BEZPIECZNY
BANK

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Financial Liberalization as a Determinant of Banks' Efficiency

Abstract

Contemporary pressures to enhance supervision and regulation of financial intermediation are aimed at increasing the efficiency of financial market functioning and the resilience of the global financial system to disturbances in its operation. The purpose of this paper is to evaluate the impact of financial liberalization on the banking sector efficiency. The analysis answers the following questions: Does financial liberalization affect changes in the banking sector cost/income ratio? How did the relationship between financial liberalization and European banks' efficiency develop in 1995–2015? The research was conducted for 28 European countries between 1995 and 2015 divided into two periods: before the financial crisis (1995–2008) and after the crisis (2009–2015).

Key words: banking sector, financial liberalization, efficiency, ratio of costs to revenues

JEL: G1, G21, G32, G39

Liberalizacja finansowa jako determinanta efektywności banków

Streszczenie

Współczesna presja na wzmocnienie nadzoru i regulacji pośrednictwa finansowego ma na celu zwiększenie efektywności funkcjonowania rynku finansowego i odporności globalnego systemu finansowego na zakłócenia jego funkcjonowania. Celem artykułu jest ocena wpływu liberalizacji finansowej na efektywność sektora bankowego. Analiza ma za zadanie odpowiedzi na następujące pytania: Czy liberalizacja finansowa wpływa na zmiany relacji kosztów do dochodów sektora bankowego? W jaki sposób związek między liberalizacją finansową a efektywnością europejskich banków rozwijał się w latach 1995–2015? Badania przepro-

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wadzono dla 28 krajów europejskich w latach 1995–2015 w dwóch okresach: przed kryzysem finansowym (1995–2008) i po kryzysie (2009–2015).

Słowa kluczowe: sektor bankowy, liberalizacja finansowa, efektywność, współczynnik kosztów do przychodów

1. Introduction

Given its economic, social and political dimensions, globalization has been the subject of specific research in recent years. Its definition is not confined to the interdependence of phenomena, the merging of economies, or the consolidation of economic structures, but also comprises the mobility of goods and capital. In parallel, financial and investment liberalization is ongoing, enabling investment in many financial markets by means of a wide range of instruments. From the point of view of the latest global financial crisis, which undoubtedly would not have unfolded on such a scale if not for the global nature of financial markets, it is necessary to analyse the benefits and costs of this process. Contemporary pressures to enhance supervision and regulation of financial intermediation are aimed at increasing the efficiency of financial market functioning and the resilience of the global financial system to disturbances in its operation. However, it is not certain whether more stringent regulations will favour the security of the banking system or reduce systemic risk. Regulatory policy may impose an additional burden on the financial sector when capital is a scarce good and credit supply is needed for stimulating the real economy. With the implementation of macroprudential policy, the number of studies on the impact of imposed regulations on the behaviour of the financial sector has risen considerably in the recent period. Such proposals are usually aimed at measuring the contribution of a bank's individual risk to the overall risk of the financial system, striving to determine the causal relationship between the two risks.

Considering all the above problems, this article presents the following research hypotheses:

H1: Financial liberalization has a positive influence on cost-efficiency of banks.

H2: Globalization processes improve the cost-efficiency of banks.

H3: Financial liberalization and bank efficiency nexus has changed after the global crisis of 2007–2008.

In order to prove the above hypotheses, the impact of globalization and financial liberalization on the banking sector profitability in European countries was examined. In addition, variables that characterize bank-specific and macroeconomic factors were also applied in the analysis. The estimates were made in two samples: in the period before the financial crisis, i.e. 1995-2008, and after the financial crisis, i.e. 2009–2015. The article consists of five parts: I. – introduction, II. – literature review, III. – description of data and the research method, IV. – presentation of results, V. – conclusions.

