FINANCING WORKING CAPITAL REQUIREMENTS AND FINANCIAL RISK-TAKING IN SMEs

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Abstract

Purpose: The objective of this study is to analyze the effects of working capital requirement (WCR) financing strategies on SMEs' financial risk. Our main research question is: does a greater use of short-term debt to finance WCR increase financial risk-taking?

Design/methodology/approach: We use two variables previously used in the literature -FWCR, to measure WC financing strategy, and SD_ROE, to measure financial risk-taking- and conduct econometric analyses using fixed effects and two-way clustering methods to control for heterogeneity. We also control for other factors that may affect financial risk, as per the literature.

Findings: The results of this study indicate a linear relationship between the proportion of WCR financed with short-term debt and financial risk since more aggressive financing strategies, i.e., with a higher proportion of short-term debt, imply higher financial risk. The main hypothesis is confirmed for the entire sample and individually for the vast majority of industries. In addition, it has been verified that the instability of cash generation impacts the choice of WCR funding strategy, as these factors may lead to greater financial risk-taking.

Practical implications: Once the economic structure has been defined and the need for financial resources to finance WCR arises, managers must consider their financial structure and choose the strategy that fits their risk-taking tolerance. Using short-term financing without considering the firm's risk profile could destroy value, especially when sales fluctuations affect the firm's economic structure and add uncertainty and instability to cash generation. Moreover, creditors can analyze a firm's financing WCR strategy to discuss debt terms such as length, rates, or potential covenants depending on the strategy, since firms with more aggressive strategies have more financial risk, which leads to solvency problems.

Originality/value: This work contributes to the literature on WCR management in several ways. On the one hand, it explores a topic that has not received enough attention in the literature on working capital: the relationship between WCR financing and its risk. To the best of our knowledge, this is the first article to highlight the effects of WCR financing strategy on SME financial risk in the financial literature. As it focuses on SMEs, which are the backbone of the economy, the issue addressed is particularly important.

Key words

Working capital requirements, short-term debt, financial risk-taking, SMEs.

JEL classification: G30, G31, G32.

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FINANCING WORKING CAPITAL REQUIREMENTS AND FINANCIAL RISK-TAKING IN SMEs

1. INTRODUCTION

The objective of corporate finance is to obtain, invest, and manage a company's financial resources to maximize its value. One of the fundamental aspects of financial management is financing working capital requirements (WCR), which represents the financial resources necessary to cover a company's day-to-day operations. Decisions on how to finance these needs have a direct impact on the company's profitability and financial risk, affecting its stability and growth capacity (Smith, 1980).

Previous empirical literature has extensively studied the effects of WCR investment on profitability (Shin and Soenen, 1998; Deloof, 2003; García-Teruel and Martínez-Solano, 2007; Baños-Caballero *et al.*, 2012; Deari *et al.*, 2022; among others), firm value (José *et al.*, 1996; Kieschnick *et al.*, 2013; Baños *et al.*, 2020; among others), and risk (Bin-Feng *et al.*, 2022), as well as certain components of current assets, such as customer management (Elsilä, 2015) and cash management (Ruey-Jenn *et al.*, 2024) on firm risk-taking. The effects of different WCR financing strategies on profitability have been addressed to a lesser extent, focusing on their impact on the profitability of small and medium-sized enterprises (SMEs) (Baños-Caballero *et al.*, 2016; Panda and Nanda, 2018; Altaf and Ahmad, 2019). However, the effects on risk have not been analyzed despite being, along with return, a fundamental factor in determining firm value. In this regard, a financing strategy with a higher proportion of WCR funded by short-term bank debt reduces funding costs but also implies greater exposure to potential fluctuations in refinancing conditions and interest rates. In contrast, a strategy using a higher proportion of WCR funded by long-term bank debt entails higher funding costs but provides greater stability in financing terms. Therefore, the objective of this study is to analyze the effects of working

capital requirement (WCR) financing strategies on SMEs' financial risk. Our main research question is: Does a greater use of short-term debt to finance WCR increase financial risk-taking?

The study focuses on a sample of small and medium-sized Spanish enterprises since they represent 99.8% of Spanish firms, according to the Spanish Ministry of Industry, Energy, and Tourism. Furthermore, Spain's economy is characterized by bank-dependent SMEs (Carbó *et al.*, 2016). In this context, Chen and Kieschnick (2018) argue that the management of working capital in these bank-dependent firms differs from that of less bank-dependent firms. Moreover, their current assets and short-term liabilities have a greater weight in their economic and financial structure than those of large companies (Giannetti, 2003), and bank-dependent firms rely more on these current assets and liabilities when managing their working capital, compared to less bank-dependent firms (Chen and Kieschnick, 2018). Due to their size, SMEs face greater financial difficulties (Fazzari and Petersen, 1993) and have less access to long-term financing (Petersen and Rajan, 1997), making working capital management even more important for these companies.

The results of this study indicate a linear relationship between the proportion of WCR financed with short-term debt and financial risk since more aggressive financing strategies, i.e., with a higher proportion of short-term debt, imply higher financial risk. The main hypothesis is confirmed for the entire sample and individually for the vast majority of industries. In addition, it has been verified that cash generation instability affects the choice of WCR funding strategy, as these factors may lead to greater financial risk-taking.

