Corporate Sensitivity to Sovereign Credit Distress: The Mitigating Effects of Financial Flexibility

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This version: 30th November 2023

Abstract

This paper investigates the role of financial flexibility in sovereign-corporate rating nexus. Using a panel data of non-financial European firms rated by S&P during 2005-2022, we show that financially flexible firms are more protected from the consequences of sovereign rating downgrades than their financially inflexible counterparts. Financial flexibility becomes particularly valuable for corporates in GIIPS countries, during the European sovereign debt crisis and the COVID-19 pandemic. Finally, private firms benefit more from financial flexibility than public firms due to their financing constraints. Our findings have implications for corporate managers, governments, and regulators alike, as financial flexibility can act as a shield against sovereign risks' shocks.

Keywords: Financial flexibility; Sovereign ratings; Corporate ratings; Spillover effect.

JEL classification: G01, G24, G32.

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Acknowledgements: We are indebted to the Editor, Associate Editor, and anonymous reviewers for their insightful suggestions.

1. INTRODUCTION

This paper investigates the sensitivity of corporate credit risk to sovereign credit risk, with a special focus on the mitigating effects of corporate financial flexibility. We focus on whether financially flexible (FF) firms can cope with the contagion effects of sovereign credit risk on company's credit ratings better than their financially inflexible (FIF) counterparts. Financial flexibility refers to a firm's ability to access and adjust financing under unexpected circumstances that may affect its cash flows and investment opportunities (Gamba and Triantis 2008). According to Bancel and Mittoo (2004) and Graham and Harvey (2001), financial flexibility and credit ratings are the two most important considerations of American and European corporate managers when issuing debt. Corporate rating changes are an important trigger of corporate debt adjustments (e.g., Wojewodzki et al. 2018; Hung et al. 2020), whereas financial flexibility is a crucial tool for protecting a firm's investment opportunities and cash flows against shocks (Agha and Faff 2014; Arslan-Ayaydin et al. 2014). However, the literature remains silent about whether corporate ratings benefit from financial flexibility when the market faces an increase in sovereign credit risk.

The widespread effect of sovereign credit ratings on the economy has been widely documented in the academic literature. Sovereign rating downgrades decrease the value of government debt guarantees and securities, hence weakening the performance of the banking and corporate sector. They lead to lending contraction, hinder firms' capital market access, increase the borrowing cost and depress corporate investments. Sovereign rating shocks influence stock and bond market stability and international capital flows across countries (Adelino and Ferreira 2016; Almeida et al. 2017), while they also affect electoral prospects of countries' political parties (Nguyen et al. 2023).

Corporate managers meticulously observe sovereign credit ratings because they are an important determinant of corporate credit ratings which determines their firm's access to external capital and ability to undertake investments (Borensztein et al. 2013). Therefore, ratings have been considered in shaping various firm policies such as capital structure (Wojewodzki et al. 2018) or dividend smoothing (Asimakopoulos et al. 2021). The significance of ratings can be attributed to their role

in bridging the information gap between corporate issuers and investors in capital markets, thereby influencing firms' investment decisions (Kang 2022). Studies on the relationship between sovereign and corporate risks have identified several key channels through which sovereign risks affect the domestic corporate sector. Firms may be directly linked to their governments through government equity holdings in the firms (Bai and Wei 2017), or indirectly through the banking sector or their exposure to the domestic market (Bedendo and Colla 2015). Several empirical studies have highlighted a significant increase of corporate risk caused by the deterioration of sovereign credit risk especially during the European sovereign debt crisis (e.g., Bedendo and Colla 2015; Acharya et al. 2018). More recently, the COVID-19 pandemic has put a pressure on the government's fiscal resources in many European countries, threatening their creditworthiness (Augustin et al. 2022).

Alongside the growing concerns about sovereign credit quality and its profound effects on corporate risk, it is of great importance for firms to be able to protect themselves from this type of shock. Prior studies have emphasised that firms prepare for cashflow shocks by building financial slack and/or borrowing below their long-term optimal capacity during normal times (Acharya et al. 2007). It is expected that, with a large cash stock and untapped borrowing capacity, firms will be able to fund investment opportunities that arise under unfavourable financing conditions (Byoun 2021; Fahlenbrach et al. 2021). We refer to them as FF firms. FF firms are able to enhance investment capacity and reduce their sensitivity of investments to shocks. We extend this argument and examine whether such firms will be able to mitigate the negative effects of changes in sovereign credit ratings in their country of domicile. To test this empirically, we use cross-country analyses of 740 European firms during the period 2005-2022 and examine whether credit ratings of firms that maintain financial flexibility are more resilient to changes in sovereign ratings compared to firms that do not employ this policy.

We find that the degree of financial flexibility can mitigate the negative effects of sovereign rating downgrades on corporate ratings in all European countries, but it does not improve firm ratings following sovereign rating upgrades. The strongest effect occurs when the governments

have experienced severe sovereign rating downgrades, during the 2010-2012 European sovereign debt crisis and the 2020-2021 COVID-19 pandemic. At heart of the European sovereign debt crisis, the mitigating effects of financial flexibility on corporate risk's sensitivity to sovereign risk is most pronounced for companies based in Greece, Ireland, Italy, Portugal, and Spain (GIIPS) where the worsening of sovereign credit quality has been the most drastic. In addition, the rapid spread of COVID-19 has put a strain on the government's fiscal balance in many countries, hence posing a threat to sovereign creditworthiness (Augustin et al. 2022). In this study, we show that FF firms' ratings are not affected during the COVID-19 pandemic despite rising sovereign risk because FF firms are better prepared for this type of shock. Such shielding effect of financial stability persists after controlling for the potential confounding effect of governments' counter measures to combat the adverse consequences of COVID-19 for the economy.

We further investigate whether the resilience of corporate risk to sovereign risk varies between private firms and public firms. The value of financial flexibility might be more prevalent for firms that have less room to build financial flexibility and vice versa. Private firms are generally at a disadvantage due to more constrained financial choices, as they face more expensive cost of equity compared to public firms (Brav 2009). This hinders private firms from hoarding cash by issuing equity, which means that achieving financial flexibility is limited to cash hoarding from internal cashflows. Hence, private firms should benefit more from financial flexibility than public firms.[1] Our results support this prediction.

Our contribution to the literature and practical implications stems from several angles. Although the literature on the connection between sovereign risk and corporate risk is established (e.g., Bai and Wei 2017), we are the first to present the firms' financial flexibility as a mitigating mechanism to a long-standing sovereign-to-corporate risk spillover effect which will be especially valued by corporate managers. To the best of our knowledge, this is the first study to compare the

[1] Our sample mainly consists of large firms, but an additional sub-sample analysis highlights that smaller FF firms are slightly better at coping with the spillover of sovereign risk than larger FF firms.

resilience of corporate risk to sovereign risk between private firms and public firms, providing new evidence on the more pronounced value of financial flexibility for private firms. Our study also contributes to the literature new insights about the impact of government responses to the COVID-19 pandemic on the resilience of firm risk to sovereign risk. Further, our paper adds to the literature on the role of corporates' financial stability.

To et al. (2022) investigate the effect of sovereign rating changes on corporate performance measured by return-to-total assets (ROA) ratio. They show, after a sovereign rating downgrade the ROA of firms bound by the sovereign ceiling deteriorates significantly more (particularly for lower rated firms) while non-bound firms' ROA increases very slightly. In comparison, our study provides new evidence on the corporates' creditworthiness, exploring the role of financial flexibility in sovereign-corporate rating nexus. We offer new insights that financial flexibility acts as a shield against sovereign rating downgrades, whereby ratings of FF firms deteriorate less than those of FIF firms following sovereign ratings downgrades. We also show the benefit of financial flexibility works best during the most turbulent times and benefits the most vulnerable institutions. In addition, To et al. (2022) measure corporates' financial flexibility using corporate rating levels (proxied by investment-grade corporate ratings), implying that financial flexibility is restricted to firm's ability to borrow. In our paper, the financial flexibility is identified (differently) based on firms' cash accumulation and spare debt capacity to prepare for shocks using two accounting metrics: *Cash* and *Leverage*. We highlight new insights to corporate managers that financial flexibility works better through the cash-accumulation channel than through leverage conservation channel. To et al.'s (2022) identification approach of FF firms ignores the issue that financial flexibility is a choice rather than the firms' inability to borrow (Oad Rajput et al. 2019).