2. Literature review

Literature is dominated by research on the banking sector profitability in the context of banking regulations and supervision (Demirguc-Kunt et al. 2004; Barth et al., 2006; Laeven et al. 2009). Bank performance is presented in two broad approaches: structural and non-structural (Hughes and Mester 2015). The structural approach focuses on financial ratios, describes the operations of banks in the terms of maximizing profits or minimizing costs, and applies to banking sector selected cost-efficiency measures for example: COST-INCOME RATIO, ROA, ROE, margin. The non-structural approach goes beyond it and takes into account bank's investment strategies – risk exposure – so it examines bank performance in relation to maximizing their utility, which is a function of market value and risk. As a result of financial liberalization and increasing of global financial integration, banking sectors aimed at enhancing efficiency through: introducing new financial products and services, implementing more effective company structures, developing IT infrastructures, and more efficient methods of capital allocation (Isik and Hassan 2003; Levine 2001). Also the reduction of personnel and information costs should be an important factor in the efficiency of banks, therefore our survey included the cost to income ratio as the efficiency measure. According to Barth's research based on 4,050 banks in 72 countries in 1999–2007, excessive state interference in the activities of financial institutions is inversely proportional to the efficient operational activity of banks (Barth et al. 2010). He claims that banks operating in countries with high levels of economic and financial freedom manage costs more efficiently.

The topic of financial liberalization is most commonly discussed in relation to the economic development of a country or region, as primarily indicated by the meta-analysis of 60 articles (Bumann et al. 2013). Literature also reports on research about the impact of financial liberalization on the banking sector profitability, yet such research refers to various concepts of liberalization. A separate strand of literature has highlighted how the globalization and financial liberalization, influence lending and bank risk taking (Demirgüç-Kunt and Detragiache 2002; Fielding and Rewilak 2015; Caballero 2016). Chortaes, Girardone and Ventouri examined the importance of financial liberalization, defined by the Heritage Foundation index, on the efficiency of banks for 27 European Union countries (Chortareas et al. 2013). According to their results, restrictive regulations regarding banks' activities negatively affect the banking sector efficiency, and there is a positive relationship between financial liberalization and banks' profitability, in particular for the following ratios: EQAS (equity/assets), ROAE (return on average equity), LNTA (LN of total assets), CR (total loans/total assets). In turn, Psillaki and Mamatzakis – who used financial liberalization construed as the Fraser Institute economic freedom index, and the EBRD reform index – demonstrated that financial regulations and structural reforms regarding business and the labour market positively affected the banking sector results (Chortareas et al. 2013). Their research was based on the performance of

268 commercial banks in 10 countries of Central and Eastern Europe in 2004–2009 and showed that better-capitalized banks were more cost-efficient.

Literature also contains studies that do not refer to a specific liberalization index, but rather understand financial liberalization as increased availability of financial services or loose banking regulations. Demirguc-Kunt investigated the impact of regulations, market structures, institutions and intermediation costs on banking efficiency treated as the margin level for 72 countries (Demirguc-Kunt 2004). According to that research, restrictive barriers to entry into the banking sector and tougher regulations increase intermediation costs, directly affecting the financial condition of banks. The studies by Hermes and Meesters are also worth mentioning. They covered over 60 countries and indicated that financial liberalization was conditionally positively linked with the banking sector efficiency (Hermes and Meesters 2015). This dependence is determined by the quality of banking regulations and supervision, which means that liberalization without strict banking regulations may adversely affect the efficiency of banks.

As shown by the studies conducted by Andries and Capraru based on the impact of financial liberalization and reforms on banks' profitability for 17 countries in Central and Eastern Europe in 2004–2008, banks were more cost-efficient and able to offer cheaper services to customers in countries with a high level of liberalization (Andries et al. 2013). In turn, banks in non-EU countries were less cost-efficient, but large banks achieved higher productivity growth. For the emerging Asian countries, Lin, Doan and Doong investigated the cost-efficiency of banks in relation to the change in their ownership structure and the financial liberalization index (Lin et al. 2016). According to their studies, foreign banks improve the efficiency of banks in countries with a high degree of financial liberalization. Nonetheless, after the financial crisis, it was domestic banks that were more efficient in countries with a high degree of financial liberalization. Literature presents the issue of banks' profitability in the context of the economic crisis and its impact on the condition of foreign and domestic banks in EU countries (Bouzgarrou et al. 2017; Hamdaoui 2017; Petria et al. 2015; Poposka et al. 2016). In turn, by generating banking crises, losses and a wide variety of inefficiencies (depreciated portfolio of securities, etc.), have been found to impact bank efficiency negatively. However, there are some arguments that by reducing inefficient banks crises should help raise the overall efficiency of the sector.