This work contributes to the literature on WCR management in several ways. It explores a topic that has not received enough attention in the literature on working capital: the relationship between WCR financing and its risk. To the best of our knowledge, this is the first article in the financial literature to highlight the effects of WCR financing strategy on SME financial risk.

As it focuses on SMEs, which are the backbone of the economy, the issue addressed is particularly important. Finally, the study provides practical tools for SMEs to optimize their financial management by reducing risks and improving their financial strategy.

The paper is structured as follows: Section 2 provides the theoretical framework and a literature review of WCR financing strategies and their effects on profitability and risk. Section 3 describes the data and methodology used in the empirical study. Section 4 presents the results of the analyses, and Section 5 offers the main conclusions and limitations of the study.

2. WORKING CAPITAL REQUIREMENTS AND CORPORATE RISK-TAKING.

Working capital requirements represent the net investment necessary to fund the company's current operations: inventories, accounts receivable, and operating cash holdings minus accounts payable (Baños-Caballero *et al*., 2016). It can also be represented as the investment in inventories and accounts receivable minus the spontaneous financing provided by suppliers (Hill *et al.*, 2010). The decision to finance positive WCR involves determining the proportion to be financed with long-term resources (owner's equity and long-term debt) and the proportion to be covered with short-term debt. In this context, companies may choose their WCR funding strategy by financing working capital needs with short-term debt, or they may opt for a strategy that relies on long-term resources. An intermediate position that balances the two may also be taken.

Given that the main objective of firm's managers is to maximize firm's value, which is measured as the profitability of a firm discounted by its risk as reported by Modigliani and Miller (1958), managers must consider how their choice of financing WCR affects value both through profitability and risk. Regarding profitability, choosing to finance WCR with short-term debt can benefit the company in various ways. It allows for better management and is more

adaptable to each company's specific financial needs, as indicated by Jun and Jen (2003). In this sense, nominal interest rates and issuance costs are lower than those for long-term debt, which means that the cost of short-term debt is significantly lower. Moreover, short-term debt is renewed annually, reducing agency conflicts and providing greater control over managers (Myers, 1977; Rajan and Winton, 1995; Ozkan, 2000; Hart and Moore, 1998; Stulz, 2000; Harvey *et al.*, 2004, among others). Furthermore, firms with a larger proportion of short-term debt could have lower future stock price crash probability due to the monitoring and renewal effects (Dang *et al.*, 2018; Hasan *et al.*, 2020). The literature has identified a trade-off between WCR financing and firm profitability (Baños-Caballero *et al.*, 2016; Panda and Nanda, 2018; Altaf and Ahmad, 2019). Initially, the use of short-term debt to finance WCR enhances firm performance, because of its benefits. However, beyond certain thresholds, relying on short-term debt reduces returns, a decline driven by the inherent characteristics of this type of financing, above all, its higher associated risk. In this sense, excessive use of short-term debt also presents several drawbacks. This type of financing is subject to potential challenges in renewing short-term credits, which may complicate the continuity of funding, and to fluctuations in interest rates, which may lead to potential increases in the cost of financing (Jun and Jen, 2003). Short debt maturities also increase potential liquidity shocks (Childs *et al.*, 2005; Johnson, 2003). Moreover, Diamond and He (2014) find that shorter-term debt makes equity value more volatile.

Although being a key determinant of firm value, the direct link between WCR financing and financial risk has not yet been explored. A financing strategy with greater short-term debt funding WCR may be associated with higher firm financial risk, affecting its value. Therefore, we aim to provide evidence on how financing WCR also affects value via corporate risk-taking decisions.

Managers' risk-taking tolerance, known in the literature as corporate risk-taking, affects the value of their companies. Some studies show that under various assumptions, greater risk-taking implies higher-than-expected returns and, therefore, higher company value (Lee *et al.*, 2003; Lattuch, 2019). A company's risk exposure is directly related to the country's economic growth since making riskier decisions, such as increasing investments in R&D or following various WCR investment and financing policies, affects the value of companies and, by extension, the country's economy (Solow, 1956; DeLong and Summers, 1991; among others). However, excessive risk-taking can deteriorate a company's value, as it is more exposed to potentially adverse situations in the company itself and the sector or overall economy. Therefore, it is important to maintain a balance between profitability and risk to maximize the company's value.

Corporate risk-taking is affected by operational risks arising from business activities and financial risks stemming from financial decisions. Firms could be expected to increase their financial risk-taking by raising the proportion of short-term debt used for financing, i.e., using an aggressive financing strategy, while reducing their corporate risk-taking by financing with long-term resources, i.e., a conservative strategy. Thus, a more aggressive WCR financing policy could contribute to profitability volatility by increasing financial risk.

The standard deviation of stock returns is generally used as a risk indicator for publicly traded companies, as it reflects potential fluctuations in their share prices and, consequently, the inherent risk associated with these shares. This measure of risk is the most important measure of risk from a manager's point of view (Roberts, 2016). However, for non-publicly traded companies, such as most SMEs, the standard deviation of their stock returns cannot be calculated due to the lack of a market price. Instead, metrics related to the volatility of the company's profitability are typically used. Specifically, risk-taking can be approximated by the variability of the return on assets (John *et al.*, 2008; Boubakri *et al.*, 2013; Tian *et al.*, 2022). While these studies typically approximate risk through the variability of ROA, this study

focuses on ROE because our aim is to analyze the impact of WCR financing on financial risk and ROE is considered a good proxy for risk exposures (Moussu and Petit-Romec, 2017) and reflects the risk associated with the use of leverage in the capital structure (Yung and Chen, 2018).