We also complement Agha and Faff's (2014) study which examines how the financial flexibility influences the impact of corporate rating changes on the firms' cost of financing. In comparison, we focus on the mitigating effects of financial flexibility on the impact of sovereign rating changes on corporate ratings, treating the sovereign rating changes as the exogenous shocks. Changes to the

countries' creditworthiness measured by sovereign credit rating actions have wide stemming implications for the entire economy and their intertwined nature with corporate risk makes our findings important not only to the corporate managers but also to the policy makers, the regulators and the governments themselves. The economic costs of lack of credit can endure for a long time and have detrimental effect on the economic growth for decades (Reinhart et al. 2012).

Further, we employ a rich, recent dataset covering 740 public and private firms in 20 European countries during 2005-2022, allowing us to explore the value of FF for larger versus smaller firms, across GIIPS and Eurozone countries and during times of severe sovereign rating downgrades, the European sovereign debt crisis, the COVID-19 pandemic and the Russian-Ukraine conflict's period, offering new perspectives to previous studies. For example, the sample used by To et al. (2022) includes 132 public firms in 13 countries and ends in 2016,[2] while Agha and Faff's (2014) sample covers public firms in a single country (the USA) and ends in 2009.

The design and delivery of political packages targeting sovereign ratings by governments provide evidence of how ratings can influence government legislation/policy (Bloomberg 2021). Credit ratings are known to influence electoral prospects of incumbent political parties (Cunha et al. 2020). Namely, incumbent politicians can take advantage of the reduced financing costs generated by their sovereign rating upgrades to increase government spending and decrease taxes. Ratings can also have a direct effect on voting through voters' perceptions of the quality of incumbent's politicians (Nguyen et al. 2023). For example, ratings can serve as a certification mechanism of the incumbent's fiscal responsibility.

The importance of sovereign ratings might be widely understood, but their repercussions on the private sector are less obvious. Although sovereign ceiling policy has not been strictly applied in the last two decades, corporate ratings are heavily influenced by the sovereign rating of their

[2] See Section 2.2 and Appendix D in To et al.'s (2022) paper for their final sample used in their empirical analysis. Their sample includes limited number of firms/observations rated at speculative-grade level (10 after rating downgrades), which are identified as FIF firms.

country of domicile (To et al. 2022; Cheikh et al. 2021; Borensztein et al. 2013).[3] This study highlights the importance of existing links with private sector that should not be ignored in future regulations of credit rating agencies (CRA) by the European Securities and Markets Authority (ESMA) and the US Security and Exchange Commission (SEC).

Our study also relates to a larger literature on corporate finance. Specifically, we extend the work of Arslan-Ayaydin et al. (2014), Ferrando et al. (2017), Barry et al. (2022) who have uncovered the value of financial flexibility for corporate investments and employment. We corroborate Ferrando et al. (2017) who find significant effects of financial flexibility on private firms' ability to invest, while shed new insights on the benefit of financial stability to private firms' credit ratings. In contrast to these studies, we highlight the significant role of financial flexibility in reducing the negative spillover of sovereign risk on corporate risk, particularly for private firms and during European sovereign debt crisis and the COVID-19 pandemic.

The remainder of the paper is structured as follows. Section 2 reviews the literature and develops our research hypothesis, Section 3 discusses the data and empirical design, Section 4 presents and discusses our empirical results, and Section 5 concludes.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Empirical studies related to the transmission of sovereign risk to corporates use the changes in credit prices to measure the changes in the risk (e.g., Bedendo and Colla 2015; Bai and Wei 2017; Augustin et al. 2018). For instance, Augustin et al. (2018) show that a 10% increase in sovereign credit default swap (CDS) spreads in Europe is associated with an average 1.1% increase in corporate CDS spreads. Another strand in the literature uses sovereign credit rating actions to measure the change in the risk. Several channels that link corporate risk with sovereign risk have been found in prior studies (see Section 1). One of these channels is the sovereign ceiling effect.

[3] Sovereign ceiling policy implies that it is unlikely for non-sovereign issuers (e.g., corporates, banks, insurers) to be rated higher than the sovereign rating of their country of domicile.

Under the sovereign ceiling effect, corporate ratings are constrained by the sovereign ratings. Although the sovereign ceiling policy has been relaxed by S&P since 1997, Borensztein et al. (2013) show that sovereign ratings continue to be an important determinant of corporate credit ratings. Similarly, Almeida et al. (2017) show that bound firms (with ratings at or above their sovereign ratings prior to the sovereign rating downgrades) tend to cut down leverage and curtail investment more than unbound firms.[4]

Given this inherent spillover of credit risk from sovereigns to corporates, it is important to reveal the mechanism which would enable firms to withstand sovereign credit shocks. Bai and Wei (2017) find that high quality institutional features such as the quality of property rights might alleviate the sensitivity of corporate default risk to sovereign defaults. However, it is questionable whether such mechanism is in fact under the firms' control. Cheikh et al. (2021) reveal that a healthy financial state of firms can withstand sovereign risk, but the question that remains unresolved in their study is identifying an effective vehicle through which to achieve it.

In the past two decades, researchers have shown that firms choose a flexible financial policy to prepare for investment shocks. In a survey of 392 CFOs in the United States, Graham and Harvey (2001) find that CFOs' first consideration when it comes to capital structure decisions is financial flexibility. The debt level is determined based on whether firms want to achieve financial flexibility to prepare for shocks. This has been found to be prevalent not only in the US but also in European firms (Bancel and Mittoo 2004). Firms are motivated to build financial flexibility as it has several potential benefits. Financial flexibility enhances investment capacity (Marchica and Mura 2010) and reduces the sensitivity of investments to cashflow shocks especially in crises (Duchin et al. 2010; Arslan-Ayaydin et al. 2014; Ferrando et al. 2017). When sovereign risk increases, tapping funds from either the capital market or the banks becomes difficult. This is because market perception of risk increases the cost of acquiring capital and banks curtail lending (Adelino and

[4] Further support for the rating channel of the sovereign-corporate nexus can be found in Cheikh et al. (2021) and To et al. (2022).

Ferreira 2016; Altavilla et al. 2017). FIF firms tend to abandon projects in this condition, while FF firms can still pursue positive net present value (NPV) projects despite the rising costs. This is because FF firms possess sufficient financial slack accumulated in previous periods. They save cash out of internal cashflows instead of paying it out to investors as dividends (Blau and Fuller 2008). These firms also avoid issuing debt and choose seasonal equity offerings to hoard cash in order to prepare for unanticipated large capital outlays (Barclay et al. 2021; Byoun 2021).

FIF firms, on the other hand, do not have the same cushion to raise finance for their large investment projects and when the conditions deteriorate, they might subsequently need to abandon the projects. FIF firms do not have the alternative vehicles to raise finance for their large investment projects while FF firms can draw down on their large cash balance or borrow at the higher cost without causing material distress costs. Thus, we conjecture that FF firms are better prepared for negative shocks associated with sovereign risk, because investments by FF firms are less likely to be interrupted by sovereign rating downgrades. Hence FF firms are more capable of generating stable cashflows to meet debt obligations even under difficult conditions such as rising cost of capital and tax increase by the governments, etc. It follows that FF firms could avoid rating downgrades better than FIF firms when sovereign ratings decrease.

Since ratings are a secondary consideration in capital structure policy after financial flexibility, firms often manipulate financing choices to achieve a desirable rating level (Kisgen 2006). Therefore, it is of great interest to managers to determine if financial flexibility can improve firms' credit ratings. Under our analytical framework, we investigate the effect of shocks, such as sovereign rating downgrades and upgrades, on the ratings of FF and FIF firms. Being financially flexible means that a firm tends to use less leverage during normal times, allowing to raise funds for large investment opportunities without compromising its creditworthiness. Also, FF firms tend to build up cash reserves for precautionary reasons, thereby reducing the likelihood of agency problems. In brief, the low leverage and the precaution-motivated cash reserve make FF firms more resilient than FIF firms. Therefore, we posit that negative shocks (sovereign rating downgrades)

bring fewer challenges for FF firms than for FIF firms while positive shocks (sovereign rating upgrades) bring more opportunities for FF firms than for FIF firms.

These lead us to our research Hypotheses as follows:

Hypothesis 1: Credit ratings of FF firms decrease less than those of FIF firms when the sovereign credit ratings are downgraded in their countries of domicile.

Hypothesis 2: Credit ratings of FF firms increase more than those of FIF firms when sovereign credit ratings are upgraded in their countries of domicile.

While Hypothesis 1 addresses the mitigating effect of financial flexibility, Hypothesis 2 addresses the aggravating effect of financial flexibility on the sovereign-corporate risk nexus.

