



# SME access to market-based finance across Eurozone countries

Paola Bongini · Annalisa Ferrando ·  
Emanuele Rossi  · Monica Rossolini

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**Abstract** This paper provides an in-depth analysis of small and medium enterprise (SME) access to capital markets across Eurozone countries. First, we determine which factors—at firm and country level—influence the likelihood of SME access to market-based finance. Second, we construct an index of *market suitability* to indicate the percentage of firms potentially fit for market-based finance. Our results suggest that while several Eurozone countries have realised SMEs’ ‘potential’ for capital market financing, a large number of firms fit for market-based finance remain unexploited. We also find that overall business conditions—measured by GDP growth, the development degree of domestic financial markets and the quality of the legal and judicial enforcement system—considerably influence a firm’s market suitability. In the studied period (2009–2014), macro-economic and institutional factors

tended to reduce the likelihood of SMEs accessing market-based finance in most countries in our sample.

**Keywords** Market-based finance · SME financing · Eurozone · Capital markets union

**JEL** G10 · G23 · G32

## 1 Introduction

It is widely known that small and medium enterprises (SMEs) face more obstacles in gaining access to finance and are consequently characterised by less diversified funding sources than large firms. Their financial structure is more dependent on bank loans, due to asymmetric information problems, agency risks, shorter operating track records and insufficient collateral (Jaffee and Russell 1976; Stiglitz and Weiss 1981; Berger and Udell 2006). The last financial crisis, characterised by pervasive rationing of credit provision, has disrupted SMEs’ business and investment activities (Ferrando and Grieshaber 2011; ECB 2014; Ferrando and Ruggieri 2018). This explains the recent boom in research on SME funding, especially in the Eurozone, where SMEs represent the backbone of the economy: the majority of Eurozone firms are SMEs, and they employ more than half of the labour force while generating around 60% of value added (European Commission 2017a).

Most of this research has focused on formal bank lending and the availability of other forms of credit, such as trade credit, leasing, factoring and other loans from a

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P. Bongini · E. Rossi (✉) · M. Rossolini  
Department of Business and Law, University of Milano-Bicocca,  
Via Bicocca degli Arcimboldi 8, 20126 Milan, Italy  
e-mail: emanuele.rossi@unimib.it

P. Bongini  
e-mail: paola.bongini@unimib.it

M. Rossolini  
e-mail: monica.rossolini@unimib.it

A. Ferrando  
European Central Bank, Sonnemannstraße 20, 60314 Frankfurt  
am Main, Germany  
e-mail: annalisa.ferrando@ecb.europa.eu

related company or family and friends (Love et al. 2007; Ferrando and Griesshaber 2011; Canton et al. 2013; Casey and O'Toole 2014; Holton et al. 2014; Moro et al. 2016; Andrieu et al. 2018; McGuinness et al. 2018; Palacín-Sánchez et al. 2018; Mol-Gomez-Vasquez et al. 2019). Another stream of empirical studies has explored European SME funding diversification and financing patterns (Hall et al. 2004; Daskalakis and Psillaki 2008; De Jong et al. 2008; Psillaki and Daskalakis 2009; Lawless et al. 2015; Moritz et al. 2016; Masiak et al. 2019). These studies have revealed that the percentage of firms using market-based financial instruments (i.e. debt securities, external equity) to fund their business remains small, in spite of the difficulties encountered with their traditional funding source (i.e. bank lending) and in spite of the many subsequent efforts to set up a capital markets union (CMU) to facilitate SME fundraising and the financing of start-ups and non-listed companies (European Commission 2015a, 2015b, 2016a). Increased SME access to market-based finance is considered crucial for better diversification of funding sources and avoiding over-reliance on bank lending, especially during a credit crunch or intensified period of bank risk aversion. However, it remains unclear how and under what circumstances SME access to market-based funding can be improved. As this issue has not been addressed in the literature, we aim to fill this research gap by comprehensively analysing the factors that facilitate SME access to market-based funding and also to what extent Eurozone SMEs are potentially suitable for this source of funding across firm size, sector and country.

Specifically, we address two main research questions:

- a) What factors—at the firm and country level—might influence the likelihood of SMEs gaining access to market-based finance?
- b) What proportion of firms is suitable for market-based finance at firm size, sector and national level?

We define market-based finance to include both the going-public option (access to a public market, bond or equity) and the private placement channel, through which a firm can raise new equity or issue bonds. In the Eurozone context, we have strong evidence that the private placement channel has recently become more frequently used as an option for financing growth,

thanks to the renewed involvement of venture capital and private equity funds<sup>1</sup> (Goncalves and Lehmann 2019). From this perspective, our study also contributes to the existing literature on capital market funding by simultaneously considering the determinants of access to public markets (as in Ritter 1987; Mikkelsen et al. 1997; Pagano et al. 1998; Pagano and Röell 1998; Chemmanur and Fulghieri 1994; Chemmanur and Fulghieri 1999; Denis and Mihov 2003; Hale and Santos 2008; Mizen et al. 2009; Gao et al. 2013; Ritter et al. 2013; Badoer and James 2016; Ewens and Farre-Mensa 2018) and to private placements (as in Diamond 1991; Carey et al. 1993; Fenn et al. 1997; Black and Gilson 1998; Cumming et al. 2006; Cumming and Johan 2007; Bonini and Alkan 2012; Groh et al. 2010; Grilli et al. 2018).

Our empirical analysis is performed using weighted probit models with a unique and proprietary dataset of about 50,000 SMEs in the period 2009–2015. Our dataset combines evidence on firms' funding decisions, collected via the European Central Bank/European Commission Survey on the Access to Finance of Enterprises (SAFE), with firm-level and macro-level data. In particular, we match SME responses to the SAFE from 2009 to 2015 (ECB 2016) with detailed financial statements data. We focus on survey participants' answers to questions concerning access to capital market funding. The dependent variable in our empirical analysis is firms' decision to raise new equity and/or issue bonds.

The SAFE survey is particularly appropriate to assess European firms' ability to access market-based finance as it includes in addition to listed firms a considerable portion (97%) of unlisted SMEs (the majority of European SMEs), which have negligible coverage in other databases such as Reuter's Thomson One and Dealogic. By combining the SAFE survey with the issuers' financial statements data,<sup>2</sup> we can undertake the in-depth microanalysis suggested as a future research step by prior studies (Lawless et al. 2015; Moritz et al. 2016),

<sup>1</sup> For example, Invest Europe (2018) shows that, in the last four years, European private-equity funds have raised over EUR 240 billion to invest in companies in Europe, representing more than double the amount raised in the four years following the financial crisis. Meanwhile, the private placement channel of the bond market has grown rapidly in Europe, from EUR 4.7 billion in 2014 to EUR 8.4 billion in 2015 (EC 2017b, p. 33).

<sup>2</sup> Using tax identification codes, each survey reply is matched with the Bureau van Dijk Amadeus (hereafter simply 'Amadeus') dataset, which includes information on firms' balance sheet and profit and loss accounts.

whose extensive investigations of EU SME market-based funding choices were limited by the inability to match SAFE-surveyed firms with their detailed financial report data.

We find a generally positive relationship between the use of equity and bond issuances and certain firm-specific characteristics, such as size, listed status, growth, liquidity and leverage. Several country-specific variables also influence the likelihood of a firm using market-based funding. In particular, the development of the country's financial system and national economic performance (GDP growth) is positively related to the use of market-based finance. These country-specific factors have been described by prior literature, but only in the context of external finance, both bank- and market-related. Here we obtain specific evidence for market-based instruments. Our results suggest that while several Eurozone countries have realised SME *potential* for capital market financing, a large number of firms, especially among medium-sized firms and in Southern Europe, have failed to exploit market-based finance.

Our paper makes the following contributions. First, we comprehensively discuss the firm-specific and country-specific factors which influence the likelihood of Eurozone firms accessing market-based finance. Prior research, on the other hand, has mainly focused on firms' financial structure, including their capability to diversify funding sources and the going-public and private equity decisions. Second, we highlight and discuss the relative importance of these factors, applying a sound method and performing robustness checks. Third, we propose a composite *market suitability* measure and methodology to quantify how individual Eurozone countries and/or firm size groups have already realised SME potential for capital market financing. Fourth, we underline that when the context in which firms operate, including institutional characteristics of the business environment, is considered, firms' *market suitability* is reduced. This reduction is negligible, or even non-existent, in some countries but significant in others.

Finally, we offer valuable insights for policy-makers in tailoring government support programmes to better mitigate discrepancies and foster integration in capital market segments. In particular, our findings can be linked to a number of goals of the CMU agenda and we contribute to this important topic of debate.

The paper is structured as follows. Sections 2 and 3 review the related literature and present our testable

predictions. Section 4 describes data, methods and the variables used in the empirical analysis. Section 5 presents and discusses the results; finally, Section 6 reports the conclusions.

## 2 Literature review: SME funding

The academic literature on small business finance is vast and has grown substantially since the last financial crisis. Furthermore, the decision to access market-based finance is highly complex, so that no single theory can capture all aspects.

Among the core issues related to small business finance, four are particularly pertinent to our analysis and help to frame this paper's contribution: first, the life cycle of small business finance, with different forms of SME financing connected to and influenced by the life cycle of the firm itself (Carey et al. 1993; Meyer 1998; Berger and Udell 1998); second, the financial patterns of European SMEs (Hall et al. 2004; Daskalakis and Psillaki 2008; De Jong et al. 2008; Psillaki and Daskalakis 2009; Lawless et al. 2015; Moritz et al. 2016; Palacín-Sánchez et al. 2018; Andrieu et al. 2018; D'Amato 2019; Mol-Gomez-Vasquez et al. 2019; Masiak et al. 2019); third, the private placement funding channel (Black and Gilson 1998; Schertler 2003; Cumming et al. 2006; Cumming and Johan 2007; Groh et al. 2010; Grilli et al. 2018); and fourth, firms' decision to go public (Pagano et al. 1998; Pagano and Röell 1998; Chemmanur and Fulghieri 1999; Denis and Mihov 2003; Hale and Santos 2008; Mizen et al. 2009; Gao et al. 2013; Ritter et al. 2013; Doidge et al. 2017; Ewens and Farre-Mensa 2018).

### 2.1 The life cycle of small business funding

Exploring a number of facets of US small-firm finance, Berger and Udell (1998) developed a growth cycle paradigm in which different capital structures are optimal at different points in the firm's life cycle. In particular, different sources of debt and equity finance become important at different stages of the firm's growth, with a hierarchy that starts with insider (internal) finance, moves toward angel investors and venture capitalists, and then commercial banks, and ends with public bonds and public equity. The authors warned against using this paradigm in every small business situation, but the life cycle has received considerable empirical support (e.g.

in the USA: Robb and Robinson 2014). The paradigm emphasises the importance of age, size and informational opacity, as these (intertwined) characteristics explain firms' capital structure choices. The older and larger the firm and the lower its informational opacity, the broader the spectrum of its available financing sources. By contrast, small firms and new ventures, which face difficulties building reputations to signal their quality or overcoming their initial informational opacity, are the most dependent on internal finance (Carey et al. 1993; Meyer 1998).

Our study contributes to this debate by using a novel large database of micro, small, medium-sized, and large EU firms, and estimating a firm's probability of accessing market-based finance by controlling for these life cycle characteristics—age, size and informational opacity as proxied by listed status—plus other firm-specific features.

## 2.2 Financial patterns of European SMEs

This strand of empirical literature has shown that SMEs rarely have direct access to capital markets in Europe. Lawless et al. (2015) found that firms tended to use two or three sources of finance across all countries. However, firms in peripheral economies were generally less financially diversified. Size and age were also found to be relevant, as larger and older firms had more diversified financial structures. They also documented the common use of firm's internal resources. Moritz et al. (2016) presented a taxonomy of SME financing patterns in which a cluster analysis identified six distinct SME financing types. These financing models differed according to the number of financial instruments used and their combinations. Through this approach, they analysed in-depth the substitutive and complementary effects of different financing sources available for SMEs. The main differences in financial funding patterns among European SMEs, due to both firm- and country-specific factors, have been extensively debated (Hall et al. 2004; Daskalakis and Psillaki 2008; De Jong et al. 2008; Psillaki and Daskalakis 2009). More recently, Masiak et al. (2019) examined the financing patterns of European smaller firms. They found that smaller firms were not only less financially diversified than larger SMEs but also more prone to use short-term debt through instruments such as credit lines and bank overdrafts. The role of the other non-market-based finance instruments such as trade credit and bank loans have

also been widely discussed (Palacín-Sánchez et al. 2018; Andrieu et al. 2018; McGuinness et al. 2018; D'Amato 2019; Mol-Gomez-Vasquez et al. 2019) as they are the typical source of available finance for smaller, financially constrained firms.