Therefore, building upon the theoretical findings discussed, we add to the existing literature by analyzing how different financing WCR strategies may affect financial risk. To obtain a comprehensive understanding of the effect of financing strategies on firm value, it is also necessary to analyze corporate risk-taking. Therefore, in this paper we argue that firms that use more aggressive WCR financing strategies increase their financial risk by exposing themselves to higher return volatility. Accordingly, our main hypothesis is:

H1: There is a positive relationship between adopting an aggressive WCR financing strategy and financial risk-taking.

3. DATA AND METHODOLOGY

3.1. Sample

The sample used in this study was obtained from the SABI database (Iberian Balance Sheets Analysis System), which primarily compiles annual accounts for companies. The information extracted was from the balance sheet and income statement items of non-financial Spanish SMEs according to the requirements established by European Commission Recommendation 2003/361/EC of 6 May 2003 (fewer than 250 employees, less than 50 million euros in turnover a year, and less than 43 million euros in total assets). We selected firms with audited annual accounts without qualifications to ensure data quality and achieve reliable, undistorted results. Data was collected for the period 2013-2020, although data from the first and last year were not used because the standard deviation is calculated as a moving average of the current year, the previous year, and the following year. Therefore, the years 2013 and 2020 are used to calculate

the standard deviation but are not analyzed, as they lack a previous and subsequent year, respectively.

Furthermore, since only positive WCR requires financing, observations where working capital requirements were negative have been eliminated. Observations with missing information, accounting errors, or extreme values were also removed. Specifically, values below the 1st percentile and above the 99th percentile were eliminated. As a result, the sample comprises 7,465 companies, with a total of 19,934 observations.

3.2. Methodology and variables

To study the financing of WCR, we follow Baños-Caballero *et al.* (2016) and use the variable FWCR, obtained by dividing short-term bank debt by WCR, where WCR is defined both as current assets minus trade payables (Baños-Caballero *et al.,* 2016) and as accounts receivable and inventories minus accounts payables (Hill *et al.*, 2010). However, short-term bank debt also includes next year's payments of long-term bank debt. Since we cannot separate the items, we assume that all short-term bank debt is used to finance WCR.

This variable indicates the proportion of WCR financed with short-term debt. Higher values indicate an aggressive WCR financing strategy, while lower values reflect a conservative strategy. A high value of FWCR does not necessarily mean higher risk, as short-term financing can reduce agency costs, lower financing costs, and better align financing with the company's needs (Jun and Jen, 2003), which could improve the firm's performance and reduce net income variability (Morris, 1976).

To approximate financial risk, the standard deviation of return on equity (ROE) is used as a variable, where ROE is calculated as net income divided by shareholders' equity. Equation 1 shows the risk-taking variable proposed, which is an adaptation of Tian *et al.*'s (2022) to measure the risk for firm *i* in period *t*. The original risk-taking equation uses the standard

deviation of the return on assets (ROA) as a moving average. We use ROE instead of ROA, as the objective of this paper is to analyze financial risk. This method allows us to capture the risk of a year by considering the preceding and subsequent years, enabling comparisons between t-1, t, and t+1 with the FWCR variable at time t, thereby better capturing the impact of FWCR on financial risk while mitigating potential endogeneity issues.

$$SD\_ROE = \sqrt{\frac{1}{N-1}\sum_{t=1}^{N}\left(ROE_{i,t} - \frac{1}{N}\sum_{t=1}^{N} mean\ ROE_{i,t}\right)^2}, N = 3 \quad (1)$$

An econometric analysis is conducted, using control variables and FWCR and SD_ROE as study variables. This regression analysis uses fixed effects estimation and the two-way clustering method. Fixed effects estimation is used when there is unobservable heterogeneity for each firm that is correlated with the explanatory variables. In this way, the fixed effects method captures these individual differences, allowing for more precise estimates than the traditional ordinary least squares (OLS) method. We perform the Hausman test to determine whether to use the fixed effects or random effects method. The clustering method consists of grouping firms into clusters and performing a regression. This way, we consider that correlations may exist among observations of the same firm, thus obtaining a more precise estimate. In other regression methods using panel data, standard errors are approximations that are sometimes biased because they are imprecise. Other methods, such as OLS and, to a lesser extent, fixed effects, tend to underestimate the standard error, leading to inaccurate estimates. Petersen (2009) presents a method for clustering in two dimensions, which produces less biased standard errors. We cluster by both firm and year, capturing the unspecified correlation between observations on the same firm in different years (clustering by firm) and observations on different firms in the same year (clustering by year) at the same time.

