

THE IMPACT OF ECB LOAN VALUATION METRICS ON THIRD-PARTY LOAN PRICING: A EU FIRM PERSPECTIVE

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Abstract

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This paper delves into the implications for the bank behaviour about firm loan pricing conditions of the new direction undertaken by supervisory and regulatory authorities in the aftermath of the deterioration of the loan portfolio quality that hit EU banks. The 2014 AQR exercise embraces the new direction and extensively uses debt service coverage measures to assess a firm's loan quality. We, therefore, check whether the DSCR has influenced debt pricing conditions by analysing a panel of 655 listed EU firms from 2009 to 2017. Our findings show that Z-score is unable to discriminate between high and low credit risk firms. The DSCR becomes significant only after 2014, highlighting the incremented importance of this ratio in the bank's loan pricing determination. Our work contributes to the literature investigating third-party interdependencies with the interplay between lender-borrower relationship and loan pricing and further extends the literature on creditworthiness metrics beyond their mere default-prediction ability (Beaver, 1966; Houghton & Woodliff, 1987). Our results highlight the relevance of the DSCR in the bank's loan pricing determination and inform firm managers about the drivers that influence the cost of debt thereby enhancing their operational and financial planning.

Keywords: Bank, AQR, DSCR, Debt Pricing

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1. INTRODUCTION

In the aftermath of the global financial crisis (GFC), European banks experience a severe deterioration of their loan portfolio quality (EBA, 2016) that is further exacerbated by the sovereign-debt crisis that weakens the banking sector of some European countries.

Supervisory and regulatory authorities intervene in undertaking a series of measures aimed at containing repercussions on bank lending, financial stability, and economic growth (ECB, 2020).

Firms' resilience is at stake as the impact on bank lending conditions may be material. This is particularly relevant for the euro area where bank loans represent more than 50% of the external

financing of both small and large non-financial enterprises (Altavilla, Canova, & Ciccarelli, 2019). As a comparison, the equivalent figure in the US is only 25%.

To ensure a more effective bank's lending and support firms in leading economic growth, supervisory and regulatory authorities address the NPL's issue by undertaking measures that include a harmonized classification of non-performing exposures (EBA, 2013), clear identification criteria and provisioning instructions (ECB, 2017), and an enhanced impairment model (IFRS9).

In detail, the EBA intervenes harmonizing the definition of NPLs in order to grant its consistency and comparability across the member states. The EBA's Implementing Technical Standards distinguish between non-performing exposures (NPEs) and NPEs with forbearance measures. The former further consists of three different categories: 1) bad loans, 2) unlikely-to-pay (UTP) and 3) past-due.

The ECB's Guidance to banks on NPLs sets out some criteria to identify the condition of the financial difficulty of the debtor. Moreover, the document sets out ECB's expectations for prudent levels of provisions for new NPLs. Specifically, the ECB requires full coverage of the new secured and unsecured non-performing exposures within seven and two years, respectively (ECB, 2018).

Regarding impairments, the IFRS9 introduces a forward-looking expected credit loss model for the calculation of provisions in order to replace the traditional incurred loss model for credit exposures.

All these measures contribute to shaping the framework and approach of the comprehensive assessment undertaken by the ECB before assuming full responsibility for supervision under the Single Supervisory Mechanism (SSM) in November 2014. This is particularly evident for the Asset Quality Review (AQR), namely one of the two pillars of the assessment, together with the stress test, whose purpose is to enhance the transparency of bank exposures by reviewing the quality of banks' assets, including the adequacy of asset and collateral valuation and related provisions.

The AQR Phase 2 Manual uses a definition of financial difficulty which strictly relates to the consistency and level of cash flows and is crucial in qualifying an exposure as credit-impaired.

More specifically, a material decrease in estimated future cash flows or a decrease of the debt service coverage ratio (DSCR) below the threshold of 1.1 qualify as minimum triggers of significant financial difficulty of the borrower.