The subject of globalization is broadly discussed in various contexts, yet few articles exist that systematically and measurably examine its impact on the efficiency of banks. They usually concern selected countries or regions: south-eastern Europe (Fang et al. 2011), China (Sufian and Habibullah 2012), southern Africa (Sufian and Kamarudin 2016), or even individual cities such as London or New York (Degl'Innocent et al. 2017). They explore the effects of globalization by verifying the differences in the efficiency between domestic and foreign banks.

Gosh drew up a comprehensive study on the globalization of the banking sector in 1998–2013, measuring its profitability by means of the generalized method

of moments (GMM) (Ghosh 2016). Globalization results in reduced profits and overall costs, greater competitiveness, information asymmetry and assimilation of better technology and management processes in host countries. Globalization has increased banks' profits only in emerging markets, which explains the rapidly growing presence of foreign banks.

The literature review concerning financial liberalization, globalization and banking sector profitability does not contain comprehensive research on the impact of financial liberalization and globalization on the banking sector profitability in the European market. To our knowledge, the liberalization and globalization indices developed by Dreher (Dreher 2006) have not previously been used to examine the banking sector profitability in Europe within one study. Thus, this article expands the knowledge on this subject.

3. Data and method

Through a dataset that covers European banking sectors in 28 European countries (Austria, Belgium, Greece, Finland, France, Denmark, Germany, Spain, the Netherlands, Luxembourg, Ireland, Iceland, Norway, Portugal, Sweden, Switzerland, the United Kingdom, Italy, Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Poland, Romania, Slovenia, Slovakia, Hungary) spanning the period 1995–2015 and using the methodology of panel regression, the empirical findings document the determinants of bank efficiency. The selection of countries was dictated by the availability of sufficiently long time series of observations.

Empirical studies were based on annual data; the source of balance sheet data of banking sector was the OECD Statistics and the World Bank, and indices used to identify the extent of globalization and financial liberalization of a country from the Financial Freedom Index. A country's investment liberalization index tests the extent to which the free flow of investment capital, both within the country and between countries, is constrained[1]. The starting score is 100, meaning total investment liberalization. It is an ideal state that is not reflected in reality. According to the Heritage Foundation methodology, the score for a country is calculated by deducting points for investment restrictions in selected areas: (a) national treatment of foreign investment; (b) legal regulations regarding foreign investments; (c) restrictions on land ownership; (d) sectoral investment restrictions; (e) restrictions on or expropriation of investments without fair compensation; (f) controls on currency exchange; (g) capital flow controls (e.g. payments, dividend transfer, taxes). 25 points are deducted for the greatest deviations from liberalization, and 15 and 5 points – for less serious ones. Although there are countries for which more than 100 points are deducted, their result is 0.

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[1]   Information from http://www.heritage.org/index/investment-freedom.

Figure 1. Liberalization index distribution in European countries in 1995–2015 period
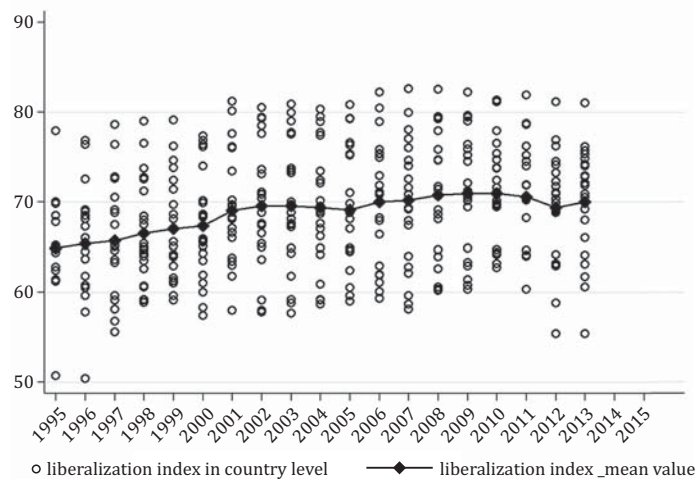
Source: Heritage Foundation

A country's financial liberalization index is an indicator of the banking sector efficiency and the financial sector independence of the influence and control of national governments[2]. According to the Heritage Foundation methodology, each country is classified in five areas: (a) the extent of government regulation of financial services; (b) the degree of state intervention in banks and other financial institutions through direct and indirect ownership; (c) the extent of financial and capital market development; (d) government influence on the allocation of credit; (e) openness to foreign competition. The scores range from 0 to 100 and the higher the score, the greater the financial liberalization. The total score for a country is calculated by deducting points in selected areas from the initial, ideal score of 100. A country's globalization index conceived by Dreher covers many dimensions of state activities (Dreher 2006). It includes the following components: (a) economic integration data, including current flows and the level and area of government restrictions; (b) data on political engagement; (c) data on social globalization. Each component is assigned a specific weight: 35%, 28% and 38%.[3] The indices range from 0 (non-globalized) to 10 (globalized).

