



LINKING FINANCIAL REPORTING QUALITY AND COST OF DEBT: EVIDENCE FROM SERBIAN SMES

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ABSTRACT

Using the financial statement database of the Serbian Business Registers Agency (APR), we analyze the extent to which the quality of a company's financial reporting is associated with its cost of debt. The focus of this study is small and medium enterprises (SMEs) because they represent a critical segment of the economy in most countries. Our results suggest that financial reporting quality, proxied by accruals quality, is inversely related to the cost of debt. However, the extent to which better financial reporting quality is associated with reduced interest rates is difficult to determine in Serbia as a number of other factors that cannot be controlled for in our study also affect the cost of debt. These include an overall environment of greater financial instability vis-à-vis advanced economies, and stronger intervention by the government in the financial system. Also, there are some limitations on the financial statement data that are available in Serbia, such as the lack of loan-specific interest rate, maturity, and collateral information. Nonetheless, our findings in Serbia are consistent with the results of other studies in advanced economies that have found that financial reporting quality seems to reduce information asymmetry between lenders and SME managers, and SMEs with a higher quality of financial statements pay lower interest costs than SMEs with poorer accounting information quality.

1. BACKGROUND

Small and medium-sized enterprises (SMEs) are the backbone of the economy in most countries and play a key role as engines for economic development. More than 95 percent of firms around the world are SMEs, and they hire the majority of employees in many countries (Beck and Cull 2014; Ayyagari, Demirgüç-Kunt and Maksimovic 2011). In Serbia, SMEs represent 99.8 percent of registered companies, 65 percent of total employment, 56 percent of total gross value added, and 44.8 percent of total exports (OECD 2017).

Around the world, SMEs face significant financing challenges as compared to large firms (Beck and Demirgüç-Kunt 2006; Berger and Udell 1998). Kuntchev et al. (2014) demonstrate that the probability of being credit constrained decreases with firm size, and several cross-country studies find that a lack of access to finance is a key constraint to SME growth in developing economies (Beck, Demirgüç-Kunt, and Maksimovic 2005; Beck et al. 2006). Ayyagari et al. (2017) argue that impediments to obtaining finance also prevent the entry of new firms and present obstacles to young firms wanting to invest in new opportunities and grow. These factors in turn adversely affect the economy's growth prospects.

Initially, SMEs look upon internal sources as the primary source of credit. These include insider funds such as owners' personal savings and funds provided by family and friends. Berger and Udell (1998) have set forth a detailed financial growth cycle that describes how firms utilize different sources of finance, depending on their size. Often, only after a firm has obtained significant tangible assets that can be pledged as collateral would it be able to obtain formal, external credit from financial institutions. They further suggest that banks loans obtained by small firms are usually also backed by the personal assets of the owners, if the firm's collateral is not sufficient. In Serbia, the main source of SME financing is the owners' personal funds, although one-third of SMEs do use external sources of funding, mostly bank lending, as well as lending from friends and family (OECD 2017). More information on SME lending in Serbia is provided in Box 1.

Banks are the main source of formal, external capital used by and accessible to SMEs globally (Howorth and Moro 2012). However, the lack of high-quality and transparent financial data about SMEs aggravates information asymmetries that exist between SMEs and lenders and increases the risk of lending or investing in these firms. This increased risk is reflected in a higher interest rates, shorter maturities, and less desirable credit terms in general. What is true at the global level also applies in the Serbian context, where SMEs typically pay higher interest rates than their larger counterparts. According to an OECD study on SME access to finance covering 39 countries, the average interest rate charged to SMEs in Serbia was 2.09 percentage points higher than that charged to large enterprises; the average spread for all participating countries was 1.39 percentage points (OECD 2017).

Box 1: Background on SME financing in Serbia¹

At the beginning of 2015, the Government of the Republic of Serbia adopted the Development Strategy for Small and Medium Enterprises, Entrepreneurship and Competitiveness for 2015-2020, which is a medium-term framework for SME and enterprise development policy for the coming period. The access to sources of financing pillar of the strategy included several measures. The objective of these measures is to make loans to SMEs accessible under advantageous conditions as well as the implementation of training in financial management, in particular: improvement in the quality of offerings of the banking sector to SMEs; development of new financial instruments; and improvement of ability of SMEs to access various sources of financing. In 2014, in contrast to previous years, outstanding SME loans expanded by 15%, the average maturity rose, and SME loans increased their share in overall corporate lending. New lending to SMEs increased by 19.5%, and interest rates fell mainly due to government subsidized loan programs. All of these positive trends continued in 2015. Although the government subsidized lending programs were terminated at the end of 2014 and these loans were maturing in 2015, the outstanding stock of SMEs loans continued to grow by 12.6% in 2015. In addition, the outstanding stock of SME long-term loans increased by 20.7% as a result of the strong impulse of corporate lending of investment loans.

Interest rates continued to decrease as well as the percentage of SMEs that were required to provide collateral. As a result of stronger monetary policy relaxation, that started in May 2013, the average interest rate on loans denoted in the local currency decreased by 600 basis points in over the 2013-15 period and stood at 12.3% in 2015. Over the same period the average interest rate charged to SMEs in foreign currencies decreased by 190 basis points to 6.6%, thus continuing a generally downward trend since 2007.

Even though the regulatory framework for venture capital (VC) is still not in place in the Republic of Serbia, there are some sporadic investments of VC and equity funds established abroad. Activities of the West Balkans Enterprise Development & Innovation Facility program (WB EDIF), an initiative of the European Union, are thus of great significance for future progress and investment increases in the VC area.

