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Bail-in as an instrument protecting the banking sector from system risk vs. capital adequacy of banks in the EU

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**Bail-in as an instrument protecting the banking sector
from system risk vs. capital adequacy of banks in the
EU**

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Bail-in as an instrument protecting the banking sector from system risk vs. capital adequacy of banks in the EU

JEL Classification: G21; G33

Keywords: bail-in, financial crisis, capital adequacy

Research background: The article refers to the introduced bank regulations aiming at maintaining capital adequacy of banks and a stable situation in the banking sector, allowing to keep the financial system stable at a time of a possible financial or systemic crisis.

Purpose of the article: This article aims at presenting methods of protecting banks. It mostly focuses on the capital structure and the use of capital assets to repay liabilities in a situation that poses a risk to the continued functioning of a banking sector or a financial system.

Methodology/methods: Our research was conducted by ways of analysing literature on using bail-in in the banking sector during an ordered bank restructuring or a winding up process. Data analysis was conducted with the use of statistical methods, including correlation analysis, followed by a comparative analysis of obtained results. The level of interdependence was determined on the basis of Pearson's correlation analysis, and the results were verified with the use of J. Guildford's classification of interdependence.

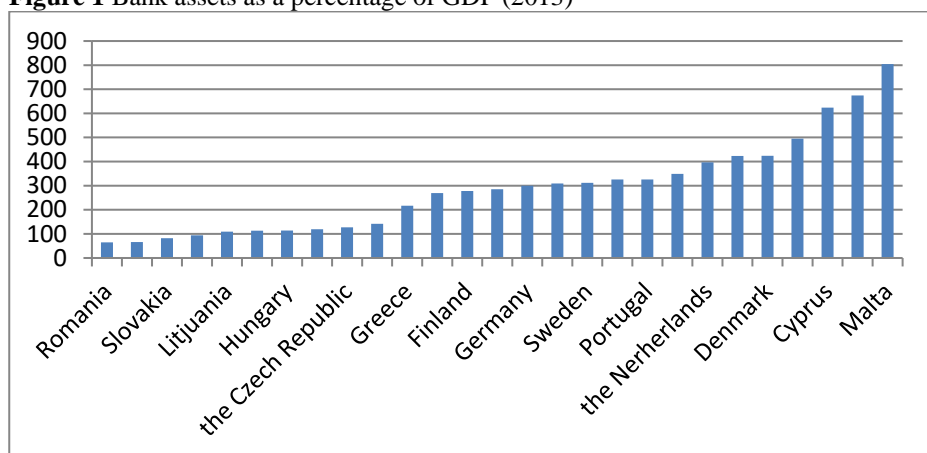
Findings & Value added: The article presents bail-in — an instrument aiming at performing ordered restructuring or winding up of a bank in the context of capital adequacy of banks in the European Union. The text shows how quickly and strongly capital adequacy rate of banks was changing in specific EU member states between 2006 and 2016, including the variation value evaluated with regard to the division into developed and developing countries. What is more, the article also points at current directions of changes in capital structure of banks in EU member states.

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Introduction

Efficient operation of central and commercial banks ensures proper functioning of a financial system. It also allows for a proper flow of cash and economic growth. Any disturbances in the way the financial system functions arising from problems of banks can have negative consequences affecting the economy. The financial crisis of 2007–2009 is a perfect example of such a situation, when the disturbances in bank functioning resulting from excessive involvement of banks in risky financial instruments led to serious problems in the financial system. Only with national financial help could the financial situation stabilize and the financial system could function under its normal conditions. However, in the following years, this crisis also led to the implementation of new regulations aiming at creating an *ex ante* protecting mechanism for collecting capital and using it at a time of crisis. This mechanism is supposed to protect the banking sector and prepare for any kind of risk and the necessity to provide additional capital to the banking sector when it loses its liquidity. This article aims at presenting the mechanism of ordered restructuring or winding up of banks (bail-in), together with an analysis of their capital-related situation. European Union banking sector is characterized by a significant share of bank assets in relation to GDP (fig. 1).

