Financing Patterns of European SMEs: An Empirical Taxonomy

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Working Paper 2015/30
EIF Research & Market Analysis

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Luxembourg, November 2015

Preface

Small and medium-sized enterprises (SMEs) are often called the backbone of the European economy, contributing to job creation and economic growth. In 2013, more than 21.5m of SMEs in the European Union made for more than 99% of all non-financial enterprises, employed almost 89m people (67% of total employment), and generated 58% of total added value. However, access to finance is more difficult for SMEs than for larger enterprises, not only during the current financial and economic crisis, but also on a permanent structural basis, due to market imperfections in SME financing (see Kraemer-Eis, Lang and Gvetadze, 2015, for more details).

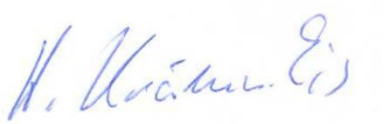
The European Investment Fund (EIF) supports Europe's SMEs by improving their access to finance through a wide range of selected financial intermediaries. To this end, the EIF primarily designs, promotes and implements equity and debt financial instruments which specifically target SMEs. In this role, the EIF fosters EU objectives in support of entrepreneurship, growth, innovation, research and development, and employment.

EIF's Research & Market Analysis team has established a research cooperation with the Chair of Management at the University of Trier. This EIF Working Paper is one result of the successful cooperation. A follow-on project, building on the findings of the presented analysis and financially supported by the EIB Institute under the Knowledge Programme, is scheduled to start soon.

Even though research in SME financing has strongly increased over the recent years, the financing *patterns* of SMEs in Europe are still not well analysed. Previous empirical studies have shown that firm-, product-, industry-, and country-specific factors influence the financing of SMEs. However, there are only few studies with a holistic perspective taking into account the interrelationships between different financing instruments and their determinants.

The research, presented in this EIF Working Paper, provides an integrative perspective of SME financing patterns by identifying and analysing in detail the use of various financing instruments by SMEs. The findings can support the design and development of SME financing instruments across Europe.

We thank the researchers for their important work and the very good cooperation with the EIF. We also thank the participants of a seminar with the researchers, which took place at EIF, as well as the participants of a workshop that took place at the European Central Bank, for fruitful discussions.



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Abstract

This EIF Working Paper takes a holistic approach to investigate SME financing patterns in Europe by performing a cluster analysis including 12,726 SMEs in 28 European countries. The results reveal that SME financing in Europe is not homogenous but that different financing patterns exist. The cluster analysis identifies six distinct SME financing types: mixed-financed SMEs, state-subsidised SMEs, debt-financed SMEs, flexible-debt-financed SMEs, trade-financed SMEs and internally-financed SMEs. These SME financing types differ according to the number of financing instruments used and the combinations thereof. Furthermore, the SME financing types can be profiled according to their firm-, product-, industry- and country-specific characteristics. Our findings can support policy makers in assessing the impact of policy changes on SME financing and in designing financing programs tailored to the specific needs of SMEs.

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1 Introduction[1]

SMEs' access to finance has received an increasing interest of academics and policy makers over the last years, in particular since the start of the financial market crisis in 2008. However, prior empirical studies mainly focused on a single financing instrument and its determinants (Berger and Udell 1998; Cosh et al. 2009). But this is unsatisfactory, as the different financing instruments and their determinants cannot be investigated in isolation from each other. Various substitutive and complementary effects exist between them. We tap into this research gap by taking a more holistic perspective by developing an empirical taxonomy of financing patterns of European SMEs.

Today, it is widely accepted that SMEs are not 'scaled-down versions' of large firms (Cressy and Olofsson 1997). SMEs are different in many respects. Especially their ownership structure affects their business strategy, but also their business financing (Ang 1992; Chittenden and Hutchinson 1996; Michaelas et al. 1999). To understand the financing of SMEs, demand and supply factors have to be considered. To determine SMEs' financing decisions, cost arguments have to be put in the context of the entrepreneurial interest of self-determination and the desire to maintain control of their firm (Achleitner et al. 2011; Cressy 1995). Hence, financing decisions of SMEs are highly complex, as they are based on an array of social, behavioural and financial factors (Romano et al. 2001). Furthermore, access to finance for SMEs is restricted by high information asymmetries, agency risks, insufficient collateral and small transaction volumes. In this context, prior research has shown that the utilization of financing instruments by SMEs depends on different firm- and product-specific characteristics such as firm size, firm age, ownership structure or innovativeness of firms (Artola and Genre 2011; Berger and Udell 1998; Ferrando and Griesshaber 2011; Huyghebaert et al. 2007), the industry in which they operate (Degryse et al. 2012; Hall et al. 2000) and their macroeconomic and legal environment (Agarwal and Mohtadi 2004; Beck et al. 2008; La Porta et al. 1997). However, to the best of our knowledge, no study currently exists which provides an integrative perspective of SME financing patterns using a large number of financing instruments and analyses their characteristics in detail.