¹ Source: OECD 2017

1.1. SMES AND FINANCIAL INFORMATION OPACITY

According to Berger and Udell (1998), the degree of financial information opacity of small businesses influences their financing decisions and is the main element that distinguishes them from large firms. This informational opacity is often taken as a static characteristic of the SME sector in general, both by policymakers and lenders, as SMEs are often seen to lack the necessary capacity to produce reliable financial reports. That said, both policymakers and lenders recognize the economic benefits and potential market gains that can be had from expanded SME lending, and in this regard, both have implemented various programs and initiatives. These include initiatives that involve government, donor, or other interventions such as credit-guarantees, subsidized lending, and other risk-sharing schemes, through which the government or other third party assumes a portion (or all) of the risk that lenders face when lending to certain SMEs. Financial institutions, for their part, have explored ways to lower their need for reliable financial information through mechanisms such as factoring and leasing, asset-based lending, and relationship-based lending practices. These initiatives and mechanisms, however, are based on the assumption and common belief that SMEs are not able to prepare high quality financial statements (Berger and Udell 2006).

Using financial statements of high quality effectively addresses a lender's concerns stemming from information asymmetries. When lenders believe they can trust the information presented in financial statements, they are able to assess a borrower's repayment capacity and make lending decisions in a relatively quick and low-cost manner. However, SMEs do not always have sufficient capacity prepare good financial reports for SMEs, nor the financial resources to pay an accountant to do so. In practice, financial statement lending tends to be seen as more appropriate for larger, more transparent firms. In fact, Allee and Yohn (2009) demonstrate that the demand for sophisticated financial statements is positively related to firm size and growth.²

1.2. MEASURING FINANCIAL REPORTING QUALITY OF SMES

Due to doubts about the capacity of SMEs to prepare reliable financial reports, the use of financial statement lending is often assumed to be inadequate for SME finance. Few empirical studies have questioned this assumption. Moreover, the relationship between financial reporting quality of SMEs and their loan conditions has not been investigated broadly. This may be because the concept of quality in financial reporting is difficult to measure reliably

² Allee and Yohn (2009) define sophistication of financial statements in terms of whether the financials are compiled, reviewed, and/or audited by a professional accountant and whether the firm produces accrual-based financial statements.

and objectively at a large scale. That said, several studies have done so, utilizing different approaches in this regard.

1.2.1. Audits as a proxy for quality

Van Caneghem and Van Campenhout (2012) use audits as a proxy for quality of financial statements. They utilize dummy variables for audited financial statements, unqualified audit opinions, and financial statements audited by the Big Four³ accounting firms as a signal of higher quality. However, tests using auditor verification-based proxies stem from the assumption that auditor verification enhances the quality of financial reporting (Vander Bauwhede et al. 2015). There are two main issues with using audit verifications as a proxy for quality in our study. First, in the case of Serbia, medium and large-sized companies have a statutory obligation to have their annual financial statements independently audited, and non-statutory audits are rare. Therefore, audits would be a reflection of firm size, and would not be a good proxy for quality in the case of Serbia. The Big Four proxy would likewise not be suitable because, in most cases, very few Serbian SMEs would have the financial resources necessary to engage a Big Four accounting firm to perform their audit.

1.2.2. Qualitative surveys

Other authors have utilized qualitative survey data to measure financial statement quality. Sarapaivanich and Kotey (2006) surveyed SME owner-managers in an attempt to capture the accuracy, completeness, timeliness, and consistency of financial reports. Similarly, Howorth and Moro (2012) conduct a survey of bank lending managers to construct variables of perceived information quality, quantity, completeness, and timeliness. Survey data such as these are subject to limitations, since they are often subjective. Regardless, a survey could not be funded as part of this study.

1.2.3. Quantitative measure of financial reporting quality (accruals quality)

Dechow and Dichev (2002) introduced a quantitative definition of financial reporting quality, which was subsequently adopted by a number of academics (including Vander Bauwhede et al. 2015; Schroff 2015; García-Teruel et al. 2010; Bharath et al. 2008; Francis et al. 2005; McNichols 2002). The measurement relies on the quality of accruals as a proxy for financial reporting quality. The rationale behind this variable is that, in the context of information asymmetry, bankers and investors use financial reporting and earnings to predict a company's future earnings and repayment capacity. These earnings are based on assumptions and

³The "Big Four" is the collective name given to the four largest accounting firms in the world: Deloitte, Ernst & Young, KPMG, and PriceWaterhouseCoopers,.

estimations made by the management of the company that affect the quality of accruals. Accruals quality measures the extent to which accruals map into cash flow realizations and can thus depict more accurately the future earnings of a company (Dechow and Dichev 2002). It provides a continuous measure of earnings quality (Vander Bauwhede et al. 2015), while taking into account both unintentional and intentional errors (Dechow and Dichev 2002).

1.2.4. Research linking accruals quality and access to credit

The research that exists on the relationship between accruals quality and access to credit has been conducted in developed markets such as the United States (Shroff 2015; Bharath et al. 2008; Francis et al. 2005), Belgium (Vander Bauwhede et al. 2015; Van Caneghem and Van Campenhout 2012), and Spain (García-Teruel et al. 2010). Only two of these focus specifically on SMEs. One paper shows that higher accruals quality facilitates SMEs' ability to obtain loans from banks (Van Caneghem and Van Campenhout 2012). In the other, Vander Bauwhede et al. (2015) use a sample of Belgian SMEs to demonstrate that SMEs with higher quality financial reporting have a lower cost of debt.

1.3. ABOUT THIS STUDY

This study builds on the existing research, namely Vander Bauwhede et al. (2015) by testing the effect of financial reporting quality on credit terms using financial statements from SMEs in an emerging market. We use a large panel database of financial statements of Serbian companies obtained from the Serbian Business Registers Agency (APR).

The results of this study suggest financial reporting quality, proxied by accruals quality, is inversely related to the cost of debt. We find that financial reporting quality seems to be associated with lower information asymmetry between lenders and SME managers, and SMEs with a higher quality of financial statements receive lower interest rates from banks than SMEs with poorer financial reporting quality. However, the extent to which better financial reporting quality is associated with reduced interest rates is more difficult to determine in Serbia because a number of other determinants also affect the cost of debt. A context of limited refinancing lines, rising costs of credit, and dampening credit growth is the environment in which SMEs were operating in Serbia during the period of interest (from 2007 to 2014). These hurdles are similar to those faced by SMEs in other emerging economies. This is important to consider when seeking to interpret the results of the analysis.

