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Article

Divulgence of Additional Capital Requirements in the EU Banking Union

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Abstract: The European Central Bank, as a supervisory authority, set additional to the European level one capital requirements known as Pillar 2 for 118 significant credit institutions. Disclosure of Pillar 2 requirements is not compulsory, although many credit institutions choose to inform about them. We estimate a logit model to investigate if being listed on stock exchange, size, profitability and credibility have impact on the probability of divulgence. We estimate sixteen specifications of our model to compare the explanatory power of different measures of size, profitability and credibility. The legal form and the size are statistically significant in all specifications, while profitability and credibility are significant only in some of them.

Keywords: pillar 2 requirements; P2R; capital requirements; disclosure of financial data; financial market regulation; EU; banking union

JEL Classification: G18; G21; G28

1. Introduction

Inadequate financial regulation is widely seen as one of the sources of the Global Financial Crisis (Stiglitz 2010; Dagher 2018). The role of financial regulation is especially important for monetary unions, because as famously stated by the financial trilemma financial stability, financial integration and national financial policies are incompatible. Only two of these three aims can be achieved simultaneously (Schoenmaker 2011; Rey 2018). After the Global Financial Crisis European policy makers chose to transfer important competences in the area of banking supervision to the European level through the introduction of the banking union. The aim of the banking union is to ensure that the credit institutions of the—so far—19 member states from the euro area will be subject to a single supervision, a single resolution, and a common deposit insurance system (Schäfer 2016).

The European Central Bank set the additional capital requirements (known as Pillar 2) for 118 significant credit institutions responsible for almost 82% of banking assets in the euro area (ECB 2018a). The disclosure of Pillar 2 Requirements (P2R) is not compulsory, although as our analysis identified nearly 70% of supervised entities disclosed them.

The increased level of accounting openness benefits the public and investors, as they can read financial-statement disclosures to gauge crucial elements of economic performance of any entity. This is a reason why disclosure of financial data since decades ago is an important topic of research (Bens et al. 2011; Berger 2011; Gad 2015). Although, the determinants of divulgence of additional capital requirements set for the banks in the Eurozone have not been investigated before.

Our contribution to economic research is twofold. We collect information on the disclosure and value of P2R for 2018 and as far as we know we first time publish so detailed descriptive statistical

data on P2R requirements on the country level. Then we estimate logit probability model to identify factors impacting the disclosure of P2R.

2. Institutional Settings

Single Supervisory Mechanism is one of the core elements of the banking union. Since 2014 the European Central Bank (ECB) directly supervises significant credit institutions in the Eurozone. It means that ongoing supervision of the significant banks (significant credit institution) is carried out by Joint Supervisory Teams (JSTs). Each significant bank has a dedicated JST, comprising staff of the ECB and the national supervisors (National Competent Authority—NCA).

Less significant credit institutions are supervised by NCAs in a close cooperation with the ECB. So formally all final decisions are signed by the President of the ECB, despite the fact that substance was prepared by the NCA. It should be noted the ECB in accordance with the SSM Regulation (Regulation (EU) No 1024/2013) may at any time, on its own initiative or upon the request of an NCA, decide to directly supervise one or more less significant institutions to ensure consistent application of high supervisory standards. Since the SSM came into existence, the ECB has not introduced direct supervision of less important bank (Götz et al. 2019).

The list of significant credit institutions is determined on the basis of value of total assets, size of total assets relative to country GDP, and scope of cross-border activities. Moreover, three biggest credit institution in each country of the Eurozone are directly supervised by the ECB even if they not fulfill above mentioned quantitative criteria.

Basic or minimum capital requirements (known as Pillar 1) for credit, market and operational risk are fully harmonized within the European Union. According to the art. 92 of the CRR (Regulation (EU) No 575/2013) all European banks shall at all times satisfy the following own funds requirements:

- (a) a Common Equity Tier 1 capital ratio of 4,5%;
- (b) a Tier 1 capital ratio of 6%;
- (c) a total capital ratio of 8%.

All capital ratios are expressed as a percentage of the total risk exposure amount, i.e., risk-weighted assets, RWA (Ojo 2015).