Figure 1 Bank assets as a percentage of GDP (2013)



Source: www.marketoracle.co.uk, access date: 28 Dec, 2016.

Bail-in legal grounds and mechanism

In order to create a mechanism protecting the banking sector from the loss of liquidity and to fight destabilization of the financial system in the European Union, an implemented package of CRD IV / CRR has been used.² Another step in the process of creating the regulation was to introduce BRRD³ to provide a specific order in obtaining capital by banks in order to regulate required liabilities. BRRD (fig. 2) endorses the possibility to finance restructuring of banks with the use of owned capital, subordinated debt, but also with clients' deposits over EUR 100,000 placed in the bank. These resources are not covered with a guarantee according to DGS⁴. A minimum level of deposits that can be used for bank restructuring has been determined at a level of min. 8% of bank's liabilities.

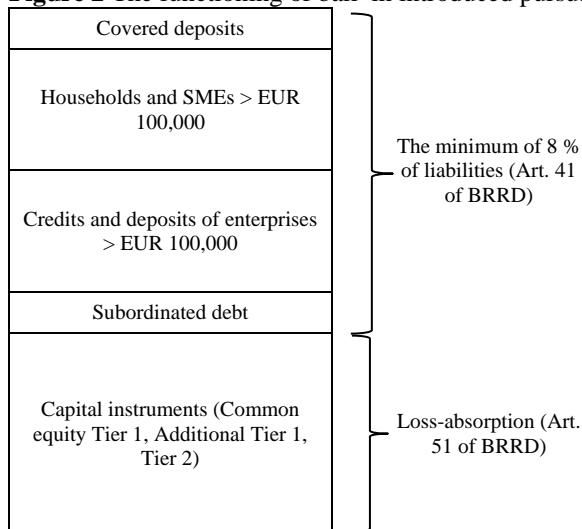
² The package includes the following documents:

- Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 *on prudential requirements for credit institutions and investment firms, amending Regulation (EU) No 648/2012 (Capital Requirements Regulation, CRR)*
- Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 *on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms*, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC (*Capital Requirements Directive IV, CRD IV*)

³ Bank Recovery and Resolution Directive.

⁴ Directive on Deposit Guarantee Schemes.

Figure 2 The functioning of bail-in introduced pursuant to BRRD



Source: Magnus, Backman,(2015, p. 4).

Restructuring and ordered winding up of banks are multidimensional processes and pose a challenge when it comes to forming new legal standards. Moreover, the creation of a current protection mechanism is focused on forming security measures and several checkpoints (the requirements of capital adequacy) alarming about a possible difficult situation of a bank.

Overview of literature on the functioning of bail-in and the support for banks

The mechanism of restructuring and ordered winding up of banks (bail-in) at the time of crisis is based on obtaining the sources of financing liabilities in a specific order (fig. 2). In literature, we can find studies on the capital structure in enterprises, such as the research conducted by Modigliani and Miller (Modigliani, Miller, 1958, pp. 261-297), later developed in the study (Modigliani, Miller, 1963, pp. 433-443) by Kraus and Litzenberger (Kraus, Litzenberger, 1973, pp. 911 – 922) published in 1973. Mentioned studies were based on the analysis of a concept of capital structure. On the basis of the conducted studies, Myers and Majluf (Myers, Majluf, 1984, pp. 187 – 221) initiated Pecking Order Theory, according to which the financing sources should be used in a specific order. In bail-in,