This study addresses this research gap by using firm level data of the 'Survey on the access to finance of enterprises (SAFE survey)', which is compiled on behalf of the European Central Bank (ECB) and the European Commission (EC). The survey is well-suited for the research objective, as it has information on 14,859 companies in 37 countries in Europe (wave 2013H1) and most of the firms questioned in the survey are SMEs (around 90%). Furthermore, the SAFE contains information on a large number of financing instruments such as retained earnings or sale of assets, grants and subsidised bank loans, bank overdrafts, credit lines or credit card overdrafts, bank loans, trade credit, other loans (from related companies or family and friends), leasing, hire-purchase or factoring, equity, debt securities issued and subordinated/participating loans or preferred stock. To identify financing patterns of European SMEs, we use these financing instruments as active variables in a cluster analysis including 28 European countries and 12,726

[1] Acknowledgements: We would like to thank Helmut Kraemer-Eis and Frank Lang from the European Investment Fund (EIF) for their valuable suggestions and feedback. Furthermore we would like to thank Annalisa Ferrando from the European Central Bank (ECB) for the fruitful discussions about this research project.

SMEs (see Section 4.1). Afterwards, the financing patterns are analysed according to various passive variables, including firm-, product-, industry- and country-specific variables.

The results of this study provide three main contributions to the literature. First, it contributes to prior research on SME financing by focusing on the substitutive and complementary effect of different financing instruments (Beck et al. 2008; Casey and O'Toole 2014). Second, the results extend the research on firm-, product- and industry-specific characteristics of SME financing (Hall et al. 2004; Jõeveer 2012). And third, it contributes to cross-country research of SME financing including a large number of European countries (Beck et al. 2008; Hall et al. 2004; Jõeveer 2012). The understanding of SME financing patterns and their determinants is of great practical relevance and could support policy makers in assessing the impact of policy changes on SME financing and in designing financing programs tailored to the specific needs of SMEs.

This study is structured as follows: Section 2 reviews prior research on capital structure and financing determinants of SMEs. In Section 3 the SAFE survey, the method used and the variables are described. Section 4 describes the sample, presents the results of the cluster analysis and investigates the characteristics of the financing patterns. In Section 5, we summarise the results, discuss the theoretical and practical relevance of the main findings and identify further research directions.

2 Review of the literature

Empirical evidence confirms that SMEs demand for and access to finance is influenced by a number of different factors such as size, age, growth, profitability, ownership and industry (Chittenden and Hutchinson 1996; Degryse et al. 2012; Ferrando and Griesshaber 2011; Michaelas et al. 1999). In addition, prior research found that the macroeconomic, legal and financial environment impact the financing of companies (La Porta et al. 1997; Levine 2002; Rajan and Zingales 1995). It has been argued that the national markets are even more important for SMEs as the size of their financial requirement often is too small to facilitate cross-border transactions (Guiso et al. 2004; Mullineux and Murinde 2010).

Empirical research on SME financing has shown that SMEs in countries with better institutional developments and better protection of property rights are to a lesser degree financially constraint (Beck et al. 2008; Hall et al. 2004; Hernandez-Canovas and Koeter-Kant 2011). However, most studies in the past only differentiated between external equity and external debt, and did not take into account that a variety of external financing instruments exist, which can complement and/or substitute traditional debt or equity instruments (Beck et al. 2008; Berger and Udell 1998; Casey and O'Toole 2014; Cosh et al. 2009). Furthermore, it has been found that these effects change over the business cycle and in particular in times of financial crises (Casey and O'Toole 2014; Psillaki and Eleftheriou 2014). Table 1provides an overview of relevant empirical studies.