We notice that there are limited efforts in the literature to empirically examine the effects of financial flexibility on the sovereign-corporate risk relationship. Most studies concentrate on FF firms' investment capacity. Studies supporting the enhanced investment capacity of FF firms include Marchica and Mura (2010) and Ferrando et al. (2017). More specific studies on corporate investment capacity of FF firms in regional and international crises are conducted by Duchin et al. (2010), Arslan-Ayaydin et al. (2014), and Barry et al. (2022). All these studies point to the positive effects of financial flexibility on firms' ability to undertake investments in distressed periods such as the 1997 Asian currency crisis (e.g., Arslan-Ayaydin et al. 2014), the 2007 global financial crisis (Duchin et al. 2010), and the COVID-19 pandemic (Barry et al. 2022), but they do not consider corporate ratings. Additionally, these papers do not offer evidence on the likely effects of financial flexibility on firm risk in general or firm credit ratings in particular. Agha and Faff (2014) are the first to link the financial flexibility with corporate ratings, however they ignore the sovereign risk. Agha and Faff (2014) find that financial flexibility becomes an effective cushion against the negative consequences of corporate rating downgrades to the firms' capital structure's adjustments. The empirical setup in Agha and Faff (2014) identifies corporate rating changes as exogenous firm-specific shocks. Unlike Agha and Faff (2014), our hypothesis treats sovereign rating changes as the exogenous systemic shocks while corporate rating changes become an endogenous variable. It

has major advantages in terms of modelling and mitigating potential reverse causality. For instance, it is established that sovereign risk spillover onto corporate ratings (Almeida et al. 2017), but there are no previous studies suggesting the opposite, which strengthens our identification.

To sum up, to the best of our knowledge, the effects of financial flexibility on the sovereign-corporate risk nexus have not been examined in the literature. Our study fills this important void.

3. DATA AND METHODOLOGY

3.1. Identification of Financially Flexible (FF) firms

The literature reveals that FF firms tend to have low leverage and large cash stocks whilst FIF firms tend to have high leverage and low cash stocks. DeAngelo et al. (2011) argue that the corporate borrowing policy is not the only consideration of the trade-off between tax shield benefit and distress cost of debt. They suggest forecasted future investment opportunity shocks are another influential factor. For this reason, firms with high investment volatility tend to reserve a spare debt capacity, accumulate cash out of free cashflows or from seasoned equity offerings. Hence, they exhibit a low leverage and high cash balance. Lambrinoudakis et al. (2019) provide empirical evidence supporting DeAngelo's et al. (2011) theoretical predictions concerning the conservative debt policy of FF firms.

Byoun (2021) shows that firms in the stage of building financial flexibility status will issue equity to hoard cash and save borrowing capacity in order to maintain a large cash balance and a low leverage ratio. Firms in the stage of utilising financial flexibility status will exhaust the accumulated cash stocks and mobilise funds from issuing debt. Finally, firms already utilising their financial flexibility status would like to restore it by increasing cash stocks and lowering leverage again through paying down debt and saving cash out of cashflows. Examining the interrelation between financing choices and investment needs, Barclay et al. (2021) find similar patterns, with firms selecting seasoned equity offerings as a means of hoarding cash to fund future large investment projects. Leverage at this stage is below the firm's target level, therefore firms can maintain a large cash reserve and an untapped borrowing capacity.

The identification of FF firms in the literature is consistent with the notion that firms seek financial flexibility status by hoarding cash and saving borrowing capacity. Several studies identify FF firms by either observing their capital structure choices or liquidity policies. Specifically, they measure the untapped borrowing capacity as the difference between the firms' actual amount of debt and the amount of debt they can borrow. This approach is employed by Marchica and Mura (2010), Ferrando et al. (2017), Agha and Faff (2014) and Fliers (2019). Several other studies, such as Ang and Smedema (2011) and Arslan-Ayaydin et al. (2014), measure financial flexibility using both the cash stocks and leverage. Fahlenbrach et al. (2021) identify US FF firms if they hold large cash balances, have less short-term debt and less long-term debt in their capital structure, while FIF firms have smaller cash balances and more short-term and long-term debts.

We employ an identification strategy for financial flexibility in the same spirit as Fahlenbrach et al. (2021). We classify firms as FF firms if they have large cash stocks and low leverage in the previous year. An increase in the cash stocks and decrease in leverage will lead to an improvement of financial flexibility. We measure cash stocks with the total value of cash and cash equivalents normalised by the book value of total assets. Leverage refers to the book value of total debt divided by the book value of total assets.[5] This method has two important advantages over previous related studies such as Marchica and Mura (2010) and Agha and Faff (2014). First, our method is not sensitive to the specification of target leverage's estimation model, which remains contentious in the literature on capital structure theories. Second, we simplify the data requirement for firms to be identified as financially flexible, given that firms report cash and total leverage each year. This method captures the main features of financial flexibility (i.e., firms build financial flexibility by means of conserving borrowing capacity or stockpiling cash) without sacrificing many data points due to insufficient data for estimating the target leverage.

[5] We use the book leverage throughout this paper since our data sample includes private companies whose market data are not observable.

In addition, we construct a dichotomous variable for financial flexibility in which a value of one is assigned if a firm is in the top quartile of the previous year's industry-specific cash distribution and in the bottom quartile of the previous year's industry-specific leverage distribution.[6] Firms not fulfilling these joint conditions of cash and leverage are either financially inflexible or neutral, which we label as 'FIF firms'. Our proposed dummy variable approach has several attractive characteristics compared to Fahlenbrach's et al. (2021) method. First, the FF dummy variable circumvents the problem associated with the distorting effects of outliers. In addition, our dummy variable approach simultaneously captures both aspects of financial flexibility that is consistent with the literature, i.e., FF firms are cash rich and underleveraged. Finally, we impose more stringent conditions for firms to become flexible than in Fahlenbrach et al.' s (2021) approach. [7]

A flexible finance policy has been proved beneficial when the investment opportunities arise under unfavourable conditions for firms to raise funds. This policy somehow relaxes the concerns about financial constraints. The literature emphasises the greater value of financial flexibility for financially constrained firms than for financially unconstrained firms (Chortareas and Noikokyris 2021). In a study on the effects of sovereign ratings on corporate profitability, To et al. (2022) attribute financial flexibility (proxied by investment grade corporate ratings) to the easy access to capital markets. They utilise investment-grade rating status to identify FF firms, suggesting that corporate debt policy is reactive to borrowing cost. In other words, financial flexibility in their study is considered as the opposite of financial constraint. However, we argue that their identification of FF firms is inappropriate because firms might intentionally deviate from their

[6] Since debt is influenced by industry characteristics, the level of debt variation might vary across industries. There are ten industries including Consumer Non-durables, Consumer Durables, Manufacturing, Energy, Chemicals, Business Equipment, Telecommunications, Wholesale and Retail, Healthcare and pharmaceutical, and Other.

[7] As a robustness test, we also identify firms as FF firms if their actual cash ratio is greater than the target cash level or their actual leverage is less than the target level. We employ Opler at al.'s (1999) cash model and Agha and Faff's (2014) leverage model to estimate the target cash and target leverage for public firms. The robustness test is restricted to a sub-sample of public firms due to unavailability of market data for private firms (particularly *Market-to-Book of Equity ratio*) required for the models' estimations of target cash and target leverage. Results (available on request) are consistent with our findings (in Section 4) highlighting the significant mitigating effects of financial flexibility on firms' sensitivity to sovereign risk, particularly through the cash-accumulation channel than leverage conservation channel.

optimal debt levels while increasing their cash balances, which is driven by their forecasted future funding needs and the probability of recessions (DeAngelo et al. 2018; Ang and Smedema 2011). In essence, the low leverage can be a matter of choice rather than firms' inability to borrow (Oad Rajput et al. 2019). This suggests that conventional measures of financial constraints, such as credit ratings, might not be effective in identifying FF firms. Hence, it is unlikely that our approach of identifying FF firms picks up financially unconstrained firms. This also alleviates the concern that our financial flexibility proxy variables capture the unobserved effects of financial constraints on corporate credit ratings.