We also control for other factors that may affect financial risk according to literature. Numerous studies related to working capital link WCR and financial profitability to variables such as size,

leverage, growth (Baños-Caballero *et al.*, 2012; García-Teruel and Martínez Solano, 2007; Deari *et al.*, 2022, among others), and company age (Elsilä, 2015; Bin-Feng *et al.*, 2022, among others). To control for leverage and given that the FWCR variable is obtained as the ratio of WCR to short-term financial debt, short-term non-financial debt and long-term debt have been used as control variables to avoid excessive correlation among variables. Extreme values have been removed from these variables. Equation 2 shows the model to be estimated to observe the expected relationship between both variables:

$$\begin{aligned} SD\_ROE_{i,t} = {} & \beta_0 + \beta_1 FWCR_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 AGE_{i,t} + \beta_4 GROWTH_{i,t} + \beta_5 NFLEV_{i,t} \\ & + \beta_6 LTLEV_{i,t} + \eta_i + \lambda_t + \delta_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (2)$$

Definitions of variables are provided in Table A1. ηi explains the unobservable heterogeneity in the fixed effects estimation, and time (λ_t) and sectoral ($\delta_{i,t}$) dummy variables have been included. $\varepsilon_{i,t}$ is the random error. Companies have been classified according to their main economic activity following the Standard Industrial Classification of Economic Activities into the following sectors: Agriculture and Mining; Manufacturing; Construction; Trade; and Services and Transportation.

The second estimated model includes the same variables, but $FWCR_i$ is calculated as accounts receivable and inventories minus accounts payable, thereby excluding cash.

3.3. Summary statistics

Table I reports the descriptive statistics and correlations, organized into three panels: Panel A, which contains the primary study variables; Panel B, which includes the control variables; and Panel C presenting the correlations among variables. The average financial risk for the sample is 4.56%, and the average FWCR is 35.28% when using cash and 48.17% when not, meaning that, on average, 35.28% and 48.17% of WCR for the sample firms are financed with short-term bank debt, depending on the use of cash for the variable WCR. Regarding leverage, the

average value without short-term financial debt is 39.12%, consisting of 12.27% long-term debt and 26.85% non-financial leverage. Table I also provides the descriptive statistics of our data set, reporting means, standard deviations, and the 10th, 50th, and 90th percentiles for the rest of the variables in the study. Next, a correlation analysis is conducted among the variables of the proposed models in panel C of Table I. As observed, the variables of interest, SD_ROE and both FWCR, show a significant and positive correlation, as hypothesized. This means that as the proportion of WCR financed with short-term debt increases, financial risk also increases. On the other hand, the control variables do not show excessive correlation among themselves or with the variables of interest, except for the FWCR variables, which exhibit a high correlation coefficient due to their similar purpose.

Insert table I here

4. RESULTS

4.1 Univariate analysis

Panel A of Table II presents the average values of FWCR and SD_ROE for each year from 2014 to 2019. As indicated in Table I, 35.28% of WCR for the sample firms is financed with short-term debt when WCR includes cash and 48.17% otherwise. Regarding financial risk, the average level for the sample is 4.56% for the entire period. There are no significant variations in either variable in any year, given that these are years of economic stability following the crisis that affected Spain until 2013.

The industry sector is a key determinant of a firm's WCR investment and financing (Weinraub and Visscher, 1998; Filbeck and Krueger, 2005). Firms within the same industry tend to exhibit similar WCR behaviors due to industry-specific characteristics and different cycles. However, significant differences exist across industries. These disparities are attributable to sectoral

differences in payment and collection periods, as well as inventory investment (Gombola and Ketz, 1983; Smith, 1987; Weinraub and Visscher, 1998). Therefore, Panel B of Table II presents the average FWCR and SD_ROE for each industry, aiming to identify potential differences due to varying WCR financing characteristics. The Trade and Services and Transportation sectors stand out with the highest FWCR values, indicating more aggressive WCR financing policies, with 41.16% and 38.62% of WCR financed with short-term debt, respectively, when including cash. When obtaining WCR without cash holdings, the values increase to 77.48% and 49.15%, respectively. Conversely, the Construction sector has the lowest FWCR, which can be explained by its typically longer operating cycle. Consequently, it relies more on long-term debt, with only 24.92% of WCR financed with short-term debt when including cash. However, when FWCR does not include cash, the Manufacturing sector exhibits the lowest FWCR, with a value of 38.57%, which could be explained by the fact that the Construction sector has a high level of cash holdings, which lowers the first FWCR ratio. Manufacturing and Agriculture and Mining exhibit intermediate values when including cash. When WCR excludes cash, all sectors exhibit values close to the overall sample average, except for the Services and Transportation and Manufacturing sectors. Regarding financial risk, the Services and Transportation sector has the highest standard deviation of returns at 5.62%. In contrast, the Trade sector has the lowest at 4.14%, while the remaining sectors exhibit values of around 4.5% and 5.4%.

Insert table II here

4.1.1. Relationship between WCR financing and financial risk

Next, the relationship between working capital requirements (WCR) financing and financial risk is analyzed. The FWCR variable has been ordered from lowest to highest, and the observations have been classified into quartiles to quantify the WCR financing strategy. $FWCR_1$ refers to a conservative WCR financing strategy with a low FWCR value, indicating

WCR are financed to a greater extent with long-term debt. At the other extreme, $FWCR_4$ refers to companies that follow an aggressive policy, with higher FWCR values, financing most of the WCR with short-term debt. $FWCR_2$ and $FWCR_3$ refer to intermediate strategies.