the order of using bank financing sources is significant, just as in the case of enterprise financing sources. In the context of banks, this order mostly refers to one's owned capital required by a regulator, but new regulations introduce the possibility to use clients deposits as a part of CRD IV/CRR package. Capital requirements are to reduce the risk of future destabilization and regulate any possible winding up of banks. During financial crisis banks assets were shrinking very fast and it has impact on system (Frey, 2016, pp. 90-113). System risk significantly affects future economic fluctuations and practice of banks, which, when combined with improper management, failure to observe other types of risk or to notice some problems at an early stage of their development by regulators or state authorities, can result in serious problems or even a crisis (Zenios, 2016, pp. 579 – 606). The financial crisis of 2007 and its long-term consequences resulted in a necessity to introduce changes in the banking sector in order to reduce risk, including a system-related one. The potential recovery depends on specific of financial crisis and wide variety of financial instruments involved in crisis. The recovery from recession lasted long and it could be comparable to Great Contraction in 1930 and recession in early 1990s (Bordo, Haubrich, 2017, pp. 527 – 541). This situation was related to the fact that conforming to market rules (market discipline) ceased to be a priority for the sake of maintaining the financial system stable (for financial stability), but also to the stratification of legal and financial system (Biljanovska, 2016, pp. 105 – 135). Stability is really important in sensitive banking system and this is why stress tests was conducted in many banks as a instrument to check resistance on recession (Klepczarek, 2015, pp. 81-98). Drawing conclusions are useful to enter new regulatory actions in banks stability procedures.

Research hypotheses

Our research was based on verified hypotheses which served as a basis for presented generalizations and conclusions.

Hypothesis 1 (H1): Irregular increase of capital adequacy index⁵ for banks in European Union member states.

At the time of a financial crisis (2007–2009) and restoring stabilization in the following years, enterprises – including those in the banking sector – were also in the process of intensive concentration. In some cases, these companies were still big institutions commonly called “too big to fail” (TBTF). An appreciation of the owned capital to assets ratio due to new regulations was expected; however, in the European Union member states, this process could be asymmetric.

Hypothesis 2 (H2): Verification of capital adequacy index in EU15 states in the context of countries that have joined the EU since 2004 (EU13).

A significant increase of the ratio of bank assets to GBP in EU15 countries should be based on a large share of capital in relation to assets. Our task is to carry out a comparative analysis of a percentage capital to assets ratio in EU15 countries and in new Member States (EU13).

Methodology

This research was conducted on the basis of World Bank’s data on the banking sector in the European Union (EU). The study refers to the capital level as compared to the assets, and also to the coefficient of variation of these factors in relation to the GBP in a given country. The study includes data on the banking sector in the European Union collected from 2004, based on the analysis of individual countries, but also on the comparison of two groups of countries: those which had been in EU before 2004, and those which joined EU in 2004 and later.

The studies were conducted on the basis of literature on the use of bail-in in the banking sector during ordered restructuring or winding up of a bank. The data was analysed with the use of statistical methods, particularly including a correlation analysis, followed by a comparative analysis of obtained results. The level of interdependence was determined on the basis

⁵ Percentage capital to assets ratio of banks

of Pearson's correlation analysis, and the results were verified with the use of J. Guildford's classification of interdependence.

Verification of hypotheses

The introduction of capital requirements for banks means that own capital of a bank will increase. The aim is to determine the level of capital adequacy in individual EU member states and carry out H1 verification (table 2). The level of capital of banks to assets ratio was under appreciation in 2006–2016 (table 1). The highest level was reached in 2015, and the lowest one in 2006. The coefficient of variation⁶ was the highest in 2008 and 2011 at the time of financial crisis in the world (2008) and the debt crisis in the Mediterranean countries (2011). The share of percentage capital to assets of banks ratio, as well as standard deviation, increased in EU member states.

Table 1 Indexes of capital to assets ratio of banks in EU

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
EU 28 — average [%]	6.37	6.69	6.42	6.84	7.01	6.90	7.38	7.86	8.21	8.55	8.45
EU 28 — median [%]	6.40	6.53	6.05	6.46	6.58	5.92	6.70	7.14	7.31	7.81	8.06
EU 28 — standard variation [pp]	1.85	2.11	2.37	2.16	2.22	2.54	2.64	2.58	2.78	2.49	2.18
EU 28 — the coefficient of variation	0.29	0.32	0.37	0.32	0.32	0.37	0.36	0.33	0.34	0.29	0.26

Source: Own analysis on the basis of World Bank's data.