The next section presents our research design. Section 3 reports the empirical results of our analysis. The fourth section presents the limitations of this study. The fifth and final section concludes and suggests areas for future research.

2. RESEARCH DESIGN

2.1. DATA SOURCE AND SAMPLE SELECTION

To conduct our research, we use data sourced from APR. All companies registered in Serbia are required to submit their annual and consolidated financial statements to the APR in accordance with specific templates. All companies except micro-entities⁴ are required to prepare annual financial statements comprised of a balance sheet, income statement, statement of other comprehensive income, statement of changes in equity, statement of cash flows, and notes to financial statements (World Bank 2015). By law, micro-entities need only submit a balance sheet and income statement. The complete set of financial statements, together with the audit report (when required), must be submitted electronically to the APR by June 30 every year.

From the APR database, we gather yearly data on Serbian SMEs between 2007 and 2014. For the purpose of this study, we use the number of employees in a particular year as the sole size criterion because it is a straightforward variable and is reported consistently. Our analysis focuses on commercial companies that are currently active and domestically owned, with between 10-250 employees. This is the same employment threshold used in Serbian law and in the European Union to define small and medium enterprises. Some legal forms (including cooperatives and non-profit organizations) are excluded, and companies from the following industries are dropped from the sample because they are subject to a distinct set of financial reporting requirements (Minnis 2011; Heyman et al. 2008): financial and insurance companies, real estate companies, public administration and defense companies, activities of extraterritorial organizations and bodies, and companies from the utility sector. We eliminate further observations with missing values for financial debt (short-term financial liabilities and long-term loans) and interest expense variables, and those with missing data for the control variables in the accruals quality and cost of debt regressions (Vander Bauwhede et al. 2015). We also eliminate observations with an accounting period different than 12 months in order to obtain perfect calculations of the Accruals Quality (AQ) variable (Vander Bauwhede et al. 2015). Finally, we eliminate observations with extreme variations in total assets (i.e. when total assets increase or decrease by a factor of two or more) in order to mitigate the effects of restructuring activities (Vander Bauwhede et al. 2015; Vermoesen et al. 2013). The final sample is composed of 12,656 firm-year observations from 3,879 distinct SMEs over the period 2007–2014.

⁴ In Serbia, micro-entities have up to 10 employees, a turnover of up to 700,000 EUR, and a balance of up to 350,000 EUR. See Table 1 in “Report on the Observance of Standards and Codes on Accounting and Auditing: Republic of Serbia” (World Bank 2015).

Table 1. Sample breakdown by year, age and industry

Panel A: By year			Panel B: By age in years		
	no. of observations	%		no. of observations	%
2007	922	7.29	≤10	3,655	28.88
2008	1,059	8.37	>10, ≤15	3,016	23.83
2009	1,275	10.07	>15, ≤20	3,303	26.10
2010	1,540	12.17	>20, ≤25	2,373	18.75
2011	1,663	13.14	>25	309	2.44
2012	1,919	15.16			
2013	2,006	15.85			
2014	2,272	17.95			
Total	12,656	100.00	Total	12,656	100.00

Panel C: By number of employees		
	no. of observations	%
10–19	3,604	28.48
20–49	5,104	40.33
50–99	2,301	18.18
100–250	1,647	13.01
Total	12,656	100.00

Panel D: By industry		
	no. of observations	%
Agriculture, fishing, natural res.	765	6.04
Manufacturing	5,473	43.24
Construction	891	7.04
Retailing	3,408	26.93
Hotels and restaurants	277	2.19
Transport and communication	858	6.78
Services / other	984	7.77
Total	12,656	100.00

As shown in Table 1, the companies in this study are on average rather young (Panel B), have between 20-49 employees (Panel C), and operate essentially in the manufacturing and retailing industries (Panel D). The total assets of the selected companies represent, on average, around 29% of the total assets of all SMEs in the country.⁵

⁵ The average number of years in business in the sample/population is 15.2/12.9, and the average number of employees is 50.0/40.0. These information on the population of Serbian SMEs was calculated using the data from APR during the period 2007 to 2014.

2.2. MODEL SPECIFICATION

To analyze the effects of accruals quality on the cost of debt, we estimate the following regression model (1):

$$\text{Cost of Debt}_{i,t} = \beta_0 + \beta_1 \times \text{AQ}_{i,t} + \beta_2 \times \text{Leverage}_{i,t} + \beta_3 \times \text{Interest coverage}_{i,t} + \beta_4 \times \text{CF performance}_{i,t} + \beta_5 \times \text{Size}_{i,t} + \beta_6 \times \text{ROA}_{i,t} + \beta_7 \times \text{Growth}_{i,t} + \beta_8 \times \text{Asset tangibility}_{i,t} + \beta_9 \times \text{Age}_{i,t} + \beta_{10} \times \text{Maturity}_{i,t} + \beta_{11} \times \text{Collateral}_{i,t} + \beta_{12} \times \text{Industry}_{i,t} + \beta_{13} \times \text{Time}_t + \varepsilon_{i,t}$$

The subscripts i and t indicate firms and years, respectively.

2.3. VARIABLE DEFINITIONS

2.3.1. Dependent variable

$$\text{Cost of Debt}_{i,t} = \frac{\text{Interest Expenses}_{i,t}}{\text{Debt}_{i,t-1}}$$

The dependent variable, Cost of Debt, is the approximate cost of debt of SMEs. We use an estimation of the cost of debt because we were not able to obtain loan-level data for this analysis, and the actual interest rate paid by firms is not provided in our data set. The cost of debt is defined as the ratio of the interest expense at year t to the financial debt at year $t-1$. This measure of the cost of debt is derived from the accounting theory and the effective interest method, which stipulates that the interest expense is the product of the effective interest rate and the beginning book value of the debt. The financial debt in the denominator is the sum of the short-term financial liabilities and long-term loans. To mitigate the impact of outliers, we use the following truncation rule: if a company's cost of debt is lower than the 5th percentile or higher than the 95th percentile in a given year, but not in the previous or following year, then the company is dropped from the sample (i.e. in all years)⁶.