The Basel 2 accord introduced the Supervisory Review Process as a tool for banking supervisors to monitor and evaluate additional banks' risks. The possibility and necessity of using such tool are underlined by the Basel 3 package. Supervisory authorities can transform their findings into supervisory decisions, including capital requirements (Basel Committee on Banking Supervision 2006). Additional capital requirements, known as Pillar 2 cover bank-specific risks, which are not adequately covered by Pillar 1 capital requirements that applies to all banks. According to the EU law Pillar 1 obligations are set up by means of Level 1, i.e., Regulation (EU), but Pillar 2 depends on supervisory actions.

The possibility of imposing Pillar 2 requirements has been implemented to the European law by the Capital Requirement Directive IV (Directive 2013/36/EU). According to art. 104 of the CRDIV competent authority shall have powers to require credit institutions to hold own funds in excess of the requirements set out in Regulation (EU) No 575/2013 relating to elements of risks not covered by that Regulation. The level of capital ratio depends of the results of supervisory review. According to art. 97 of the CRDIV competent authority, responsible for banking supervision, shall review the arrangements, strategies, processes and mechanisms implemented by the banks to comply with this directive and CRR Regulation. The banking supervisors are obliged to evaluate:

- (a) risks to which the credit institutions are or might be exposed;
- (b) risks that bank poses to the financial system as a whole (systemic risk);
- (c) risks revealed by stress testing taking into account the nature, scale and complexity of a bank's activities.

Since the Single Supervisory Mechanism came into existence, the ECB is legally treated as a competent authority. So, all above mentioned rules are applicable to the ECB too.

Taking into account art. 104 and art. 97 of the CRDIV the European Central Bank each year conducts Supervisory Review and Evaluation Process (SREP) to assess significant banks' risks. Each bank is assessed according to the common methodology and decision process allowing for peer comparison and transversal analyses. Overall SREP score is based on four elements: viability and sustainability of business model, adequacy of governance and risk management, risks to capital and risks to liquidity and funding (ECB 2017). On the basis of SREP results European Central Bank communicate Pillar 2 requirements to all significant credit institution. Pillar 2 is separated in two parts: compulsory Pillar 2 requirement (P2R) impacting the Maximum Distributable Amount (MDA) trigger and not legally binding Pillar 2 guidance (P2G). Nonetheless the ECB expects credit institutions to comply with Pillar 2 guidance too. Pillar 2 ratio are always expressed as a Common Equity Tier 1 capital ratio (CET1).

The ECB neither prevents nor dissuades credit institutions from disclosing Pillar 2 requirement, while it does not expect credit institution to disclose Pillar 2 guidance. The Market Abuse Regulation—MAR—(Regulation (EU) No. 596/2014) obligates all listed entities to disclose price-sensitive inside information, although it is not clear if P2R constitute a price-sensitive inside information.

On the one hand P2R impacts the Maximum Distributable Amount (MDA)-trigger and if capital requirements are not met the amounts of dividend are limited (Ebner 2018). On the other hand, almost all directly supervised entities have capital levels above their capital requirements (ECB 2018b). The European Securities and Markets Authority, responsible for the supervisory convergence on the European capital market, did not provided market participants with the clear interpretation of MAR requirements, but only advised that banks should asses on case-by-case basis if Pillar 2 requirements constitute price-sensitive inside information (ESMA 2017).

3. Methodology and Data

The divulgence of Pillar 2 requirements is not standardized and can take many forms. We collected data on P2R manually checking banks websites and press releases, annual/biannual/quarterly financial statements, investor presentations and bond issuance prospectuses. Nearly all credit institutions in our sample publish these materials in English, although we also checked sources available only in national languages. However only in few cases the P2R disclosures have not been available to the international public opinion or investors. Our investigation happened in December 2018. The most important information and descriptive statistics on the Pillar 2 requirements are reported in the Table 1.

The main aim of our empirical research is to investigate the most important determinants of the Pillar 2 disclosures. In formal language we wanted to predict probability of dichotomous outcome: bank publishes information about Pillar 2 requirement or not. The most popular quantitate techniques used for such predictions is logistic regression (Weisberg 2005; Dieguez et al. 2015). We decided to estimate multivariate logistic model:

$$Y = \begin{cases} 0 \\ 1 \end{cases} ; \quad (1)$$

where:

$Y = 0$ if bank did not publish P2R ratio;

$Y = 1$ if bank disclosed P2R ratio;

and:

$$p = P(Y = 1|X_1 = x_1, X_2 = x_2, \dots, X_k = x_k) = f(X_1, X_2, \dots, X_k); \quad (2)$$

where:

p —probability;

X_1, X_2, \dots, X_k —explanatory variables;
 F —the logistic distribution function (link function).