While this research stream has enriched our understanding of European SME funding, the reasons for SME low access to market-based finance await comprehensive discussion. The real focus of this prior research has typically been firms' funding diversification and changes in their overall financial structures.

## 2.3 The private placement funding channel

Venture capital (VC) and private equity (PE) are the two key segments of this market-oriented funding channel that are greatly influenced by the features and conditions of local financial markets (Black and Gilson 1998). Groh et al. (2010) studied the supply-side dynamics of this market in Europe and analysed the attractiveness of EU markets to private equity investors in relation to a number of business environment characteristics. After discussing the determinants of VC/PE activity, they found that many European countries still show low attractiveness. Eurozone countries fell short on both the depth of local capital markets and the human and social environment, in part reflecting labour-market rigidities. Moreover, for all EU countries, the index for legal investor protection deteriorated over time. Cumming et al. (2006) also observed that the quality of a country's legal system is more closely connected to facilitating VC/PE exits than the size of its stock market. Cumming and Johan (2007) underscored the importance of regulatory harmonization for increasing investor commitments to private equity funding. Likewise, other studies have emphasized the importance of a developed capital market (Black and Gilson 1998; Gompers and Lerner 2000; Schertler 2003), labour market flexibility (Black and Gilson 1998; Djankov et al. 2002) and entrepreneurial culture for venture capital, measured, for instance, through the number of patents and the volume of investment in R&D (Schertler 2003). Finally, Grilli et al. (2018) complemented existing studies on VC in Europe discussing the impact of formal institutions and social capital as an indirect positive driver of VC activity. They identified a wide-ranging set of 'soft' determinants such as political stability, regulatory quality, investor protection, rule of law and control of corruption.

In line with this strand of research, we also consider country and local conditions, such as the depth of capital markets and the quality of the domestic legal system.

#### 2.4 The firm's decision to go public

Our study is also related to the literature analysing a firm's decision to go public and its determinants. This decision was addressed in Pagano et al.'s (1998) seminal paper, which empirically analysed the determinants and tested the effects of initial public offerings (IPOs). A firm's size was found to significantly affect the probability of accessing the capital market, as the direct and indirect fixed costs of access can be proportionately larger for smaller firms (Ritter 1987). Focusing on the Italian stock market, they also stressed that, unlike in US-based studies (e.g. Mikkelsen et al. 1997), few young firms were going public to finance their growth. They concluded by asking whether small European companies find other, more efficient, channels to finance their investments.

Like Pagano et al. (1998), we are also interested in the ex ante characteristics of firms that choose to access market-based finance. However, as we enlarge our analysis to a set of Eurozone countries, we also include relevant country-specific features that may influence the likelihood of firm market-based funding. So unlike Pagano et al. (1998), we investigate any equity or bond transaction directly between investors and the firm through a private sale (the private placement funding channel), as well as the decision to access a public market (the going-public option). As highlighted by research on the adverse selection cost of accessing public financial markets (Leland and Pyle 1977; Chemmanur and Fulghieri 1999), young and small companies have a shorter track record and are less visible than more mature and larger firms. This means that investors have imperfect information, which raises access costs for younger firms.

As well as Pagano et al. (1998), two more recent strands of research are pertinent to our investigation. The first investigates reasons for the drop in IPO activity in the last two decades, and the second analyses the development of secondary markets for SMEs in Europe.

Gao et al. (2013) discussed the decline in IPOs in US markets, whose annual average dropped from 310 during 1980–2000 to only 99 during 2001–2012. The four main European equity markets (UK, Germany, France and Italy) experienced a similar decline in the volume of

IPOs. To explain the prolonged low level of access to public equity markets, the authors proposed the economies of scope hypothesis, whereby small, independent companies are less interested in going public and prefer to stay private because greater value is created in a private sale to a strategic buyer in the same or a related industry. Exploring possible explanations for the sharp decrease in the number of publicly listed firms in the USA, Doidge et al. (2017) observed that developments in financial markets make it easier for firms to thrive without being listed. On this basis, the lower net benefit of being listed is a positive development, reflecting easier and possibly more efficient access to capital.

Ritter et al. (2013) showed that the patterns discussed by Gao et al. (2013) were also present in Europe in the 1995–2011 period, with a more pronounced decline in small-firm IPOs. They present evidence of increased difficulty for small firms to remain profitable and a higher probability of being acquired soon after the IPO, compared to large firms. Ewens and Farre-Mensa (2018) analysed the contribution of changes in private equity markets to the IPO decline. They showed that the 1990s deregulation of security laws facilitated the process of raising capital privately, and was thus a key driver of the IPO drought and, more generally, of changes in the going-public versus staying-private trade-off. All these findings seem to suggest that smaller firms' access to market-based finance can no longer be evaluated solely by the going-public decision. From this perspective, our research may be of particular interest, as the private placement channel of equity financing could have become a major substitute for standard access to public equity markets (Goncalves and Lehmann 2019).

The second research strand tackles the rise of various secondary markets for SMEs in the European context. Vismara et al. (2012) discussed the organisation of most equity markets in Europe and major implications. Stock exchanges in Europe are organised in segments with a main market and one or more second-tier markets dedicated to small- and medium-sized firms; such is the growth in importance of these dedicated second-tier markets over time that, in some cases, their listings show the majority of firms going public in their respective countries. Most IPOs on these junior equity markets, with minimal regulations and admission requirements, are offered exclusively to institutional investors and are roughly equivalent to private placements. This main

feature of European second-tier markets is also supported by the fact that they rarely develop liquid trading.

In line with our research focus, Vismara et al. (2012) indicate that the private placement channel of equity funding has recently grown significantly through second-tier markets. From this perspective, it is probably no longer useful to distinguish the private placement channel from the equivalent *formal* channel via IPOs on relatively illiquid second-tier markets. Our research focus has the distinctive feature of considering the decision to access market-based finance through both public and non-public channels.

### 3 Hypothesis development

On the basis of the prior research outlined above, we derive the following testable predictions organized into two main groups concerning firm-specific and country-specific characteristics (as summarised in Table 1).

### 3.1 Hypotheses on firm-specific characteristics

#### 3.1.1 Firm size

According to the life cycle paradigm (Carey et al. 1993; Berger and Udell 1998), size is expected to be positively related to financial debt: larger firms are more diversified and hence less likely to face bankruptcy; are more profitable and therefore more likely to use debt as a tax shield; and are less informationally opaque, enabling them to issue larger amounts of debt, thus spreading the associated issuing costs. Less clear is the relationship between size and the likelihood of new equity issues. The adverse selection cost of IPOs (Leland and Pyle 1977; Chemmanur and Fulghieri 1999) predicts lesser use of equity by smaller firms; and asymmetric information theory suggests that larger companies can more easily issue informationally sensitive securities, such as equity (Rajan and Zingales 1995). Conversely, private finance from a venture capitalist, i.e. the private placement funding channel, is more efficient for young, little-known firms because satisfying a single investor (venture capitalist or private equity fund) minimises

**Table 1** Summary of testable hypotheses

Hypotheses	Rationale
Hypotheses on firm-specific characteristics	
H1: Greater size is associated with higher use of market-based finance	Life cycle and adverse selection cost of IPOs
H2: Firm age is positively associated with higher access to market-based finance	Life cycle, limited track record, risk of failure, and liability of 'newness'
H3: Listed status is positively associated with higher use of market-based finance	Informational opacity and transaction costs of gathering information
H4: Higher profitability is negatively associated with higher use of market-based finance	Underperformance of recent SME IPOs
H5: Higher liquidity is positively associated with higher use of market-based finance	Lack of reputational capital
H6: Higher growth is positively associated with higher use of market-based finance	Overcome borrowing constraints from banks for high-investment firms and investors recognition
H7: Higher leverage is positively associated with higher use of market-based finance	Overcome borrowing constraints from banks and gaining bargaining power with banks
H8: Higher tangibility is positively associated with higher use of market-based finance	Mitigation of lender's risk
Hypotheses on country-specific characteristics	
H9: A higher degree of domestic capital market development is positively associated with higher use of market-based finance	Capital market breadth, depth and liquidity facilitate firms' access
H10: Higher dependence on bank credit is positively associated with higher use of market-based finance	Excessive dependence on bank credit can promote diversification of firms' external funding options
H11: A higher quality of the legal and judicial enforcement system is positively associated with higher use of market-based finance	Degree of protection of property rights is key for prospective capital markets investors

information production costs (Pagano et al. 1998). Finally, consistent with the life cycle paradigm, larger firms tend to tap equity markets more frequently than smaller firms to satisfy their financial needs. On balance, we expect to observe a positive effect of size on equity market-based funding.

H1: Greater size is associated with higher use of market-based finance.

### 3.1.2 Firm age

Firm age has often been considered a key determinant of SME source of funding. According to the life cycle paradigm (Carey et al. 1993; Berger and Udell 1998; La Rocca et al. 2011), younger firms depend heavily on insider funding sources during their start-up and initial stages of growth because of their unique features, including informational opacity stemming from a limited established track record (Berger and Udell 1998); high risk of failure (Huyghebaert and Van de Gucht 2007); and liability of ‘newness’, i.e. the difficulties that new ventures face in accessing the resources they need to grow their businesses (Watson and Everett 1996; Nucci 1999; Zhang and White 2016). This ‘newness’ feature is also a disadvantage in the acquisition of debt capital (Coleman 2004). As SMEs advance through their business life cycle, they start to establish a track record as well as the ability to provide collateral. This improves the creditworthiness of the firm and attracts the interest of investors who can provide new funds. Furthermore, older and established companies, in their maturity phase, should have higher leverage ratios, as equity investors are less interested in firms with lower growth opportunities, lower risk and lower profitability. According to pecking order theory (Myers 1984; Myers and Majluf 1984), older firms are better able to accumulate (internal) funds and, hence, have less need for long-term or short-term debt or equity-based finance. The pecking order view however was refuted by the empirical work of Helwege and Liang (1996) who found no evidence of a significant relationship between raising finance externally and a deficit in internal sources. In sum, we can predict that age affects positively market-based finance.

H2: Firm age is positively associated with higher access to market-based finance.

### 3.1.3 Firm listed status

SMEs are typically considered an example of informationally opaque-type firms (Berger et al. 2001; Berger and Udell 1998). Outside stakeholders of small businesses in fact face several information problems. Beyond the well-known asymmetric information issue, where insiders are expected to have more information about the prospects of the firm, previous studies (Ang 1991; Peterson and Rajan 1994) have also considered the relatively high fixed cost of gathering information involving a small transaction: the reduced incentives for a third party, such as outside analysts, to collect information due to the smaller market for this type of information and the greater difficulties for small business to make their claims credible.

In this context, where SMEs account for a large portion of our empirical sample, we therefore consider a firm’s listed status as a proxy for its informational transparency, directly linked to a higher (lower) degree of financial disclosure in the case of listed (private) firms. Unlisted firms, since they do not have publicly traded securities, are not in fact under legal or institutional obligation to produce verifiable information. In the case of listed SMEs, potential investors tend to be less discouraged by the opacity of the SME finance market and their limited exit options. Accordingly, we expect a firm’s listed status to positively affect its use of market-based finance.

H3: Listed status is positively associated with higher use of market-based finance.

### 3.1.4 Profitability

Among firm performance factors, profitability, liquidity and growth are often quoted in the prior literature (Hall et al. 2004; de Jong et al. 2008; Psillaki and Daskalakis 2009; Lawless et al. 2015) as determinants of the decision to access external funding.

The role of profitability is unclear. We can generally expect it to have a positive effect on market-based finance, since SMEs can use the visibility and track record of their past and current profitability to attract the interest of new investors (Hall et al. 2004; de Jong et al. 2008; Lawless et al. 2015; Moritz et al. 2016). However, Gao et al. (2013) and Ritter et al. (2013) found a recent pattern of low profitability among small firms that went public in US

and EU equity markets. Vismara et al. (2012) also reported a long-running strong underperformance of second-market IPOs in Europe, relative to that of main market IPOs. As these markets are usually used by SMEs, the negative abnormal returns of second-market IPOs seem to stem from smaller firms' insufficient profitability.

H4: Higher profitability is negatively associated with higher use of market-based finance.

