Given some data limitations, dynamic panel analysis is performed. Nonperforming loans are identified as an important indicator of financial stability along with private credit and liquid reserves of commercial banks. These results are in line with many published studies focused on different sets of countries. Contrary to some published results no or little support is identified in the case of the number of commercial bank branches per capita and bank capital to asset ratio.

Keywords: *Eurasian Economic Union, economic performance, financial stability, GMM, panel estimation*

JEL Classification: E30, G00, O53

DOI: https://doi.org/10.31577/ekoncas.2022.01.02

Introduction

The relationships between the financial conditions of the economies and their economic development have long been at the forefront of economic discussions. The research into this particular area of economics was, of course, even more, encouraged by the Great Recession and the associated financial crisis. The Great Recession was sparked off by instability in the financial markets in the US, which points to the importance of the question of financial stability and its impacts on the

* Vít POŠTA, University of Economics, Prague, Faculty of Business Administration, Department of Microeconomics, nám. W. Churchilla 1938/4, 130 67 Prague 3, Czech Republic; e-mail: vit.posta@vse.cz

** Aziya MUKUSHEVA – Nurilya KUCHUKOVA, L. N. Gumilyov Eurasian National University, Satpayev Str., 2, Nur-Sultan, Republic of Kazakhstan; e-mail: mukushevaaziya@gmail.com; nkuchukova@mail.ru

functioning of the real economy. The current economic distress, which is observable on a worldwide scale, highlights once again the importance of these questions.

While, from the empirical point of view, it is a well-researched area in the case of the developed economies, on the other hand, the empirical results are either rather scarce or practically inexistent in the case of developing economies.

The purpose of this paper is twofold. First, we want to provide empirical evidence concerning the relationships between financial stability and economic performance for a group of countries for which there are practically no empirical findings available. In so doing, we contribute to the existing results for different sets of countries and show to what extent the relationships are similar or different. Second, we extend the empirical analysis in how we measure economic performance since the analysis does not rest on the gross domestic product as the only measure of the development of the real economy.

We focus on the Eurasian Economic Union which comprises Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia. Some results may be found, especially, for Russia, but overall there are practically no empirical results concerning the relationship between economic development and financial stability. We believe that the main reason is the problematic accessibility of the data. However, we show that when the countries in question are considered together as a panel, the data series are long enough to perform some meaningful analyses.

In the next section various empirical papers are presented with two aims: first, to introduce the methods typically used in this area and also the key findings, second, to show what variables are usually used as measures of financial stability. The major problem concerning the concept of financial stability is that the way it is employed in both theoretical and empirical analyses takes on a large array of actual meanings. Therefore, we find it necessary to give an overview of various approaches to the concept and to lay down the bases on which the approach taken in this paper is built. In the second section, the methodology and data used in this paper are presented. The third section states the estimates and their discussion concerning the review presented in the second section of the paper. Finally, we conclude by summarizing the main findings.

1. Empirical Findings and Methodology

The relationships between economic development and financial stability are mostly studied by applying the generalized method of moments (GMM) on either panel or individual data or by using vector autoregression (VAR) and/or causality tests. In this section, the key, and sometimes conflicting, empirical findings are presented as well as the typically used variables.

Saci et al. (2009), Adusei (2013), Creel et al. (2015) Guru and Yadav (2019), Ijaz et al. (2020) use the GMM techniques, and their findings confirm that there is a positive relationship between financial stability and economic development. Rioja and Valev (2004) find that such financial development indicators as private credit and liquid liabilities of commercial banks have a positive and significant effect on economic growth. Saci et al. (2009) conclude that in the case of developing countries stock market development is positively related to economic growth. Adusei (2013) argues that the relationship between financial stability and economic growth is positive and this relationship is bi-directional causal. The indicators of financial development used are, as in Rioja and Valev (2004) and Saci et al. (2009), private credit and liquid liabilities of commercial banks. Ijaz et al. (2020) conclude that bank stability is important for economic growth, especially during the crisis period.

Beck et al. (2000), Leitão (2010), Manu et al. (2011), Batuo et al. (2018), Xue (2020) use dynamic panel data and show financial stability positively influences economic performance. Beck et al. (2000) claim that better functioning financial intermediaries improve resource allocation and accelerate total factor productivity growth with positive repercussions for long-run economic growth. Batuo et al. (2018) suggests that economic growth reduces financial instability. Xue (2020) states that functioning financial sector development may reduce aggregate fluctuations and dampen inflation shocks.