By means of the logistic distribution function we get:

$$p = P(Y = 1 | X_1 = x_1, X_2 = x_2, \dots, X_k = x_k) = \frac{\exp(\beta_0 + \sum_{i=1}^k \beta_i x_i)}{1 + \exp(\beta_0 + \sum_{i=1}^k \beta_i x_i)}. \quad (3)$$

The logistic distribution function transforms the regression (3) into the interval (0, 1). Further defining the $\text{logit}(p)$ as:

$$\text{logit}(p) = \ln\left(\frac{p}{1-p}\right). \quad (4)$$

the model can be rewritten as:

$$\text{logit}(p) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k. \quad (5)$$

Taking into account the purpose of our research we estimated following logit model:

$$\text{logit}(p(\text{disclosure})) = \beta_0 + \beta_1 * \text{listed} + \beta_2 * \text{size} + \beta_3 * \text{profitability} + \beta_4 * \text{credibility}. \quad (6)$$

Data on the legal form of credit institution and information about being listed on stock exchange, value of total assets, return on average assets, risk weighted assets, return on risk weighted assets, return on equity, credit ratings, and ratio of impairment loans to risk weighted assets have been collected on the basis of bank websites, financial statements and Moody's Analytics BankFocus database. We also used the results of Comprehensive Assessment which have been published by the European Central Bank (ECB 2014). Financial data used in our model are actual at the end of 2018.

We use accounting data at the highest level of consolidation. Accounting data at the highest level of consolidation reflect the entire scale of operation of the significant credit institutions, including the operation carried out by subsidiaries. If we instead choose to use accounting data on the parent company of each observation (solo level) we may miss part of the operations. Moreover, our estimation would be prone to international differences in the organizational structure of significant credit institutions.

Table 2 present descriptive statistics of banks included in our sample. Significant credit institutions are quite diverse. In case of 17 significant credit institutions the value of assets is smaller than 10 billion euro, while in case of six of them the value is bigger than 1 trillion euro. This diversity remains important also on a country level. In case of many countries the mean value of assets is smaller or similar to the standard deviation of the value of assets. Profitability indicators are also quite diverse. Only bank ratings are relatively similar on a country level. This is not surprising, because bank rating partly reflects also risk profile of country, in which bank is operating.

Some of the significant credit institutions are the subsidiaries of other credit institutions. This is particularly common in Baltics. Each bank directly supervised by the ECB is treated as the independent observation, even in case, in which given credit institution is a subsidiary of another credit institution.

The binary variable "listed" is equal to one if given institution is listed on the stock exchange or the parent company of the given institution is listed on the stock exchange. This variable is equal to one even if the parent company of the bank is listed in the country, which is not the part of the banking union. Listed significant credit institutions sometimes disclose the P2R information on subsidiaries, which are not listed on their own.

Table 1. Disclosure of Pillar 2 requirements in the Eurozone.

Country (1)	Number of SCI (2)	Number of Listed SCI (3)	Number of SCI Disclosing P2R (4)	Transparency Share (5)	Mean P2R (6)	Mean P2R Weighted by Total Assets (7)	Mean P2R Weighted by RWA (8)	Lowest P2R (9)	Highest P2R (10)
Austria	6	3	6	100.00%	2.200%	2.016%	2.016%	1.75%	2.50%
Belgium	7	4	5	71.43%	2.250%	2.075%	1.962%	1.75%	3.00%
Cyprus	4	3	3	75.00%	3.160%	3.265%	3.224%	3.20%	3.70%
Estonia	3	2	1	33.33%	1.500%	1.500%	1.500%	1.50%	1.50%
Finland	3	1	3	100.00%	1.750%	1.750%	1.750%	1.75%	1.75%
France	12	6	9	75.00%	1.639%	1.462%	1.445%	1.25%	2.75%
Germany	21	6	11	52.38%	2.038%	2.272%	2.244%	1.25%	2.75%
Greece	4	4	4	100.00%	3.375%	3.382%	3.425%	3.00%	3.75%
Italy	12	10	11	91.67%	1.932%	1.878%	1.904%	1.00%	3.25%
Ireland	5	4	3	60.00%	2.95%	2.715%	2.807%	2.25%	3.45%
Latvia	4	3	1	25.00%	1.50%	1.500%	1.500%	1.50%	1.50%
Lithuania	3	3	2	66.67%	1.90%	1.893%	1.923%	1.80%	2.00%
Luxembourg	4	2	0	0.00%	.	.	.	.	.
Malta	3	3	1	33.33%	2.50%	2.500%	2.500%	2.50%	2.50%
Netherlands	6	2	6	100.00%	1.833%	1.767%	1.764%	1.25%	2.50%
Portugal	3	2	3	100.00%	2.833%	2.660%	2.697%	2.25%	4.00%
Slovakia	3	3	1	33.33%	3.50%	3.500%	3.500%	3.50%	3.50%
Slovenia	3	0	0	0.00%	.	.	.	.	.
Spain	12	8	12	100.00%	1.814%	1.539%	1.550%	0.75%	2.50%
TOTAL	118	69	82	69.49%	N/A	N/A	N/A	N/A	N/A