2.3.2. Explanatory variable

Accruals quality (AQ), the key explanatory variable, is estimated following the procedure developed by Dechow and Dichev (2002) and extended by McNichols (2002). Consistent with

⁶ As noted in prior studies (Vander Bauwhede et al. 2015; Minnis 2011; Francis et al. 2005), defining the cost of debt as the effective interest cost instead of the actual interest rate paid by firms is prone to significant noise and outliers. In order to mitigate this issue, the cost of debt variable is significantly truncated.

this model, AQ proxies for earnings quality and is defined as the extent to which working capital accruals map into operating cash flow realizations.

The following model (2) is estimated cross-sectionally for each industry-year combination using ordinary least squares (OLS):

$$\Delta WCA_{i,t} = \beta_0 + \beta_1 \times CFO_{i,t-1} + \beta_2 \times CFO_{i,t} + \beta_3 \times CFO_{i,t+1} + \beta_4 \times \Delta Sales_{i,t} + \beta_5 \times PPE_{i,t} + \varepsilon_{i,t}$$

The subscripts i and t indicate firms and years, respectively, and all variables are scaled by average total assets in year t to avoid heteroskedasticity concerns (Vander Bauwhede et al. 2015; García-Teruel et al. 2010; Bharath et al. 2008; Francis et al. 2005).

ΔWCA is the change in non-cash working capital accruals between year $t-1$ and year t , calculated as the change in current assets between year $t-1$ and year t , minus the change in cash and cash equivalents between year $t-1$ and year t , minus the change in current liabilities between year $t-1$ and year t , plus the change in short-term debt between year $t-1$ and year t (Vander Bauwhede et al. 2015; Garcia-Teruel et al. 2010; Francis 2005; Dechow and Dichev 2002); CFO_{t-1} , CFO_t , and CFO_{t+1} are the cash flows from operations of the prior, current, and future periods, respectively, and are calculated as the net income (before extraordinary items) in year t , minus ΔWCA in year t , plus depreciation in year t ; $\Delta Sales$ is the change in sales between year $t-1$ and year t ; and PPE is the gross value of property, plant, and equipment in year t . In line with the prior literature, all variables were winsorized at the 1st and 99th percentiles (Vander Bauwhede et al. 2015; Francis 2005).

Annual cross-sectional estimations of equation (2) yield firm- and year-specific residuals, which are the basis of the AQ measure (Francis 2005). The residual term reflects the portion of the change in working capital accruals that are neither explained by cash flows from operations of the previous, current, and subsequent years, nor by the change in sales and the gross value of property, plant, and equipment. The larger the residual is, the lower the AQ.

The measure of a firm- and year-specific AQ is defined as the absolute value of the residual, per Garcia-Teruel (2010).⁷ Following Vander Bauwhede et al. (2015), we multiply the AQ measure by -1 to facilitate the interpretation of the measure.

$$AQ_{i,t} = -|\hat{\varepsilon}_{i,t}|$$

⁷ Due to the unbalanced nature of our panel, the Dechow and Dichev (2002) original definition of AQ, which defines AQ as a five-year moving-window standard deviation of estimated OLS residuals, could not be used because it would dramatically reduce the number of firm-year observations of the cost of debt regressions. Instead, the absolute value of the residual for each firm-year observation was used, per García-Teruel (2010). The absolute value of the residual was used by Dechow and Dichev (2002) and Vander Bauwhede et al. (2015) as a robustness check.

In this way, a larger AQ value reflects a higher quality of accruals and, therefore, a higher earnings quality.

2.3.3. Control variables⁸

Our regression model includes the following firm-level control variables that have been frequently used in prior literature:

- Firm size: natural logarithm of the number of employees. We used number of employees as a metric for firm size instead of using total assets or net sales to be consistent with our SME definition. This variable has been used as a control variable in several studies examining the effect of accruals quality on firms' capital structure (see e.g. Vander Bauwhede et al. 2015; Van Caneghem and Van Campenhout 2012; García-Teruel et al. 2010; Francis et al. 2005).
- Firm age: natural logarithm of the number of years since incorporation (see e.g. Vander Bauwhede et al. 2015; Van Caneghem and Van Campenhout 2012). This variable indicates at which stage of the business lifecycle a firm is.
- Leverage: ratio of total interest-bearing debt to total assets (see e.g. Vander Bauwhede et al. 2015; Garcia-Teruel et al. 2010; Francis et al. 2005). Leverage reflects the financial structure of a company, and also the financial risks associated with a company given that highly leveraged companies are considered riskier.
- Interest coverage: ratio of Earnings Before Interest and Taxes (EBIT) over interest expense (see e.g. Vander Bauwhede et al. 2015). This variable proxies for a firm's ability to service its debt using operating income (Minnis 2011).
- Cash flow performance: cash flow from operations divided by total assets (see e.g. Vander Bauwhede et al. 2015; Shroff 2015). It is a proxy of financing needs given that firms with a lot of cash may have enough internal funds to finance their growth, and therefore need to borrow less.
- Profitability: return on assets (ROA) net profit divided by the average change in total assets between previous and current year (see e.g. Shroff 2015; Van Caneghem and Van Campenhout 2012; Francis et al. 2005). ROA indicates the profitability of a company's operations in relation to their average assets.
- Asset tangibility: tangible fixed assets divided by total assets (see e.g. Shroff 2015; Vander Bauwhede et al. 2015; Van Caneghem and Van Campenhout 2012). This variable captures the extent to which a firm could use its assets as collateral to secure loans.

⁸ Following Vander Bauwhede et al. (2015) and Minnis (2011), negative equity was initially included as a control variable. However, after cleaning the data, all firm-years left in the sample had positive equity. This indicates that surviving companies are companies with a sound financial structure. We therefore exclude this variable from the regressions.