Xu (2000), Shan and Morris (2002), Shan (2005), Carbó-Valverde and Sánchez (2013), Samargandi and Kutan (2016), Pradhan et al. (2017) use the VAR approach with mixed findings. Xu (2000) finds that financial development measured as total bank deposits is important to GDP growth. However, Shan and Morris (2002) and Shan (2005) conclude that there is no strong evidence that financial development leads to economic growth. Carbó-Valverde and Sánchez (2013) suggest that financial stability changes the behavior of the linkage between financial development and economic growth. Samargandi and Kutan (2016) find that private credit consistently affects economic growth. Pradhan et al. (2017) evidence that the banking sector, stock market, bond market, and insurance market all matter in the determination of long-run per capita economic growth.

Demetriades and Hussein (1996), Al-Tamimi et al. (2002), Al-Yousif (2002), Kar et al. (2011), Bangake and Eggoh (2011) make use of causality tests and in general, confirm that the relationship between financial development and economic growth is bi-directional and in the case of Kar et al. (2011) it is hard to identify at all. The variables used as measures of financial stability vary from study to study and are greatly influenced by the availability of data. Beck et al. (2000), Rioja and Valev (2004), Saci et al. (2009), Bangake and Eggoh (2011),

Adusei (2013), Menyah et al. (2014), Guru and Yadav (2019), Batuo et al. (2018) all use liquid liabilities of commercial banks. Botev et al. (2019) and some other papers employ the development of the stock market as a measure of financial stability. Pradhan et al. (2017) use domestic credit provided by the banking sector as one of the indicators of financial stability. Creel et al. (2015) find that non-performing loans are one of the relevant indicators of financial stability. Manu et al. (2011) employs capital adequacy variable and liquidity variable, both for commercial banks, as financial stability variables. According to Vo et al. (2019) financial inclusion approximated by the number of commercial bank branches over 100 000 account holders is found to enhance financial stability.

Gross domestic product is typically used as a measure of economic development in most of the studies. The overview of the literature shows that the existing body of empirical research may be divided into two categories regarding how the concept of financial stability is employed. The first approach relies on using individual and quite specific measures related to some particular features of the financial sector of an economy. Examples of this approach include, for example, Rioja and Valev (2004), Saci et al. (2009), Xu (2000), and Samargandi and Kutan (2016), all mentioned above. The other approach is best represented by, for example, Ijaz et al. (2020), Beck et al. (2000), or Pradhan et al. (2017) who relate financial stability to specific sections of the financial market such as the banking sector as a whole, bond market, etc. and not really to specific indicators.

Upon the analysis of the data available for the group of countries in question, we concluded that only the first approach was possible since the data is not sufficient to comprise measures that would reflect the development of large sections of the financial sector of the economies, for example, the banking sector in the sense of its stability. As far as the economic performance is concerned, we broaden the view as to how to measure it. Given the fact that the data set includes economies with various degrees of openness and levels of presence of foreign capital, we deem it essential to use, besides GDP, gross and net national income, and also some labor market statistics. The data, as well as the methodology used in this study, are presented in the following section.

2. Data and Econometrical Analysis

Following up on the previous discussion we will test some relationships between economic performance and financial stability indicators. The data was drawn from the World Bank. We employ various measures of economic performance. The economic performance is measured by five variables: gross domestic product per capita in constant 2010 USD referred to as GDP, gross national

income per capita in constant 2010 USD referred to as GNI, net national income per capita in constant 2010 USD referred to as NNI, employment of the population 15 years and older referred to as EMP, and unemployment rate denoted as UR.

Given the availability of the data for the countries in question, we can capture financial stability by the following indicators: bank liquid reserves to bank assets ratio denoted as LRTA, commercial bank branches per 100 000 adults denoted as CB, domestic credit to the private sector by banks to GDP referred to as DCTGDP, bank capital to assets ratio denoted as CTA, and bank nonperforming loans to total gross loans referred to as NPL.

Table A in the Appendix summarizes the statistical properties of these series expressed in logarithms. The sample varies according to the availability of the data and the exact information about the sample is given in the tables presenting the output of the estimations. Table A shows that all of the series may be considered stationary in first differences.