Note: when analysing P2R values, check the number of banks that disclosed P2R. In the case where only one bank in given country disclosed P2R the same values apply in columns 5-9SCI- Significant Credit Institution. *Source:* websites, annual, semi-annual and quarterly reports and bond prospectuses of 118 credit institutions directly supervised by the European Central Bank.

Table 2. Descriptive statistics.

Country (1)	Number of SCI (2)	Assets (3)	RWA (4)	RoE (5)	RoAA (6)	Rating (7)
Austria	6	78.8 (82.9)	46.3 (43.7)	7.43% (10.21%)	0.50% (1.1%)	14.33 (1.86)
Belgium	7	103 (97.3)	19.4 (28.2)	4.30% (7.77%)	0.42% (0.45%)	15.5 (2.66)
Cyprus	4	13.3 (7.5)	7.6 (6.8)	−8.72% (28.2%)	−11.76% (23.87%)	5.5 (1.73)
Estonia	3	6.5 (3.5)	2.9 (0.7)	8.08% (3.5%)	1.28% (0.64%)	16.33 (2.51)
Finland	3	251 (29.1)	59.2 (6.2)	9.95% (2.35%)	0.53% (0.09)	18.67 (1.15)
France	12	636 (791)	205 (211)	6.37% (4.25%)	0.52% (0.64%)	17.33 (1.43)
Germany	21	205 (326)	57.6 (79.2)	2.97% (4.30%)	0.19% (0.30%)	17.09 (2.45)
Greece	4	62 (4.9)	44.1 (6.4)	−1.39% (3.19%)	−0.16% (0.34%)	4.25 (1.25)
Italy	12	214 (302)	90.4 (117)	5.43% (17.25%)	0.22% (1.21%)	11.5 (3.2)
Ireland	5	61.9 (43.5)	31.8 (17)	4.78 (4.95)	0.64 (0.89)	13 (2.64)
Latvia	4	5.5 (2.6)	2.5 (1.3)	9.76% (6.57%)	1.11% (0.78%)	16.33 (4.61)
Lithuania	3	7.46 (0.5))	3.35 (0.8)	7.79% (8.7%)	0.77% (0.88%)	17.33 (2.88)
Luxembourg	4	24.5 (14.7).	11.2 (6.23).	6.97% (1.76%)	0.59% (0.20%)	14.75 (6.07)
Malta	3	7.1 (4.6)	3.04 (1.58)	8.73% (2.34%)	0.73% (0.25%)	16 (4.24)
Netherlands	6	355 (319)	106 (126)	9.52% (2.45%)	0.44% (0.21%)	17.66 (2.94)
Portugal	3	72.4 (21.2)	42.1 (9.7)	−7.38% (18%)	−0.73% (1.69)	8.66 (4.04)
Slovakia	3	14.4 (2.1)	6.7 (1.6)	11.45 (1.05)	1.1% (0.09%)	15.33 (1.15)
Slovenia	3	2.9 (2.5)	4.52 (3.63)	9.49% (4.35%)	1.35% (0.5%)	12 (1)
Spain	12	275 (471)	95.2 (110)	4.89% (5.83%)	0.35% (0.42%)	12.08 (2.39)
TOTAL	118	190 (375)	63.8 (106)	5% (9.6%)	0.18% (4.53%)	14.29 (4.34)

Notes: Assets and risk-weighted assets (RWA) are given in billions of euro. Ratings have been transformed to numeric variable increasing with rating—the value of 1 corresponds to Moody's C, while 21 stands for Moody's Aaa. Standard deviation in parentheses. Source: websites, annual, semi-annual and quarterly reports and bond prospectuses of 118 credit institutions directly supervised by the European Central Bank.