- Firm growth: the difference between the logarithm of sales between the current and the previous year.
- Debt maturity: ratio of long-term debt over total debt (see Vander Bauwhede et al. 2015; García-Teruel et al. 2010).
- Industry: industry dummies control for industry effects (see e.g. Vander Bauwhede et al. 2015; Van Caneghem and Van Campenhout 2012). The largest industry in this sample, manufacturing, serves as the base category.
- Time: year dummies control for time fixed effects, using 2008 as the base year. This allows us to capture any economy-wide effect that may have influenced the cost of debt of all the companies, such as business cycle, credit expansion or contraction, interest rates used as a reference for floating-rate loans, exchange rates, or any systemic shock in general.
- Collateral: APR does not collect data on collateral or the secured status of loans; therefore, such information was not possible to obtain for our study. Since the collateral variable was an important and highly significant variable used in the previous literature (Vander Bauwhede et al. 2015, Bharath et al. 2008), we constructed a proxy that estimates the probability that a firm in a particular year has a collateralized loan, using a separate, loan-level dataset obtained from a representative Serbian bank and applied the proxy in this study

$$\text{Collateral}_{i,t} = \frac{1}{1 + e^{-y_{i,t}}}$$

The latent variable $y_{i,t}$ satisfies the following linear relationship with financial data:

$$y_{i,t} = \beta_0 + \beta_1 \ln(\text{Long-term Loans}_{i,t}) + \beta_2 \frac{\text{Equity}_{i,t}}{\text{Total Assets}_{i,t}} + \beta_3 \frac{\text{Short-term Liabilities}_{i,t}}{\text{Debt}_{i,t}} + \eta_{i,t}$$

The beta coefficients are estimated by running a logit model on the bank's loan-level dataset.

The collateral proxy has a value of 0 or 1, which indicates the probability of having collateral. Alternatively, we can interpret it as the expected fraction of debt being collateralized. The explanatory variables come from the best-fitting logit model. However, the factors do have some economic intuition as well:

- (1) $\ln(\text{Long-term Loans})$ has a positive beta coefficient, since it is more likely that a larger long-term loan has collateral than a smaller one.
- (2) $\text{Equity}/(\text{Total Assets})$ has a negative beta coefficient: the higher the ratio, the lower the leverage, and hence the lower the probability of having or requiring collateral.
- (3) $(\text{Short-term Liabilities})/\text{Debt}$ has a negative beta coefficient: short-term liabilities are typically issued for liquidity purposes and hence tend to be unsecured. If they represent

a substantial fraction of a company's debt in a particular year, it is highly unlikely that the debt is collateralized.

This measure of collateral is imperfect and only allows for an estimation of the probability of having collateral rather than a certain affirmation that a loan is secured. However, given our data constraint, it is the best proxy that could be constructed.

To mitigate the impact of outliers, all continuous variables but firm age⁹ are winsorized at the 1st and 99th percentiles.

⁹ Following Vander Bauwhede et al. 2015, firm age is not winsorized because there is little to no uncertainty about the date of incorporation of a company.

3. EMPIRICAL RESULTS

3.1. DESCRIPTIVE STATISTICS

Table 2. Descriptive statistics cost of debt regression

	Mean	SD	p10	Median	p90	p90–p10
Cost of debt	0.107	0.986	0.017	0.071	0.176	0.158
AQ	−0.054	0.052	−0.117	−0.040	−0.007	0.110
Size	3.580	0.782	2.639	3.497	4.754	2.115
CF performance	0.074	0.132	−0.065	0.064	0.230	0.295
Age	2.603	0.503	1.946	2.708	3.135	1.189
Leverage	0.257	0.164	0.067	0.229	0.482	0.415
Interest coverage	0.083	0.858	−0.001	0.005	0.107	0.108
Asset tangibility	0.414	0.218	0.126	0.404	0.710	0.584
Growth	−0.243	1.071	−0.937	0.048	0.362	1.298
Maturity	0.561	0.300	0.136	0.572	0.994	0.858
ROA	0.060	0.100	0.001	0.041	0.177	0.176
Collateral	0.057	0.046	0.016	0.044	0.117	0.102

Table 2 presents the basic features of the variables of the cost of debt regressions. The mean cost of debt of the Serbian SMEs of this dataset is 10.7 percent, which is slightly higher but still very close to the cost of debt of firms from developed countries. Vander Bauwhede et al. (2015) reported a cost of debt of 9.6 percent for Belgian SMEs, Francis et al (2005) reported a cost of debt of 9.9 percent for U.S. listed companies, and Hernández-Cánovas and Martínez-Solano (2007) reported a cost of debt of 11.5 percent for Spanish SMEs. Regarding the AQ variable, the table shows that the mean and median values of the AQ measure are -0.054 and -0.040 respectively. Given these values, Serbian SMEs have a lower earnings quality than Spanish listed companies (García-Teruel et al. 2010). The table also shows that Serbian SMEs are on average as indebted as Belgian SMEs (leverage ratios of 25.7 and 27.1 percent respectively), but have lower interest coverage ratios (8.3 and 15.8 percent respectively) and use on average less long-term debt (debt maturity of 56.1 and 63 percent respectively) than Belgian SMEs. The table also indicates that the average fraction of debt that is collateralized is around 5.7 percent (the median being 4.4 percent), and that only 10 percent of SMEs in the sample have more than 11.7 percent of their debt collateralized.

3.2. BIVARIATE ANALYSIS

Following previous studies (Vander Bauwhede et al. 2015; Francis et al. 2005), we conduct a bivariate analysis between the cost of debt and AQ. Table 3 presents the average cost of debt for each quintile of the ranked AQ distribution. In this table, Q5 represents firms with the best quality of accruals whereas Q1 represents SMEs with the worst quality of accruals. As Table 3 shows, SMEs with higher earnings quality (Q5) pay slightly lower interest rates than those with lower information quality, with an interest rate differential of 80 basis points (0.8 percentage points). These results are statistically significant, although their economic relevance is limited. Because these results do not control for other factors that may influence the cost of debt (Vander Bauwhede et al. 2015; Francis et al. 2005), the next section supplements this bivariate analysis by providing the results of a regression analysis with several control variables.