3.2. Empirical design

The multivariate analyses investigate the effects of financial flexibility on the sovereign-corporate risk nexus. Sovereign risk is captured by the monthly changes in sovereign ratings whilst corporate risk is captured by the monthly changes of corporate ratings. Our baseline regression is specified as follows:

$$\begin{aligned}\Delta\mathrm{CCR}_{\mathrm{i,j,t}} = {} & \alpha + \beta_1\mathrm{SDWN}_{\mathrm{j,t}} + \beta_2\mathrm{SUP}_{\mathrm{j,t}} + \gamma_1\mathrm{CASH}_{\mathrm{i,j,t-12}} + \varphi_1\mathrm{CASH}_{\mathrm{i,j,t-12}} \times \mathrm{SDWN}_{\mathrm{j,t}} + \\ & \varphi_2\mathrm{CASH}_{\mathrm{i,j,t-12}} \times \mathrm{SUP}_{\mathrm{j,t}} + \gamma_2\mathrm{LEV}_{\mathrm{i,j,t-12}} + \varphi_3\mathrm{LEV}_{\mathrm{i,j,t-12}} \times \mathrm{SDWN}_{\mathrm{j,t}} + \\ & \varphi_4\mathrm{LEV}_{\mathrm{i,j,t-12}} \times \mathrm{SUP}_{\mathrm{j,t}} + \omega\mathrm{CCR}_{\mathrm{i,j,t}} + \boldsymbol{\theta}\mathbf{X}_{\mathbf{i,j,t-12}} + \boldsymbol{\vartheta}\mathbf{Z}_{\mathbf{j,t-12}} + \mathbf{In}_{\mathbf{i}} + \mathbf{CO}_{\mathbf{j}} + \mathbf{Y}_{\mathbf{t}} + \boldsymbol{\varepsilon}_{\mathbf{i,j,t}} \qquad (1)\end{aligned}$$

$\Delta CCR_{i,j,t}$ is the change of comprehensive credit rating (CCR) of firm *i* in country *j* in month *t*. The 58-CCR scale is defined as follows, AAA= 58, AA+ = 55, …, CCC- = 4, C/SD/CC/DD = 1. For positive (negative) watch, we add (subtract) 2, whereas for positive (negative) outlook we add (subtract) one (Nguyen et al. 2023). $SDWN_{j,t}$ takes the value of one if the sovereign CCR is downgraded, zero otherwise. $SUP_{j,t}$ takes the value of one if the sovereign CCR is upgraded, zero otherwise. We expect the coefficients of $SDWN_{j,t}$ ($SUP_{j,t}$) to be negative (positive) and significant as they reflect the sovereign ceiling impact.

We measure the degree of financial flexibility with two accounting variables $CASH_{i,j,t-12}$ and $LEV_{i,j,t-12}$. $CASH$ is the proportion of cash and cash equivalents to total assets and LEV is the

proportion of book value of total debt to total assets of firm *i*. We lag these variables by one year (12 months) so that cash and leverage in each month of a year are the values of the previous fiscal year. Since our contribution stems from studying the effects of sovereign rating shocks on the corporate ratings through the medium of financial flexibility, the key variables of interest are the interaction terms between FF status and sovereign rating upgrades and downgrades ($CASH_{i,j,t-12} \times SDWN_{j,t}$, $LEV_{i,j,t-12} \times SDWN_{j,t}$, $CASH_{i,j,t-12} \times SUP_{j,t}$, $LEV_{i,j,t-12} \times SUP_{j,t}$). Because FF status improves as *CASH* increases and *LEV* decreases, the expected sign of $CASH_{i,j,t-12} \times SDWN_{j,t}$ coefficient φ_1 is positive and for $LEV_{i,j,t-12} \times SDWN_{j,t}$ coefficient φ_3 is negative if Hypothesis 1 holds. In other words, firms which have a larger cash stock, and a larger borrowing capacity are less likely to be downgraded following sovereign ratings downgrades. According to Hypothesis 2, we expect that the coefficient φ_2 of $CASH_{i,j,t-12} \times SUP_{j,t}$ is positive and the coefficient φ_4 of $LEV_{i,j,t-12} \times SUP_{j,t}$ is negative. It means that ratings of FF firms with a large cash balance and low leverage increase more than those of FIF firms following a sovereign rating upgrade.

To control for the effects of firm-specific and country-specific time-varying factors on corporate ratings, we include firm-level controls $\boldsymbol{X}_{i,j,t-12}$ and country-level controls $\boldsymbol{Z}_{\boldsymbol{j,t-12}}$. $\boldsymbol{X}_{i,j,t-12}$ includes company characteristics, including *Interest Coverage*, *Firm Size*, *Tangibility*, and *Profitability*. Our control variables are chosen based on prior studies on the determinants of corporate credit ratings and rating standards such as Cornaggia et al. (2017), Bhandari and Golden (2021). We lag firm-level accounting controls and country-level economic controls by one year so that the values observed in each month of a year are the values reported in the previous fiscal year.

We also add a firm-specific monthly covariate $CCR_{i,j,t}$, which is the CCR of firm *i* at the beginning of month *t*, to account for the fact that rating changes are not the same across rating levels. This variable partially captures a firm's access to external financing, hence controlling for the possible confounding effects of financial constraints.

Because sovereign-corporate risk nexus might be confounded by the possibility that corporate risk responds to the dynamics of domestic macroeconomic fundamentals (Augustin et al. 2018),

we include six important macroeconomic indicators $\boldsymbol{Z_{j,t-12}}$: *GDP per capita*, *Gross government debt/GDP*, *Inflation*, *Current Account Balance*, *Fiscal balance/GDP*, and *World Bank's Control of Corruption Index*. All variables are defined in Section 3.3.

To address the omitted variable bias problem, we include industry fixed effects $\boldsymbol{In_i}$, country fixed effects $\boldsymbol{CO_j}$ **,** and year fixed effects $\boldsymbol{Y_t}$. $\boldsymbol{In_i}$ and $\boldsymbol{CO_j}$ absorb the unobserved effects of time-invariant industry and country characteristics affecting corporate risk. $\boldsymbol{Y_t}$ capture the heterogeneity in the common economic risk factors. For robustness test, we estimate Eq. (1) using interacted $\boldsymbol{CO_j * Y_t}$ fixed effects, which consider the time-varying country-specific risk determinants. We estimate Eq. (1) using firm $\mathbf{J_i}$ and year $\boldsymbol{Y_t}$ fixed effects, whereby the firm fixed effects $\mathbf{J_i}$ purge out the likely impact of unobserved firm-specific time-invariant features that affect corporate ratings.

$\varepsilon_{i,j,t}$ is the standard error term. We use doubled clustered by firm and year standard errors.

Secondly, we estimate Eq. (2) where we replace cash and leverage with a single dichotomous variable FF as follows.

$$\begin{aligned}\Delta\mathrm{CCR}_{\mathrm{i,j,t}} = \alpha + \beta_1\mathrm{SDWN}_{\mathrm{j,t}} + \beta_2\mathrm{SUP}_{\mathrm{j,t}} + \gamma_1\mathrm{FF}_{\mathrm{i,j,t-12}} + \varphi_1\mathrm{FF}_{\mathrm{i,j,t-12}} \times \mathrm{SDWN}_{\mathrm{j,t}} + \\ \varphi_2\mathrm{FF}_{\mathrm{i,j,t-12}} \times \mathrm{SUP}_{\mathrm{j,t}} + \omega\mathrm{CCR}_{\mathrm{i,j,t}} + \boldsymbol{\theta}\mathbf{X}_{\mathrm{i,j,t-12}} + \boldsymbol{\vartheta}\mathbf{Z}_{\mathbf{j,t-12}} + \mathbf{In_i} + \\ \mathbf{CO_j} + \mathbf{Y_t} + \varepsilon_{\mathrm{i,j,t}} \qquad (2)\end{aligned}$$

$FF_{i,j,t-12}$ is a dummy variable for the financial flexibility status measured in the previous fiscal year. A firm is financially flexible (FF firm) if its cash balance is at the top quartile of the previous year's industry-specific cash distribution and leverage is at the bottom quartile of the previous year's industry-specific leverage distribution. Otherwise, we consider such firms as FIF firms.[8,9] The key variables of interest are the interaction terms between *FF* and sovereign rating shocks ($FF_{i,j,t-12} \times SDWN_{j,t}$, and $FF_{i,j,t-12} \times SUP_{j,t}$).

[8] To calculate the annual industry-specific distributions of cash and leverage, we use our initial pre-screened dataset of all European firms reporting annual cash and leverage from 2004 to 2021. Our lagged variables including $FF_{i,j,t-12}$ are calculated using values from 2004 since our sample begins in 2005.