Table 1: Relevant empirical literature

Authors	Main findings	Main data source[a]	Country	Related sub-project[b]
Allen et al. (2012)	Utilization of a large range of financing instruments worldwide. Alternative financing channels (i.e., all non-market, non-bank external sources) have an important role in both developed and developing countries.	WBES	Worldwide	2, 4
Artola and Genre (2011)	Small and young firms suffer disproportionately by deteriorating financing conditions.	SAFE	Europe	1, 2, 3
Beck et al. (2008)	Firm size, financial development and property rights protection are important factors to determine financing patterns of SMEs.	WBES	Worldwide	1, 2, 4
Canton et al. (2012)	Size and age are positively related to perceived access to bank loans. Concentration of the banking sector in a country is negatively related to perceived credit constraints of SMEs.	Eurostat	Europe	1, 2, 3
Casey and O'Toole (2014)	SMEs are more likely to use alternative external financing instruments (i.e., non-bank lending, trade credit, leasing and factoring) in times of financial crises.	SAFE	Europe	1, 2, 3, 4
Chavis et al. (2011)	Young firms use more informal finance (i.e., informal sources such as family and friends) in comparison to more mature firms, which use more bank financing. As firms age, they substitute informal finance with bank finance. Effect is stable for different firm sizes, sectors and countries.	WBES	Worldwide	1, 2, 4
Chittenden and Hutchinson (1996)	Profitability, asset structure, size, age and access to capital markets affect the capital structure of small firms.	U.K. Private+ database	United Kingdom	1
Cosh et al. (2009)	Most firms are able to get desired capital from one of the different external sources (data: 1996-97). Size, age, growth, innovativeness and profitability are important influence factors on availability of financing sources.	Survey	United Kingdom	1, 4
Degryse et al. (2012)	Firm-specific (profitability, growth, collateral) affect SME financing. Intra- and inter-industry differences in financing behavior. Evidence of maturity-matching strategies.	Bank data	Netherlands	1
Deloof et al. (2007)	Support that specific financing instruments are substitutes for SMEs (leasing vs. bank loans). Firms with low profits and high growth have more leases.	Bel-first database	Belgium	1, 4
Drakos (2012)	Lending conditions for SMEs deteriorated from 2009 to 2011, esp. for SMEs with increased interest expenses and decreased profits. Evidence of large country heterogeneity.	SAFE	Europe	1, 2, 3
Ferrando and Griesshaber (2011)	Age and ownership are robust predictors of perceived financing constraints of European SMEs. Mixed results for the influence of size and industry.	SAFE	Europe	1, 2, 3

Table 1 continued:

Authors	Main findings	Main data source[a]	Country	Related sub-project[b]
Ferrando and Mulier (2013)	Matching of survey data with balance sheet information to examine if perceived financing constraints match actual financing constraints. Age and profitability important in explaining access to capital.	SAFE	Europe	1, 2, 3
Hall et al. (2004)	Influence of both, firm- (profit, growth, asset structure, size and age) and country-specific factors on capital structure of SMEs (short- vs. long-term debt).	Dun & Bradstreet	Europe	1, 2
Hall et al. (2000)	Asset structure, firm size, age, growth and industry related to capital structure (long-term/short-term debt) of SMEs.	Lotus One-Source Database	United Kingdom	1
Hernandez-Canovas and Koeter-Kant (2011)	Positive relationship between protection of creditor rights and enforcement of existing laws and maturity structure of SME bank loans.	ENSR survey	Europe	2
Holton et al. (2014)	Effect of EU crisis on credit demand and supply (2009-2011). Age and size positively related to access to finance.	SAFE	Europe	1, 2, 3
Huyghebaert et al. (2007)	Start-ups consider not only financing costs but also different liquidation policies between suppliers and banks. Private benefits also considered (e.g., control).	Start-up data	Belgium	1, 4
Jõeveer (2012)	Leverage variation of small vs. large listed and unlisted firms. Country-specific factors are more important for small, unlisted firms in comparison to larger firms.	Amadeus database	Europe	1, 2
Klapper et al. (2002)	Eastern European SMEs very small, younger, more highly leveraged and more profitable firms. They borrow only short-term debt (high financial constraints).	Amadeus database	Eastern Europe	1, 2
López-Gracia and Sogorb-Mira (2008)	Pecking order and trade-off theory help to explain capital structure of SMEs. Size, age, tax-shields, growth and internal resources important determinants in SME financing.	SABE database	Spain	1
Mac an Bhaird and Lucey (2010)	Firm age, size, level of intangible activity, ownership structure and the provision of collateral important determinants of SME financing. Effects similar across industries.	Survey	Ireland	1
Michaelas et al. (1999)	Different capital structure determinants across time and industries (panel dataset). Influence on total level of debt and maturity structure. SMEs are highly sensitive to macroeconomic changes.	Lotus One-Source Database	United Kingdom	1, 3
Öztürk and Mrkaic (2014)	Increased bank funding costs and debt-to-asset ratio of borrowers negatively related to access to finance. Use of government subsidies improves access to finance. Access to finance positively related to firm size and age.	SAFE	Europe	1, 2