Table 3. Link between AQ and cost of debt

Quintile	Average cost of debt
Q5	0.085
Q4	0.086
Q3	0.083
Q2	0.087
Q1	0.093
Q5–Q1	–0.008
T statistic	2.392***
p-value	0.008

Table 4. Correlation matrix

	Cost of debt	AQ	Size	CF perf.	Age	Leve- rage	Interest cove- rage	Asset tangibility	Growth	Maturity	ROA	Colla- teral
Cost of debt	1.000											
AQ	-0.010	1.000										
Size	-0.084***	-0.003	1.000									
CF performance	0.061***	-0.079***	-0.035***	1.000								
Age	0.014	0.048***	0.067***	-0.013	1.000							
Leverage	-0.181***	-0.001	0.054***	-0.252***	-0.095***	1.000						
Interest coverage	-0.123***	-0.025**	0.021**	0.043***	-0.023**		-	1.000				
							0.036***					
Asset tangibility	-0.016*	0.083***	0.130***	0.173***	0.007	0.087***	-0.003	1.000				
Growth	0.064***	0.002	-0.039***	0.006	-0.082***	-0.003	0.024***	-0.069***	1.000			
Maturity	-0.024***	-0.009	-0.098***	0.092***	-0.069***	-0.020**	0.018**	0.144***	0.022**	1.000		
ROA	0.001	-0.032***	-0.095***	0.488***	-0.038***		-	0.109***	-0.102***	0.102***	0.046***	1.000
							0.278***					
Collateral	-0.209***	0.027**	0.426***	-0.158***	0.038***	0.522***	-0.001	0.108***	-0.052***	0.244***	-0.198***	1.000

3.3. MULTIVARIATE ANALYSIS

Table 5 reports the results of the estimation of equation (1) using pooled-panel OLS, Fama-MacBeth two-step OLS, fixed effects, and random effects. Pooled-panel OLS is chosen in line with Dechow and Dichev (2002): pooled panel coupled with time dummies is an adequate choice of estimator if unobserved firm-level fixed effects are not strong. Vander Bauwhede et al. (2015) and Francis et al. (2005) argue that to control for time effects in circumstances where panel data techniques cannot be used, especially when the stability of the main explanatory variable over time is questionable, the preferred choice of estimator should be the Fama-MacBeth procedure. In this method, year-specific cross-sectional OLS regressions are executed, and the coefficients from these regressions are then aggregated into coefficients and standard errors across each year. Next, to control for any unobserved firm-specific effects, such as quality of management or company's reputation, we run the usual fixed-effect estimator. Finally, we include the random-effect GLS regression as another alternative. All these estimators provide consistent results for the relationship between AQ and the cost of debt.

Table 5. Cost of debt and AQ

	Pooled-panel OLS	Fama-MacBeth 2-step OLS	Fixed effects	Random- effects GLS
Constant	0.132***	0.118***	0.071*	0.125***
AQ	-0.064***	-0.047*	-0.065***	-0.058***
Size	-0.003**	-0.004*	0.005	-0.003
CF performance	-0.073***	-0.080***	-0.087***	-0.085***
Age	0.000	0.000	0.006	0.000
Leverage	-0.035***	-0.039**	-0.007	-0.024***
Interest coverage	-0.009***	-0.009***	-0.006***	-0.007***
Asset tangibility	0.006	0.010	0.023*	0.008
Growth	0.003	0.004	0.006**	0.004*
Maturity	-0.006	-0.009	-0.004	0.000
ROA	0.020	0.023	0.031**	0.028**
Collateral	-0.167***	-0.176***	0.077	-0.132***
Industry dummies				
Primary sector	0.008*	0.005		0.006
Construction	0.019***	0.020***		0.021***
Retailing	0.009***	0.010*		0.009***
Hotels and restaurants	0.002	0.001		-0.004
Transport	0.033***	0.037**		0.033***
Services/other	0.021***	0.028*		0.019***

	Pooled-panel OLS	Fama-MacBeth 2-step OLS	Fixed effects	Random- effects GLS
Time dummies				
2009	−0.017***		−0.018***	−0.017***
2010	−0.019***		−0.024***	−0.021***
2011	−0.021***		−0.026***	−0.022***
2012	−0.017***		−0.024***	−0.019***
2013	−0.036***		−0.043***	−0.038***
Observations	7681	7681	7681	7681
Within- R^2			0.077	0.070
Between- R^2			0.004	0.070
Overall/average R^2	0.080	0.082	0.017	0.077
F statistic	22.88***	40.19***	26.57***	
Wald χ^2 statistic				586.52***

Notes: The asterisks ***, **, and * indicate 1%, 5%, and 10% significance levels respectively. Pooled-panel OLS estimates apply robust standard errors. Interest coverage is scaled by a factor of 1,000 for numerical stability.

Our findings show that four control variables have strong and significant effects on the cost of debt. Cash flow performance, leverage, interest coverage and collateral are all negatively related to the cost of debt. These results suggest that the most important factors for banks when making lending decisions are a firm's ability to meet its financial obligations (represented by the cash flow performance and the interest ratio) and, in case of default, how much the bank will be able to recover (represented by the collateral). The negative coefficient of cash flow performance is in contradiction with the findings of Vander Bauwhede et al. (2015) and Hernández-Cánovas and Martínez-Solano (2010). However, a negative association is in line with the theory that more profitable and cash-generating firms are less risky clients because banks have more confidence in their capacity to meet their financial obligations (i.e. lower probabilities of default). Consequently, banks charge lower premiums to these firms, which results in lower rates. Interest coverage negatively affects the cost of debt, meaning companies with better debt service bear less financial risk and therefore enjoy lower interest rates.