⁶ The coefficient of variation was calculated with the following interdependency: standard deviation / average.

Table 2 Verification of correlation between changes in individual countries and EU average (capital to assets ratio of banks, the verification of H1)

Hypothesis 1 (H1): Irregular correlation of change in capital to assets ratio of banks in EU countries			
Interdependence classification according to J. Guilford	Number of countries	Share of countries (%)	Positive or negative correlation
$ r =0$ or $r=0$ — no correlation	0	0.00%	----
$0.0< r \leq 0.1$ — slight correlation	0	0.00%	----
$0.1< r \leq 0.3$ — weak correlation	0	0.00%	----
$0.3< r \leq 0.5$ — medium correlation	2	7.14%	100% — positive correlation
$0.5< r \leq 0.7$ — high correlation	5	17.86%	60% — positive correlation, 40% — negative correlation
$0.7< r \leq 0.9$ — very high correlation	12	42.86%	91.67% — positive correlation, 8.33% — negative correlation
$0.9< r \leq 1.0$ — almost full correlation	9	32.14%	100% — positive correlation
$ r =1$ or $r=1$ — full correlation	0	0.00%	----
TOTAL	28	100.00%	

Source: Own analysis.

The objective of Hypothesis 2 is to perform a comparative analysis of countries which, for the purpose of this article, can be classified as developed (they had belonged to EU before 2004 — EU 15) with the countries classified as developing, which have joined EU since 2004 (EU 13). The average value of capital to assets ratio of banks in developed countries (table 3) reached the highest level of 7.26% in 2016, with standard deviation of 1.8 pp. The lowest capital to assets ratio was observed in 2011 and amounted to 5.17%.

Table 3 Indexes of capital to assets ratio of banks in EU 15

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
EU 15 — average [%]	5.44	5.49	4.84	5.52	5.47	5.17	5.65	6.27	6.68	7.36	7.26
EU 15 — median [%]	5.12	5.25	4.70	5.44	5.32	5.05	5.51	6.39	6.50	6.83	7.24

EU 15 — standard deviation [pp]	1.64	1.31	1.11	0.94	0.90	0.87	1.02	1.10	1.97	2.21	1.80
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Source: Own analysis on the basis of World Bank's data.

An average bank capital to assets ratio in developing countries (table 4) had an upward trend, similarly to that in the developed countries. However, the ratio value was different, being significantly lower in EU 13. The lowest level for the EU 13 countries observed in 2006 (7.83%) was still higher than the highest level in the EU 15 countries (7.36% in 2015).

Table 4 Indexes of bank capital to assets ratio in EU 13

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
EU 13 — average [%]	7.83	8.23	8.25	8.35	8.78	9.07	9.55	10.03	10.29	10.18	9.87
EU 13 — median [%]	7.60	8.00	8.19	8.08	8.53	9.01	9.49	10.35	10.31	10.11	10.15
EU 13 — standard deviation [pp]	1.07	1.97	2.12	2.19	1.95	2.26	2.42	2.43	2.35	1.88	1.73

Source: Own analysis on the basis of World Bank's data.

Conclusion

This article focuses on bank capital adequacy with a special emphasis on the endorsements of the Basel Committee and the European Parliament, introducing new rules to protect banks from system risk. This study includes an instrument related to ordered restructuring or winding up (bail-in) of banks, which uses deposits over EUR 100,000 collected in banks to repay liabilities. New rules are to allow for an ordered management of banks, and, in particular, to normalize the situation at a time of possible disturbances and crisis. Capital requirements at hazardous moments are extremely demanding due to the significant capital that banks have invested. During such time, state support in fact means the use of resources coming from tax payers (bail-out). With new regulations to monitor and prevent the lack of capital in unpredicted situations, this situation has been changing.

This study was based on the analysis of foreign and domestic literature, but also of other available data on capital adequacy of banks in European Union member states. Hypotheses were verified with statistical methods.