Table 1 continued:

Authors	Main findings	Main data source[a]	Country	Related sub-project[b]
Psillaki and Daskalakis (2008)	Firm-specific (size, asset structure, profitability, risk) rather than country-specific characteristics explain differences in capital structure of SMEs.	Amadeus database	Europe	1, 2
Psillaki and Eleftheriou (2014)	Support for flight-to-quality hypothesis that in bad times, credit is granted to larger, higher grade firms. Trade credit for small firms in times of tightening conditions complement not substitute to bank loans.	Bureau van Dijk– Diane database	France	1, 3, 4
Sogorb-Mira (2005)	Firm size positively related to leverage, profitability negative. Spanish SMEs follow maturity matching principle.	SABE database	Spain	1

[a] Abbreviations:
BLS: Business Longitudinal Survey
ENSR: European Network for SME Research
SABE: Sistema de Análisis de Balances Espanoles
SAFE: Survey on Access to Finance for Small- and Medium-sized Enterprises
WBES: World Business Environment Survey

[b] Main research focus:
1. Firm-, product- and/or industry-specific characteristics
2. Country-specific characteristics
3. Changing macroeconomic conditions / financial market crises
4. Alternative financing instruments (one or more with substitutive/complementary effects)

Research on the substitutive and complementary use of a larger number of financing instruments in different countries is scarce. We tap into this research gap by developing an empirical taxonomy of SME financing patterns and analyse how these groups of SMEs can be characterised according to their firm-, product-, industry- and country-specific factors.

3 Data, method and variables

3.1. The SAFE survey

To answer our research objective, we use the 'Survey on the access to finance of enterprises (SAFE survey)', conducted on behalf of the European Central Bank (ECB) and the European Commission (EC). As the SAFE covers both the needs of the EC for structural purposes and the ECB for its monetary policy, the survey is carried out on a bi-annual basis on behalf of the ECB and every two years (and since 2013 on an annual basis) as a joined survey on behalf of the ECB and the EC (ECB 2013, 2014a; European Commission 2013). The two waves differentiate by the number of questions included in the survey and the number of participating countries. The companies are randomly selected from the Dun & Bradstreet database and the survey is carried out by professional research companies using Computer Assisted Telephone Interviews (CATI).

The survey contains firm-specific information such as size (number of employees and turnover), firm autonomy, firm age and ownership. Furthermore, it contains information about the firms' main activity, their innovation activity and growth (joined waves), their recent financing sources used, their short-term development regarding the firms' financing needs and their assessment of the access to finance conditions. The size categories applied include micro (1-9 employees), small (10-49 employees), medium-sized (50-249 employees) and large firms (250+ employees). The

sample is stratified by these firm-size classes (based on the number of employees), economic activity and country. In order to restore the artificially distorted proportions from the sampling process relating to company size and economic activity, post-stratification weights[2] are used. The SAFE survey we used for this study was conducted between April and September 2013 (2013H1).[3] It includes 14,859 firms in 37 European countries. Of those firms, 92% have less than 250 employees. The sub-sample used for the taxonomy development will be described in Section 4.1.

3.2. Method

To develop an empirical taxonomy of SME financing patterns in Europe, we perform a hierarchical cluster analysis. Cluster analysis is a group of multivariate methods with the purpose to classify objects into groups according to their occurrences (Hair et al. 2010). It is used for data reduction to develop a more understandable description of observations with minimal losses of information (Hair et al. 2010). Thus, cluster analysis is an appropriate method for our research objective, as it organises the observed data about the utilization of financing instruments by European SMEs into taxonomies and facilitates a comparison of the different groups (Hair et al. 2010; Özari et al. 2013; Sørensen and Gutiérrez 2006).