We test for the presence of unit roots by utilizing the Breitung (2000) unit root tests. Suppose the following representation of the panel:

$$\Delta y_{i,t} = \alpha y_{i,t-1} + \sum_{j=1}^{n_i} \beta_{i,j} \Delta y_{i,t-j} + \delta x_{i,t} + \varepsilon_{i,t} \tag{1}$$

where y represents the endogenous variable, x stands for exogenous variables, ε represents errors, i denotes cross-sections, $j = 1 \ldots n_i$ signifies possible different lag orders for the cross-sections. As well as another unit root test frequently used in panel analysis, the Levin-Lin-Chu (2002) test, the Breitung unit root test assumes a common unit root process across the cross-sections. From the point of view of equation (1) this means that the parameter α is not differentiated according to the cross-sections. This assumption is preferable in this case because the sample is not based on particularly long data series. In addition to this fact, the Breitung test is less computationally complex than the Levin-Lin-Chu test, which given the data limitations with respect to time makes it more convenient for our analysis. The null hypothesis of the Breitung test is that α is equal to zero, which means that the data contain the unit root process.

The general structure of the empirical model we estimate is:

$$y_{i,t} = c_i + \alpha y_{i,t-1} + \delta x_{i,t} + \varepsilon_{i,t} \tag{2}$$

where c represents constants, y contains economic performance indicator, x contains financial stability indicator(s). Given the fact that y_{t-1} and c are positively correlated, OLS cannot be employed. Any transformation based on fixed or random effects approach does not solve the problem as it would contain a positive correlation between the transformed error term and transformed lagged dependent variable. Therefore, this type of model is typically dealt with in first differences:

$$\Delta y_{i,t} = \alpha \Delta y_{i,t-1} + \delta \Delta x_{i,t} + \Delta \varepsilon_{i,t} \quad (3)$$

which have already been shown to be stationary, see Table A. The estimation of the transformation (3) typically rests on generalized method of moments, GMM, which employs instrumental variables. We now summarize the approach taken in this analysis.

Given the structure of the empirical model (2) we have to account for possible endogeneity relationships, possible autocorrelation, and fixed effects. Therefore, we resort to the Arellano-Bond estimator. We use the dynamic one lag of the financial stability indicators as instruments. The instruments used in each estimation are stated in the description of Tables 1 to 3. The validity of instruments was tested by Sargan-Hansen J-test, which is reported in Tables 1 to 3.

In the estimation, we employ two-step White weighting matrix which is robust to panel-specific autocorrelation and heteroscedasticity. Autocorrelation in the residuals was tested by the Arellano-Bond test for the presence of autoregression in the residuals. Given the fact that the model is estimated in first differences, the Arellano-Bond test for AR(1) shows possible autoregression in the first differences of the residuals. This is confirmed in some of the cases and is also expected. The more important is the test for the AR(2) autoregression, which indicates whether or not there is autoregression in the levels of the residuals. These results are also reported in Tables 1 to 3.

The underlying structure of the empirical model (2) captures impacts coming from all sources other than financial stability by the lagged value of the performance indicator itself. This means that we do not include any other specific relationships to try to explain the behavior of the performance indicator. This stems from the limited availability of the data. We would not have been able to reach reasonable estimates from the point of view of statistical inference or any estimates at all for that matter. We perform the empirical investigation in three stages. The first stage consists in running simple estimations between the performance indicator and one financial indicator. This means that given formula (2), x contains only one variable. We use two subsets with respect to the time sample because we were only able to obtain a bit shorter series of CTA and NPL in comparison with the other variables. The results are given in Table 1. The second stage captures the joint effects of LRTA, CB, and DCTGDP on economic performance. The estimates are based on an adjusted sample starting in 2005. The results are presented in Table 2. The third stage of the analysis captures the joint effects of CTA and NPL on economic performance. The estimates are based on an adjusted sample starting in 2006. We do not include the financial stability variables from the previous stage because we do not have long enough series to perform such an analysis. The results are presented in Table 3.