We applied a two-step generalized method of moments (GMM) robust estimator (Arellano and Bond 1991; Blundell and Bond 1998). However, using the two-step GMM estimator may impose a downward/upward bias in standard errors (t-statistics) due to its dependence on the estimated residuals. This may lead to unreliable, asymptotic statistical inference (Arellano and Bond 1991; Blundell

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[2]   Information from http://www.heritage.org/index/financial-freedom.
[3]   Values do not add up to 100 due to rounding.

and Bond 1998). Taking into account the above factors, this paper used a two-step robust estimator for the baseline model. To test the validity of the instruments, we implemented the Hansen specification test. As instrumentals were used lagged dependent variable. We also used the Arellano-Bond tests for AR(1) and AR(2) in first differences. All regression parameters are provided with the level of significance, which should facilitate interpretation of results.

As the globalization and financial liberalization reduce the cost of bank's operating, our survey included the cost to income ratio as the efficiency measure. Following the previous study, we aggregated independent variables into three groups: financial liberalization and globalization (FINAN_FREE), macroeconomic factors (MACRO) and structural for banking sector (BANK_ACTIVITY).

We tested for the interaction between financial liberalization and bank efficiency using a panel regression model presented as:

$$EFFICIENCY_{i,t} = FINAN\_FREE_{i,t} + MACRO_{i,t} + BANK\_ACTIVITY_{i,t} + \varepsilon_{i,t}$$

where:

$EFFICIENCY_{i,t}$ = [COST_INCOME]– we test COST_INCOME ratio at the banking sector level,

$FINAN\_FREE_{i,t}$ = [FINAN_FREE, INVEST_FREE, GLOBAL_INDEX], including: FINAN_FREE – financial liberalization index of the country; INVEST_FREE – investment liberalization index of the country; GLOBAL_INDEX – the country's globalization index (Dreher 2006);

$MACRO_{i,t}$ = [CREDIT_GDP, FINAN_GDP], including: CREDIT_GDP – loans/GDP ratio; FINAN_GDP – size of the financial system/GDP; STOCK_GDP – market capitalization/GDP;

$BANK\_ACTIVITY_{i,t}$ = [FOREIGN_BANKS, MARGIN, NPL_LOANS, TRADING_INCOME, SPREAD_DEPOLOAN] including: FOREIGN_BANKS – share of foreign banks' assets in the country's banking sector; MARGIN – level of bank margin; NPL_LOANS – non-performing loans/loans; TRADING_INCOME – result on trading activity/bank's operating result; SPREAD_DEPOLOAN – spread between interest rates on loans and deposits;

$\varepsilon_{i,t}$ is a random component.

Descriptive statistics of the research sample are presented in Table 1, and the correlation matrix is depicted in Table 2. The basic statistical measures for the COST_INCOME ratio show that it fluctuated around 59.1 on average for the sample, with the standard deviation of 15.23. The analysed investment liberalization index ranged from 30 to 95 with a variation of 12.06. The financial liberalization index was similar – from 30 to 90, with a variation of 15.22. In turn, the globalization index was 79.84 on average and fluctuated at 10.22.

Table 1. Descriptive statistics

	ROA	CREDIT_GDP	FINAN_GDP	MARGIN	COST_INCOME	STOCK_GDP	NPL_LOANS	TRADING_INCOME	SPREAD_LOAN-DEPO	FORE-ING_BANKS	INVEST_FREE	FINAN-CIAL_FREE	GLOBAL_INDEX
Mean	0.58	86.41	76.01	2.07	59.11	65.02	5.32	13.42	289.17	36.17	72.54	68.59	79.84
SD	1.09	44.28	63.45	1.36	15.23	53.28	5.71	44.04	121.57	34.17	12.06	15.22	10.22
Max	7.56	262.46	479.67	9.62	117.89	265.13	33.78	531.97	745.45	100.00	95.00	90.00	99.15
Min	-9.53	13.27	0.07	0.12	9.88	2.17	0.08	-18.05	78.09	0.00	30.00	30.00	46.75

Source: Prepared by the authors.