### 3.1.5 Liquidity

For liquidity, too, the expected sign is not necessarily clear in the SME setting. From one viewpoint, life cycle theory and the pecking order theory of firm capital structure (Myers 1984; Myers and Majluf 1984) suggest that accumulated cash and other liquid assets should be used before tapping any source of external finance. Therefore, a higher liquidity ratio should be associated with lower use of market-based finance. Conversely, the higher informational opacity of smaller firms and their negligible, or lack of, reputational capital (Diamond 1991; Denis and Mihov 2003; Hale and Santos 2008) can require SMEs that wish to tap capital markets to offer good fundamentals to prospective investors. Otherwise, they risk weak demand in their market-based forays. Accordingly, we might expect a positive effect of liquidity on external market-based finance.

H5: Higher liquidity is positively associated with higher use of market-based finance.

### 3.1.6 Growth

Pagano and Roell (Pagano and Röell 1998) indicated a positive link between growth performance and external access to market-based finance for high-investment companies. In the presence of informational asymmetries, a firm with large external funding needs may face financial constraints from banks as a source of finance; we would, therefore, expect firms with significant investment outlays to be more likely to access market-based finance. Another potential issue with bank loans is that banks can extract rents from their privileged information about their clients' creditworthiness. By gaining access to market-based finance and disseminating information to a wider range of investors (investor recognition), a firm promotes more competition among

its funding sources, thus ensuring better external financing conditions (Rajan 1992). We predict that firms with high growth are more likely to access market-based finance.

H6: Higher growth is positively associated with higher use of market-based finance.

### 3.1.7 Leverage

A key benefit of going public or tapping the private placement channel of equity funding is gaining access to a source of finance other than bank loans. Moreover, issuing external equity can relieve borrowing constraints such as high interest rates and even credit rationing (Rajan 1992). For these reasons, equity-based market finance is more likely for high-debt firms. We expect leverage to positively affect new equity issuance. Conversely, the effect of these factors on debt instrument issuance is less clear, although we can expect bond issuance to increase bargaining power with banks by offering an alternative external finance source. Under these circumstances, we expect leverage to have a positive effect on market-based debt.

H7: Higher leverage is positively associated with higher use of market-based finance.

### 3.1.8 Asset tangibility

Firm characteristics will affect the choice between bank and market-based debt financing (Chemmanur and Fulghieri 1994). Firms that are larger, more profitable and more creditworthy, or have more investment opportunities, will access the bond markets earlier (Denis and Mihov 2003; Hale and Santos 2008; Mizen et al. 2009). In addition, according to the reputational model (Diamond 1991), firms with a better reputation enter the bond market sooner than firms with a worse reputation. The findings of Hale and Santos (2008) corroborate this evidence. Furthermore, the provision of collateral and the presence of tangible assets will facilitate bond issuances, provided that these elements act as a buffer against default (Hall et al. 2004; de Jong et al. 2008). Therefore, in our setting, we expect asset tangibility to have a positive effect on debt market-based finance.

H8: Higher asset tangibility is positively associated with higher use of market-based finance.

## 3.2 Hypotheses on country-specific characteristics

### 3.2.1 Domestic capital market development

Greater breadth, depth and liquidity of capital markets (bond and equity) are expected to facilitate firms' access to market-based finance (Beck et al. 2008; de Jong et al. 2008; Kayo and Kimura 2011; Moritz et al. 2016). The development of bond and stock markets should increase the supply of funding available to firms and lower their costs of capital. In our setting, we predict that the degree of development of domestic capital markets (both equity and bond) positively affects market-based finance.

H9: A higher degree of domestic capital market development is positively associated with higher use of market-based finance.

### 3.2.2 Banking system development

The extent of the banking system development has also been documented as a relevant factor (Levine 2002). In fact, excessive dependence on bank credit can promote the diversification of external funding sources in the life cycle of a firm, particularly during a period of bank distress and generalised credit crunch. From a different perspective, bank credit can be seen as a signal of creditworthiness that is especially relevant for informationally opaque firms, which can more easily access capital markets thanks to this credit. This view of a positive link between bank credit and other funding sources is supported by empirical evidence on the relationship between financial development and economic growth (King and Levine 1993). Indeed, the combined development of capital markets and the banking system is an important factor explaining a country's economic development.

H10: Higher dependence on bank credit is positively associated with higher use of market-based finance.

### 3.2.3 Quality of the legal and judicial enforcement system

Finally, it is well documented that certainty regarding the law and legal rights enforcement through the courts positively impacts firms' access to external finance (La Porta et al. 1997; Giannetti 2003; Beck et al. 2005, 2008). Indeed, if the laws better protect both shareholders and bondholders (and other creditors), agency problems among different financial stakeholders are

reduced, thus improving firms' access to market-based finance (de Jong et al. 2008; Jøeveer 2013; Moritz et al. 2016).<sup>3</sup> Accordingly, we predict that the quality of a given country's legal and judicial enforcement system positively affects access to market-based finance.

H11: A higher quality of the legal and judicial enforcement system is positively associated with higher use of market-based finance.

## 4 Data, methods and variables

### 4.1 Data

The analysis is based on two different databases. In the first analysis stage, to determine which factors affect the probability of accessing market-based finance, we use a proprietary database that combines information from the SAFE and from Amadeus in one dataset. In the second analysis stage, to create our novel index of firms' *market suitability*, we use a larger dataset of companies derived directly from the Amadeus database.

The starting dataset is derived from the ECB/EC's SAFE, which is run every six months to assess latest developments in the financing conditions of Eurozone firms. The survey collects firm-level data on SME financing needs, their diversification of finance sources and their past experience of access to finance. The SAFE also provides other information on SME perceptions of economic and financial conditions, as well as some structural characteristics, like size, age, ownership type and activity sector. The survey covers micro, small, medium-sized, and large firms,<sup>4</sup> and provides evidence across branches of economic activity and Eurozone countries. The SAFE is extensively used by the literature, mainly to examine SME bank financing and credit constraints (e.g. Ferrando and Griesshaber 2011; Holton et al. 2014; Lawless et al. 2015) and their diversification of funding (Lawless et al. 2015; Moritz et al. 2016). The SAFE sample is stratified by firm-size class, economic activity and country, and the dataset provides sampling

<sup>3</sup> Firms that operate in countries with weak creditor protection and low-quality judicial enforcement systems may even face a competitive disadvantage relative to firms located in countries with strong protection and high-quality enforcement (Moro et al. 2016).

<sup>4</sup> SAFE firms are exclusively non-financial corporations. Size is based on number of employees: micro firms are defined as those with less than 10 employees; small firms as those with 10–49 employees; medium-sized firms as those with 50–249 employees; and large firms as those with 250 or more employees.

weights that can be used to adjust the sample to the economic weight (number of employees) of each firm-size class, economic activity and country. We include these weights in our regressions.<sup>5</sup>

The original database of surveyed firms was matched with the Amadeus database, using firm tax identification codes, to link firms' qualitative answers with their financial statements. This proprietary dataset is a key strength of our study. In order to be able to match a sizeable number of firms in each country with available financial data, we were forced to analyse only seven of the 12 countries covered by the SAFE: Belgium, France, Finland, Germany, Italy, Spain and Portugal.

Regarding the panel dimension of our dataset, it should be recalled that the original Eurozone sample includes a rotating panel of Eurozone enterprises, i.e. firms may be included in more than one wave, though not in consecutive waves. In the final sample, where all our variables of interest are available to run the probit analysis, less than 25% of firms are present for two or more years. This greatly limits the panel dimension of the data, preventing us from exploiting firm-level effects in our econometric analysis.

The data cover the period from September 2009 to September 2015 (waves 2–13 of the SAFE)<sup>6</sup> and account for approximately 50,000 firms. Our sample is composed as follows: micro-sized firms—29.2%; small firms—32.8%; medium-sized firms—28.8%; and large firms—9.3% (see Table 2).

Table 3 and Figs. 1 and 2 present the proportions of firms that declare having used market-based instruments (equity and debt) for each country in our sample.<sup>7</sup> The reported figures are all weighted with sampling weights. Figure 3 provides details on capital market involvement over time for both the SME and large firm subsamples across the SAFE waves. Germany, Belgium and Finland are the countries in which firms have most often used market-based

instruments, with the other four countries trailing behind. The difference between leading and lagging countries is mainly accounted for by new equity issuance, while the gap is less pronounced for debt security issuance (Table 3, panel A and Fig. 1).

Firms from distressed southern European countries (Italy, Spain and Portugal) show less involvement in market-based instruments, both in the overall sample and the SME subsample (Table 3 and Figs. 1 and 2). These differences between core and peripheral Eurozone countries are more pronounced with respect to equity-level funding, particularly among SMEs (Fig. 2). Firm-year observations amount to approximately 40,000 in the matched SAFE-Amadeus database.

In the second analysis stage, to determine the percentage of firms potentially fit for market-based finance in each country, we use a large sample of companies derived from Amadeus. We consider the entire universe of Amadeus for accounting data (both balance sheets and income statements). Typically, one annual release of Amadeus covers, at most, the preceding ten accounting years of each firm. Additionally, Amadeus removes a firm after five years of no reporting data. Therefore, to eliminate potential survivorship bias, we compile our database by collecting accounting information from each annual release retrospectively, giving complete historical data for all firms across the entire sample period (Kalemli-Ozcan et al. 2015). We eliminate observations which input mistakes (e.g. negative total assets), and winsorise all variables at the top and bottom 1% of their distributions within each country. Our data filtering yields an unbalanced panel of roughly 4 million firm-year observations over the 2009–2014 period.<sup>8</sup>

## 4.2 Methods

To detect which factors influence the likelihood of SMEs accessing market-based finance, we perform a weighted probit model.<sup>9</sup>

The dichotomous dependent variable takes the value 1 if firms report having used market-based instruments (new equity or debt securities) in the previous six months, according to the SAFE definition, and 0

<sup>5</sup> More detailed information about SAFE is available at: [https://www.ecb.europa.eu/stats/ecb\\_surveys/safe/html/index.en.html](https://www.ecb.europa.eu/stats/ecb_surveys/safe/html/index.en.html). Detailed information on the SAFE weighting methodology is available at: [https://www.ecb.europa.eu/stats/pdf/surveys/sme/methodological\\_information\\_survey\\_and\\_user\\_guide.pdf?3193098a993584e5bd27d9c68d13bd36](https://www.ecb.europa.eu/stats/pdf/surveys/sme/methodological_information_survey_and_user_guide.pdf?3193098a993584e5bd27d9c68d13bd36), p.11.

<sup>6</sup> Amadeus-sourced financial statement data include annual financial reports from 2009 until 2014.

<sup>7</sup> Some changes in the questionnaire may have caused a break in the series for German firms, as the questions related to equity changed from 'Kapitalbeteiligung in Ihrer Firma' (wave 2) to 'Eigenkapital' (wave 3) and then to 'Anteilskapital' (wave 4). For this reason, percentages in wave 3 are calculated as averages of those in waves 2 and 4.

<sup>8</sup> Our Amadeus data was collected following the approach of Kalemli-Ozcan et al. (2015). It covers 75–80% of economic activity reported in Eurostat.

<sup>9</sup> This methodology has often been employed in the literature, starting from Pagano et al. (1998).

**Table 2** Number of SAFE sample firms by country and size (waves 2–13, 2009–2015)

Country	All firms		Micro		Small		Medium		Large	
	Number	%	Number	%	Number	%	Number	%	Number	%
Belgium	4,572	9.2	1,756	12.1	1,678	10.2	907	6.3	231	5.0
Germany	8,593	17.2	1,667	11.4	2,821	17.2	2,992	20.8	1,113	24.0
France	10,589	21.2	3,189	21.9	3,248	19.8	3,048	21.2	1,104	23.8
Finland	4,010	8.0	1,320	9.1	1,578	9.6	902	6.3	210	4.5
Italy	7,753	15.5	1,994	13.7	2,359	14.4	2,603	18.1	797	17.2
Spain	10,015	20.0	3,137	21.5	3,165	19.3	2,824	19.7	889	19.2
Portugal	4,421	8.9	1,509	10.4	1,527	9.3	1,092	7.6	293	6.3
Total	49,953	100.0	14,572	100.0	16,376	100.0	14,368	100.0	4,637	100.0
	100.0		29.2		32.8		28.8		9.3	

Source: matched database SAFE-Amadeus. Firms are only non-financial corporations. Micro firms are defined as firms with fewer than 10 employees, small firms are those with 10–49 employees, medium firms are those with 50–249 employees and large firms have more than 250 employees. Period analysed: 2009–2015

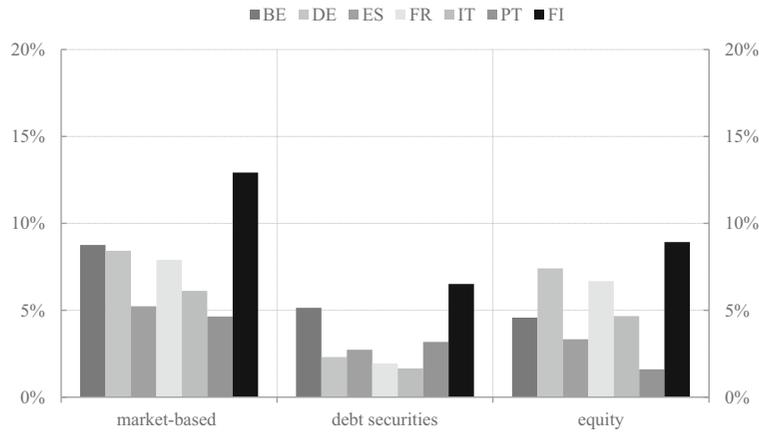
otherwise. Our dependent variable is qualitative in nature, as it captures a firm's ability to access market-based finance.