3. Results and Discussion

Table 1 presents the results of estimations of (3) based on one indicator of financial stability only. We perform this stage of the analysis because of the lack of data so that the conclusions are based on a range of estimates. As expected, the results show a great deal of autoregression concerning the dependent variable. Bank liquid reserves to bank assets ratio (LRTA) is statistically significant when net national income is used as a measure of economic performance. Bank nonperforming loans to total gross loans (NPL) is found highly statistically significant independently of the measure used as an economic performance indicator. We also highlight that the bank capital to assets ratio (CTA) is close to being statistically significant (p-value less than 0.15) when GDP is used as an economic performance indicator. Table 1 shows that there is no problem with autocorrelation in residuals and instruments are valid.

T a b l e 1

Separate Estimates Differentiated by the Measure of Financial Stability

Model	GDP	GNI	NNI
No. of cross-section, 5, adjusted time sample, 2005:2019			
Dependent (–1)	0.99***	0.99***	0.99***
LRTA	0.03	0.04	0.11**
J-statistic	1.83	3.08	2.70
AR(1)	–0.64	–2.08**	–0.57
AR(2)	–1.90*	–0.19	–0.30
Dependent (–1)	0.83***	0.91***	0.99***
CB	0.02	–0.03	–0.21
J-statistic	4.59	3.48	1.56
AR(1)	–1.87*	–0.93	–1.53
AR(2)	–1.61	–0.20	–0.20
Dependent (–1)	0.96***	0.88***	0.94***
DCTGDP	0.00	–0.02	0.00
J-statistic	3.87	1.97	3.73
AR(1)	–0.06	–0.21	–0.72
AR(2)	–0.00	–0.02	–0.05
No. of cross-section, 5, adjusted time sample, 2006:2019N			
Dependent (–1)	0.80***	0.77***	0.74***
CTA	0.09^{+}	–0.08	0.11
J-statistic	3.74	3.58	4.85
AR(1)	–0.75*	–1.33	–2.77**
AR(2)	–0.45	0.19	0.03
Dependent (–1)	0.76***	0.78***	0.75***
NPL	–0.06***	–0.05***	–0.10*
J-statistic	3.91	3.83	4.56
AR(1)	–0.93	–0.65	–1.48
AR(2)	–0.17	0.65	0.60

Notes: Instruments: dynamic one lag of the financial stability indicator whose relevance is tested. J-statistic refers to the test of the validity of over-identifying restrictions with the null of the restrictions being valid. AR(1) and AR(2) refer to the m-statistic of autocorrelation test in residuals with the null of no autocorrelation. *, **, *** means rejection of the null at 10%, 5%, and 1% level of significance, respectively. $^{+}$ means p-value less than 0.15 but greater than 0.1.

Source: Own computations and estimates.

The second stage of the empirical analysis examines the joint role of LRTA, CB, and DCTGDP on economic performance. The results are given in Table 2. We extend the variables capturing economic performance by employment and unemployment rate. Again, the dynamics of the economic performance indicators are to a great extent and to no surprise governed by autoregression, except for employment. Commercial bank branches per 100 000 adults (CB) is never found to be statistically significant. Bank liquid reserves to bank assets ratio (LRTA) is statistically significant when gross national income is used as a measure of economic performance and is close to being statistically significant when economic performance is captured by GDP. When GDP and NNI are used as measures of economic performance domestic credit to private sectors by banks to GDP (DCTGDP) is detected as statistically significant. Table 2 shows that there is no problem with autocorrelation in residuals and instruments are valid.

T a b l e 2

Estimates with More than One Measure of Financial Stability I

Model	GDP	GNI	NNI	EMP	UR
No. of cross-section, 5, adjusted time sample, 2005:2019					
Dependent (–1)	0.76***	0.77***	0.81***	0.91	0.53**
LRTA	0.02^{+}	0.04**	0.03	–0.01	–0.00
CB	0.11^{+}	–0.02	–0.07	0.07	0.07
DCTGDP	0.10***	0.06	0.11*	0.01	-0.08^{+}
J-statistic	1.63	1.94	1.95	0.77	2.52
AR(1)	–1.34	–1.59	–1.47	–1.50	–0.39
AR(2)	–0.65	–0.11	–0.46	–0.36	–0.71

Notes: Instruments: dynamic one lag of LRTA and DCTGDP. J-statistic refers to the test of the validity of overidentifying restrictions with the null of the restrictions being valid. AR(1) and AR(2) refer to the m-statistic of autocorrelation test in residuals with the null of no autocorrelation. *, **, *** means rejection of the null at 10%, 5%, and 1% level of significance, respectively. $^{+}$ means p-value less than 0.15 but greater than 0.1.