We estimate the model (6) in four specifications. In each of the specifications variable “listed” is a binary variable equal to 1 if credit institution is quoted on the stock exchange and equal to 0 otherwise. In the first specification the logarithm of total assets is used as a measure of the bank size, return on average assets stands for bank profitability, while the bank credibility is given by bank rating. As usually done in financial econometrics ratings have been transformed to numeric variable increasing with rating (Cantor and Packer 1996; D’Apice et al. 2016). In our case the value of 1 corresponds to Moody's C, while 21 stands for Moody's Aaa.

In the second specification size is expressed by the logarithm of risk-weighted assets, while profitability is measured by the return on risk weighted assets. The measurement of the rest of variables did not changed.

In the third specification logarithm of total assets is used as measure of the bank size and a return on average assets stands for bank profitability, while bank credibility is measured on the basis of the ECB Comprehensive Assessment (ECB 2014, 2015). One of the very important components of this analytical exercise was stress test performed to check the resilience of banks' balance sheets to adverse market developments. We used the spread between bank reported (current) CET1 ratio and CET1 ratio estimated after 3 years in the adverse scenario as the proxy for bank credibility.

In the last specification logarithm of risk-weighted assets is used as a measure of bank size and return on risk weighted asset stands for bank profitability, while bank credibility is measured on the basis of ECB Comprehensive Assessment.

We estimated also twelve additional specifications in which return on equity is used as a measure of the bank profitability, while ratio of the impairment loans to risk weighted assets or the CET1 ratio after 3 years in the adverse scenario of the ECB Comprehensive Assessments are used as measures of the bank credibility. All these variables however turned out to be statistically insignificant and we have decided to not present them in the paper because of the brevity.

4. Empirical Results and Discussion

Using the above assumptions and data we conducted the logistic regressions. The estimated logit models are summarized in Table 3.

In each specification the impact of being listed on a stock exchange and bank size on the disclosure probability is statistically significant. The level of statistical significance of both variables is similar in all specifications.

The second specification is the only one in which the impact of bank profitability on the disclosure probability is statistically significant. The impact of the return on risk weighted assets on the disclosure probability is statistically significant at 10 percent level, although only marginally. The impact of the bank credibility on the disclosure probability is statistically significant when it is measured by the spread between the bank reported CET1 ratio and the CET1 ratio after 3 years in the adverse scenario of the ECB Comprehensive Assessment, while the impact of bank ratings is not statically significant.

Table 3. Estimated logit models.

Variable	(1)	(2)	(3)	(4)
listed	2.5865 *** (1.11)	3.6470 *** (1.3104)	2.9255 ** (1.0687)	3.7857 *** (1.3351)
ln_assets	0.6034 *** (0.2289)		0.5367 ** (0.2102)	
ln_RWA		0.6060 *** (0.2133)		0.635 *** (0.2178)
RoAA	−0.0303 (0.2165)		−0.0239 (0.1904)	
RoRWA		0.2235 * (0.1370)		0.1861 (0.134)
rating	−0.0912 (0.0734)	−0.0545 (0.077)		
stress test			0.1259 * (0.0716)	0.1684 ** (0.0797)
constant	−12.9854 *** (5.3469)	−13.4089 *** (5.008)	−13.3164 *** (5.3722)	−13.8974 *** (5.2007)

Notes: The logit model is cross-sectional, based on data for 2018. RWA—risk-weighted assets; RoAA—return on average assets; RoRWA—return on risk-weighted assets; stress test describes the results of the ECB Comprehensive Assessment—see: Section 3 for details. Standard errors in parentheses. Source: Authors' results. * indicates significance at 0.10 level, ** indicates significance at 0.05 level, *** indicates significance at 0.01 level.

The spread between CET1 ratio and the CET1 ratio after 3 years in the adverse scenario of ECB Comprehensive Assessment is higher in the case of more vulnerable banks, which may be seen as

less credible. The fact that lower credibility increases the probability of disclosure may be seen as surprising. It is possible that in the case of management of more vulnerable banks the P2R is more often perceived as price-sensitive information due to the worse financial condition of those credit institutions. As well, the management is characterized by higher propensity to disclose, even when publishing information is not legally necessary.