In the probit equation, we estimate the probability that firm  $i$  uses market-based instruments in year  $t$ , using the following model:

**Table 3.** Firms that have used market-based finance according to SAFE replies (weighted percentages)

Panel A. All firms (%)							
	Debt securities	Equity	Market-based finance				
Belgium	5.1	4.6	8.8				
Germany	2.3	7.4	8.4				
Spain	2.7	3.3	5.2				
Finland	6.5	8.9	12.9				
France	1.9	6.7	7.9				
Italy	1.7	4.7	6.1				
Portugal	3.2	1.6	4.6				
Panel B. SMEs and large firms breakdown							
SME (%)	Debt securities	Equity	Market-based finance	Large firms (%)	Debt securities	Equity	Market-based finance
Belgium	0.8	5.7	6.4	Belgium	6.9	6.9	12.1
Germany	0.7	6.6	6.7	Germany	2.6	8.5	10.8
Spain	2.2	3.0	4.3	Spain	3.4	3.8	6.5
Finland	1.1	4.8	5.8	Finland	13.3	10.6	20.3
France	1.3	4.8	5.8	France	3.8	9.8	11.9
Italy	1.4	3.4	4.6	Italy	2.3	7.9	9.9
Portugal	0.9	1.2	1.9	Portugal	7.4	3.4	10.7

Source: matched database SAFE-Amadeus. Weighted average percentages of firms that have used market-based instruments (equity or debt securities) in the previous six months and 0 otherwise. Debt securities are short-term commercial paper or long-term corporate bonds issued, equity capital refers to raising capital through the sale of shares. For Germany, percentages in wave 3 are calculated as averages of those in wave 2 and wave 4 as some changes in the questionnaire may have caused a break in the series on equity. SMEs defined as firms with fewer than 250 employees. Period analysed: 2009–2015



**Fig. 1** Firms in the SAFE sample that have used market-based finance (*weighted percentages*). Source: matched database SAFE-Amadeus. All firms (large and SMEs). Weighted percentages of firms that have used market-based instruments (equity or debt securities) in the previous six months and 0 otherwise. Debt securities are short-term commercial paper or long-term corporate

bonds issued, equity capital refers to raising capital through the sale of shares. For Germany, percentages in wave 3 are calculated as averages of those in wave 2 and wave 4 as some changes in the questionnaire may have caused a break in the series on equity. SMEs defined as firms with fewer than 250 employees. Period analysed: 2009–2015

$$\begin{aligned}
 & Prob(Mark\_fin_{i,k,t} = 1) && (1) \\
 & = F \left( \begin{aligned} & \alpha + \beta_1(FirmChar)_{i,t-1} + \beta_2(InstVariab)_{i,t-1} \\ & + \beta_3Wave_t + \beta_4Country_k + \beta_5Sector + \varepsilon_{i,k,t} \end{aligned} \right)
 \end{aligned}$$

where Mark\_fin is the response of firm *i* in country *k* at time *t* indicating use of market-based instruments in the previous six months.  $\alpha$  is a constant term,  $FirmChar_{i,t-1}$  is a vector of firm-specific variables, and  $InstVariab_{i,t-1}$  is a vector of institutional/(country) variables (discussed in Section 4.3 and reported in Appendix Table 10). All variables are lagged to control for endogeneity problems.<sup>10</sup> We control for country, sector and time fixed effects.  $F(\cdot)$  is a cumulative distribution function, namely, the standard normal distribution function  $\Phi$ . As in the descriptive statistics, we use the sampling weights in the econometric specifications.

In the next stage of our analysis, we create a market suitability index (MSI) to answer our second research question: what proportion of firms in a country is suitable for market-based finance? The index attempts to identify firms considered suitable for market-based financing, using information derived from their financial

situation, country characteristics and SAFE replies analysed in the first stage.

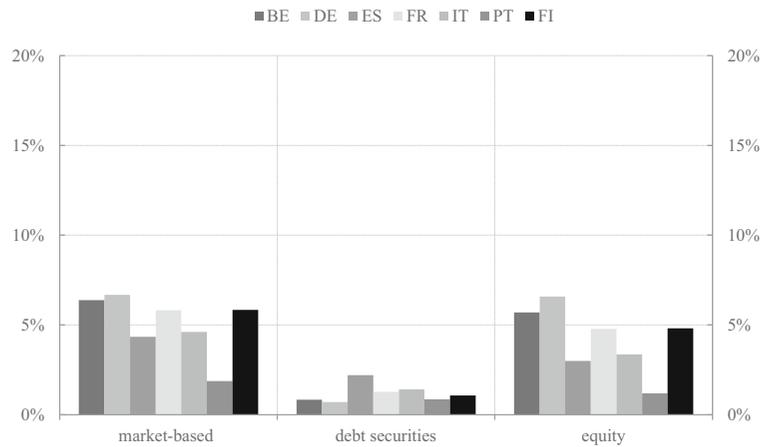
The index is constructed in two steps. In the first step, the coefficients of the estimated probit model ( $\hat{\beta}_s$ ) are used to compute a predicted SAFE score for the larger pool of firms of the Amadeus dataset, using the following equation:

$$\begin{aligned}
 & SAFE\ score_{i,k,t} = \alpha + \hat{\beta}_1(FirmChar)_{i,t-1} && (2) \\
 & \quad + \hat{\beta}_2(InstVariab)_{i,t-1} \\
 & \quad + \hat{\beta}_3Country_k + \hat{\beta}_4Sector
 \end{aligned}$$

where the estimated coefficients are those calculated from previous Eq. (1). This score is defined at firm level and varies over time.

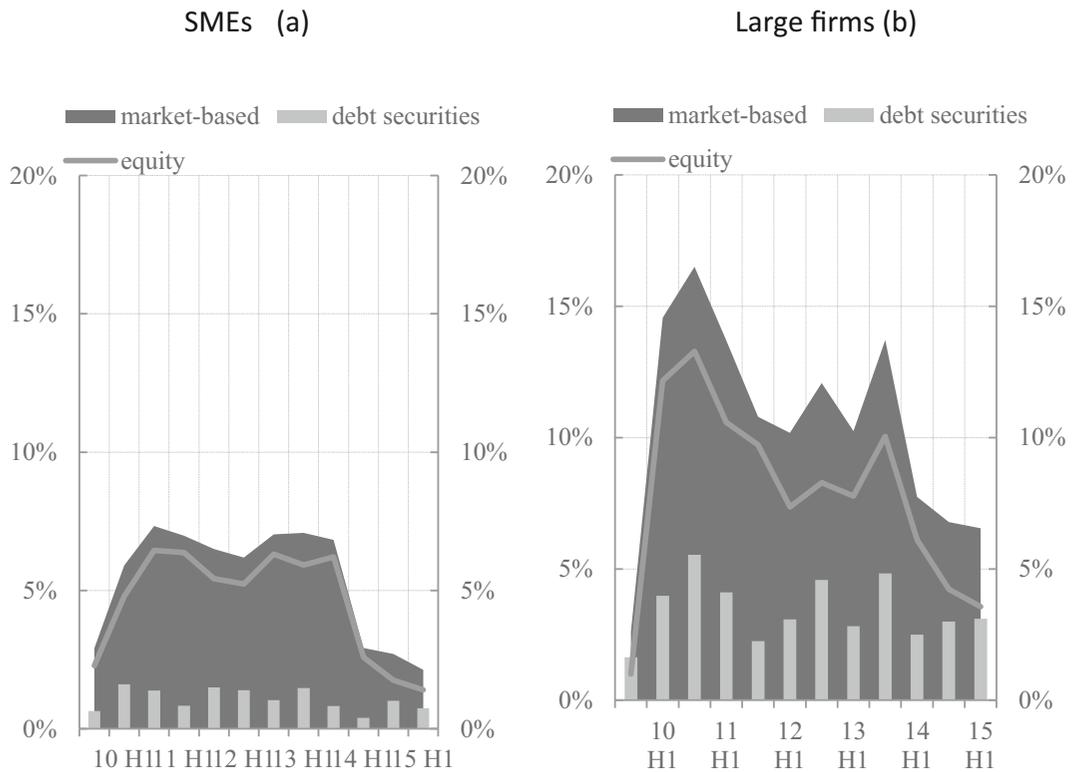
As scores cannot be directly interpreted, we use them only to rank firms and classify them as market suitable and non-market suitable, according to whether their scores exceed a certain threshold. In particular, following the approach used by Ferrando et al. (2015), we obtain a threshold over the SAFE score distribution using information from the survey data. Specifically, we select the top *x*% of the SAFE score distribution by country, where *x* is the percentage of firms that declared using market-based instruments during the 2009–2015 period. Finally, for each year and country, firms suitable for market-based financing are identified as those with a SAFE score above the threshold.

<sup>10</sup> Since some firm-specific variables could be persistent, we check the presence of endogeneity by running the same analyses considering the following variables at time *t*–2 instead of *t*–1: leverage, turnover growth, current ratio, fixed asset growth and size. The results are similar; the only difference concerns the current ratio which becomes not significant.



**Fig. 2** SMEs that have used market-based finance (*weighted percentages*). Source: matched database SAFE-Amadeus. SMEs are defined as firms with fewer than 250 employees. Weighted percentages of firms that have used market-based instruments (equity or debt securities) in the previous six months and 0 otherwise. Debt securities are short-term commercial paper or long-term

corporate bonds issued, equity capital refers to raising capital through the sale of shares. For Germany, percentages in wave 3 are calculated as averages of those in wave 2 and wave 4 as some changes in the questionnaire may have caused a break in the series on equity. SMEs defined as firms with less than 250 employees. Period analysed: 2009–2015



**Fig. 3** SMEs and large firms that have used market-based finance over time (*weighted percentages*). SMEs (a). Large firms (b). Source: matched database SAFE-Amadeus. Weighted percentages of firms that have used market-based instruments (equity or debt securities) in the previous six months and 0 otherwise. Debt securities are short-term commercial paper or long-term corporate

bonds issued; equity capital refers to raising capital through the sale of shares. For Germany, percentages in wave 3 are calculated as averages of those in wave 2 and wave 4 as some changes in the questionnaire may have caused a break in the series on equity. SMEs defined as firms with fewer than 250 employees. Period analysed: 2009–2015.

Consequently, our MSI is a dichotomous variable equal to 1 for firms with a SAFE score above the threshold, and 0 otherwise. We calculate this index for the entire sample of firms in the Amadeus database for our seven sample countries. This enables us to investigate the potential for market-based financing at country level. We thereby identify which countries, sectors and firms are more suitable for capital market financing.

### 4.3 Variables

#### 4.3.1 Dependent variable in the probit model

The dependent variable of our analysis comes from the SAFE questionnaire<sup>11</sup> and concerns the use of market-based financial instruments. Survey participants were asked whether they had used different financing instruments in the previous six months. The SAFE questionnaire includes a long list of financing instruments; for our purposes, we only consider debt securities (including short-term commercial paper and long-term corporate bonds) and equity (listed or unlisted new share issuances or other forms of equity provided by the owners themselves or by external investors, including venture capitalists and angel investors but excluding mezzanine finance).

#### 4.3.2 Explanatory variables

We consider two main groups of explanatory variables: firm-specific and country-specific. Following previous studies (e.g. Hall et al. 2004; de Jong et al. 2008; Psillaki and Daskalakis 2009; Lawless et al. 2015), we consider the following as firm-specific variables: firm size, age, listed status, profitability, liquidity, leverage and tangibility (measured as fixed assets over total assets). We employ two indicators of past growth performance, one related to sales (average turnover growth) and the other to assets and/or investments (fixed asset growth).<sup>12</sup> Taxation is proxied by the effective tax rate.

As regards country-specific variables, we follow prior studies (Beck et al. 2008; Levine 2002; La Porta et al.

<sup>11</sup> The variable is based on question Q4 of the SAFE questionnaire (ECB 2016).