Thus, much importance is attributed to the EBITDA, as a proxy of the cash flows generated by a firm, and its related ratio the DSCR which is an indicator of dynamic debt repayment.

As reported in the AQR Phase 2 Manual, the EBITDA is fundamental for three purposes: a) forming indicators for the exposure's classification; b) identifying debtor's financial difficulties; c) setting the level of provisions on a going concern.

To sum up, the new direction undertaken by supervisory and regulatory authorities marks a turning point from backward-looking to forward-looking logics and measures that ground on the evaluation of cash flows and aim to anticipate dynamics instead of registering them ex-post.

Thus, the research question that this paper seeks to answer is how this new approach is

affecting the bank-firm relationship. We focus on the effects of ECB's loan valuation metrics on third-party pricing policies. In particular, give its extensive use in the AQR exercise, we assess the impact of the debt service coverage ratio on the bank behavior about firm loan pricing conditions.

We, therefore, contribute to the literature investigating third-party interdependencies with the interplay between lender-borrower relationship and loan pricing (Kim, Song, & Tsui, 2012; Byrne & Kelly, 2019). As the role of the ECB has been merely addressed studying the policy rate pass-through to lending rates, we offer a novel perspective assessing the impact of debt service coverage metrics used in the AQR on the firm's cost of debt, thereby considering a measure of dynamic debt repayment and further extending the literature on such ratios beyond their mere default-prediction ability (Beaver, 1966; Houghton & Woodliff, 1987).

Our sample consists of 655 EU-listed firms in eleven EU countries. We collect annual firm financial data from the Amadeus (Bureau Van Dyke) database over the period 2009-2017.

We, therefore, employ a fixed effect panel data regression to evaluate the ability of DSCR measures in explaining the level of debt pricing.

Our main result points out that the DSCR becomes statistically significant in explaining the firm's cost of debt only after the introduction of this measure within the AQR exercise of 2014.

This result is relevant both for the implications for banks' net-interest margins and for the large dependence of corporate financing to bank lending. Moreover, it has several implications for both policymakers and managers. Regarding the former, our result suggests the relevance gained by the DSCR by bank managers for the determination of loan pricing conditions thereby supporting the effectiveness of the new direction undertaken by supervisory and regulatory authorities.

Regarding management, on one hand, bank managers introduce into lending practices a simplistic tool that provides a straightforward output and further fully embraces the new regulatory and supervisory approach. On the other hand, firm managers understand the drivers that influence the cost of debt thereby they can better plan their operational and financial strategies. The paper is organized as follows: Section 2 reviews the relevant literature; Section 3 describes the DSCR and disentangles it in its main drivers; Section 4 outlines the research design; Section 5 provides the results; Section 6 concludes and highlights the managerial and policy implications.

2. LITERATURE REVIEW

Credit scoring is a statistical method used to predict the probability that a loan applicant or existing borrower will default or become delinquent (Mester, 1997). Banks may use scoring to develop risk-related loan pricing but is essential for the users to understand the economic value of the models and to integrate such information into traditional lending practices in a profitable manner (Stein, 2005).

Quantitative credit risk modelling has come a long way since the Altman's Z-score. The first modern-day quantitative model of credit risk was based on a multivariate discriminant analysis of five accounting ratios. Despite being still useful for many market players (Benzschawel, 2012), the Z-score has

been criticized for being backward-looking and intermittent, as accounting ratios are based on historical data. Therefore, credit risk modelling has evolved into structural and reduced-from models (Zamore, Djan, Alon, & Hobdari, 2018).

Although, replaced by more advanced techniques, the employment of debt service coverage measures by the ECB in the 2014 AQR exercise to assess the firm's loan quality may have resumed the role of credit scores in the bank lending process. In particular, the score may influence loan pricing conditions, and this assumes particular relevance for its implications for the banks' net-interest margins and overall profitability.