Source: Own computations and estimates.

The third stage of the empirical analysis examines the joint role of CTA and NPL on economic performance. The results are given in Table 3. Bank capital to assets ratio (CTA) is close to being statistically significant when economic performance is captured by net national income. Strong significance is reported in the case of bank nonperforming loans to total gross loans (NPL) when economic performance is captured by employment and unemployment rate. Table 3 shows that there is no problem with autocorrelation in residuals and instruments are valid.

Let's first turn to the comparison of our results with some of the mentioned above which focus on developing countries. In line with Manu et al. (2011), who focus on a set of African economies, we confirm that in the case of the Eurasian Economic Union nonperforming loans are a very important indicator of financial stability and their effect is negative. As in Samargandi and Kutan (2016), who perform their analysis on the set of BRICS countries, and Pradhan et al. (2017),

who focus on ASEAN Regional Forum economies, we find some support for domestic credit as a financial variable that should be taken into account and that has a positive effect on economic performance. On the other hand, we find no statistically significant relationship between the number of commercial bank branches per 100 000 adults and economic performance, which runs contrary to Vo et al. (2019), who focus on emerging economies from various parts of the world. It should be noted that with the progress of online banking the number of commercial bank branches per capita is to be expected to play a less important role.

T a b l e 3

Estimates with More than One Measure of Financial Stability II

Model	GDP	GNI	NNI	EMP	UR
No. of cross-section, 5, adjusted time sample, 2006:2019					
Dependent (–1)	0.90***	0.83**	0.84***	0.63**	0.40
CTA	0.07	–0.06	0.44^{+}	–0.01	–0.00
NPL	–0.09	–0.08	–0.10	–0.03**	0.18***
J-statistic	3.87	3.78	4.32	2.19	1.75
AR(1)	–0.56	–0.27	–2.96***	–0.09	0.06
AR(2)	–0.05	–0.14	0.49	–0.61	0.00

Notes: Instruments: dynamic one lag of CTA. J-statistic refers to the test of the validity of over-identifying restrictions with the null of the restrictions being valid. AR(1) and AR(2) refer to the m-statistic of autocorrelation test in residuals with the null of no autocorrelation. *, **, *** means rejection of the null at 10%, 5%, and 1% level of significance, respectively. $^{+}$ means p-value less than 0.15 but greater than 0.1.

Source: Own computations and estimates.

As far as empirical findings in the cases of developed economies are concerned, in line with Creel et al. (2015), who perform their analysis on a set of 27 EU economies, nonperforming loans are found to be a very important indicator of financial stability with the expected negative effect on economic performance. Ferreira (2017) shows that bank solvency measured by debt to equity ratio has a positive effect on GDP growth. We do not work exactly with this measure, however, the bank capital to assets ratio reflects the same idea. We found limited support for its significance in determining economic performance. She also finds that the ratio of loans to total deposits and borrowings plays an important role as far as GDP growth is concerned, which is in line with our finding that the ratio of domestic credit to GDP is statistically significant in determining the economic performance. Prochniak and Wasiak (2017) find that the growth of domestic credit has a positive effect on GDP growth in the EU but not in the OECD countries while nonperforming loans have an important negative effect in both the EU and OECD countries. Their analysis also shows that the bank capital to assets ratio has a statistically significant positive effect on GDP growth in the OECD countries, while its impacts in the case of EU countries are less clear. This especially supports our findings concerning the role of nonperforming roles and

domestic credit while it shows that the role of bank capital may be found to be unclear; in our case, the estimate for it falls short of statistical significance. Bayar et al. (2021) focus on post-transition EU countries. Their findings support that the impact of nonperforming loans on economic development is negative.

Altuzarra et al. (2016) perform an analysis of the impacts of the amount of credit on economic growth in the EU. They use long-term data. They find that until the 1990s the effect was positive while since then it seems to be negative. They conclude that this structural change occurred because nonfinancial corporations started to use the credit for financial investment and not for investments into physical capital, which might have further stimulated economic growth. Their analysis shows why in less developed countries the amount of credit may play an important positive role concerning economic performance and at the same time in more advanced countries its effect may not be significant or its role might be even negative.