[9] For robustness test, we re-estimate Eq. (2) whereby a firm is considered as FF firm if its cash balance (leverage) is at the top (bottom) tercile as well as 20th percentile of the previous year's industry-specific cash (leverage) distribution. The results are consistent and available on request.

3.3. Data sample and Descriptive analysis

Our sample includes monthly long-term foreign currency ratings, outlooks and watches assigned by S&P to sovereigns, public and private non-financial firms in 20 European countries during the period 2005-2022. The rating data is collected from the S&P Rating Direct database. S&P is chosen as it provides the largest coverage of sovereign and corporate ratings in Europe (ESMA 2018). The selected 20 countries have the largest corporate ratings' coverage across Europe. Further, we use S&P Capital IQ database to identify firms as private or public firms. The selection criteria for public and private firms requires that the firm's headquarter is in one of the 20 European countries included in our sample. The firms must also have their S&P corporate ratings as well as their *CASH*, *LEVERAGE* and other accounting data available during our sample period. We exclude financial firms because the capital structure and the methodology for determining ratings for these firms are distinct from those for non-financial firms.[10]

Table 1 lists all 20 European countries, the number of public firms and private firms in each country. The sample includes 403 public and 337 private firms, with 62,415 firm-month observations during 2005-2022. These entities are unevenly distributed across 20 countries, with firms in United Kingdom and France collectively accounting for 38% of the entire dataset. Countries with less than 10 firms are Austria, Bulgaria, Denmark, Finland, Portugal, and Ukraine.

[Insert Table 1 here]

Figure 1 presents the distributions of sovereign and corporate rating levels in our sample. In general, the distribution of corporate ratings is symmetric and widely dispersed (Figure 1a). Ratings of firms below the investment-speculative threshold are generally within two broad categories (BB and B). This is in sharp contrast with the distribution of sovereign credit ratings which is positively skewed (Figure 1b). Figure 1b shows that most of the sovereign ratings in Europe are at the

[10] Unlike non-financial firms, financial institutions are required by the capital adequacy regulations to hold minimum equity capital on their balance sheet. They might also be induced to increase capital due to market forces such as competition in the credit market (Allen et al. 2011). CRAs develop separate sets of criteria to determine ratings of financial institutions. For example, S&P considers four bank-specific metrics in determining a bank's credit profile (S&P 2022).

investment grade category, suggesting that they are high-income economies. However, there are clear signals of deteriorating sovereign risk in this region.

[Insert Figure 1 here]

Figure 2 shows that the intensity of negative sovereign rating actions increases steadily after the outbreak of the 2007 global financial crisis and peaks in 2011 and 2012 after the Greek public debt problem unfolds. Starting in 2015, sovereign risk in Europe experiences a tranquil period because there were more positive than negative sovereign rating actions. This positive trend ends in 2020 when the COVID-19 pandemic causes fear of a bleak outlook for the world economy. Negative sovereign rating actions increase again in 2022, mostly dominated by several rating downgrades of Russia and Ukraine when the conflict between the two countries escalated.

[Insert Figure 2 here]

Figure 3 shows the distribution of corporate rating actions by CCR points. Although corporate rating changes in Europe are irregular, there are 3,670 firm-months in which corporate ratings are upgraded or downgraded, which accounts for approximately 5.9% of the full sample. There are 1,978 (53.9%) negative corporate rating actions. Figure 3 shows that the majority (86%) of the overall downgrades are within 3 CCR points.[11]

[Insert Figure 3 here]

Panel A of Table 2 provides the variables' definitions and summary statistics of the full sample.[12] The accounting variables of public firms are obtained from Compustat while the private firms are sourced from S&P Capital IQ database. Macro-economic indicators are collected from the World Bank and IMF databases. The average corporate rating is 31 CCR points (BBB-/Baa3). The average values of firm accounting ratios are in line with this since the average interest coverage ratio is 5.2, the average profitability (ROA) is 8.0% and the average proportion of tangible assets

[11] Most of rating downgrades of 18 CCR points or more by S&P are for Russian firms operating in energy and manufacturing sectors. They are 19 downgrades to near default rating (CCC-/CC) from BBB- or BB+ for Russian firms in March 2022, shortly after the Russia's invasion of Ukraine. Another downgrade by 18 CCR points (to CC from B+ with negative outlook) is for a UK-based firm, Britannia Bulk PLC, in October 2008.

[12] All continuous control variables including cash and leverage are winsorised at 1% and 99% to remove outliers.

to total assets is 43.9%. However, these average values come with large standard deviations, which is driven by firms in defaults (1 CCR). Firms reporting operating losses are present in the sample since ROA and interest coverage ratios can fall below zero. A typical European firm in our sample has 7.4% liquid assets (standard deviation of 7.8%) and 35.4% debt (standard deviation of 22.2%) relative to their total assets' values. The quality of governments in these countries is good as reflected by a high average corruption index score (1.43).

Panel B of Table 2 reports the summary statistics for FF versus FIF firms. Firms are classified as FF firms at given year, based on their cash and leverage positions during the sample period (see Section 3.1). The number of firm-months observations in which firms are classified as FF firms is 4,112, which accounts for 6.59% of the full sample. A typical European FF (FIF) firm in our sample has 14.6% (6.9%) liquid assets and 13.8% (37.0%) debt relative to their total assets. We use the joint criteria of cash and leverage according to our dummy variable approach to identify FF firms. In general, FF firms tend to be larger in size than FIF firms since the median asset value of FF firms is significantly higher than that of FIF firms. The median interest coverage ratio of FF firms is also significantly higher than that of FIF firms, implying the formers' stronger capacity to repay debt. Yet, FF firms have less tangible assets that can be pledged to secure new debt. The mean ROA values suggest that FF firms perform better than FIF firms, but the median ROA values show that there is not a noteworthy difference in the operating performance between the two types of firms.

We report the summary statistics for public firms versus private firms in Panel C of Table 2. In our sample, a typical European private (public) firm has 1.5% (9.7%) liquid assets and 47.5% (30.6%) debt relative to their total assets. Public firms are assigned higher corporate ratings than private firms by up to 7 CCR points (equivalent to two notches). This could be partially explained by public firms being larger (total assets), having more liquid assets (cash), having less debt (total leverage) and being more profitable (ROA) than private firms. However, public firms have fewer tangible assets relative to total assets compared with private firms. Our data lends support to the

notion that private firms are more financially constrained than public firms, suggesting that private firms benefit more from the flexibility policy than their public counterparts.[13]

[Insert Table 2 here]

4. EMPIRICAL RESULTS

4.1. Baseline results

The estimation results of Eq. (1) are reported in Table 3. Columns (1) - (3) present the coefficient estimates using cash and leverage as proxies of financial flexibility. Columns (4) - (9) report the results of Eq. (1) using either cash or leverage. In Columns (1), (4), (7), we add the industry fixed effects $\boldsymbol{In_k}$, country fixed effects ***Co*** and year fixed effects ***Y***. In Columns (2), (5) and (8), we use the interacted ***Co*Y*** fixed effects and remove all the macro-economic controls to avoid perfect collinearity, which is in line with Jiménez et al. (2012). In Columns (3), (6) and (9), firm fixed effects ***J*** and year fixed effects ***Y*** are used.

Similar to Borensztein et al. (2013), we find that corporate ratings respond to sovereign rating changes in an asymmetric manner. In particular, the coefficient on $SDWN_{j,t}$ is larger in magnitude than that on $SUP_{j,t}$ in all estimations. The results confirm the sovereign ceiling impact. Our key variables of interest are the interaction terms between sovereign rating shocks (sovereign rating downgrades and upgrades) and the financial flexibility variable. The coefficients of $CASH_{i,j,t-12} \times SDWN_{j,t}$ are positive and significant in all estimations (Columns (1) - (6)), while the coefficients of $LEV_{i,j,t-12} \times SDWN_{j,t}$ are negative and significant in Columns (2) and (8). Consistent with our expectations, the results imply that corporate ratings of cash-rich firms and underleveraged firms decrease less compared with ratings of cash-poor firms and highly leveraged firms when sovereign ratings are downgraded. In other words, FF firms are better at coping with the spillover of sovereign risk. Column (2)' results show that when sovereign rating is downgraded, a corporate rating increases by 0.177 CCR points if the firm's cash position in the previous year increases by one

[13] In all estimations, we use *Firm Size* control variable to control for the effects of firm size. Also, see Table 2 for the list of firm characteristics' control variables in all regressions.

standard deviation (2.265×0.078 = 0.177) and it increases by 0.120 CCR points if the firm's leverage in the previous year decreases by one standard deviation (-0.541×-0.222 = 0.120). This result implies that the sensitivity of corporate ratings to sovereign ratings is mitigated by improving financial flexibility (i.e., cash increases and leverage decreases). In addition, we find that the financial flexibility works best via the cash-stockpiling channel since the coefficients' magnitude of the interaction term $CASH_{i,j,t-12} \times SDWN_{j,t}$ are always larger and more significant than $LEV_{i,j,t-12} \times SDWN_{j,t}$ coefficients. Further, the effect of financial flexibility is significant only in the case of deteriorating sovereign credit quality (i.e., sovereign downgrades), and yields insignificant results for sovereign rating upgrades (see $LEV_{i,j,t-12} \times SUP_{j,t}$). Besides, the negative coefficients of $CASH_{i,j,t-12} \times SUP_{j,t}$ suggest that holding a large cash reserve does not help increasing corporate ratings when sovereign ratings are upgraded (Columns (1) - (3) of Table 3).