This is relevant also for borrowers as in the euro area corporate financing is predominantly bank rather than market-based (de Bondt et al., 2005). Bank loans represent, indeed, more than 50% of the external financing of both small and large non-financial corporations (Altavilla et al., 2019). Changes in lending conditions may, therefore, affect the level of economic activity and welfare.

Literature has extensively investigated the lender-borrower relationship and its impact on loan pricing. The intensity of the relationship is found to be crucial in explaining loan pricing (Gabbi, Giammarino, Matthias, Monferrà, & Sampagnaro, 2020) as well as borrower and lender characteristics.

Regarding the impact of borrower's characteristics on loan pricing, Bharath, Sunder, and Sunder (2008) provide evidence of loan interest rates being lower for borrowers with higher accounting quality. Graham, Li, and Qiu (2008) show that borrower financial restatements increase loan rates. Zhang (2008) finds that loan interest rates are negatively related to borrower accounting conservatism. Chava, Livdan, and Purnanandam (2009) investigate the impact of borrower governance characteristics on loan pricing and show that takeover defenses are negatively associated with loan rates. Chen, King, and Wen (2020) examine the link between non-executive employee ownership and the terms and pricing of corporate loans pointing out the negative effect of non-executive employee ownership on loan spreads.

Specularly, a strand of literature is dedicated to the interplay between lender characteristics and loan pricing. Hubbard, Kuttner, and Palia (2002) consider bank capital and show that low-capital banks tend to charge higher loan rates than well-capitalized banks. Coleman, Esho, and Sharpe (2002) investigate the impact of several lender characteristics and show that bank monitoring ability, bargaining power, risk, and syndicate structure have a significant influence in determining loan maturity and pricing.

Among the external factors like the political (Delis, Hasan, & Ongena, 2020; Ashraf & Shen, 2019) and regulatory environment (Chen, Mazumdar, & Yan, 2000), third parties' characteristics, such as size and tenure of borrower's auditors, are found to be relevant in explaining loan interest rates. In this regard, Kim et al. (2012) find that the loan interest rate is significantly lower for borrowers with prestigious Big 4 auditors than for borrowers with non-Big 4 auditors. Moreover, auditor tenure is negatively associated with the loan interest rate, suggesting that a long client-auditor relationship lowers the loan borrowing cost.

Of particular interest to the purpose of this paper is the role played by the ECB. Literature has focused on monetary policy decisions and their

impact on the interest rates set by banks for lending operations. In particular, an extensive strand of literature has examined the interest rate pass-through concluding that bank rates are sticky in the short term, i.e., changes in short-term market interest rates are not immediately fully reflected in bank interest rates. de Bondt et al. (2005) and Camba-Mendez et al. (2016) show that the pass-through of short-term to long-term rates in the euro area plays a key role in the determination of bank lending rates and their sluggishness. Moreover, Byrne and Kelly (2019) link the effectiveness of the monetary policy pass-through to the bank asset quality pointing out that distressed loan books may hamper the adjustment of lending pricing in response to changes in the policy rate.

Regarding the ECB comprehensive assessment, Steffen (2014) has questioned the robustness, validity, and significance of both asset quality review and stress test. Moreover, Acharya and Steffen (2014a, 2014b) estimated the capital shortfalls of European banks and compare their results with those of the ECB assessment. The results diverge significantly and authors attribute such divergence to the continued reliance on static risk-weights in the regulatory assessment.

However, the literature does not link ECB supervisory or regulatory measures to loan pricing. On an international regulatory level, instead, few studies have addressed this question investigating the association between Basel rules, specifically credit risk measurement techniques, to loan pricing. Repullo and Suarez (2004) show that low-risk firms overcome increases in their loan rates by borrowing from banks adopting the IRB approach whereas high-risk firms do the same by borrowing from banks that adopt the less risk-sensitive standardized approach. Moreover, Ruthenberg and Landskroner (2008) find that low-risk corporate customers can reduce loan interest rates by interacting with large banks that, most probably, adopt an IRB approach, whereas high-risk corporate customers can enjoy the same reduction by shifting to small banks that, most probably, adopt a standardized approach.