Panel A of Table III shows the average financial risk and its median value for each of the created quartiles, including cash in the variable FWCR. Figure 1 graphically illustrates this relationship. Companies with a more conservative financing strategy, that is, with lower FWCR values, have less variability of financial profitability and, therefore, assume less financial risk. Thus, companies that finance a small proportion of their WCR with short-term debt have an SD_ROE of 4.25%, and as the proportion of short-term bank debt rises, financial risk increases, reaching 4.85% when the company finances its WCR to a large extent with short-term bank debt. This positive relationship between FWCR and financial risk is also maintained when considering the median of SD_ROE. A test for difference of means between each quartile is calculated, showing that while $FWCR_2$ and $FWCR_3$ are not significantly different statistically, there is a difference between the conservative and aggressive strategies, therefore confirming our hypothesis. Panel B of Table III shows the same data when excluding cash holdings from the FWCR calculation. Figure 1 also illustrates this relationship. Results remain mostly unchanged regardless of the use of cash to obtain WCR.

Insert table III here

Insert figure 1 here

As mentioned previously, companies in different sectors have unique characteristics that lead to disparities in their collection, payment, and inventory periods, ultimately affecting their WCR. Figure 2 shows the relationship between FWCR and SD_ROE by sector in the cash case.

The relationship is linear in almost all sectors, implying that conservative financing strategies reduce a company's average financial risk. The Agriculture and Mining sector shows a convex

relationship in terms of financial risk, as it decreases in the last quartile of WCR. This disparity could be explained by the sector's specific characteristics or the low number of observations relative to the total: 2.54% of the data (see Table II). The Services and Transportation sector shows a negative relationship for all WCR quartiles, with a decreasing trend from 5.76% to 5.36%, although there is a slight increase in the second quartile. In the no-cash situation, the picture remains almost the same: conservative strategies reduce a firm's financial risk in almost all sectors, with the exception of the Agriculture and Mining sector, which could be again explained by the low number of observations for this sector. Results have not been shown as they remain similar to this figure.

Insert figure 2 here

In general, the direct relationship between the proportion of working capital requirements (WCR) financing with short-term debt and financial risk holds for the 2014-2019 period. For most of the sectors, a more conservative WCR financing strategy results in lower financial risk, while more aggressive strategies present higher risk. This can be explained by the characteristics of short-term debt, as well as interest and financing risks, which result in a higher risk than long-term debt use. The results remain consistent regardless of whether cash is included in the calculation.

4.2. Multivariate analysis

Following previous literature (Jun and Jen, 2003; Diamond and He, 2014; Childs *et al.*, 2005; Johnson, 2003), we argue that firms that use shorter-term debt to finance WCR, and thus follow more aggressive financing strategies, incur higher financial risk-taking. To confirm our hypothesis, we now proceed to perform a multivariate analysis.

Table IV presents the results of the estimations using the fixed effects and cluster methods. Columns 1 and 3 include FWCR with cash, while columns 2 and 4 include FWCR without cash. In both fixed effects estimations, Columns 1 and 2, the Hausman test yields a p-value of 0, which implies that the null hypothesis is rejected, confirming the suitability of the fixed effects method, although the test has not been included in the table.

The positive values of the FWCR coefficient indicate a linear relationship between the aggressiveness of the WCR financing strategy and financial risk, confirming the hypothesis that when more short-term debt is used to finance WCR, financial risk increases. This is consistent with the literature because this type of financing is subject to potential challenges when renewing short-term credits, which may complicate the continuity of funding, and fluctuations in interest rates, which may lead to potential increases in the cost of financing (Jun and Jen, 2003) and, ultimately, higher return on equity volatility (Diamond and He, 2014) and potential liquidity shocks (Childs et al., 2005; Johnson, 2003).

Although the significance and sign of the coefficients provide context, in order to explain the economic significance of our results, we scale the variables by the standard deviation of the dependent variable to report standardized coefficients (Mitton, 2024). As a result, we observe that an increase of one standard deviation in the variable FWCR produces an increase of 10.42% over the mean value of the dependent variable (SD_ROE) in Column (1), and 6.73% in Column (2). This relationship is supported by both the fixed-effects estimation and the clustering method, as well as obtaining Working Capital as current assets minus payables, i.e., including cash, or inventories and receivables minus payables, i.e., not using cash. A joint significance F-test has also been conducted to determine whether the model is valid in explaining the dependent variable, obtaining a p-value of 0 in both cases, which confirms that both models are valid using fixed effects and, especially, the clustering method. Results also remain unchanged when removing the control variable NFLEV, which includes suppliers.

Insert table IV here

Moreover, we perform some additional test to confirm that our results are robust and reliable. Datta *et al.* (2019) and Dangl and Zechner (2020) suggest that firms with riskier cash flows are more likely to issue short-term debt, and Worley and Green (1989) indicate that cash flow variability is directly associated with small business risk. Hence, we expect that firms with higher cash generation variability and, therefore, higher economic risk, will have a higher increase in their financial risk when issuing more short-term debt.

To carry out these analyses, we follow the same methodology and model but including the variable cash flow variability (SD_CF), calculated using the standard deviation of periods t-1, t, and t+1. We add this variable as a normal dummy and by multiplying the independent variable FWCR. The dummy variable takes the value 1 if the value is above the 75^{th} percentile of cash flow variability, and 0 otherwise.