Our proxy for collateral has a negative sign, as expected, meaning that SMEs with more collateral pay lower interest rates. This is in line with the agency theory because the existence of collateral helps mitigate information asymmetry between the lender and the SME (Vander Bauwhede et al. 2015). Firms with greater collateral thus receive loans with more favorable terms (Berger and Udell 1998). Consistent with Vander Bauwhede et al. (2015), Minnis (2011), and Francis et al. (2005), we find that leverage is negatively related to the cost of debt.

Companies that are able to borrow at lower interest rates usually exploit this advantage and have large amounts of debt, resulting in higher leverage ratios.

The industry dummies show that SMEs from the construction, retailing, transport, and service industries have significantly higher cost of debt than firms from the manufacturing sector. These industry dummies enable us to capture unobservable differences in borrowing practices between companies from different sectors (Vander Bauwhede et al. 2015).

Time dummies are all significant and negative in pooled-panel, fixed-effects, and random-effects regressions, indicating that economy-wide shocks have a significant impact on the relative interest expenses in each year.¹⁰

The results of F and Wald tests indicate joint significance of the explanatory variables in the model. The null hypothesis of all coefficients being zero is overwhelmingly rejected for all four estimators. However, the overall R^2 is somewhat smaller when compared to the one obtained in similar studies. For instance, Vander Bauwhede et al. (2015) obtain an R^2 of around 0.206 using Fama-MacBeth regression on 8,908 observations, while in our study the corresponding value is 0.082 on 7,681 observations.

The coefficient of AQ, our key explanatory variable, is negative and highly significant at the 1 percent level in three regressions, and at the 10 percent level in the Fama-MacBeth regressions, which were used and preferred in Vander Bauwhede et al. (2015) and Francis et al. (2005) studies. This suggests that firms with lower quality financial statements are associated with higher interest rates. Our results are in line with prior studies that have analyzed the relationship between financial reporting quality and access to credit in developed markets. Notwithstanding, the economic significance in our study is lower than the one carried out in Belgium, which was to be expected. In Serbia, an increase in one standard deviation in AQ would represent a decrease of about 24-33 basis points in the interest rate, depending on the estimator.

¹⁰ The fixed-effect regression averages out any variation that is common across the firm dimension. Hence, the industry dummies are cancelled out and do not appear in the estimates. Similarly, one stage in the Fama-MacBeth procedure involves running cross-sectional regression on variables averaged over the time dimension, hence effectively eliminating the time dummies.

4. LIMITATIONS

One limitation of this study relates to the accruals quality variable. While this measure is one of the more advanced proxies of financial reporting quality, it is not perfect. It cannot, for example, differentiate between “normal” accruals, i.e., those that capture the underlying business performance, and “abnormal” accruals, i.e., those that capture intervention by the management (i.e., managed accruals). An alternative interpretation of the accruals quality model is, therefore, that firms with more volatility in their cash flows and that would have more “abnormal accruals” are just riskier firms and hence, would have to borrow from banks at a higher rate. This has to do with the volatility of their operations and not poor accounting quality. Further, while the accruals quality model has worked well in advanced economies, where companies are more mature, it is possible that it could work less well in developing economies, where financial reporting quality tends to be lower.

Second, in Serbia and possibly in other emerging markets, many unobserved factors or variables that are difficult to capture in a regression affect lending practices. Greater financial instability and stronger intervention and involvement of government in the financial system are examples of external factors that also affect lending and loan pricing decisions and are difficult to capture.

Third, there tends to be a general assumption that SMEs produce financial information of low quality, which can dilute the value that lenders place on financial statements for SMEs overall. Thus, the effect of an individual SME’s higher quality of accruals may be tempered due to this assumption.

Fourth, there are some factors that affect interest rates and thus cost of debt that cannot be captured in a large, publicly-available financial statement dataset such as this one. For example, financial statements do not provide information on the currency and maturity structure of loans on the face of the balance sheet. In the case of Serbia, local currency loans are predominantly short-term liquidity loans with little or no collateral security and are charged higher interest rates, on average, as compared to Euro loans, which are mostly medium- and long-term investment loans that are better collateralized (Atanasijević and Božović 2016). Likewise it is not possible to identify whether an SME benefited from one of several loan subsidy programs offered by the Serbian government, which results in a lower interest rate. Some unobservable effects can be captured indirectly, through individual fixed effects, industry and time dummies, or collateral, but the whole impact of these effects is difficult to account for without detailed loan-level data. Finally, since collateral information was not available in Serbia, we estimate the probability a firm has a collateralized loan, as described in detail in the description of the control variables.

Finally, the official template used by companies to submit their financial statements to the Serbian government was modified three times over the period of the study. Certain definitions of variables may have changed slightly, thus possibly lowering their consistency.

5. CONCLUSION

In general, SMEs face greater challenges to access finance than larger firms, and these constraints are more severe in an emerging market, such as Serbia. SMEs are perceived as riskier clients by financial institutions, and information asymmetry between lenders and SME managers is a significant problem. Financial statements can play an important role in helping companies access finance because lenders use these statements to understand the financial performance of the company and gauge its repayment capacity. Few studies have explored empirically the relationship between financial reporting quality of SMEs and their access to credit.

This study uses financial statement data from 3,879 distinct SMEs in Serbia, sourced from the Serbian Business Registers Agency (APR). The final sample is composed of 12,656 firm-year observations over the period 2007–2014. Our results suggest that financial reporting quality, proxied by accruals quality, is inversely related to the cost of debt. We tested four models, and the coefficient of AQ, our explanatory variable, is negative and highly significant at the 1 percent level according to three models, and at the 10 percent level in one.

Our findings suggest that firms with lower quality financial statements are associated with a higher cost of debt: an increase in one standard deviation in AQ (0.052) would correspond to a decrease of about 24–33 basis points in the interest rate (depending on the estimator). The findings in Serbia are consistent with the results of a similar study in Belgium, which had comparable findings albeit with greater economic significance. They are also consistent with the concept that lenders place value in the quality of financial statements, as a means for predicting repayment capacity of SMEs. In this regard, SME owners may find it beneficial to invest in better quality financial reporting, as tangible benefits are associated with this. Further, institutions and governments may find it worthwhile to further develop the financial capacity of SMEs as this may support greater access to finance for these companies.