Our work, therefore, attempts to close this gap. Given that the regulatory environment in which banks operate significantly affects the loan rate (Chen et al., 2000), we investigate the impact of ECB's loan valuation metrics employed in the 2014 AQR exercise on loan pricing conditions. As a result, we contribute with a novel point of view to the loan pricing literature and further assess an ECB supervisory measure so far unnoticed by scholars.

3. DEBT SERVICE COVERAGE RATIOS

Although the AQR Phase 2 Manual (2014) does not specify the exact calculation of DSCR, the most commonly used formula for this ratio is the following:

$$DSCR = \frac{NOCF}{Debt\ repayment + Interest\ expense} \quad (1)$$

where *NOCF* is the net operating cash flow, calculated as earnings before interest, taxes depreciation, and amortizations (EBITDA), minus taxes, and the variations in net operating working capital

(inventories plus working receivables minus working debts). The ratio focuses on the ability to repay the medium to long-term debt and interest expense, thus debt repayment stands only for this part of the debt.

Assuming that long-term changes in the net operating working capital have a reduced influence on cash flows or at most a negligible shifting effect over the observed period of time, the formula becomes as follows:

$$DSCR = \frac{EBITDA - Taxes}{Debt\ repayment + Interest\ expense} \quad (2)$$

Unfortunately, using publicly available data, it is impossible to know a company's annual financial commitments in terms of loan repayments.

Therefore, in this study, the medium to long-term debt duration is commensurate with the residual life of the fixed assets usually financed by these loans:

$$Debt\ duration\ (years) \cong Fixed\ Assets\ duration = \frac{Fixed\ Assets}{Depreciations + Amortizations} \quad (3)$$

Thus, the DSCR formula becomes:

$$DSCR = \frac{EBITDA - Taxes}{\frac{Medium/Long\ term\ debt}{Debt\ duration} + Interest\ expense} \quad (4)$$

A ratio of more than 1 indicates sufficient capacity to cover the financial commitments of the firm. However, the AQR should use a higher threshold of 1.1 to be considered safe.

The AQR also uses an indicator to measure whether all of the company's financial debt (both medium to long-term debt and short-term debt) can be repaid out of the company's EBITDA, fixing a threshold of six years:

$$\frac{Total\ debt}{EBITDA} \leq 6 \quad (5)$$

Using the DSCR coverage logic in terms of unity, we can formulate the second version of this ratio as follows (that we can dub *Total DSCR*):

$$Total\ DSCR = \frac{EBITDA \cdot 6}{Total\ debt} \quad (6)$$

The above ratio should be higher than 1 (or 1.1 in the ECB's prudential logic).

4. DATA AND METHODOLOGY

We are interested in testing how DSCR and Total DSCR influence the firm's debt pricing compared to a more traditional risk measure such as the Z-score.

We collect annual firm financial data from Amadeus (Bureau Van Dyke) database. From the universe of EU companies, we create the sample

setting the following criteria: 1) the company is listed; 2) the latest year of accounts is 2017, and 3) the status is active. Thus, our sample includes all EU-listed firms available in Amadeus: 655 firms in 11 EU countries (BE, BG, DE, ES, FI, FR, GR, IT, LU, SE, SK) over the years 2009-2017. We focus on listed firms because we can calculate the traditional and full version of the Z-score, which is influenced by market capitalization. The starting period of our sample corresponds to the first available financial year of the dataset.

The dataset presents some missing data and a set of outlying observations. The first step in our analysis considered the deletion of some anomalous values. These have been identified as outliers in the distribution of the explanatory variables. To avoid the introduction of subjective assumptions during data completion, we decided to face the issue of outliers using a listwise deletion approach. Considering the specific model matrices, the final sample size was reduced from 7,191 observations to 5,634 observations (699 units observed from 1 to 9 times; 8.06 is the average number of observations per unit).