These results again confirm the linear relationship between FWCR and financial risk, showing that as the WCR financing strategy becomes more aggressive, financial risk increases significantly. For our economic risk proxy, results show a positive coefficient of the SD_CF dummy, which indicates that companies with greater variation in cash flow generation have more variability in their results. Likewise, the coefficient of the interaction term SD_CF×FWCR is positive, indicating that in companies with less stable cash generation, more financing strategy aggressiveness leads to a greater increase in financial risk than in companies with more stable cash flows. Results are confirmed for both FWCR and methods. This analysis has also been carried out using the standard deviation of ROA (SD_ROA) as an alternative measure of economic risk. Results are omitted for brevity but are available upon request.

5. CONCLUSIONS

This paper analyzes the effects of different working capital requirement (WCR) financing strategies on firms' financial risk. It fills an important gap in the working capital literature, where prior research has extensively examined the impact of investment strategies on profitability, risk, and value, as well as the effect of financing strategies on profitability, but has largely overlooked how the aggressiveness or conservativeness of WCR financing influences financial risk. This omission is particularly relevant given that WCR financing decisions lie at the core of the classic risk-return trade-off and are central to firms' strategic behavior. To this end, this study examines how WCR financing affects financial risk-taking, measured as the standard deviation of ROE, using a panel of non-financial Spanish SMEs during the period 2014-2019.

The results show a positive relationship between aggressive WCR financing strategies and financial risk, highlighting that working capital financing choices are key elements of firms' value creation and risk management strategies. In the period studied, firms relying more heavily on short-term financing to fund WCR systematically faced higher financial risk than those that pursued more conservative strategies. Moreover, although each industry has its own characteristics and cycles that affect working capital, the relationship between WCR financing and financial risk remains consistent across most sectors and is significantly stronger for firms with unstable cash flows. These findings emphasize that WCR financing strategies interact with firms' operating characteristics and shape their overall risk profile.

From a strategic management perspective, our results suggest that WCR financing decisions directly affect firms' strategic flexibility and their ability to sustain competitive positions over time. For SMEs in particular, aggressive WCR financing strategies may support short-term profitability or faster growth in stable environments, but they also increase vulnerability to demand shocks and cash flow volatility. As financial risk increases, managers' discretion

becomes constrained and entrenched, which could force firms to prioritize liquidity preservation over long-term strategic initiatives such as investment, innovation, or market expansion. In this sense, WCR financing choices may condition future strategic options rather than merely being a neutral financial adjustment.

Conversely, more conservative WCR financing strategies can be interpreted as deliberate strategic choices aimed at enhancing resilience and preserving strategic flexibility, even at the cost of lower short-term profitability. This paper highlights a fundamental strategic trade-off for SME owners and managers between short-term financial efficiency and long-term sustainability. Aligning WCR financing policies with the firm's business strategy, growth objectives, and risk tolerance is therefore critical to avoid destroying value from mismatches between operating and financial structure.

The results of the study may be affected by the fact that the sample consists only of years of economic expansion, so it is not possible to study the effect of WCR financing strategies on financial risk in periods of crises. However, it is foreseeable that the effect would be the same or even more intensified. This could be a future line of research. Additionally, while our measure of WCR financing includes next year's payments of long-term debt, we assume that it is entirely used to finance WCR. Although this assumption involves a limitation, we believe it does not affect the overall conclusions of the study.

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7. APPENDIX

Table AI. Variable definitions

Name	Definition
ROE	Net income divided by shareholders' equity
SD_ROE	Standard deviation of ROE for t_{-1}, t and t_{+1}
WCR_{cash}	Current assets minus trade payable
$WCR_{no\ cash}$	Accounts receivable and inventories minus accounts payable
$FWCR_{cash}$	Short-term bank debt divided by WCR_{cash}
$FWCR_{no\ cash}$	Short-term bank debt divided by $WCR_{no\ cash}$
SIZE	Natural logarithm of total assets
AGE	Natural logarithm of firm's age
GROWTH	Percentage change in sales
NFLEV	Short-term non-financial debt to total assets
LTLEV	Long-term debt to total assets
SD_CF	Standard deviation of cash flow for t_{-1}, t and t_{+1}

Source: Authors own work.

Table I. Summary statistics and correlations

Panel A: Main variables						
	Nº obs.	Mean	Std. Dev.	10th perc.	Median	90th perc.
SD_ROE	19,934	0.0456	0.0460	0.0072	0.0308	0.1022
FWCR cash	19,934	0.3528	0.3508	0.0180	0.2471	0.8221
FWCR no cash	19,934	0.4817	0.5913	0.0284	0.3273	1.0107

Panel B: Control variables

	Nº obs.	Mean	Std. Dev.	10th perc.	Median	90th perc.
SIZE	19,934	9.1663	0.6681	8.3373	9.1506	10.0807
AGE	19,934	3.1992	0.5729	2.4849	3.2958	3.7842
GROWTH	19,934	0.0769	0.1737	-0.0879	0.0598	0.2523
LTLEV	19,934	0.1227	0.1183	0.0079	0.0889	0.2871
NFLEV	19,934	0.2685	0.1527	0.0979	0.2386	0.4839