<sup>12</sup> Average turnover growth is calculated as the difference between the turnover value in period  $t$  and the average value of variable turnover in periods  $t-1$  and  $t-2$ , scaled by the average value in periods  $t-1$  and  $t-2$ . Fixed asset growth is calculated as the difference between the value of fixed assets in period  $t$  and the average value of variable fixed assets in periods  $t-1$  and  $t-2$ , scaled by the average value in periods  $t-1$  and  $t-2$ .

1997) by considering some institutional and environmental variables that can affect SME access to finance: stock and bond market development, banking system development, economic growth and the characteristics of the legal and judicial enforcement system.

The strength of the legal and judicial enforcement system is proxied by a number of publicly available measures: the Rule of Law Index,<sup>13</sup> the Property Rights Index,<sup>14</sup> the number of procedural steps involved in a commercial dispute<sup>15</sup> and the time needed for dispute resolution.<sup>16</sup> These proxies are often employed in prior literature on firms' access to external finance (La Porta et al. 1997; Beck et al. 2005, 2008; de Jong et al. 2008). In our context, a higher score for the Rule of Law Index and Property Rights Index is expected to be positively associated with firms' access to capital markets. Similarly, the longer the time required to resolve a dispute, the higher the probability that firms will be denied credit, particularly from the banking sector. In this sense, diversifying external funding through capital markets can help to avoid credit constraints that arise in the bank-firm relationship (hence, we assume a positive relationship in the regressions). By contrast, a higher number of procedural steps for judicial enforcement should be linked to reduced access to capital market funding.

Appendix Table 10 summarises and describes our firm-specific and country-specific variables, while

<sup>13</sup> The Rule of Law Index is sourced from the World Bank's World Governance Indicators and captures perceptions of the extent to which agents have confidence in and abide by the rules of society, particularly the quality of contract enforcement, property rights and the courts, as well as the likelihood of crime and violence.

<sup>14</sup> The Property Rights Index is sourced from the Heritage Foundation's Index of Economic Freedom. This variable measures individuals' ability to accumulate private property, secured by clear laws that are fully enforced by the state. Hence, it measures the degree to which a country's laws protect private property rights and the degree to which its government enforces those laws. It also assesses the likelihood that private property will be expropriated. The more certain the legal protection of property, the higher a country's score (between 0 and 100).

<sup>15</sup> We source data from the World Bank's Doing Business dataset. A procedural step is defined as any interaction, required by law or commonly used in practice, between the parties or between them and a judge or court officer. Other procedural steps, internal to the court or between the parties and their counsel, are also counted. Procedural steps include those to file and serve a case, to assign a case to a judge, for trial and judgement, and as necessary to enforce a judgement.

<sup>16</sup> We again use the World Bank's Doing Business dataset, using the average time needed to resolve a dispute in calendar days. The time is counted from the moment the plaintiff decides to file a lawsuit in court until payment. It includes both the days when actions occur and the waiting periods between them.

Tables 4 and 5 respectively report the descriptive statistics and correlation coefficients for the explanatory variables.

## 5 Empirical findings and discussion

We group our results into five parts: in Section 5.1, we comment on findings related to only firm-specific variables. In Section 5.2, we discuss our results when also including country-specific variables. In Section 5.3, we comment on our robustness tests of the probit regression models. In Section 5.4, we present the main findings based on our survey-based MSI; and finally, in Section 5.5, we discuss our results, limitations and future research avenues.

### 5.1 Considering only firm-specific variables

Table 6 shows the results of the probit regressions. The specification reports only variables that are statistically significant after using backward-stepwise estimation. Panel A reports the estimated coefficients, and panel B presents the marginal effects. Columns 1 and 2 identify which firm-specific variables affect the use of market-based instruments in our sample of Eurozone firms,<sup>17</sup> in column 2, the specification controls for country fixed effects, in addition to sector and time dummies. We use this specification in subsequent steps of our analysis.<sup>18</sup>

Size, profitability, current ratio, average turnover growth, financial leverage and listed status are statistically significant in explaining a firm's decision to raise

market-based finance. Panel B shows the effect of these variables on capability to use market-based financial instruments.

Leverage appears to be the firm-specific variable with the largest positive impact on use of market-based financial instruments: an increase of 1% in the leverage ratio increases the probability of using these instruments by 5.40%. Two other significant variables, with a marginal coefficient of approximately 0.02, are turnover growth and listed status. Listed firms with high turnover growth rates are more able to issue debt or new equity instruments. Financial leverage, listed status and turnover growth coefficients all have signs in line with our assumptions. H3, H6 and H7 are confirmed.

Firm size has a positive effect on the use of market-based instruments, in line with life cycle theory. An increase of 1% in firm sales (expressed as the logarithm of sales) increases the use of market-based instruments by 1.2%. These results confirm the first hypothesis (H1). The negative sign for profitability (equal to  $-0.13$ ) is consistent with the pecking order theory applied to SMEs: less profitable firms have less internal cash flow to use in funding their activities, and therefore need more external financing. The impact of profitability on the use of market-based financial instruments is significant: an increase of 1% in profitability reduces the ability to use these instruments by approximately 13.2%. Our fourth hypothesis (H4) is confirmed. The firm's age seems to be not relevant in influencing the use of market-based finance; thus, our second hypothesis (H2) is rejected.

Interpreting the sign of the current ratio is less straightforward. We detect a positive relationship between firm solvency and the use of market-based instruments, although the marginal coefficient is very low (0.003). Given that our database focuses mainly on SMEs, we can explain this positive relationship through the lack of reputational capital. SMEs wishing to tap capital markets are, therefore, required to offer good fundamentals to prospective investors; otherwise, they incur the risk of weak demand in their securities offerings. This feature, coupled with the negative relationship observed for the profitability variable, may explain why SMEs must achieve good current ratio performance via less short-term financial debt, rather than surplus cash and cash equivalents (which would negate the pecking order theory assumptions). It is well-known that SMEs, particularly in southern European countries, have mostly depended on excessive and increasing

<sup>17</sup> The estimations reported in the paper were performed using robust standard errors. To verify the robustness of results, we also performed the same estimations clustering standard errors at country level. The results are not reported here but are available on request from the authors.

<sup>18</sup> We tested for the presence of country differences using a chi-square test. First, we considered a restricted model in which we only included firm-specific variables, without considering the presence of potential differences across countries. Next we analysed an unrestricted model in which country dummies were inserted to account for possible differences between countries. The chi-square test verified the null hypothesis that all countries' coefficients were equal. This result allows us to reject the null hypothesis ( $\text{chi-square}(6) = 112$  Prob  $> \chi^2 = 0.000$ ). In these circumstances, we adopt the unrestricted model with country dummies, taking account of country differences. We also fit a mixed effect binomial model with a random intercept at the country level. A likelihood ratio test comparing this random intercept model with the one-level binomial regression model favours the former, indicating that there is significant variation in access to market-based financial instruments across countries.

**Table 4.** Descriptive statistics of explanatory variables

	Obs	Mean	Std. dev.	Min	Max
<b>Panel A. Matched SAFE-Amadeus database (2009–2014)</b>					
Firm-specific variables					
Tangibility	40,802	0.320	0.245	0.00	0.95
Profitability	36,359	0.084	0.128	-0.43	0.48
Turnover growth	31,446	0.048	0.342	-1.87	4.00
Fixed asset growth	39,142	0.066	0.396	-0.51	1.31
Current ratio	38,937	2.259	3.284	0.15	26.15
Listed	49,590	0.032	0.176	0.00	1.00
Size	36,501	8.167	1.999	0.00	17.97
Age	49,547	24.052	18.654	1.00	105.00
Leverage	35,925	0.222	0.217	0.00	0.93
Tax	34,466	0.197	0.215	-0.15	0.92
Country-specific variables					
Stock market development	42	0.544	0.218	0.15	0.87
Bond market development	42	0.055	0.037	0.000	0.148
Banking system development	42	1.067	0.336	0.54	1.72
Rule of law	42	1.242	0.460	0.34	2.12
Time needed to dispute resolution	42	564.51	279.45	235.0	1210.0
Property rights	42	74.591	12.875	50.0	95.0
Number of procedural steps	42	33.226	4.829	26.0	41.0
Economic growth	42	0.435	1.847	-7.49	5.01
<b>Panel B. Amadeus database (2009–2014)</b>					
Firm-specific variables					
Tangibility	4,129,101	0.34	0.29	-1.44	1.33
Profitability	4,011,228	0.09	0.15	-0.5	0.64
Turnover growth	4,129,251	0.03	0.43	-1.0	5.00
Fixed asset growth	4,050,820	0.00	0.46	-1.0	5.00
Current ratio	4,106,875	2.02	2.26	0.05	15.5
Listed	4,129,251	0.00	0.04	0.0	1
Size	4,128,961	6.26	1.79	0.0	19.02
Age	4,127,165	15.2	13.2	0.0	435
Leverage	4,029,522	0.18	0.21	0.0	0.99
Tax	3,652,962	0.20	0.27	-1.0	1.0

Source: All firms (large and SMEs) in our Eurozone country sample. See Appendix Table 10 for a description of the independent variables. Panel A: descriptive statistics of independent variables for firms in the matched database SAFE-Amadeus. Panel B: descriptive statistics of independent variables for firms in the enlarged Amadeus sample. Period analysed: 2009–2014

short-term debt financing<sup>19</sup> from the banking system. In this sense, our fifth hypothesis (H5) is confirmed. We find no evidence to support the predicted positive

relationship between tangibility and market-based finance, so H8 is rejected. Previous studies have argued that tangible assets facilitate debt funding in general (Hall et al. 2004; de Jong et al. 2008), but this variable is not significant in our study.

In sum, we can expect a higher probability of accessing market-based finance among large, listed

<sup>19</sup> Excessive dependence on short-term bank financing by distressed-country SMEs has increased, particularly since 2011 in the aftermath of the Eurozone sovereign debt crisis.

**Table 5.** Correlation matrix of independent variables**Panel A. Firm-specific variables**

	Tangibility	Profitability	Turnover growth	Fixed asset growth	Current ratio	Listed	Size	Age	Leverage	Tax
Tangibility	1									
Profitability	0.03	1								
Turnover growth	0.01	-0.01	1							
Fixed asset growth	0.10	0.05	0.08	1						
Current ratio	-0.16	0.05	-0.01	-0.02	1					
Listed	0.02	0.00	-0.01	0.00	-0.01	1				
Size	-0.01	0.09	-0.04	0.04	-0.09	0.18	1			
Age	0.01	-0.03	-0.05	-0.05	0.06	0.05	0.37	1		
Leverage	0.35	-0.12	-0.01	0.03	-0.03	-0.04	-0.10	0.07	1	
Tax	0.03	0.30	-0.01	0.06	0.01	-0.01	0.12	0.01	-0.08	1

**Panel B. Country-specific variables**

	Stock market dev.	Banking system dev.	Bond market dev.	Rule of law	Time needed to dispute resolution	Property rights	Number of procedural steps	Economic growth
Stock market dev.	1							
Banking system dev.	0.26	1						
Bond market dev.	0.08	-0.34	1					
Rule of law	0.41	-0.23	0.60	1				
Time needed to dispute resolution	-0.61	-0.06	-0.54	-0.90	1			
Property rights	0.31	-0.26	0.69	0.96	-0.87	1		
Number of procedural steps	0.00	0.74	-0.46	-0.59	0.47	-0.60	1	
Economic growth	0.10	-0.32	0.49	0.24	-0.24	0.29	-0.31	1

Mean Variance Inflation Factor 7.71

Source: matched database SAFE-Amadeus. All firms (large and SMEs) in our Eurozone country samples. See Appendix Table 10 for a description of the independent variables. Period analysed: 2009–2015. Variance inflation factor is calculated considering all the explanatory variables

firms that have strong growth, are more highly leveraged and can compensate for lower profitability through a proper level of solvency (via a reassuring current ratio, due to less short-term financial debt).<sup>20</sup>

## 5.2 Introducing country-specific variables

Columns 3 and 4 of Table 6 (panel B) display the probit regression statistics, including those for the country-specific variables that may influence the likelihood of SMEs using market-based funding. The results for firm-specific variables hold in sign and dimension, while a number of country-specific variables prove to be statistically significant, sometimes exhibiting larger magnitudes

<sup>20</sup> Because our analysis categorises both new equity and bond financing as market-based funding, it is not surprising that creditworthiness indicators, such as the current ratio, appear to be relevant for prospective bond investors.

than the firm-specific variables discussed in Section 5.1. Column 3 summarises the specification model with sampling weights, whereas the results in Column 4 are not weighted.<sup>21</sup> We also performed a series of tests to check the predictive power and goodness of fit of our model specifications; the results are reassuring.<sup>22</sup>

<sup>21</sup> We use the specification with sample weights to compute our novel MSI, following the methodology discussed for the restricted model with only firm-specific variables.