Exploiting a research design similar to that used in Francis, LaFond, Olsson, and Schipper (2005) and Van der Bauwhede, De Meyere, and Van Cauwenberge (2015), we tested the ability of DSCR measures to explain the level of debt pricing. We implemented a fixed effect panel data regression:

$$Cost_{j,t} = \gamma_0 + \gamma_1 Country_{j,t} + \gamma_2 Nace_{j,t} + \gamma_3 Size_{j,t} + \gamma_4 Rate_{j,t} + \gamma_4 CR_{j,t} + \partial_i + \varepsilon_{j,t} \quad (7)$$

where $j = 1$ to N identifies the firms and $t = 1$ to T is the time indicator. *Cost* is the annual cost of debt calculated by dividing interest expense by total debt. *Country*, *Nace*, *Size*, and *Rate* constitute control variables: *Country* is a factor variable that represents the country in which the firm has its headquarters; *Nace* is a factor variable representing the type of industry; *Size* is the logarithm of total assets; *Rate* is the official interest rate applied by the ECB (macro-economic control variable). *CR* is the variable expressing the firm's credit risk declined in four configurations; and ∂_i is the individual effect. The

Hausmann test is used to decide between fixed or random effects.

The firms' credit risk measure is considered in four different configurations. The first is the pure value of the classic Altman (1968) Z-score (Model 1). The second is represented by a factor variable that identifies the levels of Z-score (Model 2): the Z-score 2 is 1, if the Z-score is defined in the interval [1.8; 3] (in this range the Z-score is not always able to separate defaulted from non-defaulted firms) and zero otherwise, and the Z-score 3 is 1 if the Z-score is at least equal to 3 (above this value the Z-score

identifies low-risk default firms) and zero otherwise. The third is a dummy variable equal to 1 if the DSCR is at least equal to 1.1 and zero otherwise (Model 3). The fourth is a dummy variable equal to 1 if the Total DSCR is equal to or greater than 1.1 and zero otherwise (Model 4). In Model 3 and Model 4, the DSCR effect is integrated with two control variables that are the variation in firm sales and the

capitalization level (Equity to Total Assets) that are both used in the AQR exercise. The estimation of the panel models is based on the transformation. The transformation is used to solve the well-known incidental parameters issue; however, as a consequence, the effects of the time-invariant variables are also depleted.

Table 1. Descriptive statistics

Variable	Valid observations	Min.	Max.	Mean	Median	Std. Dev.
Cost: dependent variable	5989	-0.0241	0.3235	0.0665	0.0517	0.0516
Size	6705	7.0926	19.8610	12.9172	12.6127	2.3198
Rate	6705	0.0000	0.0100	0.0046	0.0025	0.0044
Cap	6705	-10.2192	0.9856	0.4324	0.4281	0.2785
Var. Sales	6569	-1.0000	0.6747	0.0252	0.0307	0.1796
DSCR	6119	-16.0726	38.1095	5.4069	3.4455	6.7883
Total DSCR	5831	-11.4194	30.9608	3.7914	2.1907	4.9441
Dummy DSCR	6119			0.8438		
Dummy Total DSCR	5831			0.7644		
Z-score	6624	-5.3586	11.7202	2.6384	2.3176	1.6024
Z-score 1	6624			0.3092		
Z-score 2	6624			0.3931		
Z-score 3	6624			0.2977		

Note: This table provides the summary statistics for the variables used in regressions (7). The sample consists of 655 firms corresponding to a maximum of 6705 observations regarding the period 2009-2017.

The descriptive statistics show that the *Cost* assumes an asymmetric distribution. It presents a few negative values, which are not included in the dataset used for the model estimation (because the records present some missing values). The studied phenomenon presents an asymmetric distribution and, as most of the economic variables, it assumes positive values only. Given these characteristics, a data stabilization transformation is adopted here as a preliminary data treatment procedure. In particular, the logarithmic transformation of the dependent variable (Box & Cox, 1964) is considered.