Conclusions

We confirm some of the previously detected findings on the sample of the members of the Eurasian Economic Union. Many specifications of the empirical model lead us to believe that there is a statistically significant positive link between liquid reserves of commercial banks and domestic credit on the one hand and economic performance on the other hand. There is also a strong negative relationship between nonperforming loans and economic performance. The number of commercial bank branches per capita is statistically insignificant.

From the point of view of economic policy, it can be concluded that any index of financial stability used in this geographical area should include the following variables: liquid reserves of commercial banks, domestic credit, and nonperforming loans. Bank capital to asset ratio should not be viewed as completely a useless indicator. We stress the fact that in many estimations the associated coefficient was close to being statistically significant.

An important question, from the point of view of economic policy, is also the interdependence between the indicators of financial stability and economic performance. There is no question that in economies based on credit higher economic performance automatically leads to a higher amount of credit in the economies or that better economic performance limits the number of nonperforming loans. However, as both indicators are considered as ratios: domestic credit to GDP and nonperforming loans to total gross loans, one would need to evaluate the effects of economic performance on the denominators and then on the numerators to be able to answer the question in which direction the relationships are stronger. There is not a sufficient amount of data to try to empirically disentangle these relationships

in this case. However, using labor market statistics as a measure of economic performance helps a bit, especially, in the case of employment because the relationship between economic performance measured by GDP or similar variables and employment is less direct and stable. The fact that nonperforming loans are still identified as statistically significant indicates that in this case the relationship going from the nonperforming loans to the economic performance may be quite strong.

As we implied at the beginning of the paper the importance of the question of the relationships between financial stability and economic performance is all the more important today from the perspective of economic policy given the economic distress provoked by the measures applied in the economies all over the world in response to the COVID epidemic. The analysis shows that in this particular region attention should be turned especially to the development of the nonperforming loans. Their negative effect on economic performance is supported by a huge body of empirical literature some of which was referred to above. Other important variables from the perspective of financial stability in the case of the Eurasian Economic Union are the amount of domestic credit and liquidity reserves of banks. The available data for 2020 indicate that there was no problem with the supply of domestic credit, which increased in the region, especially as a result of monetary expansion. Increases in nonperforming loans ratios in 2020 were observed, but only in the case of Kazakhstan should it be considered significant (an increase by more than 2 percentage points), data on Kyrgyzstan is not yet available. In some countries, liquidity reserves of banks fell, especially in Russia and Belarus (by more than 2 and 3 percentage points, respectively). We can conclude that given the available data for 2020 there is not a clear indication that financial conditions worsened in this region when taking account of the variables which were found to be statistically significant. However, it does not mean that it didn't happen this year – 2021. Since no data is available, no conclusions may be drawn. On the other hand, it is a fact that some countries in this region were hit far more by the epidemic in 2021, notably Russia, so that at least in some countries a worsening of the conditions of financial stability and their negative effects on economic performance should be expected.

References

ADUSEI, M. (2013): Finance-Growth Nexus in Africa: A Panel Generalized Method of Moments (GMM) Analysis. Asian Economic and Financial Review, *3*, No. 10, pp. 1314 – 1324. Available at: <https://archive.aessweb.com/index.php/5002/article/view/1091>.

AL-TAMIMI, H. A. H. – AL-AWAD, M. – CHARIF, H. A. (2002): Finance and Growth : Evidence from Some Arab Countries. Journal of Transnational Management Development, *7*, No. 2, pp. 3 – 18. DOI: 10.1300/J130v07n02.

AL-YOUSIF, Y. K. (2002): Financial Development and Economic Growth: Another Look at the Evidence from Developing Countries. Review of Financial Economics, *11,* No. 2, pp. 131 – 150. DOI: 10.1016/S1058-3300(02)00039-3.

ALTUZARRA, A. – PEINADO, P. – RODRIGUEZ, C. – SERRANO, F. (2016): Changes in the Relationship between the Financial and the Real Sector and the Present Financial Crisis in the European Union. [Working Papers, Wpaper159.] Financialisation, Economy, Society & Sustainable Development (FESSUD) Project.

BANGAKE, C. – EGGOH, J. C. (2011): Further Evidence on Finance-growth Causality: A Panel Data Analysis. Economic Systems, *35*, No. 2, pp. 176 – 188. DOI: 10.1016/j.ecosys.2010.07.001.