In Columns (4) - (9) of Table 3, we examine the effects of cash separately from leverage. In Columns (4) - (6), we measure flexibility with cash and find that the spillover effect of sovereign rating downgrades on corporate ratings becomes weaker when cash increases. Although the coefficient of $SDWN_{j,t}$ in Columns (4), (5) and (6) of Table 3 is negative and significant at the 1% level, $CASH_{i,j,t-12} \times SDWN_{j,t}$coefficient is positive and significant at least 5% level or above. This finding is consistent with our expectation that increasing cash balance in the previous period reduces the negative influence of sovereign rating downgrades on corporate ratings.

In Columns (7) - (9) of Table 3, we replace $CASH$ with LEV as the proxy of financial flexibility and find that borrowing conservatively is beneficial in the sovereign rating downgrade scenarios. Similar to Columns (1) - (3) of Table 3, the coefficients of $LEV_{i,j,t-12} \times SDWN_{j,t}$ are negative and significant in Column (8), implying that the negative spillover effects of sovereign downgrades on corporate ratings become less severe and might turn negligible when leverage decreases. Similar to cash, keeping leverage low does not help firms increase ratings further when sovereign ratings are upgraded because the coefficients of $LEV_{i,j,t-12} \times SUP_{j,t}$ are not statistically significant.

Consistent with most studies on ratings, such as Baghai et al. (2014), Cornaggia et al. (2017), Bhandari and Golden (2021), the coefficients of *LEV* are negative and significant in specifications (3) and (9) only (see Table 3). In contrast to Baghai et al. (2014), who find that corporate ratings tend to be lower in cash-rich firms, we do not find a statistically significant effect of $CASH$ on corporate rating signals.[14] This suggests that financial flexibility itself may not help firms improving their corporate ratings unless firms encounter a systemic negative shock whereby the financial flexibility's moderating effect on corporate ratings is most evident.[15] Regarding other firm-specific variables, ratings are positively related to firm size and profitability in most model specifications. CCR is negative and statistically significant across all specifications, suggesting that firms with higher rating levels have less room to be upgraded and vice versa.

Overall, the results of our baseline model (Eq. (1)) in Table 3 provide a strong support for Hypothesis 1 but do not support Hypothesis 2. Cash and the spare debt capacity accumulated during previous periods provide the cushion needed to absorb the likely unwanted consequences of sovereign rating downgrade risks. Notably, cash provides a stronger cushion against sovereign downgrade risk than leverage. The results reveal a weaker impact of negative credit sovereign signals on corporate ratings for FF firms than for FIF firms. However, the probability that ratings of FF firms increase more in the context of sovereign rating upgrades is small. In this respect, our findings contradict Agha and Faff's (2014) results that FF firms' cost of capital and investment benefit from corporate rating upgrades, but they are immune to downgrades by CRAs.

[Insert Table 3 here]

[14] Baghai et al. (2014) find that ratings tend to be low in cash-rich firms. This might be explained by their sample of only public firms where the agency cost is high. Our sample includes both private firms and public firms.

[15] Our dependent variable $\Delta CCR_{i,j,t}$ is the corporate rating change and not level of corporate ratings which may explain the insignificant coefficients of *LEV*, *CASH* and *FF* in some estimations in Tables 3-10. Our key variables of interest are the interaction terms between financial flexibility variable and the sovereign rating shocks, and therefore one should be cautious in interpreting the (in)significance of the standalone measures of financial flexibility.

4.2. Crises' periods

The baseline analyses presented in Table 3 support Hypothesis 1 regarding the mitigating effect of financial flexibility in worsening sovereign risk scenarios (sovereign rating downgrades), while rejecting Hypothesis 2 regarding its aggravating effect in strengthening sovereign risk scenarios (sovereign rating upgrades). Therefore, we conduct further investigation into the mitigating effect of financial flexibility under a systemic negative shock scenario, such as the 2010-2012 European sovereign debt crisis. The literature highlights a positive impact of financial flexibility on corporate investments during market turbulence such as the global financial crisis (Duchin et al. 2010) and the 1997 Asian currency crisis (Arslan-Ayaydin et al. 2014). To examine the value of the financial flexibility policy for corporate risk in a sovereign risk crisis, we estimate Eq. (1) using the subperiod of the 2010-2012 European sovereign debt crisis and report the results in Panel A of Table 4. Consistent with our expectations, the coefficients of $CASH \times SDWN$ and $LEV \times SDWN$ are significant with expected signs and have larger magnitudes than those reported in Table 3. The corporate ratings of cash-rich and underleveraged firms are more resilient to the negative spillover of sovereign rating downgrades during the crisis than those of cash-poor and highly leveraged firms. Our results are robust to the inclusion of different fixed effects as well as firm-specific risk-relevant determinants and economic fundamentals. In this respect, our analyses supplement original insights from Bedendo and Colla (2015) on the contagious effects of sovereign risk on corporate risk in European countries.

The 2020-21 COVID-19 pandemic poses several challenges to the public finance policy worldwide as the sovereign debt rose to record-high levels and government spending on stimulus packages increased rapidly in many countries in Europe, which has led to an increase in the countries' sovereign risk. Examining the effect of COVID-19 infections on sovereign risk proxied by the sovereign CDS premium, Augustin et al. (2022) show a positive and significant relation between the speed of COVID-19 infections and sovereign risk, particularly in countries that face fiscal constraints. Our sample paints a heterogenous picture about the fiscal capacity across 20

European countries. This can be characterised by a large variance of total government debt (relative to GDP) and fiscal balance (relative to GDP). Therefore, we investigate whether firms are better shielded against the negative external shock of COVID-19 pandemic. Specifically, we estimate Eq. (1) for 2020-21 sub-period and report the results in Panel B of Table 4. Similar to the European sovereign debt crisis, FF firms' ratings are less affected by negative sovereign rating actions than FIF firms' ratings. The mitigating effect of financial flexibility on firm risk during the COVID-19 pandemic works best via the cash-building channel, since the interaction term $CASH \times SDWN$ coefficients are larger and remain significant, whereas than $LEV \times SDWN$ do not (Columns (3) - (4) of Table 4).

In Columns (5) and (6), we add *GOVRES* variable, which is a country-level index that measures various policies and actions taken by governments to combat the adverse consequences of COVID-19 to the economy, to Eq. (1). *GOVRES* is the monthly average of the daily Oxford Coronavirus Government Response Tracker OxCGRT Index obtained from Hale et al. (2021). The index takes values between 0 and 100 whereby 100 indicates the government's most comprehensive responses. The results show that the coefficients of $GOVRES \times SDWN$ are positive and statistically significant, indicating that the governments' counter measures against COVID-19 offer a shield against the spillover risk of sovereign rating downgrades to corporate ratings. Importantly, we still observe a strong shielding effect of financial flexibility policy through stockpile cash channel (positive and significant coefficients of *CASH* × *SDWN*) even after controlling for the potential confounding effect of governments' counter measures.[16]

Prior studies (e.g., Duchin et al. 2010) have shown that FF firms with financial slack are better at preserving investment capacity during the global financial crisis than FIF firms without financial slack. Since Duchin et al. (2010) do not consider firm risk, we fill this gap by examining the mitigating effects of financial flexibility on firm ratings during all crises in our sample period.

[16] Unreported results (available on request) show positive and significant coefficients for the triple interaction term (*CASH* × *GOVRES* × *SDWN*), suggesting that ratings of FF firms, who also benefit from the governments' most comprehensive efforts to contain the negative influence of COVID-19 pandemic, are less likely to be downgraded when a sovereign rating downgrade occurs.