Several hierarchical cluster analysis algorithms were tested (single linkage, complete linkage and Ward's method), using appropriate similarity measures to be able to identify groups of SMEs with similar financing patterns. Finally, we chose the Ward's method as the results were more homogenous and the cluster sizes were more balanced (Bortz 2005). The other clustering techniques produced very unbalanced results, with sometimes only one or a few observations in a cluster and a very large number of observations with high within cluster heterogeneity in another. Hence, they were not appropriate for our research objective (Bortz 2005). The Ward's method has the advantage that it combines objects which increase the within group variation as little as possible and therefore optimises the homogeneity of the clusters (Backhaus et al. 2013). As similarity measure, we used the squared Euclidean distance (Hair et al. 2010). Squared Euclidean distance is the most commonly used measure of proximity and optimal in combination with the Ward's algorithm[4]. We calculated, compared and analysed different cluster solutions of SME financing patterns according to the number of objects in each cluster as well as the objects' characteristics. Finally, we decided for a six cluster solution according to face validity and theoretical foundation of the objects' characteristics within the clusters (Hair et al. 2010).[5]

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[2] To calculate the appropriate weights, the data on company size, economic activities and countries reported by Eurostat are used: http://appsso.eurostat.ec.europa.eu/nui/show.do?wai=true&dataset=sbs_sc_sca_r2 (accessed 15 December 2014).

[3] The questionnaire is available at https://www.ecb.europa.eu/stats/money/surveys/sme/html/index.en.html (accessed 16 October 2015).

[4] However, we also applied other proximity measures to test for the stability of the clusters. The Rogers & Tanimoto as well as the Russel & Rao similarity measure produced a relatively high matching in the cluster solutions of 77.1% and 76.2%.

[5] We validated the cluster results by using the Test of Mojena and the Elbow Criterion (Backhaus et al. 2013; Mojena 1977). As both measures did not provide an unambiguous result, different cluster results were analyzed and compared. This approach supported the six cluster solution (Hair et al., 2010).

3.3. Variables

Variables used in the cluster analysis (active variables)

For the research purpose, the question about the financing structure of the firm is of key interest, as it comprises the different financing instruments. Participants of the survey were asked whether they used different financing instruments during the past six months, did not use them during the past six months but have experience with them, or never used this form of financing. Financing instruments included are (a) retained earnings or sale of assets, (b) grants or subsidised bank loans, (c) bank overdrafts, credit line or credit card overdrafts, (d) bank loans (new or renewal), (e) trade credit, (f) other loans (for instance from a related company or shareholders or from family and friends), (g) leasing, hire-purchase or factoring, (h) debt securities issued, (i) subordinated loans, participating loans, preferred stocks or similar financing instruments and (j) equity (quoted shares, unquoted shares or other forms of equity provided by the owners or external investors such as venture capital companies or business angels). In addition, respondents could indicate that they did not use any external financing in the past six months (l). Using these financing instruments as active variables, we conducted a cluster analysis to develop an empirical taxonomy of SME financing patterns. Due to the low relevance of (h) debt securities issued and (i) subordinated loans, participating loans, preferred stocks or similar financing instruments in the dataset, we decided to merge these groups in the analysis. Furthermore, we only considered the financing instruments used over the past six months in the cluster analysis. We chose this approach as firms might have used different financing instruments in earlier life cycle stages of their company but at the time of the survey, these instruments are of no relevance for the firm. In addition, distortions by different financing conditions over the economic cycle are minimised and the analysis focuses on the current situation.

Passive cluster variables

To analyse the composition of the resulting clusters, we include a number of firm-, product-, industry- and country-specific variables as passive variables (see Table 2). Previous research has revealed considerable differences in SME financing, based on characteristics such as size, age, profitability, innovativeness, industry and country (Beck et al. 2008; Berger and Udell 1998; Cosh et al. 2009; Hall et al. 2000; Michaelas et al. 1999). All variables we use are retrieved from the survey.

Table 2: Passive variables used (SAFE)