Panel C: Correlation matrix

	SD_ROE	*FWCR cash*	*FWCR no cash*	*SIZE*	*AGE*	*GROWTH*	*LTLEV*	*NFLEV*
SD_ROE	1.000 ***							
FWCR cash	0.0421 ***	1.000 ***						
FWCR no cash	0.0485 ***	0.7546 ***	1.000 ***					
SIZE	-0.1132 ***	0.0491 ***	0.0266 ***	1.000 ***				
AGE	-0.1604 ***	-0.0757 ***	-0.0540 ***	0.0852 ***	1.000 ***			
GROWTH	0.0675 ***	0.0257 ***	0.0138 *	0.0495 ***	-0.0975 ***	1.000 ***		
LTLEV	0.1271 ***	0.2270 ***	0.2485 ***	0.1379 ***	-0.0804 ***	0.0001	1.000 ***	
NFLEV	0.2008 ***	-0.1416 ***	-0.1117***	-0.1560 ***	-0.1415 ***	0.1037 ***	-0.2315 ***	1.000 ***

*indicates significance at the 10% level. **indicates significance at the 5% level. ***indicates significance at the 1% level.
Source: Authors own work

Table II. Mean value of FWCR and SD_ROE per year and sector

Panel A: Mean value per year

Year	FWCR cash	FWCR no cash	SD_ROE
2014	0.3497	0.4579	0.0437
2015	0.3513	0.4745	0.0438
2016	0.3501	0.4928	0.0448
2017	0.3552	0.4957	0.0456
2018	0.3602	0.4949	0.0455
2019	0.3488	0.4601	0.0538
2014-2019	0.3528	0.4817	0.0456

Panel B: Mean value per sector

	Agriculture and Mining	Manufacturing	Construction	Trade	Services and Transportation	Total
FWCR cash	0.3426	0.3118	0.2492	0.3862	0.4116	0.3528
FWCR no cash	0.4749	0.3857	0.4355	0.4915	0.7748	0.4817
SD_ROE	0.0542	0.0451	0.0510	0.0414	0.0562	0.0456
N º obs	505	7,972	892	7,870	2,695	19,934

Standard industrial classification according to CNAE 2009: Agriculture and Mining, codes 01 to 09; Manufacturing, codes 10 to 39; Construction, codes 40 to 43; Trade, codes 45 to 48; Services and Transportation, codes 49 to 96 (except 64 to 68).
Source: Authors own work.

Table III. WCR financing strategy per quartiles and risk

Panel A: WCR with cash

	SD_ROE (mean)	SD_ROE (median)
$FWCR_1$	0.0425	0.0294
$FWCR_2$	0.0457	0.0313
$FWCR_3$	0.0456	0.0313
$FWCR_4$	0.0485	0.0317
t_1	-3.6664***	
t_2	0.124	
t_3	-2.9928***	

Panel B: WCR without cash

	SD_ROE (mean)	SD_ROE (median)
$FWCR_1$	0.0423	0.0287
$FWCR_2$	0.0451	0.0310

$FWCR_3$	0.0458	0.0312
$FWCR_4$	0.0491	0.0329
t_1	-3.2139***	
t_2	-0.7273	
t_3	-3.4341***	

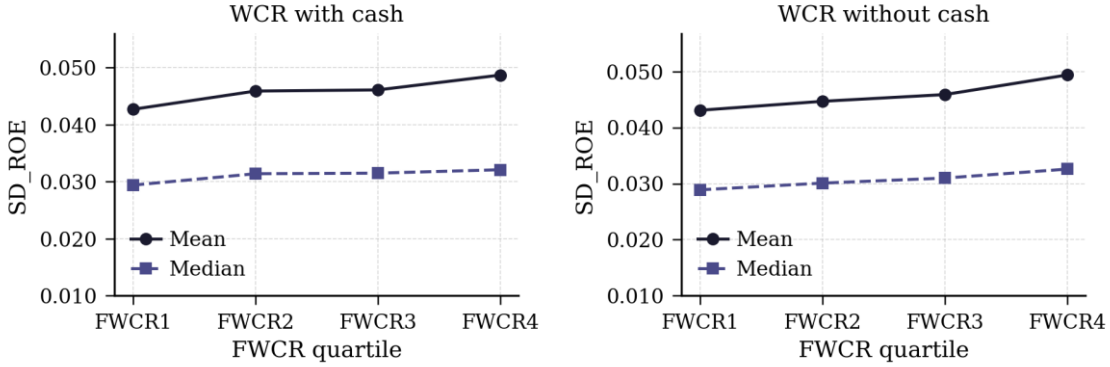
*indicates significance at the 10% level. **indicates significance at the 5% level. ***indicates significance at the 1% level. t_1 is the value of the t-statistic for the mean difference between $FWCR_1$ and $FWCR_2$. t_2 is the value of the t-statistic for the mean difference between $FWCR_2$ and $FWCR_3$. t_3 is the value of the t-statistic for the mean difference between $FWCR_3$ and $FWCR_4$.
Source: Authors own work.