This study presents the functioning of bail-in, but also capital requirements applicable to banks in EU countries. The tendency regarding variations in the capital to assets ratio of banks in EU is to increase this value in order to provide security of future liquidity of banks. The correlation level is very high or the correlation is almost full in a significant number of cases (H1), which means that these countries introduce capital norms to a different scope, but significantly in the whole sector. The variation of capital adequacy was higher in the EU 13 countries during the financial crisis of 2007–2009 and the debt crisis of 2011–2012 (H2). However, in 2015–2016, a higher variation was observed in EU 15 than in EU 13.

Presented studies are limited by the availability restrictions of detailed data of banks in EU. What is more, introduced norms and regulations have only recently started to function or are still at the stage of deployment. Business practice may look better after a few years, showing the benefits and risks of introduced changes more clearly. The study on regulations of banks and protection from hazards can be extended. Future research can be based on the verification of capital adequacy indexes, in relation to the liquidity coefficients, or the level of financial leverage in banks. Subsequent studies can be multidimensional.

The results of these studies can be used by institutions performing evaluations of or controlling macroeconomic situation of the banking sector in EU, but also by banks in order to determine the direction of future changes.

References

- Andros T. (2014) Inflate or Die! When Leverage Fails and Market Hope Turns to Fear. Retrieved from www.marketoracle.co.uk
- Biljanovska B. (2016). *Aligning Market Discipline and Financial Stability: A More Gradual Shift from Contingent Convertible Capital to Bail-in Measures*, *European Business Organization Law Review*, Springer, p. 105-135. DOI: <http://dx.doi.org/10.1007/s40804-016-0028-0>
- Bordo, MD, Haubrich J.G. (2017). *Deep Recessions, Fast Recoveries and Financial Crises: Evidence From the American Record*, *Economic Inquiry* vol. 55, issue1, pp. 527 – 541. DOI: <http://dx.doi.org/10.1111/ecin.12374>
- Frey R. (2016). *Multinational banks' deleveraging in the Global Financial Crisis*, *Journal of Multinational Financial Management* 37-38, pp. 90-113.
- Klepczarek E. (2015). *Determinants of European Banks' Capital Adequacy*. *Comparative Economic Research - Central and Eastern Europe*.
- Kraus A., Litzenberger R.H. (1973). *A State-Preference Model of Optimal Financial Leverage*, *Journal of Finance* 33, p. 911-922. DOI: <http://dx.doi.org/10.1111/j.1540-6261.1973.tb01415.x>
- Magnus M., Backman J. (2015). *Banking Union: ECB Stress Test and EU state Aid Rules*. www.europarl.europa.eu
- Modigliani F., Miller M.H. (1963). *Corporate Income Taxes and the Cost of Capital: A Correction*, *American Economic Review* 53, p. 433-443.
- Modigliani F., Miller M.H. (1958). *The Cost of Capital, Corporate Finance and the Theory of Investment*, *American Economic Review* 48, p. 261-297.
- Myers S.C., Majluf N.S. (1984). *Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not Have*, *Journal of Financial Economics* 13 (2), p. 187-221.
- Zenios S.A. (2016). *Fairness and Reflexivity in the Cyprus Bail-in*, *Empirica* 43 (3), p. 579-606.

Other sources

- Regulation (EU) No. 575/2013 of the European Parliament and of the Council of 26 June 2013 *on prudential requirements for credit institutions and investment firms, amending Regulation (EU) No. 648/2012 (Capital Requirements Regulation, CRR)*.
- Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 *on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC (Capital Requirements Directive IV, CRD IV)*.

Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems, Bank for International Settlements Basel 2010.

Data retrieved from: www.worldbank.org

Kraus A., Litzenberger R.H. (1973). *A State-Preference Model of Optimal Financial Leverage*, *Journal of Finance* 33, p. 911–922. DOI: <http://dx.doi.org/10.1111/j.1540-6261.1973.tb01415.x>

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