<sup>22</sup> These tests were performed on the model specification with country-specific variables and without sample weights (column 4 of Table 6). The percentage of cases correctly classified was as high as 93.83%; the predictive power, measured by the area under the ROC curve, reached a value of 0.674, indicating that the model has good predictive power. Goodness of fit was assessed using Pearson's chi-square and Hosmer-Lemeshow tests. Both tests confirmed that the model fits the data reasonably well, with  $\text{Prob} > \chi^2 = 0.314$  and  $\text{Prob} > \chi^2 = 0.608$ , respectively.

**Table 6.** Probit estimation with firm-specific and country-specific variables

Dependent variable: equals 1 if firms report (on SAFE questionnaire) to have used market-based instruments (new equity or debt securities) in the previous six months and 0 otherwise

	(1)	(2)	(3)	(4)
<b>Panel A. Regression coefficients</b>				
Firm-specific variables				
Profitability	-0.853*** (0.208)	-0.978*** (0.199)	-1.021*** (0.200)	-0.586*** (0.120)
Turnover growth	0.213*** (0.050)	0.171*** (0.052)	0.179*** (0.052)	0.113*** (0.044)
Current ratio	0.027*** (0.008)	0.019** (0.008)	0.020** (0.008)	0.009 (0.006)
Listed	0.204** (0.082)	0.202** (0.083)	0.195** (0.082)	0.222*** (0.057)
Size	0.109*** (0.011)	0.091*** (0.010)	0.091*** (0.010)	0.076*** (0.008)
Leverage	0.328*** (0.096)	0.402*** (0.100)	0.387*** (0.100)	0.280*** (0.065)
Fixed asset growth				0.090*** (0.035)
Country-specific variables				
Stock market development			0.616*** (0.230)	0.804*** (0.140)
Banking system development			1.071*** (0.170)	0.667*** (0.183)
Rule of law			0.933*** (0.292)	0.429** (0.180)
Time needed to dispute resolution			0.299*** (0.060)	0.234*** (0.039)
Property rights			0.020*** (0.007)	0.022*** (0.005)
Number of procedural steps			-0.074*** (0.017)	-0.049*** (0.011)
Economic growth			0.060* (0.032)	0.091*** (0.020)
Constant	-3.045*** (0.175)	-2.908*** (0.205)	-5.876*** (0.636)	-5.407*** (0.433)
Observations	25,306	25,306	24,605	23,999
Errors	Robust	Robust	Robust	Robust
Country FE	No	Yes	No	No
Wave FE	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes
Sample weights	Yes	Yes	Yes	No
Pseudo R-squared	0.069	0.080	0.082	0.053

**Table 6.** (continued)

Dependent variable: equals 1 if firms report (on SAFE questionnaire) to have used market-based instruments (new equity or debt securities) in the previous six months and 0 otherwise

	(1)	(2)	(3)	(4)
<b>Panel B. Marginal effects</b>				
Firm-specific variables				
Profitability	-0.116*** (0.029)	-0.132*** (0.027)	-0.139*** (0.028)	-0.068*** (0.014)
Turnover growth	0.029*** (0.007)	0.023*** (0.007)	0.024*** (0.007)	0.013*** (0.005)
Current ratio	0.004*** (0.001)	0.003** (0.001)	0.00267** (0.001)	0.001 (0.001)
Listed	0.028** (0.011)	0.027** (0.011)	0.027** (0.0112)	0.026*** (0.007)
Size	0.015*** (0.002)	0.012*** (0.002)	0.012*** (0.002)	0.009*** (0.001)
Leverage	0.045*** (0.013)	0.054*** (0.013)	0.053*** (0.014)	0.032*** (0.007)
Fixed asset growth				0.010*** (0.004)
Country-specific variables				
Stock market development			0.084*** (0.031)	0.093*** (0.016)
Banking system development			0.146*** (0.041)	0.077*** (0.021)
Rule of law			0.127*** (0.040)	0.050** (0.021)
Time needed to dispute resolution			0.041*** (0.008)	0.027*** (0.004)
Property rights			0.003*** (0.001)	0.003*** (0.001)
Number of procedural steps			-0.010*** (0.002)	-0.0056*** (0.001)
Economic growth			0.008* (0.004)	0.011*** (0.002)
Observations	25,306	25,306	24,605	23,999
Errors	Robust	Robust	Robust	Robust
Country FE	No	Yes	No	No
Wave FE	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes
Sample weights	Yes	Yes	Yes	No

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

Source: matched database SAFE-Amadeus. All firms (large and SMEs). Column 1 refers to model specification with only firm-specific variables without country dummies and sector fixed effects (1), column 2 with firm-specific variables and country dummies (2), column 3 including country-specific variables with sample weights (3) and column 4 including country-specific variables without sample weights (4). Independent variables are defined in Appendix Table 10. Pseudo R-squared is the McFadden Pseudo R-squared statistic. Period analysed: 2009–2014. Panel A summarizes regression coefficients while Panel B describes marginal effects

The development of domestic capital markets, proxied by the ratio of equity market capitalisation to GDP, was found to be statistically significant and positively related to use of market-based finance, together with economic (GDP) growth and domestic credit to the private sector divided by GDP. They appear to be among the most important influencers of firm access to market-based financial instruments. For instance, an increase of 1% in equity market capitalisation over GDP generates an 8.4% increase in the use of market-based finance. When we consider the weight of domestic credit to the private sector, this effect increases to 14.6%. These results confirm hypotheses 9 and 10. Thus, not only the development of the financial system but also confidence in the safety of the country appear to be relevant.

Three variables indicating the strength of the legal and judicial enforcement system (rule of law, time needed for dispute resolution and property rights) have statistically significant positive signs, while the fourth (the number of procedural steps) has a negative sign. The signs of the regression coefficients are in line with our assumptions confirming H11. In this sense, the quality of legal and judicial institutions influences the likelihood of firms using market-based funding.<sup>23</sup>

### 5.3 Robustness tests

In this section, we verify the robustness of the results obtained in the first stage of our analysis. First, we check the robustness of our findings over time by running our analysis across different time windows: waves 2–6 (September 2009–September 2011); waves 2–10 (September 2009–September 2013); and the full period (September 2009–September 2013). Columns 1, 2, and 3 in Table 7 show that the significance levels of the coefficients and their magnitudes are time invariant. Because the crisis caused financial and economic conditions to change in our sample countries during the period under investigation, we ran the analysis on a sample that omits the most affected countries (Italy, Spain and Portugal). Column 4 in Table 7 presents the results of this analysis. Among the firm-specific variables, we find no significant differences compared with the full sample (changes in the current ratio and fixed

asset growth are not statistically significant). With respect to country-specific variables, when we omit countries strongly affected by the crisis, the ratio of market capitalisation to GDP becomes statistically non-significant, whereas the relevance of banking system development increases relative to the full sample. In our main analysis, interpreting the sign of the current ratio is less straightforward. We detect a positive but weak relationship between firm solvency and use of market-based instruments. We deepen analysis of the role of firm liquidity by substituting the current ratio for a new variable: the ratio of cash flow to total assets. The results (column 5) confirm that firm liquidity is relevant and can influence access to market-based financial instruments (with a coefficient of 0.178).

### 5.4 MSI results

For each firm in each year, the SAFE score is obtained by multiplying the estimated coefficients by the corresponding values of the independent variables plus a constant.<sup>24</sup> The index also loads the sector and country dummies to explicitly take account of country and sector heterogeneity.

First, SAFE scores for all firms in the Amadeus database from 2009 to 2014 are estimated. Second, applying the thresholds (as explained in Section 4.2), we obtain the MSI, the key results for which are detailed below.

Table 8 presents the mean values of the MSI for differently sized firms. We define micro, small, medium-sized and large firms by number of employees (less than 10, between 10 and 49, between 50 and 249 and more than 250 employees, respectively). The evidence shows that if we do not consider microfirms, which are mostly ineligible for capital market funding, the fraction of small firms suitable to access capital markets is no longer negligible (with a country average of 7.6%; see Table 8, panel A), while the value is even more significant for medium-sized firms (31.1% on average). This second finding indicates that, among SMEs, medium-sized firms are better equipped to enter capital markets.

Nevertheless, our MSI displays large differences across countries (see Table 8, panel A). In the medium-sized class, France ranks highest for firms suitable for market-based finance, followed by Finland; southern European countries

<sup>23</sup> We ran the same analysis adding also country fixed effects to test for cultural and institutional factors that we could not consider with country-specific variables. The results for firm-specific variables are quite similar to those in the previous analysis, whereas many country/institutional variables become non-significant.

<sup>24</sup> To compute the predicted SAFE score, we first consider the coefficients of the estimated probit, as specified in column 2, panel A of Table 6, as this regression also considers country fixed effects.

**Table 7** Robustness tests

Dependent variable: equals 1 if firms report (on SAFE questionnaire) to have used market-based instruments (new equity or debt securities) in the previous six months and 0 otherwise

	1 Waves 2–6	2 Waves 2–10	3 All period (waves 2–13)	4 Sample without Italy, Spain, Portugal	5 Cash flow/total asset
Firm-specific variables					
Profitability	−0.545*** (0.165)	−0.446*** (0.134)	−0.586*** (0.120)	−0.368*** (0.106)	−0.595*** (0.118)
Turnover growth	0.172*** (0.057)	0.156*** (0.048)	0.113*** (0.044)	0.109* (0.061)	0.113*** (0.044)
Fixed asset growth	0.141*** (0.049)	0.098** (0.039)	0.090*** (0.035)		0.086** (0.035)
Current ratio	0.018** (0.009)	0.016** (0.007)	0.009 (0.006)		
Listed	0.175** (0.077)	0.221*** (0.063)	0.222*** (0.057)	0.308*** (0.076)	0.216*** (0.057)
Size	0.077*** (0.012)	0.075*** (0.009)	0.076*** (0.008)	0.065*** (0.011)	0.077*** (0.008)
Leverage	0.241** (0.094)	0.238*** (0.075)	0.280*** (0.065)	0.475*** (0.094)	0.320*** (0.069)
Country-specific variables					
Stock market development	0.754*** (0.219)	0.717*** (0.171)	0.804*** (0.140)		0.782*** (0.140)
Banking system development	0.921*** (0.286)	0.817*** (0.222)	0.667*** (0.183)	2.146*** (0.404)	0.685*** (0.184)
Rule of law	0.989*** (0.355)	0.675*** (0.233)	0.429** (0.180)	0.979* (0.512)	0.423** (0.180)
Time needed to dispute resolution	0.003*** (0.001)	0.003*** (0.001)	0.002*** (0.000)		0.002*** (0.000)
Property rights	0.018*** (0.006)	0.016*** (0.006)	0.022*** (0.005)	0.032*** (0.005)	0.0222*** (0.005)
Number of procedural steps	−0.070*** (0.019)	−0.051*** (0.014)	−0.049*** (0.010)	−0.216*** (0.059)	−0.049*** (0.010)
Economic growth	0.090*** (0.032)	0.121*** (0.023)	0.091*** (0.020)		0.089*** (0.020)
Cash over total assets					0.178** (0.079)
Constant	−5.837*** (0.700)	−5.343*** (0.503)	−5.407*** (0.433)	−2.175*** (0.718)	−5.482*** (0.435)
Observations	10,334	16,207	23,999	10,351	23,964
Errors	Robust	Robust	Robust	Robust	Robust
Country FE	No	No	No	No	No
Wave FE	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes
AUC	0.671	0.645	0.674	0.663	0.674

**Table 7** (continued)

Dependent variable: equals 1 if firms report (on SAFE questionnaire) to have used market-based instruments (new equity or debt securities) in the previous six months and 0 otherwise

	1 Waves 2–6	2 Waves 2–10	3 All period (waves 2–13)	4 Sample without Italy, Spain, Portugal	5 Cash flow/total asset
Pseudo R-squared	0.058	0.042	0.053	0.056	0.053

Robust standard errors in parentheses

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

Source: matched database SAFE-Amadeus. All firms (large and SMEs). Column 1 refers to model for the period September 2009–September 2011 (1), column 2 refers to the period September 2009–September 2013 (2), column 3 is the base model for the whole period September 2009–September 2015 (3) and column 4 refers to the model for the whole period but without considering distressed countries: Italy, Spain and Portugal (4). In column 5, the ratio cash flow over total assets replaces the current ratio. Independent variables are defined in Appendix Table 10. Regression coefficients are reported. AUC is the area under the ROC curve statistic. Pseudo R-squared is the McFadden Pseudo R-squared statistic

are replaced at the bottom of the rankings by Germany and Belgium. The small-sized class continues to show heterogeneity, but the differences are smaller: apart from Finland and France, countries have more similar index values. Overall, high country heterogeneity within given firm size classes is confirmed.