BATUO, M. – MLAMBO, K. – ASONGU, S. (2018): Linkages between Financial Development, Financial Instability, Financial Liberalisation and Economic Growth in Africa. Research in International Business and Finance, *45,* October, pp. 168 – 179. DOI: 10.1016/j.ribaf.2017.07.148.

BAYAR, Y. – BOROZAN, D. – GAVRILETEA, M. D. (2021): Banking Sector Stability and Economic Growth in Post-transition European Union Countries. International Journal of Finance and Economics, *26,* No. 1, pp. 949 – 961. DOI: 10.1002/ijfe.1829.

BECK, T. – LEVINE, R. – LOAYZA, N. (2000): Finance and the Sources of Growth. Journal of Financial Economics, *58*, No. 1 – 2, pp. 261 – 300. DOI: 10.1016/s0304-405x(00)00072-6.

BOTEV, J. – ÉGERT, B. – JAWADI, F. (2019): The Nonlinear Relationship between Economic Growth and Financial Development: Evidence from Developing, Emerging and Advanced Economies. International Economics, *160*, December, pp. 3 – 13. DOI: 10.1016/j.inteco.2019.06.004.

BREITUNG, J. (2000): The Local Power of Some Unit Root Tests for Panel Data. In: BALTAGI, B. (ed.): Nonstationary Panels, Panel Cointegration, and Dynamic Panels. Advances in Econometrics, *15*, pp. 161 – 178. DOI: 10.1016/S0731-9053(00)15006-6.

CREEL, J. – HUBERT, P. – LABONDANCE, F. (2015): Financial Stability and Economic Performance. Economic Modelling, *48*, August, pp. 25 – 40. DOI: 10.1016/j.econmod.2014.10.025.

DEMETRIADES, P. O. – HUSSEIN, K. A. (1996): Does Financial Development Cause Economic Growth? Time-series Evidence from 16 Countries. Journal of Development Economics, *51*, No. 2, pp. 387 – 411. DOI: 10.1016/S0304-3878(96)00421-X.

FERREIRA, C. (2017): Relevance of the EU Banking Sector to Economic Growth. International Advances in Economic Research, *23*, No. 6, pp. 2003 – 2015. DOI: 10.1007/s11294-017-9632-1.

GURU, B. K. – YADAV, I. S. (2019): Financial Development and Economic Growth: Panel Evidence from BRICS. Journal of Economics, Finance and Administrative Science, *24*, No. 47, pp. 113 – 126. DOI: 10.1108/JEFAS-12-2017-0125.

IJAZ, S. – HASSAN, A. – TARAZI, A. – FRAZ, A. (2020): Linking Bank Competition, Financial Stability, and Economic Growth. Journal of Business Economics and Management, *21*, No. 1, pp. 200 – 221. DOI: 10.3846/jbem.2020.11761.

KAR, M. – NAZLIOĞLU, Ş. – AĞIR, H. (2011): Financial Development and Economic Growth Nexus in the MENA Countries: Bootstrap Panel Granger Causality Analysis. Economic Modelling, *28*, No. 1 – 2, pp. 685 – 693. DOI: 10.1016/j.econmod.2010.05.015.

LEITÃO, N. C. (2010): Financial Development and Economic Growth: A Panel Data Approach. Theoretical and Applied Economics, *17*, No. 10, pp. 15 – 24. Available at: <http://store.ectap.ro/articole/517.pdf>.

LEVIN, A. – LIN, F. – CHU, C. (2002): Unit Root Tests in Panel Data: Asymptotic and Finite-sample Properties. Journal of Econometrics, *108,* pp. 1 – 24. DOI: 10.1016/S0304-4076(01)00098-7.

MANU, L. P. – ADJASI, C. K. D. – ABOR, J. – HARVEY, S. K. (2011): Financial Stability and Economic Growth: A Cross-country Study. International Journal of Financial Services Management, *5*, No. 2, pp. 121 – 138. DOI: 10.1504/ijfsm.2011.041920.

MENYAH, K. – NAZLIOGLU, S. – WOLDE-RUFAEL, Y. (2014): Financial Development, Trade Openness and Economic Growth in African Countries: New Insights from a Panel Causality Approach. Economic Modelling, *37,* No. C, pp. 386 – 394. DOI: 10.1016/j.econmod.2013.11.044.