Specifically, we estimate Eq. (1) for a sub-sample consisting of the global financial crisis (2007-2009), the European sovereign debt crisis (2010-2012), the COVID-19 pandemic (2020-2021) and the Russia-Ukraine conflict (2022). Our results are reported in Panel C of Table 4. Consistent with our expectations, we provide evidence supporting the significant mitigating effects of financial flexibility on the sensitivity of corporate ratings to sovereign rating downgrades. In addition, the results highlight that the financial flexibility works better through the cash-accumulation channel than through leverage conservation channel ($CASH \times SDWN$ coefficients are larger in magnitude than $LEV \times SDWN$ coefficients).

We also estimate Eq. (1) for the sub-sample of tranquil period, which excludes all the crises' periods that are used in Panel C. Our results of non-crises' periods are reported in Panel D of Table 4. Although there is evidence that FF firms with a large cash balance are less likely to be downgraded than FIF firms during normal periods, the evidence is weaker and less pronounced than during crises' periods ($CASH \times SDWN$ coefficients during non-crises' time are much smaller in magnitude and less significant (see Columns (10) - (12)) than the coefficients in Panels A, B and C of Table 4). In general, Table 4 supports Hypothesis 1, especially during an external regional shock (the European sovereign debt crisis) as well as a global shock (the COVID-19 pandemic), implying that financial flexibility is suited for becoming an effective shield for firms' ratings against crises.

[Insert Table 4 here]

In Table 5, we report the results of Eq. (2) using the FF dummy variable. Since the identification strategy of FF dummy variable is more stringent than the continuous cash and leverage ratios, there are less firm-months satisfying the condition of being classified as FF firms. The results of Eq. (2) are consistent with the results of Eq. (1). The coefficients of our key variable of interest $FF \times SDWN$ are positive and significant across all specifications. This implies that the likelihoods of corporate rating downgrades following sovereign rating downgrades are lower among FF firms than among FIF firms. This effect is more pronounced during the European sovereign debt crisis

(Panel B), all crises (Panel C) than during normal times (Panel D). Specifically, following sovereign ratings downgrades, a FIF firm rating decreases by 0.675 CCR points while the ratings of FF firms decrease by 0.03 CCR points (-0.675+0.645=-0.03, Column 3, Table 5). We find similar results during the sovereign debt crisis in Columns (4) - (6) of Table 5. For example, in Column (6) of Table 5, FIF corporate ratings decrease by 0.397 CCR points, but the decrease is less severe for FF firms (-0.397 + 0.312 = -0.085 CCR points). It implies that sovereign risk during the debt crisis impairs corporate risk regardless of the FF policy, but it is less pronounced among FF firms. The results reported in Table 5 confirm that the value of financial flexibility is evident in times of deteriorating sovereign creditworthiness but show little value in times of strengthening sovereign creditworthiness. Further, we find a significant difference between crises and non-crises periods since $FF \times SDWN$ coefficients are larger during the European sovereign debt crisis (Panel B) and all crises (Panel C) than during the non-crises' periods (Panel D).[17]

[Insert Table 5 here]

4.3. High income versus GIIPS countries

The corporate risk increases due to increasing sovereign risk in Europe is likely to be most evident in GIIPS because these countries are at the epicentre of the 2010-2012 European debt crisis and their public debt problem presents the most serious concern. We estimate Eq. (1) and Eq. (2) separately for GIIPS and for high-income European countries excluding GIIPS.[18,19] Our expectation is that sovereign risk's transmission to corporates is stronger in GIIPS, and the mitigating effects of financial flexibility are more pronounced in GIIPS countries than in high-income European countries. Results obtained from both Equations are consistent with each other.

[17] There are no firms satisfying our joint conditions of cash and leverage to become financially flexible following a sovereign rating downgrade during the COVID-19 pandemic (2020-2021). Therefore Table 5 does not report estimation results of Eq. (2) for the COVID-19 period.

[18] We identify high-income countries in accordance with the World Bank's income classification. The sub-sample excludes GIIPS, Russia, Bulgaria and Ukraine.

[19] We also estimate Eq. (1) and Eq. (2) for Eurozone countries only (11 countries in our sample). Results (available on request) are consistent, particularly with results of the GIIPS countries and the European sovereign debt crisis sub-samples' estimations.

For brevity, we report the results of Eq. (2) in Table 6.[20] Consistent with Augustin et al. (2018), Table 6 shows that sovereign risk exerts a significant influence on corporate risk across the European countries. The magnitude of their effects is large and economically meaningful especially for GIIPS. We find clear evidence for an asymmetry in the power of risk transmission from sovereigns to corporates in GIIPS countries between sovereign downgrades and sovereign upgrades, whereby the influence of downgrades is larger in magnitude than the influence of upgrades. The marginal effects of sovereign downgrades on corporate ratings in GIIPS are larger than in high-income European countries, which is consistent with our prediction. This result is not unexpected given that the concerns for sovereign defaults in Europe are triggered by the deteriorating public debt problem in GIIPS, especially Greece.

With regards to financial flexibility, the coefficient of $FF \times SDWN$ is significant across both sub-samples, suggesting that financial flexibility is beneficial for corporate ratings in GIIPS as well as in other high-income European countries. However, the larger magnitude of the coefficients on $FF \times SDWN$ in the GIIPS' sub-sample would suggest greater benefits. In summary, Table 6 shows that financial flexibility brings the largest value for corporate risk in countries severely hit by the European debt crisis (GIIPS) though it is valued by all firms regardless of the country of domicile.

[Insert Table 6 here]

4.4 Further sub-sample analyses

To further exploit our rich dataset, we explore whether the role of financial flexibility in sovereign-corporate rating nexus varies among countries with different economic, political and creditworthiness conditions as well as across larger versus smaller firms. We conduct several sub-sample analyses and report the results in Table 7.

[Insert Table 7 here]

[20] The results of Eq. (1) are available upon request.

In our sample, some countries have not experienced any sovereign rating changes during the sample period[21], while other countries have received multiple-notch sovereign rating downgrades due to the rapid deterioration of their creditworthiness. In our sample, there are 1227 negative and 838 positive sovereign rating signals. The majority (82%) of negative sovereign rating actions are by one notch (3-CCR points or below), while there are 217 multiple-notch (>3-CCR points) negative signals.[22] Amongst the positive actions, only two are by more than one-notch (>3-CCR). Therefore, we estimate the Eq. (1) and (2) for the following sub-samples, (i) countries which experienced multiple-notch sovereign rating actions (Column 1), (ii) countries which experienced one-notch sovereign rating actions (Column 2), and (iii) excluding countries which have not experienced rating actions during the sample period (Column 3).

The results confirm the mitigating effects of financial flexibility on the sensitivity of corporate ratings to sovereign rating downgrades for firms in all sub-samples. However, the impact is more pronounced for FF firms in countries which experienced multiple-notch than one-notch negative sovereign rating actions, with much larger magnitude for the coefficients of $CASH \times SDWN$ and $FF \times SDWN$ being observed in the results reported in Column (1) than Column (2) of Table 7. This implies that firms benefit more from financial flexibility in times of severe sovereign rating downgrades which typically have stronger impact on non-sovereign credit ratings (e.g., Alsakka at al. 2014). Also, the results confirm that the financial flexibility works better through the cash-accumulation channel than through leverage conservation channel.

It is also possible that the relative firm size might influence our estimations. According to Financial Conduct Authority (FCA), 98% of our firms are considered large firms. Nevertheless, we split our sample in terms of the size according to its distributional properties. Columns (4) and (5) of Table 7 report the results for larger firms versus smaller firms than the median (9.328 billion

[21] Countries which have not experienced any sovereign rating changes in our sample are Denmark, Norway, Sweden and Switzerland.

[22] There are limited number (20) of sovereign rating downgrades by three notches or more (>8-CCR points) in our sample.