As Germany and Belgium SMEs ranked first and second by actual use of market-based finance (see Table 3, panel B), the MSI signals a relatively low level of ‘residual’ market-suitable firms. A similar logic can be applied to firms located in peripheral Eurozone countries, where the MSI indicates much higher suitability for market-based finance than emerges from SAFE responses. Table 9 (panel A) summarises this evidence (i.e. the gap between suitability and effective access to market-based finance), measuring the differences between the MSI and SAFE replies by size class.<sup>25</sup>

Following the procedures used above, we replicate the SAFE score and MSI computations in the probit model that includes country-specific variables. Figure 4 presents the distribution of the MSI by firm size, while Fig. 5 shows the index mean values by sector. Most of the firms suitable for market-based instruments are concentrated in the IT and Communications and Utilities sectors. The smallest number of market-suitable firms is in the Retail sector. We observe a positive correlation between suitability for market-based instruments and the average size of firms in each sector: for example, retail trade firms have an average

size of 18 employees, whereas IT and Communications and Utilities firms have an average of 56 and 117 employees, respectively.

After controlling for country-specific effects, the MSI does not change dramatically when focusing on firm size. This result is clearly supported by the results presented in Tables 8 and 9 (panel B). Finally, Fig. 6 summarises the comparison between three versions of our MSI: with only firm-specific variables and without country fixed effects; with both firm-specific variables and country fixed effects; and including country-specific variables (see the model specifications in columns 1, 2, and 3 of Table 6). Again, with the marked exception of Germany and to some degree Belgium,<sup>26</sup> we witness a generalised decline in market suitability, particularly for medium-sized firms. In theory, the percentage of our sample firms suitable for market-based finance is substantial, yet none of the countries under investigation, except for Germany, have realised this SME potential. When the real context in which these firms operate is taken into account, including both the institutional characteristics of the business environment (e.g. efficiency of the law, functioning of the financial system) and the economic cycle, this potential is reduced. In a few countries, the reduction is negligible; in others, it is significant. In other words, the suitability of firms for market-based finance is sensitive not only to the business cycle and conditions in the financial markets (as expected) but also to the efficiency of the legal system and the depth of financial markets (both stock and banking).

<sup>25</sup> In Table 9, panel A, the MSI is computed by employing the model specification of column 1 in Table 6 (firm-specific variables only; no country fixed effects).

<sup>26</sup> Germany and Belgium were in the economically strongest phases of the business cycle in our sample period, with an average GDP growth of 1.6% and 1% respectively.

**Table 8.** MSI mean value by firm size

Firm size (%)	Firm size (%)			
	Micro	Small	Medium	Large
<b>Panel A. MSI index with only firm-specific variables (without country fixed effects)</b>				
Belgium	4.1	3.1	7.9	39.0
Germany	2.4	2.4	4.4	27.3
Spain	1.9	4.4	28.5	75.6
Finland	5.9	19.0	56.9	93.0
France	4.2	15.4	63.8	95.6
Italy	1.7	5.2	33.2	83.1
Portugal	1.8	4.0	23.2	72.1
Average	3.2	7.6	31.1	69.4
<b>Panel B. MSI index including country-specific variables</b>				
Belgium	5.4	4.2	8.6	28.2
Germany	3.7	3.3	5.5	24.5
Spain	2.6	4.5	19.3	46.3
Finland	7.7	18.9	43.8	74.1
France	4.0	12.6	43.9	82.3
Italy	2.5	6.3	25.8	63.5
Portugal	2.3	3.9	17.6	52.0
Average	4.0	7.7	23.5	53.0

Source: BvD Amadeus sample. Panel A displays results when using MSI index computed with only firm-specific variables without country dummies according to the model specification of column 1 in Table 6, while panel B exhibits the differences employing the MSI index including also country-specific variables (column 3 of Table 6) across years 2009–2014. Each MSI index selects those firms that are market suitable by introducing a threshold on the SAFE score. We pick the top  $x\%$  of the distribution of the SAFE score by country, where  $x$  is the percentage of firms which declared in the SAFE survey to use market-based instruments over 2009–2015. For each year, firms suitable for market-based financing are identified as those with a value of the SAFE score greater than the threshold. The MS index (MSI) will be equal to 1 for firms with a SAFE score greater than the threshold and zero otherwise. SMEs are defined on number of employees. Averages are simple (non-weighted) means of country values

### 5.5 Discussion and future research

The aims of the study were twofold: (1) to define firm and country features that foster SME access to market-based finance in the Eurozone; and (2) to identify the potential suitability of firms for market-based finance.

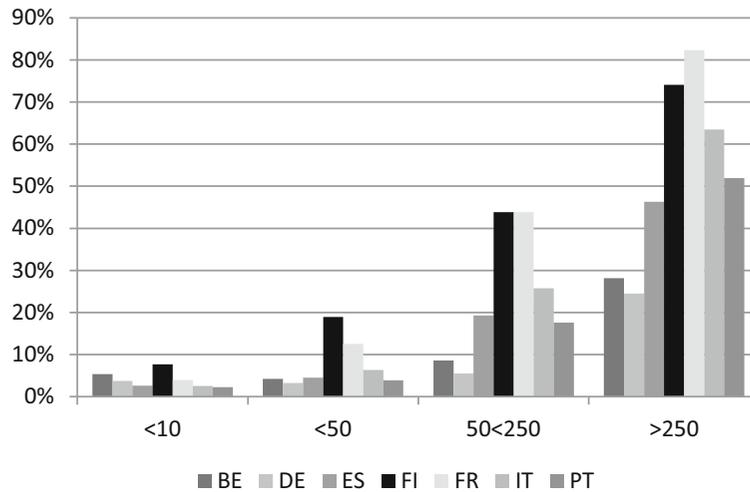
Our results reveal several firm-specific and country-specific factors that influence the likelihood of Eurozone SME access to market-based finance. We observe a

**Table 9** The difference between MSI value and SAFE replies by firm size and country

Firm size (%)	Firm size (%)			
	Micro	Small	Medium	Large
<b>Panel A. MSI index with only firm-specific variables (without country fixed effects)</b>				
Belgium	-0.6	-2.1	1.2	26.9
Germany	-2.7	-3.1	-4.3	16.6
Spain	-0.7	-0.7	24.2	69.1
Finland	-1.1	13.1	49.8	72.7
France	-1.0	8.8	57.1	83.7
Italy	-1.5	0.3	26.0	73.2
Portugal	0.7	2.3	20.0	61.4
Average	-1.0	2.6	24.9	57.7
<b>Panel B. MSI index including country-specific variables</b>				
Belgium	0.7	-1.0	1.9	16.0
Germany	-1.4	-2.3	-3.2	13.7
Spain	0.0	-0.6	15.0	39.9
Finland	0.8	13.1	36.8	53.8
France	-1.3	5.9	37.2	70.4
Italy	-0.7	1.4	18.5	53.6
Portugal	1.2	2.1	14.4	41.3
Average	-0.1	2.7	17.2	41.2

Source: BvD Amadeus sample and matched database SAFE-Amadeus. The MSI index selects those firms that are market suitable by introducing a threshold on the SAFE score derived from the SAFE (see note on Table 8). Panel A displays results when using MSI index computed with only firm-specific variables without country dummies according to the model specification of column 1 in Table 6, while panel B exhibits the differences employing the MSI index including also country-specific variables (column 3 of Table 6). For Germany, percentages in wave 3 are calculated as averages of those in wave 2 and wave 4 as some changes in the questionnaire may have caused a break in the series on equity. SMEs are defined on number of employees. Averages are simple (non-weighted) means of country values. Period analysed: 2009–2014

positive relationship between the size and listed status of a company and its access to market-based finance. Consistent with the life cycle paradigm, size and informational transparency are also important influencers of firms' funding choices. Larger and listed firms seem to be able to reduce asymmetric information (Leland and Pyle 1977; Chemmanur and Fulghieri 1999; Rajan and Zingales 1995), information opacity (Berger and Udell 1998) and the costs to the company of accessing the public market (Ritter 1987). We detect a higher probability of accessing market-based finance among firms that combine lower

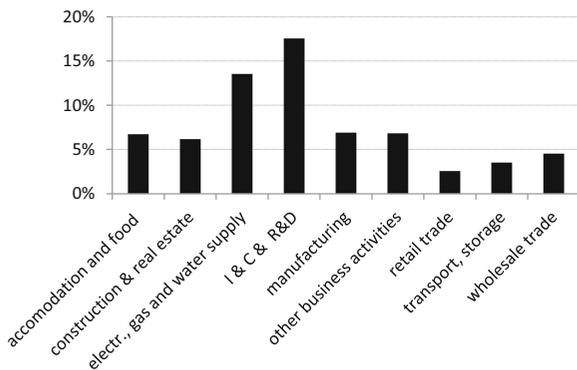


**Fig. 4.** MSI mean value with country-variables by firm size (based on the number of employees). Source: BvD Amadeus sample. To create MSI index, we select those firms that are market suitable by introducing a threshold on the SAFE score (see note on

Table 8). The MS indicator (MSI) is equal to 1 for firms with a SAFE score greater than the threshold and zero otherwise. SMEs are defined on number of employees. Period analysed: 2009–2014

profitability with a higher level of solvency (via a higher current ratio, due to less short-term financial debt). In this sense, our results confirm recent findings of a low level of profitability for SMEs that access the market (Vismara et al. 2012; Gao et al. 2013; Ritter et al. 2013).

Moreover, our results confirm the positive effect of liquidity on accessing market-based finance. This result conflicts with literature on the pecking order theory (Myers 1984; Myers and Majluf 1984) and life cycle paradigm. In Eurozone SME markets, high firm liquidity seems to provide a sort of guarantee to prospective investors who

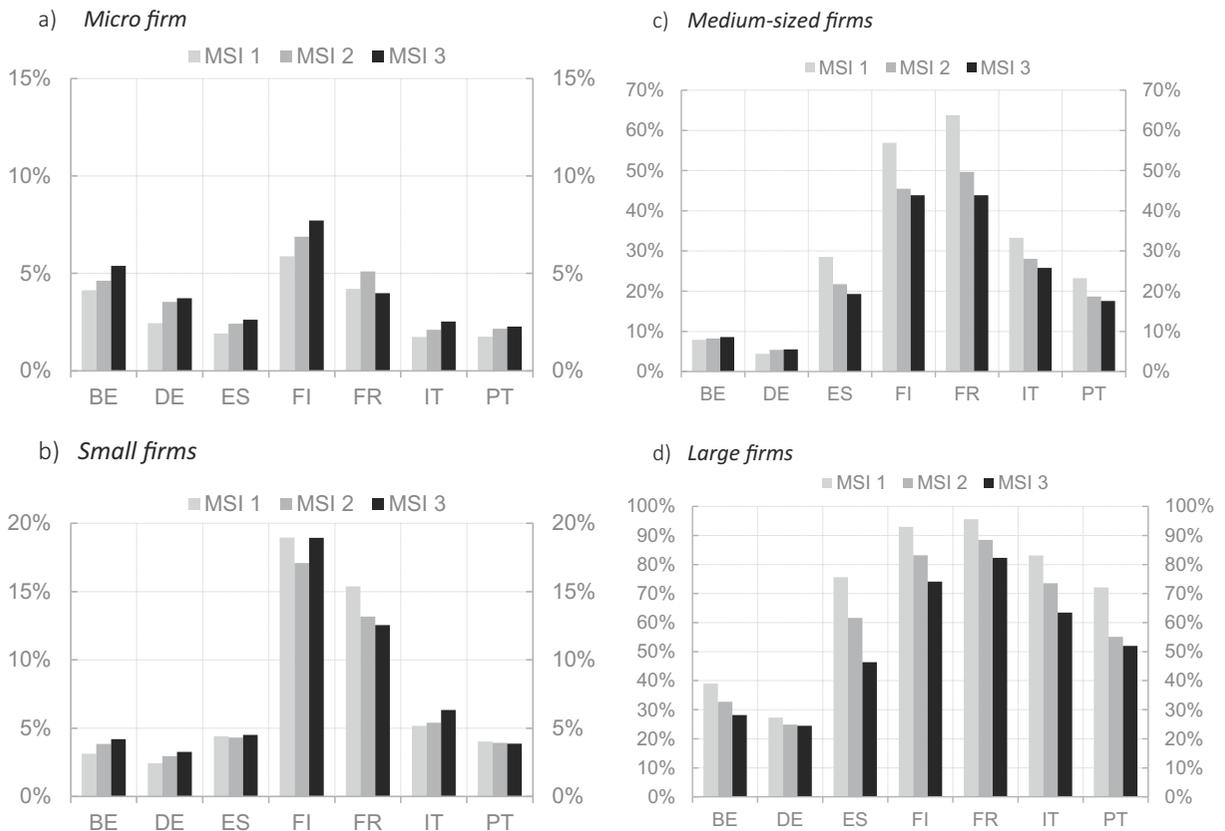


**Fig. 5** MSI mean value with country-variables by firm's sector. Source: BvD Amadeus sample. All firms (large and SMEs). To create the MSI index, we select those firms that are market suitable by introducing a threshold on the SAFE score (see note on Table 8). The MS indicator is equal to 1 for firms with a SAFE score greater than the threshold and zero otherwise. MSI value at firm level is then aggregated at sector level in order to have the MSI mean value by sector reported. Period analysed: 2009–2014

may otherwise be concerned by the lack of reputational capital (Diamond 1991; Hale and Santos 2008). Firm liquidity in this way provides a signal of solvency.