According to our model being listed on a stock exchange and bank size are crucial determinants of the divulgence of Pillar 2 requirements. 78% of listed banks had disclosed P2R information in contrast to the 57% of non-listed banks. Our findings suggest that listed credit institution conservatively interpret Market Abuse Regulation requirements and have strong preference for the disclosure of P2R information. In most cases they have little to lose in the case of the disclosure, while in the opposite scenario they face the risk of legal punishment if undisclosed P2R would be later recognized by competent authorities as a price-sensitive inside information.

The explanatory power of the credit institution size is a robust result in the research on the divulgence of financial data. Bigger and more significant credit institutions face economies of scale, because the cost of the disclosure is to large extent exogenous to credit institution size.

It could be suspected that more profitable and more credible institutions would have a preference for disclosure of P2R. The impact of the bank profitability on the divulgence probability is however statistically significant only if profitability is measured by means of the return on risk weighted assets, which is in general a less popular measure of bank profitability than return on equity or return on average assets. Similarly, the impact of the bank credibility on disclosure probability is statically significant only if measured on the basis of the ECB Comprehensive Assessment and the relationship is inverse than expected.

5. Conclusions

Disclosure of financial data is an important topic in economic research. We estimated logistic regression to measure the impact of characteristics of credit institutions on the probability of divulgence of Pillar 2 capital requirements. We used the sample of 118 significant credit institutions, responsible for 82% of bank assets in the Eurozone. These institutions are directly supervised by the European Central Bank according to the common methodology and decision process.

Legal form associated with being listed on stock exchange and the size of credit institutions are crucial determinants of the disclosure of Pillar 2 requirements. Being listed on the stock exchange is linked with much higher probability of P2R disclosure. This result proves that credit institutions conservatively interpret disclosure requirements resulting from the Market Abuse Regulation (MAR). Nevertheless, more specific interpretation of legal requirements on the disclosure of Pillar 2 capital requirements by the European Securities and Markets Authority would probably be appreciated by market participants. The easiest way to achieve such aim would be an update of the Questions and Answers on the MAR (ESMA 2017) clarifying the nature of the Pillar 2 disclosures. In our opinion the P2R divulgence should be at least clearly recommended by the European Supervisory Authorities—not only by ESMA, but also EBA (the European Banking Authority).

One of the basic principles of the well-developed capital market is transparency of issuers of securities. The vast majority of the significant credit institutions from euro zone are quoted on the stock exchanges. The results of our research proved that it is the most important determinant of disclosure of information on additional capital requirements, despite the lack of legally binding obligation. Such policy of the managements of the biggest European banks increases post-trade (post-IPOs) transparency of capital markets. We strongly support the opinion that high transparency is the crucial condition of well-functioning capital markets (Thuesen 2004; Brochet 2019) and benefits not only investors, but indirectly also consumers, taxpayers and the entire economy.

Among other characteristics of credit institution size measured by the logarithm of total assets is the most important predictor of the disclosure. Large institutions face important scale effects, which

make disclosure relatively cheaper. Institution credibility and profitability have limited impact on the disclosure probability, although in some specifications their impact is statistically significant.

At the beginning of our research we decided to take into account determinants which possess the relatively clear quantitative representations. However, market effects of divulgence of Pillar 2 requirements as well as the impact of organizational culture and management quality on the disclosure probability are promising directions for future research. Do credit institutions benefit from the disclosure of capital requirement? To what extent voluntary and full divulgence is the effect of organization culture and management quality? These and similar questions still remain unanswered.