However, it is important to note that the results of the study are by no means definitive; the extent to which better financial reporting quality is associated with reduced cost of debt is difficult to determine in Serbia as a number of other factors that cannot be controlled for in our study also affect the cost of debt. These factors are extensively explored in the section describing the limitations of this study. There are therefore a number of additional areas of future research that can be explored; some addressing the data limitations that we faced in this study, as well as others.

One interesting avenue for future research would be to break down the sample into two: one of only small and one of only medium-sized firms—to ascertain whether the effect of AQ on cost of debt differs between the two samples. This would allow for greater homogeneity in the samples and to see to what extent the association between AQ and cost of debt varies between them.

It would also be interesting to analyze the effect of financial reporting quality on the cost of debt of SMEs using loan-level data in Serbia or other emerging markets. This would address the limitations mentioned previously and could also yield a more precise cost of debt variable. An additional benefit is that loan-level data would allow for greater exploration of linkages between cost of debt and AQ. Reliable data could be used to incorporate variables such as loan collateralization, loan currency, location of the firm, sector of operation, ownership (e.g., domestically-owned, foreign-owned, and state-owned enterprises), and information from the audit report.

Another idea worth exploring would be to normalize the AQ variable – for example, to take value on a unit interval – so that the effect of accruals quality could be more readily interpreted from the regression results. As it stands now, one cannot estimate the association of an increase in accruals quality on the cost of debt from the regression results, only that the association is statistically significant (or not). With a normalized variable, a coefficient of – 0.042, for example, would mean that if a company that improved the quality of its financial reporting, by moving to a higher decile of companies ranked based on AQ, it would reduce its cost of debt by 42 basis points.

Finally, additional research could be conducted to explore the relationship between AQ and other variables. For example, as the paper suggests that better reporting quality reduces information asymmetries between firms and lenders and could lead to lower interest rates, further research could explore the importance of management in quality of financial reporting. Furthermore, future research could focus on using different measures of financial reporting quality and test the association between these and cost of debt and/or similar access to finance indicators. Thus, the field of financial reporting quality of SMEs is an area where numerous opportunities for future research exist. see, and consequent effects on access to finance.

ANNEX 1: INITIATIVES AND MECHANISMS FOR PROVIDING FINANCE TO SMES

In many countries, including Serbia, subsidized-lending schemes or credit guarantees have been offered to banks engaging with SMEs in an effort to offset their risks. The lack of collateral, which often plagues SMEs when they try to acquire finance from banks, can be offset by credit guarantees (Honohan 2010). Such initiatives depend on the availability of public funds, and these options may, therefore, not always be viable or sustainable. Furthermore, in practice, it is a challenge to design such programs well and manage their interventions properly. For example, there is concern that risk-sharing arrangements may not lead to additional lending; instead, banks may use guarantees to lower the risk on loans that they would have issued even in the absence of the guarantees. Research has shown that such problems are exacerbated in environments with weak institutions and governance (World Bank 2013). Beck et al. (2005) demonstrate that small firms use government sources or development banks to finance their investments significantly less than larger firms.

Other sources of lending prevalent among SMEs include factoring or leasing. Berger and Udell (2006) suggest that these could ease financing constraints of SMEs, as they are based on the underlying assets and cash flows rather than borrowers' financial history. Another form of lending, trade credit, has been shown to act as a substitute for bank credit during periods of monetary tightening or financial crisis (Choi and Kim 2005; Love, Preve, and Sartia-Allende 2007). However, all these alternative sources of funding such as factoring, leasing or trade credit require well-developed legal and financial systems (Beck et al. 2005). As such they are also unable to close the credit gap for SMEs in emerging markets.

Lenders, for their part, utilize different practices for SMEs, in addition to financial statement lending described in this paper: asset-based lending and credit scoring that rely on the collection of "hard" data; and relationship lending, that uses "soft" information (Berger and Udell 2006).

ASSET-BASED LENDING

In asset-based lending, the lending decision is essentially based on the value of the underlying assets of the borrower. The bank uses the value of the assets to determine the amount of the loan, and the assets serve as collateral to hedge against the risk of default by the borrower. This lending mechanism addresses information asymmetries by focusing only on the assessment of the tangible assets of the company, rather than evaluating the risk of the company as a whole. However, asset-based lending can be costly and time-consuming for the lender because the lender must verify the existence, proper registration, and value of the

assets pledged (Berger and Udell 2006). In some emerging markets, estimating the value of these assets can be burdensome, the time associated with seizing a property can be tremendous, and the marketable value of these assets can be paltry. As a result, the effectiveness and feasibility of this lending practice is heavily dependent on the lending environment in which the parties operate.

CREDIT SCORING

For credit scoring models, banks enter hard data (such as SMEs' profitability, liquidity, and financial risks, as well as personal consumer information on its owner) into a pre-designed model that generates a score based on the quantitative information. Credit scoring also depends on good quality financial statements to assess a firm's credit-worthiness. These models also address information opacity concerns because the data are obtained directly from the firm and consumer credit bureaus. Lenders develop credit scoring models for relatively small loans in order to facilitate and shorten the decision process, when such loans do not significantly increase the overall exposure of the bank.

RELATIONSHIP LENDING

Relationship lending involves acquiring "soft" information about the firm and its owner through a relationship developed over time (Howorth and Moro 2012). Examples of soft or qualitative information acquired by the lender include the firm's strategy, its corporate governance, the competence and qualifications of its managers, and its relationship with suppliers and customers. Relationship lending is more appropriate for opaque firms that cannot be reached through other lending practices. The main inconvenience of this practice is that collecting soft information is a labor-intensive and thus costly process. Banks pass the costs along to SMEs through higher fees and interest rates (Berger and Udell 2006).

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