Turnover growth and firm leverage are each positively related to equity and bond issuance. Firms with higher growth opportunities are expected to need more sources of finance, and given their greater needs, they can face financial constraints from banks, especially if they are already highly leveraged (Rajan 1992).

Regarding country-specific variables, the development of domestic equity markets, economic growth (GDP), the relative volume of domestic credit supplied to the private sector and the quality of the legal and judicial system all play a role in improving the likelihood of firms' using market-based funding. Our results fully confirm, in the context of market-based finance, prior findings on the role of country-specific variables in influencing SME funding, albeit at a more general level. According to Beck et al. (2008), de Jong et al. (2008), Kayo and Kimura (2011) and Moritz et al. (2016), greater breadth, depth and liquidity of capital markets facilitate firms' access to market-based finance. Regarding the role of banking system development, our study shows that high dependence on bank credit positively influences market-based finance, promoting the diversification of external funding sources. In this sense, we provide evidence of the complementarity of banks and capital markets in supporting the real sector.



**Fig. 6** MSI index by firm size: a comparison (2009–2014). Micro firms, small firms, medium-sized firms and large firms. Source: BvD Amadeus sample. The MSI index selects those firms that are market suitable by introducing a threshold on the SAFE score derived from the SAFE (see note on Table 8). Charts display results when using MSI index computed: with only firm-specific

variables without country dummies (MSI 1), with firm-specific variables and country dummies (MSI 2) and including country-specific variable (MSI 3) according, respectively, to the model specifications of columns 1, 2 and 3 in Table 6. SMEs are defined on number of employees. Period analysed: 2009–2014

Finally, our study demonstrates the importance of the legal and judicial enforcement system in positively influencing market-based finance. We confirm the more general findings in prior literature on firms' access to external finance (La Porta et al. 1997; Giannetti 2003; Beck et al. 2005, 2008).

Our survey-based index provides useful insights into the *market suitability* of prospective issuers across size (micro, small, medium-sized and large firms), country and sector. A few countries in the Eurozone have already realised SME potential for capital market financing, but there remains unexploited potential in a large percentage of firms suitable for market-based finance, measured as the difference between our MSI and SAFE responses, especially in the medium-size class. Unexploited southern European SMEs have become relatively better positioned to access market-based finance compared to SMEs in other EU countries in our sample.

Moreover, our index is sensitive to institutional factors and economy-wide conditions, to which SMEs appear to be particularly sensitive. Our MSI, which includes country-specific variables, highlights that business conditions, measured by GDP growth and the degree of development of domestic stock and credit markets, as well as the quality of the legal and judicial enforcement system influence a firm's market suitability, reducing the likelihood of SMEs accessing market-based finance in most countries analysed.

### 5.5.1 Limitations and future research avenues

Our empirical analysis has several limitations. First, we analyse new equity and bond issues together as a single category, defined as market-based finance. These two categories of financial instrument have obviously different

characteristics and, in some circumstances, could have a different expected sign for their relationship with our explanatory variables. The second limitation is the number of countries analysed in the study. Owing to the limited availability of economic and financial data for certain Eurozone countries, we analyse only seven. However, although this is a low number, the sample is representative of core European countries (Germany, France, Belgium and Finland) as well as peripheral southern countries (Italy, Spain and Portugal). The third limitation of our study concerns the impossibility of fully evaluating the role of important new sources of finance, such as equity crowdfunding and P2P lending. Recent years have seen huge growth in these new financial instruments. The SAFE collects information about firms' use of crowdfunding through a separate, different question on the use of a loosely specified group of alternative financial instruments (both market-based and nonmarket-based) including crowdfunding, P2P lending, subordinated loans, participating loans and other sources. Since it was not possible to separate information about crowdfunding, we were unable to analyse this new funding channel in our study. Finally, there are some limitations regarding our statistical results. The values of *R*-squared in our probit regressions were quite low, although consistent with other studies using a similar SAFE dataset to analyse SME access to external finance (e.g. Moro et al. 2016; Lawless et al. 2015; Ferrando et al. 2017). These low values may reflect that certain variables were omitted. For instance, we were unable to consider hard-to-quantify variables reflecting non-negligible country-specific factors like the entrepreneurial culture and human and social environment in terms of, for example, labour-market rigidities, R&D orientation and culture, and management skills.

Two main future research avenues lead on from our study. The first is to investigate the relationship between use of market-based finance and use of non-market-based external funding (such as bank loans). This should aim to discover the main underlying motivation for accessing market-based finance, ascertaining whether firms seek to tap all potential funding sources (complementary effect) or pursue market-based finance after being rejected or discouraged by the traditional banking system (substitution effect). The second research strand is to analyse the ex-post effects of using market-based finance on firms' investment policy, employment, productivity and profitability. To study these effects, researchers will need to analyse the pool of SAFE-surveyed firms through financial reporting data for a

period of 3–5 years after first accessing market-based finance.

## 6 Conclusions and policy implications

This study investigates SME access to market-based finance across Eurozone countries and identifies firm characteristics, integrated with country-specific features that foster such access. We also devise a survey-based index that indicates firms' potential suitability for market-based finance. We achieve our goals using an original dataset that matches firms participating in the SAFE survey with their financial statements, sourced from the Amadeus database. By integrating these two datasets, we use SMEs' decisions on raising new equity or issuing bonds through the public and private funding channels as the dependent variable in our empirical analysis.

### 6.1 Main theoretical contributions

Our study makes four main contributions to the literature on SME funding. First, we comprehensively discussed the firm-specific and country-specific factors which appear to influence the likelihood of Eurozone firms accessing market-based finance. This enabled consideration of the determinants of still-subdued SME access to market-based instruments. We thus complement previous research on SME capital market funding, which mainly explores either the decision to go public or the private placement channel of market-based funding.

Second, we find a positive relationship between the use of market-based instruments and certain firm-specific characteristics, such as size, listed status, growth, liquidity and leverage. Some of these characteristics, such as firm liquidity, had not been identified in prior research on firms' external funding. Moreover, several country-specific variables were also found to influence the likelihood of a firm using market-based funding. The development of a country's financial system and national economic performance (GDP growth) are both positively related to the use of market-based finance. A strong judicial and legal system was also found to positively influence access to market-based finance. These country-specific factors had already been identified by prior literature only in the context of firms' external finance, both bank- and market-related. Our results confirm their influence regarding market-based instruments.

Third, to the best of our knowledge, our study is the first to propose a *market suitability* index that quantifies to what extent individual Eurozone countries and/or firm size classes have already realised SMEs' potential for capital market financing. Using the index proposed, we find that many firms, especially medium-sized, which are suitable for market-based finance remain unexploited, particularly in Southern Europe. This approach allows debate on how and under what conditions access to market-based finance could be expanded for SMEs.

Fourth, and finally, we argue that the context and business environment in which firms operate can substantially hinder firms' suitability for market-based finance. We showed that there is evidence of unequal conditions across Eurozone countries.

## 6.2 Relevant policy implications

Our empirical results are also of great practical and political relevance, providing valuable insights to policy-makers in tailoring government support programmes to tackle obstacles to accessing capital markets. Our study also contributes to the debate on the CMU, and our findings can be linked to a number of goals of the CMU agenda.

One of the key targets of the CMU Action Plan (European Commission 2015b, 2016a, 2016b) is to 'Make it easier for companies to raise funds on capital markets'.<sup>27</sup> Our results confirm that firm solvency is crucial to increasing their prospects of tapping market-based instruments. Our findings reinforce those proposals directed at improving the standardisation and availability of credit and financial information on SMEs for non-bank investors (European Commission 2015b, pp. 16–17). For instance, by creating a database of standardised credit and financial information on SMEs seeking capital-market funding, such firms would be more visible to prospective investors across Europe.

Financial development and support are also important. The role of banks remains prominent in facilitating SME access to alternative, market-based funding

options,<sup>28</sup> as confirmed by the positive and significant effect of the ratio of domestic credit to GDP in our empirical analysis. This complementary role of the banking system needs to be taken into account in shaping policy measures.

Another target of the CMU Action Plan calls for 'Facilitating cross-border investing'. Our evidence that the quality of the judicial and legal system positively influences the use of capital markets is directly linked to this goal, since investors may be discouraged from investing in foreign countries by inadequate legal and judicial protection. Although harmonising bankruptcy laws could help to mobilise capital across the EU, as recommended in the CMU Action Plan, our study shows the persistence of further discrepancies in firms' institutional settings which can impede their ability to access market-based finance. Therefore, institutional reforms addressing the efficiency of the legal environment should yield significant results. Finally, another key objective of the CMU Action Plan is to improve 'Financing for non-listed companies'. Private placement markets and prospective SME growth markets appear to have a wide potential scope in the EU and our evidence indicates that, particularly in the medium-sized class, there is substantial unexploited potential in many countries. Policy programmes aimed at nurturing these markets could generate notable rewards.

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<sup>27</sup> The CMU Action Plan (European Commission 2016a, 2016b) identifies six areas of intervention, representing the objectives of the CMU project: financing for innovation, start-ups and non-listed companies; making it easier for companies to raise funds on capital markets; investing for long term, infrastructure and sustainable investment; fostering retail and institutional investment; leveraging banking capacity to support the wider economy; facilitating cross-border investing.

<sup>28</sup> See also CMU Action Plan objective n. 5: leveraging banking capacity to support the wider economy (European Commission 2016a, 2016b, 2017b).

## Appendix

**Table 10** Description of the variables

Explanatory variables	Description	Source
Size	Logarithm of sales (in periods $t-1$ )	Amadeus BvD
Age	Number of years	ECB/EC SAFE Survey
Listed status	Dummy variable equal to 1 for listed firm and zero otherwise	ECB/EC SAFE Survey
Profitability	EBITDA/total assets (in periods $t-1$ )	Amadeus BvD
Current ratio/liquidity	Current assets/current liabilities (in periods $t-1$ )	Amadeus BvD
Turnover growth	Difference between the value of turnover in period $t$ and the average value of variable turnover in periods $t-1$ and $t-2$ , scaled by the average value in periods $t-1$ and $t-2$	Amadeus BvD
Fixed asset growth	Difference between the value of fixed assets in period $t$ and the average value of variable fixed assets in periods $t-1$ and $t-2$ , scaled by the average value in periods $t-1$ and $t-2$	Amadeus BvD
Leverage	Financial debt/total assets (in periods $t-1$ )	Amadeus BvD
Tax	Taxation/profit before tax (in periods $t-1$ )	Amadeus BvD
Tangibility	Fixed assets/total assets (in periods $t-1$ )	Amadeus BvD
Economic growth	GDP annual growth rate (in periods $t-1$ )	World Bank
Stock market development	Equity market capitalization over GDP (in periods $t-1$ )	World Bank
Bond market development	Bond issued by NFC over GDP (in periods $t-1$ )	World Bank
Banking system development	Domestic credit to private sector over GDP (in periods $t-1$ )	World Bank
Rule of law	Confidence in the rules of society score (in periods $t-1$ )	World Bank WGI Indicator
Property rights	Degree to which a country's laws protect private property rights and its government enforces those laws (in periods $t-1$ )	Index of Economic Freedom by the Heritage Foundation
Time needed for dispute resolution	Average time needed to resolve a dispute in calendar days (in periods $t-1$ )	Doing Business by World Bank
Number of procedural steps	Number of procedural steps involved in a commercial dispute (in periods $t-1$ )	Doing Business by World Bank

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