5. RESULTS AND DISCUSSION

The Z-score shows a positive and statistically significant correlation with the firm's cost of debt. This result is consistent across the two configurations of the Z-score of pure value and factor variable in Model 1 and Model 2. The positive correlation with the cost of debt suggests that third-party lenders do not raise prices when firms are near default (Beltrame et al., 2017). As a result, we deem the Z-score unable to discriminate between high and low credit risk firms.

Regarding the flow variables used in the AQR exercise, both DSCR dummy and sales variation show a negative and statistically significant correlation with the firm's cost of debt over the full period in Model 3. This result can be easily explained by the great dependence of provisioning from those two indicators. Moreover, with respect to the temporal differentiation, it is interesting to notice that the DSCR dummy manifests a significant explanatory power of debt pricing in the 2014-2017 period. In particular, the dummy becomes statistically significant only after the introduction of the ratio within the framework and logics of the 2014 ECB's AQR. As regards third-party interdependencies with the interplay between lender-borrower relationship and loan pricing, this result is explained by the ECB's smoothly transmission of the new approach to banks by which the DSCR has become important for the determination of loan pricing conditions and has

alerted firms regarding the key drivers of the cost of debt that need to be taken into account when planning operational and financial strategies.

On the contrary to the DSCR dummy and similarly to Z-score results, the Total DSCR dummy shows a positive and statistically significant correlation with the firm's cost of debt in Model 4. Thus, coherently with the explanation of the Z-score results, the 6x threshold for financial debt on EBITDA does not constitute a general proxy to separate good and bad debt service firms. In fact, the Total DSCR dummy presents stable values among firms and for all of the sample period. Another explanation about the different signs of two DSCR dummy measures is that the amount of debt (long- and short-term) itself is not able to describe clearly firm financial conditions, letting more significant the comparison between cash flow and debt service.

Regarding control variables, the size shows a negative and statistically significant correlation with the firm's cost of debt over the full period. This result is consistent across all four models. The negative relationship between size and debt pricing suggests that larger firms tend to pay less because those firms enjoy economies of scale and greater stability (Anderson, Mansi, & Reeb, 2003).

The official interest rate set out by the ECB shows a positive and statistically significant correlation with the firm's cost of debt over all periods considered. This result is in line with the extensive literature on the policy rate pass-through to lending rates.

Regarding the two control variables employed in Model 3 and Model 4, the sales variation, as abovementioned, shows a negative and statistically significant correlation with debt pricing over the full period in Model 3. The result is further validated in Model 4. The explanation is that a sales reduction triggers higher levels of provisioning that the bank reflects in higher lending rates.

Finally, the capitalization level does not show a statistically significant relationship with the firm's cost of debt over the full period. The result is consistent in both Model 3 and Model 4.