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References

- Basel Committee on Banking Supervision. 2006. International Convergence of Capital Measurement and Capital Standards: A Revised Framework—Comprehensive Version. Available online: <https://www.bis.org/publ/bcbs128.pdf> (accessed on 9 September 2019).
- Bens, Daniel A., Philip G. Berger, and Steven J. Monahan. 2011. Discretionary Disclosure in Financial Reporting: An Examination Comparing Internal Firm Data to Externally Reported Segment Data. *The Accounting Review* 86: 417–49. [CrossRef]
- Berger, Philip G. 2011. Challenges and opportunities in disclosure research—A discussion of ‘the financial reporting environment: Review of the recent literature. *Journal of Accounting and Economics* 51: 204–18. [CrossRef]
- Brochet, Francois. 2019. Aggregate insider trading and market returns: The role of transparency. *Journal of Business Finance and Accounting* 46: 336–69. [CrossRef]
- Cantor, Richard, and Frank Packer. 1996. Determinants and Impact of Sovereign Credit Ratings. *FRBNY Economic Policy Review* 2: 37–54.
- D’Apice, Vincenzo, Ferri Giovanni, and Lacitignola Punziana. 2016. Rating Performance and Bank Business Models: Is There a Change with the 2007–2009 Crisis? *Italian Economic Journal* 2: 385–420. [CrossRef]
- Dagher, Jihad. 2018. Regulatory Cycles: Revisiting the Political Economy of Financial Crisis, IMF Working Paper WP/18/8. Available online: <https://www.imf.org/en/Publications/WP/Issues/2018/01/15/Regulatory-Cycles-Revisiting-the-Political-Economy-of-Financial-Crisis-45562> (accessed on 15 March 2020).
- Dieguez, Ana I., Oliver A. Blanco, and Jose C. Vazquez-Cueto. 2015. A Comparison of Classification/Regression Trees and Logistic Regression in Failure Models. *Procedia Economics and Finance* 23: 9–14. [CrossRef]
- Ebner, Andre. 2018. The Financial Stability Aspects of the EU-wide Stress Test. *Journal of Financial Regulation* 4: 326–36. [CrossRef]
- European Central Bank (ECB). 2014. Aggregate Report on the Comprehensive Assessment. Available online: <https://www.bankingsupervision.europa.eu/ecb/pub/pdf/aggreatereportonthecomprehensiveassessment201410.en.pdf?68911b281b9d831540bb474c334437e7> (accessed on 9 September 2019).
- European Central Bank (ECB). 2015. Note on the 2015 Comprehensive Assessment. Available online: https://www.bankingsupervision.europa.eu/pdf/ca/2015-11-14_note_comprehensive_assessment.en.pdf?e09834c6564ab84419970599701b5c9c (accessed on 9 September 2019).
- European Central Bank (ECB). 2017. SSM SREP Methodology Booklet. Available online: https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.srep_methodology_booklet_2017.en.pdf (accessed on 9 September 2019).
- European Central Bank (ECB). 2018a. SSM SREP Methodology Booklet. Available online: https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.srep_methodology_booklet_2018~{}b0e30ced94.en.pdf (accessed on 10 October 2019).

- European Central Bank (ECB). 2018b. Single Supervisory Mechanism. Available online: <https://www.bankingsupervision.europa.eu/about/thessm/html/index.en.html> (accessed on 9 September 2019).
- ESMA. 2017. Questions and Answers on the Market Abuse Regulation. Available online: https://www.esma.europa.eu/sites/default/files/library/esma70-145-111_qa_on_mar.pdf (accessed on 9 September 2019).
- Gad, Jacek. 2015. Disclosures on control over financial reporting: The reporting practice of banks listed on the Warsaw Stock Exchange, E-Finance. *Financial Internet Quarterly* 11: 1–10. [CrossRef]
- Götz, Martin R., Tobias H. Tröger, and Wahrenburg Mark. 2019. The Next SSM Term: Supervisory Challenges Ahead, European Parliament PE 634.389. Available online: <https://www.econstor.eu/bitstream/10419/194576/1/1662445490.pdf> (accessed on 16 March 2020).
- Ojo, Marianne. 2015. Implementing Basel III through the Capital Requirements Directive (CRD) IV: Leverage Ratios and Capital Adequacy Requirements. *Journal of Business Law and Ethics* 3: 36–61. [CrossRef]
- Rey, Helene. 2018. Dilemma not Trilemma: The Global Financial Cycle and Monetary Policy Independence, NBER Working Paper 21162. Available online: <https://www.nber.org/papers/w21162.pdf> (accessed on 15 March 2020).
- Schäfer, David. 2016. A banking union of ideas? The impact of ordoliberalism and the vicious circle on the EU banking union. *Journal of Common Market Studies* 54: 961–80. [CrossRef]
- Schoenmaker, Dirk. 2011. The financial trilemma. *Economics Letters* 111: 57–59. [CrossRef]
- Stiglitz, Joseph E. 2010. *Freefall: America, Free Markets, and the Sinking of the World Economy*. New York and London: W. W. Norton & Company.
- Thuesen, Jesper U. 2004. Transparency in Capital Markets. In *Danmarks Nationalbank Monetary Review 4th Quarter*. pp. 65–76. Available online: http://www.nationalbanken.dk/en/publications/Documents/2004/12/MON4_04.pdf (accessed on 23 January 2020).
- Weisberg, Sanford. 2005. *Applied Linear Regression*. Hoboken: John Wiley & Sons.



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