Table IV. Effects of WCR financing strategies on risk

	Fixed effects (1)	Fixed effects (2)	Cluster (3)	Cluster (4)
FWCR	0.0111***	0.0045***	0.0041***	0.0017*
	(5.52)	(4.82)	(3.08)	(1.79)
SIZE	-0.0121***	-0.0111***	-0.0067***	-0.0067***
	(-5.36)	(-4.99)	(-8.71)	(-8.67)
AGE	-0.0077	-0.0080	-0.0084***	-0.0085***
	(-1.53)	(-1.59)	(-9.02)	(-8.99)
GROWTH	0.0026	0.0028*	0.0117***	0.0118***
	(1.59)	(1.69)	(2.61)	(2.66)
NFLEV	0.0537***	0.0488***	0.0650***	0.0645***
	(9.19)	(8.54)	(20.26)	(19.53)
LTLEV	0.0567***	0.0537***	0.0589***	0.0596***
	(9.00)	(8.58)	(12.21)	(13.26)
Intercept	0.1350***	0.1312***	0.0994***	0.0995***
	(5.04)	(4.90)	(7.10)	(7.11)
Industry dummies	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes

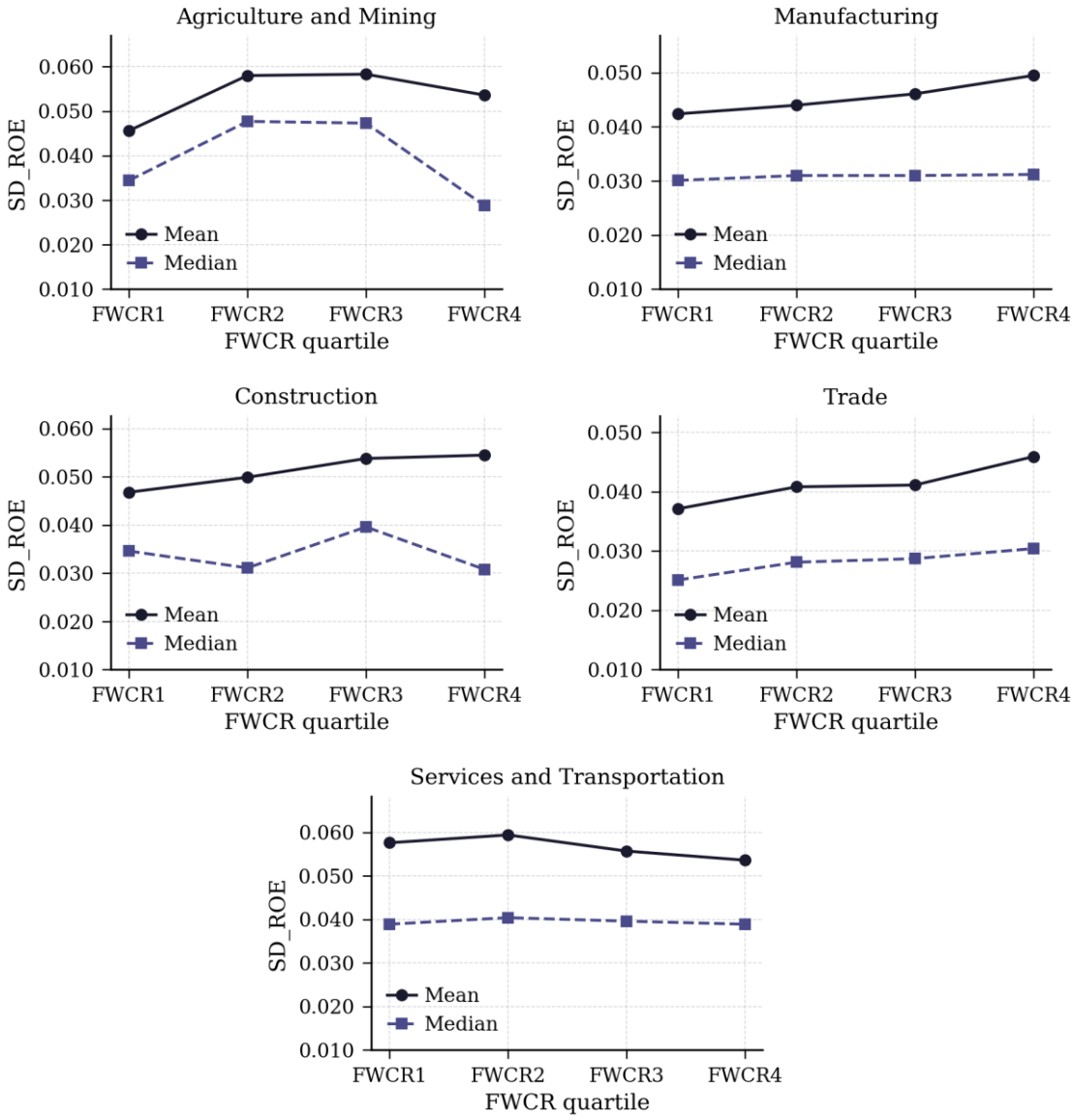
Estimation made by fixed effects and cluster methods. The dependent variable is the standard deviation of the firm's financial return in periods t-1, t, and t+1. FWCR is calculated by dividing short-term bank debt by WCR with cash in columns (1) and (3); and without cash in columns (2) and (4). The model includes time and industry dummy variables.
*: significance at the 10% level. **: significance at the 5% level. ***: significance at the 1% level
Source: Authors own work.

Figure 1. WCR financing and risk



SD_ROE: standard deviation of the company's financial profitability in periods t−1, t, and t+1. FWCR: short-term bank debt divided by working capital requirements.
Source: Authors own work.

Figure 2. WCR financing and risk by sector (with cash)



Standard Industrial Classification according to CNAE 2009: Agriculture and Mining, codes 01 to 09; Manufacturing, codes 10 to 39; Construction, codes 40 to 43; Trade, codes 45 to 48; Services and Transportation, codes 49 to 96 (except 64 to 68)
Source: Authors own work.