Table 2. Cost of debt and credit risk measures

Variable	Model 1			Model 2			Model 3			Model 4		
	2009-2013	2014-2017	Full period	2009-2013	2014-2017	Full period	2009-2013	2014-2017	Full period	2009-2013	2014-2017	Full period
Size	-0.0509 (0.0392)	0.0032 (0.0493)	-0.0530** (0.0230)	-0.0510 (0.0396)	0.0040 (0.0497)	-0.0520** (0.0231)	-0.0502 (0.0396)	0.0107 (0.0500)	-0.0475** (0.0231)	-0.0511 (0.0396)	0.0119 (0.0499)	-0.0470** (0.0231)
Rate	11.5067*** (2.4665)	0.0291*** (0.3297)	27.6425*** (1.4769)	9.9527*** (2.4796)	0.0276*** (0.3304)	26.6720*** (1.4730)	9.0326*** (2.4807)	254.8589*** (33.0112)	25.6474*** (1.4699)	9.1040*** (2.4809)	253.4101*** (32.9679)	25.8194*** (1.4669)
Z-score	0.1255*** (0.0159)	0.1305*** (0.0181)	0.0881*** (0.0101)									
Z-score 1/2				0.0818*** (0.0308)	0.1473*** (0.0383)	0.0856*** (0.0239)						
Z-score 2/3				0.1865*** (0.0437)	0.2799*** (0.0519)	0.1824*** (0.0327)						
DSCR							-0.0441 (0.0297)	-0.0789** (0.0375)	-0.0566** (0.0235)			
Total DSCR											0.1728*** (0.0558)	0.1841*** (0.0587)
Var. Sales							0.0120 (0.0467)	-0.0669 (0.0636)	-0.0884** (0.0404)	-0.0056 (0.0453)	-0.1069* (0.0632)	-0.1190*** (0.0392)
Cap							0.5576*** (0.1038)	0.1151* (0.0644)	0.0363 (0.0373)	0.5003*** (0.0122)	0.1000 (0.0641)	0.0266 (0.0372)
Obs.	2906	2392	5298	2906	2392	5298	2906	2392	5298	2906	2392	5298
R-squared	0.0344	0.0624	0.0874	0.0344	0.0504	0.0811	0.0206	0.0393	0.0778	0.0196	0.0421	0.0786

Note: This table shows the estimation results on the effect of credit risk measures on the firm's cost of debt for a sample of 655 firms over the 2009-2017 period. In all regressions, we estimated the regression model of equation (7) using the four configurations of credit risk measures alternatively. Robust standard errors are in brackets. *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

6. CONCLUSION

This paper studies the implications of the ECB's loan valuation metrics on third-party pricing policies. We investigate the implications of the extensive use of the DSCR in the 2014 ECB's AQR on pricing conditions applied by banks to the loans to firms.

We employ a sample of 655 EU-listed firms that covers the period 2009-2017. Our main result points out the significant role of the DSCR in explaining the firm's cost of debt after its introduction in the 2014 ECB's AQR exercise.

From an academic standpoint, our work contributes to the branch of literature investigating third-party interdependencies with the interplay between lender-borrower relationships and loan pricing. The novelty of our contribution lies in our focus on the creditworthiness metrics employed by the ECB instead of considering the broadly investigated policy rate pass-through to lending rates. Moreover, we further extend the literature on creditworthiness metrics by considering a measure of dynamic debt repayment and going beyond their mere default-prediction ability by studying their impact on the firm cost of debt.

From a practical standpoint, our paper provides evidence to policymakers about the effectiveness of the change of course undertaken in the aftermath of the deterioration of the loan portfolio quality that hit EU banks. In detail, the metrics adopted by the ECB to value loans have been effectively incorporated by bank managers into lending processes for the determination of loan pricing conditions. Moreover, bank managers also benefit from a simplistic tool that provides a straightforward output and whose economic meaning fully embraces the rationale behind the new approach.

Finally, further implications can be drawn for the banks' net-interest margins and overall profitability.

Important implications emerge also for borrowers, as firm managers can derive from the decomposition of the DSCR the main drivers that have to be managed to improve the score and obtain better pricing conditions. Moreover, knowing the drivers of the cost of debt may help firm managers to better plan their operational and financial strategies.

The range of these implications could be relevant given that in the euro area corporate financing is predominantly bank-based and bank loans represent more than 50% of the external financing of both small and large firms.

As regards the limits of this study we point out the inclusion in our sample of only EU-listed firms. We suggest, therefore, future research that would contribute to this study to include unlisted firms in the sample in order to determine the total effect for the EU economies. Given the crucial role of enterprises in leading economic growth, further implications may be derived regarding the level of economic activity and welfare. In this regard, the recent COVID-19 outbreak poses a serious threat to the firms' resilience and this supports the importance of our study as the DSCR will become much more crucial to assess firm creditworthiness and its drivers will become decisive for firms to plan strategies that lead them out from the crisis. We, therefore, call for future research on the interplay between the drivers of the cost of debt highlighted in this study and firm resilience during the time of coronavirus.

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