Table 2. Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
CREDIT_GDP (1)	1.00											
FINAN_GDP (2)	0.25***	1.00										
	(0.00)											
MARGIN (3)	-0.47***	-0.36***	1.00									
	(0.00)	(0.00)										
COST_INCOME (4)	-0.15**	-0.19***	0.05	1.00								
	(0.00)	(0.00)	(0.25)									
STOCK_GDP (5)	0.42***	0.50***	-0.45***	-0.04	1.00							
	(0.00)	(0.00)	(0.00)	(0.38)								
NPL_LOANS (6)	-0.09	-0.16*	0.18*	0.02	-0.40***	1.00						
	(0.26)	(0.05)	(0.02)	(0.78)	(0.00)							
TRADING_INCOME (7)	0.18*	0.01	-0.16*	-0.09	0.10	0.05	1.00					
	(0.03)	(0.88)	(0.05)	(0.28)	(0.23)	(0.55)						
SPREAD_LOANDEPO (8)	-0.22*	-0.14	0.43***	0.01	-0.32***	0.51***	-0.08	1.00				
	(0.02)	(0.15)	(0.00)	(0.95)	(0.00)	(0.00)	(0.41)					
FOREING_BANKS (9)	-0.59***	0.16*	0.22**	-0.28***	-0.12	-0.02	-0.08	-0.03	1.00			
	(0.00)	(0.03)	(0.00)	(0.00)	(0.09)	(0.78)	(0.36)	(0.77)				
INVEST_FREE (10)	0.23***	0.28***	-0.25***	-0.13*	0.15**	-0.14	0.13	-0.49***	0.26***	1.00		
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.11)	(0.16)	(0.00)	(0.00)			
FINANCIAL_FREE (11)	0.35***	0.26***	-0.21***	-0.24***	0.32***	-0.35***	0.05	-0.34***	0.32***	0.4***	1.00	
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.56)	(0.00)	(0.00)	(0.00)		
GLOBAL_INDEX (12)	0.20***	0.37***	-0.36***	-0.33***	0.34***	-0.12	0.07	-0.36***	0.47***	0.43***	0.44***	1.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.15)	(0.40)	(0.00)	(0.00)	(0.00)	(0.00)	

Source: prepared by the authors.

Therefore, the costs can change due to a banking crises in terms of lower efficiency, the research was carried out in two sub-groups: in the period before the financial crisis (1995–2008) and after the financial crisis (2009–2015).

4. Research results

The research results are presented in Table 3. The values of impact ratios are divided for model 1: the pre-crisis period (1995–2007) and model 2: after the crisis (2009–2015). The analysis of the results was limited only to indicators that showed a statistically significant relationship. The estimation results made it possible to establish that:

1. Taking into account statistically significant results, only an increase in a country's financial liberalization index (measured by the financial sector independence of the influence and control of national governments) led to a decrease in the COST_INCOME ratio in the banking sector (-4.863) in 1995–2007.
2. Greater investment liberalization does not increase the banking sector efficiency in European countries. Estimation coefficients are positive both before the financial crisis of 2007–2008 (2.801) and after the crisis (4.212). However, it should be noted that these results are not statistically significant.
3. The financial crisis changed the relationship between globalization and banking sector efficiency into a positive one (COST_INCOME increase of 12.499) vs. (COST_INCOME decrease of -7.844).
4. Banking sector efficiency is far more strongly affected by internal banking activity than by global factors:
   a) Banks' efficiency decreases as lending activity CREDIT_GDP increases (0.899), in particular as the share of non-performing loans in total loans NPL_LOANS increases (12.573).
   b) A negative impact of non-interest banking activities TRADING_INCOME (2.228).
   c) A decrease in liquidity measured by the difference between interest rates on loans and deposits SPREAD_LENDDEPO contributes little to the deterioration of the banking sector efficiency (0.947).
   d) Clearly, commercial banks in Europe improve their cost/income ratios by increasing the margin charged on loans MARGIN (-341.734).
5. The presence of foreign banks seems to be neutral for improving the efficiency of banks FOREIGN BANK (the results are not statistically significant).
6. The development of the financial sector in relation to the real economy, measured by the financial assets/GDP ratio, does not bring positive effects on the banking sector efficiency (8.865).