USD). In our sample, there are 281 firms with asset value larger than the median, and 459 firms with asset value smaller than the median.[23] The results are consistent with our prior findings. The role of financial flexibility, particularly via cash-stockpiling channel, in sovereign-corporate rating nexus is slightly more pronounced for smaller than larger firms. This implies that smaller firms, which normally have a more constrained financial policy, benefit more from financial flexibility than larger firms.[24]

4.5. Private firms versus public firms

We investigate whether the impact of financial flexibility on the sovereign-corporate risk nexus varies across private versus public firms. Brav (2009) argue that private firms are exposed to higher cost of equity due to market frictions including the value of corporate control and the level of information asymmetry. Financially fragile privately held firms in Europe face significant investment distortions when cost of capital increases (Carluccio et al. 2023). Private firms have more constrained financial policy than their public counterparts. Therefore, they tend to finance investments more with debt than with equity and stockpile more cash in good times for precautionary motives. We contend that, when confronting a high cost of private equity, building financial flexibility becomes more costly for private firms. This is because these firms are in a weaker position to issue equity, hence tend to save more cash out of current cashflows to achieve financial flexibility status (Asimakopoulos et al. 2019). Although private firms need to use more debt than equity in their capital structure, the access to debt financing is more costly for them. Hence, the borrowing capacity of private firms is more constrained, while a unit of spare debt capacity becomes more valuable. Schoubben and Van Hulle (2011) show that private firms in

[23] FCA defines small and midsize enterprises (SMEs) as firms with a market capitalisation below £200 million (Fu et al. 2023).

[24] We also estimate Eq. (1) and Eq. (2) for firms at the top quartile (131 firms with asset values of more than 28.820 billion USD) versus firms at the bottom quartile (387 firms with asset values of less than 2.652 billion USD). Results (available on request) are consistent, highlighting that the smallest FF firms are slightly better at coping with the spillover of sovereign risk than the largest FF firms.

Belgium face a less flexible debt financing than public firms especially under the pressure of high hedging needs. This means private firms are less financially flexible than public firms. Hence, we argue that the value of financial flexibility is greater for private than public firms. It follows that private firms, once achieved financial flexibility status, benefit more from the policy compared with their public counterparts. Investigating the value of financial flexibility for investment capacity in European firms, Ferrando et al. (2017) show that this is the case.

To examine whether the value of financial flexibility policy for corporate risk is larger in private firms than in public firms, we estimate Eq. (1) and Eq. (2) using sub-samples of private firms and public firms separately. We present the estimation results of Eq. (1) in Table 8 and those of Eq. (2) in Table 9. In each table, Columns (1) - (3) report the results for public firms, while Columns (4) – (6) display the results for private firms. Overall, the findings confirm the robustness of our baseline results concerning the asymmetric effects of sovereign risk on corporate risk as well as the value of financial flexibility in the deteriorating sovereign default risk scenarios.

Our results support our prediction regarding private firms. In Table 8, the coefficients of $CASH \times SDWN$(Columns (4), (5) and (6)) and $LEV \times SDWN$ (Column (5)) are significant with expected signs for private firms, yet insignificant for public firms (Panel A). On the other hand, the coefficient of $FF \times SDWN$ in Table 9 is significant for both types of firms, yet larger in magnitudes for private firms. Results from both Eq. (1) and Eq. (2) give strong empirical evidence to support our prediction that private firms, who are disadvantaged by a more constrained financial policy, tend to gain more value from financial flexibility than their public counterparts. They also corroborate findings of Ferrando et al. (2017) and Chortareas and Noikokyris (2021). Further, the results of Tables 8 and 9 also confirm that building financial flexibility status does not lead to higher corporate ratings when sovereign ratings are upgraded.

[Insert Table 8 here]

[Insert Table 9 here]

In order to investigate whether our results are specific to GIIPS, we estimate Eq. (1) and Eq. (2) separately for private firms and public firms and split them across high-income European countries versus GIIPS. Our results are presented in Table 10. Since there are no private firms in GIIPS countries fulfilling the conditions of being classified as FF firms under Eq. (2), the results of Eq. (2) are reported for high-income European countries only.

In general, Table 10 supports Hypothesis 1 about the mitigating effects of financial flexibility on the corporate risk - sovereign risk relationship, which is more pronounced for private firms. Notably, we find that this is not specific to GIIPS but also holds in high-income European countries. Specifically, the coefficients $CASH \times SDWN$ and $LEV \times SDWN$ for private firms in high-income European countries are significant (Panel A of Table 10), while they are not statistically significant ($LEV \times SDWN$) or have incorrect signs ($CASH \times SDWN$) for public firms (Panel A of Table 10). In Panel B of Table 10, the coefficients of $FF \times SDWN$ in high-income European sovereigns are significant with correct signs for private firms, but insignificant for public firms. In GIIPS countries, we find similar results. The coefficient of $CASH \times SDWN$ for private firms are significant with expected signs (Columns (7) - (8)), yet insignificant for public firms (Columns (5) - (6)). The results in Table 10 support our prediction that private firms benefit more from financial flexibility status than do the public counterparts. Further, the coefficient of $LEV \times SDWN$ is not significant in GIIPS sub-sample while it is significant in other high-income European countries (Panel A). On the other hand, $CASH \times SDWN$ coefficient is significant for private firms in both GIIPS and in high-income European countries, but with larger magnitudes in GIIPS countries. This suggests that, compared with conserving borrowing capacity, hoarding cash becomes the preferred means of achieving financial flexibility for private firms, especially private firms in GIIPS. Our results are consistent with the literature on financing and liquidity policy of private firms in Europe such as Ferreira and Vilela (2004), Brav (2009), Asimakopoulos et al. (2019).

[Insert Table 10 here]

5. CONCLUSIONS

In this paper, we examine the impact of sovereign credit rating changes on the ratings of non-financial firms operating within the jurisdiction of the sovereign. As sovereign risk increases, it poses a threat to the risk of corporates through various channels linking them to their domestic governments.[25] Given the significant influence of sovereign risk on corporate risk, we investigate whether a financial flexibility policy can mitigate the severity of this contagion risk. We refer to this as the "mitigating effect" of financial flexibility. Additionally, we examine whether the ratings of financially flexible firms (FF firms) increase more than those of financially inflexible firms (FIF firms) when sovereign credit ratings improve.

Prior studies have shown that FF firms are better than FIF firms at enhancing investment capacity despite external shocks. However, our paper addresses an important void in research by investigating how credit risk of FF firms compared to FIF firms is affected by sovereign risk shocks. Using a cross-country panel dataset of 740 firms in 20 European countries from 2005-2022, we show that financial flexibility is beneficial for firms' credit ratings when sovereign risks increase (i.e., sovereign ratings decrease), which is particularly prevalent during times of severe sovereign rating downgrades, the European sovereign debt crisis and the COVID-19 pandemic. The ability of corporate ratings to withstand negative shocks from sovereign rating downgrades is stronger in GIIPS countries which were most affected by the European sovereign debt crisis, though it holds true across Europe regardless of the country of domicile. The shielding effects of financial stability persist alongside the similar shielding mechanism related to the government's support and policies to mitigate the adverse consequences of COVID-19 to the economy. Further, private firms, which typically have a more constrained financial policy, benefit more from financial flexibility than publicly listed firms. Notably, for private firms in GIIPS, hoarding cash appears to be the preferred strategy to mitigate sovereign downgrade risks. However, it is important to note that while financial

[25] See Augustin et al. (2018) for details about the linking channels.

flexibility can effectively shield ratings against adversity, it is not enough for firms hoping to increase their ratings when conditions become favourable (e.g., when sovereign ratings increase).

Our study presents novel empirical findings that have important implications for corporate risk management practice, governments, and regulators. We highlight the importance of financial flexibility as a tool for firms to manage the challenges of deteriorating sovereign credit quality, particularly for firms located in countries with significant public debt issues. Corporate managers should also be aware that that the financial flexibility works better through the cash-accumulation channel than through leverage conservation channel. Further, in setting domestic legislations and regulatory updates of rating industry, policy makers and regulators should take into consideration the important links between sovereign risk and corporate risk. Financial flexibility is also beneficial from a policy perspective, as it can help governments avoid costly policy measures during negative events and turbulence periods. For example, during the 2020 COVID-19 pandemic, sovereign risk increased significantly, especially in countries with weak fiscal space (Augustin et al. 2022). The cost of policy measures required to protect welfare during such negative shock increases inevitably. Therefore, if more firms are well-prepared for this shock by preserving financial flexibility, it will result in less cost to the governments' budget balances.

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Figure 1a: Corporate Rating Distribution 2005 - 2022

Figure 1b: Sovereign Rating Distribution 2005 - 2022

Figure 1: The distribution of corporate and sovereign credit ratings in Europe in the period February 2005- December 2022.

Figure 2: Sovereign rating actions in Europe 2005 - 2022

Figure 2: Sovereign rating actions of 20 European countries in the period February 2005- December 2022.

Figure 3: Distribution of corporate rating changes

Figure 3: Comprehensive credit rating (CCR) changes of 740 firms in 20 European countries in the period February 2005- December 2022.