PRADHAN, R. P. – ARVIN, M. B. – BAHMANI, S. – HALL, J. H. – NORMAN, N. R. (2017): Finance and Growth: Evidence from the ARF Countries. Quarterly Review of Economics and Finance, *66*, No. C, pp. 136 – 148. DOI: 10.1016/j.qref.2017.01.011.

PROCHNIAK, M. – WASIAK, K. (2017): The Impact of the Financial System on Economic Growth in the Context of the Global Crisis: Empirical Evidence for the EU and OECD Countries. Empirica, *44,* No. 2, pp. 295 – 337. DOI: 10.1007/s10663-016-9323-9.

RIOJA, F. K. – VALEV, N. T. (2004): Does One Size Fit All?: A Reexamination of the Finance and Growth Relationship. Journal of Development Economics, *74,* No. 2, pp. 429 – 447. DOI: 10.1016/j.jdeveco.2003.06.006.

SACI, K. – GIORGIONI, G. – HOLDEN, K. (2009): Does Financial Development Affect Growth? Applied Economics, *41,* No. 13, pp. 1701 – 1707. DOI: 10.1080/00036840701335538.

SAMARGANDI, N. – KUTAN, A. M. (2016): Private Credit Spillovers and Economic Growth: Evidence from BRICS Countries. Journal of International Financial Markets, Institutions and Money*, 44*, No. C, pp. 56 – 84. DOI: 10.1016/j.intfin.2016.04.010.

CARBÓ-VALVERDE, S. – SÁNCHEZ, L. P. (2013): Financial Stability and Economic Growth, In: RADOSELOVICS, J. F. G. and MONSÁLVEZ, J. M. P. (ed.): Crisis, Risk and Stability in Financial Markets, Chapter 1, pp. 8 – 23. London: Palgrave Macmillan.

SHAN, J. (2005): Does Financial Development "Lead" Economic Growth? A Vector Auto-regression Appraisal. Applied Economics, *37,* No. 12, pp. 1353 – 1367. DOI: 10.1080/00036840500118762.

SHAN, J. – MORRIS, A. (2002): Does Financial Development "Lead" Economic Growth? International Review of Applied Economics, *16,* No. 2, pp. 153 – 168. DOI: 10.1080/02692170110118885.

VO, A. T. – VAN, L. T.-H. – VO, D. H. – MCALEER, M. (2019): Financial Inclusion and Macroeconomic Stability in Emerging and Frontier Markets. Annals of Financial Economics, *14*, No. 2, pp. 1 – 22. DOI: 10.1142/s2010495219500088.

XU, Z. (2000): Financial Development, Investment, and Economic Growth. Economic Inquiry, *38,* No. 2, pp. 331 – 344. DOI: 10.1111/j.1465-7295.2000.tb00021.x.

XUE, W. J. (2020): Financial Sector Development and Growth Volatility: An International Study. International Review of Economics and Finance, *70*, November, pp. 67 – 88. DOI: 10.1016/j.iref.2020.06.025.

Appendix

Table A

Statistical Properties of the Data

Series/Statistics	Mean	Standard deviation	Normality	Unit root – series in levels	Unit root – series in 1st differences
GDP	8.17	0.94	10.83***	1.21	–3.93***
GNI	8.15	0.93	11.80***	1.58	–4.08***
NNI	7.94	0.89	8.98**	2.01	–4.63***
EMP	4.03	0.12	8.89**	–0.87	–1.81**
UR	2.16	0.39	5.86*	–1.18	–2.84***
LRTA	2.65	0.46	2.54	–1.12	–6.50***
CB	2.05	1.11	3.35	2.53	–1.77**
DCTGDP	2.89	0.78	7.70**	0.99	–2.74***
CTA	2.64	0.28	3.94	0.82	–2.87***
NPL	1.92	0.53	0.24	–0.34	–1.96**

Notes: GDP (gross domestic product in constant 2010 USD per capita), GNI (gross national income in constant 2010 USD per capita), NNI (net national income in constant 2010 USD per capita), EMP (employment 15+), UR (unemployment rate), LRTA (bank liquid reserves to bank assets ratio), CB (commercial bank branches per 100 000 adults), DCTGDP (domestic credit to private sectors by banks to GDP), CTA (bank capital to assets ratio), NPL (bank nonperforming loans to total gross loans).

Source: World Bank. All series are expressed in logarithms. Normality is tested by the Jarque-Bera test under the null of normal distribution, the unit root is tested by the Breitung test under the null of a unit root.