**Table 3. The impact of globalization and financial liberalization
on the banking sector efficiency in Europe in 1995–2015 estimation results**

	COST_INC [1995–2007] Model 1	COST_INC [2009–2015] Model 2
Y(-1)	7.713 (1.95)	0.194 (0.25)
INVEST_FREE	2.801 (1.41)	4.212 (0.59)
FINAN_FREE	-4.863* (-1.89)	-4.037 (-0.29)
GLOBAL_INDEX	12.499 (1.59)	-7.844 (-0.47)
CREDIT_GDP	-2.448 (-1.53)	0.899* (1.85)
FINAN_GDP	8.865** (2.09)	0.161 (0.15)
STOCK_GDP	-0.856 (-1.26)	0.734 (0.35)
FOREIGN BANK	0.437 (0.57)	2.108 (0.41)
MARGIN	-341.734* (-1.89)	-122.920 (-1.24)
NPL_LOANS	12.573* (1.80)	-6.032 (-0.60)
TRADING_INCOME	2.228* (1.74)	-0.142 (-0.06)
SPREAD_LENDDEPO	0.947* (1.86)	-0.044 (-0.12)
Constant	-16.477* (-1.73)	46.177 (0.30)
Obs	70	55
AR1	-0.534	-0.534
p value	0.593	0.593
AR2	-0.513	-0.180
p value	0.608	0.857
Hansen test	0.174	3.229
p value	1.000	1.000

N.B.: standard error is shown in parentheses, significance level – *** $p < 0.01$, ** $p < 0.5$, * $p < 0.1$. AR (1) and AR (2) are the empirical values of Arellano-Bond test for autocorrelation, the 1st and the 2nd order, respectively, for the null H0 hypothesis: autocorrelation of the first (the second) order does not occur. The Hansen test means the empirical values of the Hansen test for the null H0 hypothesis: over-identifying restrictions are correct (the instruments are appropriate).

Source: Prepared by the authors.

5. Conclusion

The analysis of the globalization impact and financial liberalization on the banking sector efficiency is undoubtedly a meaningful problem in the face of the enhancement of supervision and regulations of financial intermediation in order to make it resilient to operational disturbances. The abolition of restrictions and administrative rules in financial transactions between residents and non-residents should serve to improve the efficiency of financial market participants. The literature highlights several channels through which globalization and financial liberalization improve bank's efficiency. These include, for example, greater possibilities for capital, economies of scale and scope, information costs, more advanced technologies.

We employ a unique framework to quantify the net effect of globalization and financial liberalization on banks' efficiency. However, the empirical research carried out to verify the relationship between financial/investment liberalization and the banking sector efficiency has not provided a definite answer. Only in 1995–2007 did an increase in a country's financial liberalization index (measured by the financial sector independence of the influence and control of national governments) lead to a decrease in the cost/income ratio. These results confirm only hypothesis H1 that financial liberalization is conducive to an increase in banks' efficiency, however only before 2007. Testing the hypothesis H3 emphasized that after the global crisis of 2007–2008, financial liberalization has not statistically significant influence on bank efficiency. Additionally we do not support hypothesis H2 about the positive impact of globalization on the banking sector efficiency. Banking sector efficiency is far more strongly affected by internal banking activities such as lending policy and trading operations than by global factors. It can reasonably be concluded that the effective control of costs in the banking sector through internal monitoring and management is more beneficial for banks' efficiency. And the globalization and financial liberalization are not the crucial factors to increase efficiency in banking sector.

To sum up, the implications of banking risk in European countries confirm theoretical discussion about differences in a cross-country analysis and for different stages of country development. In this paper, we compliment the existing literature by providing new insights into the impact of globalization and financial liberalization on the banking sector efficiency of the European banks. This paper provides valuable insights for banking supervisors about the role of market structure in stability risk. The findings may inform the current debate on changes in the international regulation of the banking sector. The main implication that flows from our findings concerns the policy debate about growing banking regulation.

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