Passive cluster variables	Coding	Comments
Firm size 1: Number of employees How many people does your company currently employ either full- or part-time in [country] at all its locations?	1 = from 1 employee to 9 employees 2 = 10 to 49 employees 3 = 50 to 249 employees 4 = 250 employees or more	Category 4 was excluded from the analysis
Firm size 2: Turnover What was the annual turnover of your company in 2012?	1 = up to EUR 2m 2 = more than EUR 2m and up to EUR 10m 3 = more than EUR 10m and up to EUR 50m 4 = more than EUR 50m	
Firm age In which year was your firm registered?	1 = 10 years or more 2 = 5 years or more but less than 10 years 3 = 2 years or more but less than 5 years 4 = less than 2 years	Recoded in the dataset
Ownership Who are the owners of your firm? Please select the most appropriate category in terms of majority holders if more than one category applies.	1 = public shareholders 2 = family or entrepreneurs 3 = other firms or business associates 4 = venture capital firms or business angels 5 = a natural person, one owner only 7 = other	
Growth in past 1: Employee growth Over the last three years (2010-2012), how much did your firm grow on average per year in terms of employment regarding the number of full-time or full-time equivalent employees?	1 = over 20% per year 2 = less than 20% per year 3 = no growth 4 = got smaller	
Growth in past 2: Turnover growth Over the last three years (2010-2012), how much did your firm grow on average per year in terms of turnover?	1 = over 20% per year 2 = less than 20% per year 3 = no growth 4 = got smaller	
Growth expectation Considering the turnover over the next two to three years (2014-2016), how much does your company expect to grow per year?	1 = grow substantially - over 20% per year 2 = grow moderately - below 20% per year 3 = stay the same size 4 = become smaller	
Profitability Please tell me whether your company's profit margin has decreased, remained unchanged or increased over the past 6 months?	1 = increased 2 = remained unchanged 3 = decreased	
Product-related innovativeness During the past 12 months have you introduced a new or significantly improved product or service to the market?	1 = yes 2 = no	
Main activity What is the main activity of your company?	1 = industry 2 = construction 3 = trade 4 = services	Recoded in the dataset
Country	37 European countries	27 EU countries (excl. Malta) plus Norway as member of the European Economic Area (EEA) included in the analysis[6]

Notes: for all variables 9 = DK/NA (excluded)
Source: SAFE 2013H1

[6] Table A 1 provides a complete list of countries included in the analysis.

Firm-specific variables

Firm size: We include both variables available measuring the size of the firm in our analysis: the number of employees and annual turnover (reported in categories). Previous research has shown that the size of a company is an important determinant for its financial structure (Ang 1992; Berger and Udell 1998). It has been argued that smaller firms are more opaque because the quality and quantity of information available about the firm is typically very low (Artola and Genre 2011; Berger and Udell 1998). Empirical results confirmed that the size of a firm is an important determinant of accessing external sources of financing, especially bank financing (Artola and Genre 2011; Canton et al. 2012; Coluzzi et al. 2012; Holton et al. 2014; Öztürk and Mrkaic 2014). Furthermore, empirical research reveals that smaller firms hold significantly more short-term debt than larger firms (Holmes and Kent 1991; Hutchinson 1995). Therefore, we expect that smaller firms are more likely to use internal and short-term external financing instruments. However, prior studies have shown that these effects are often not solely related to size, but are also connected to age and the ownership structure (Artola and Genre 2011; Ferrando and Griesshaber 2011).

Firm age: In the survey, firm age is reported in categories. Prior research has shown that the financing instruments used by firms vary over the business life cycle. Informal financing is more important early in the companies' life and will be replaced with more formal financing when companies mature (Berger and Udell 1998; Chavis et al. 2011; Cosh et al. 2009; Huyghebaert and van de Gucht 2007). This is explained by the growing reputation of borrowing firms, existing track records and established relationships with capital providers, which reduce information asymmetries and agency risks (Canton et al. 2012; Chavis et al. 2011; Petersen and Rajan 1994; Walker 1989). Furthermore, financial institutions have been found to prefer the provision of short-term debt instead of long-term debt in the early stages of a company, as it provides more flexibility to terminate the contract (Huyghebaert and Van de Gucht 2007). Hence, we expect to observe that the financing of firms changes depending on the firms' age. Whereas younger firms are more likely to use more informal sources and short-term financing, more mature firms are expected to use more formal sources of capital.

Ownership: The SAFE survey includes a number of different ownership structures of SMEs. We included all ownership types in the analysis, as prior research has revealed that the ownership structure of a firm influences which types of financing sources are used (Bathala et al. 2004; Ferrando and Griesshaber 2011; McMahon and Stanger 1995; Romano et al. 2001). Families, teams and single-owner firms are more likely to avoid external finance and especially financing instruments, where others gain control rights in the firm (Bathala et al. 2004; Chittenden and Hutchinson 1996; Cressy 1995; Romano et al. 2001). Hence, we expect that privately held firms use more flexible financing instruments without others taking control in the company.

Growth: This variable captures the past growth rates as well as future growth expectations of SMEs. Past growth is measured in terms of employment and turnover. Future growth expectations are measured in terms of turnover with the same categories on an annual basis over the next two to three years. Previous research indicates that firms with high growth rates are more likely to require external financing, as internal financing capabilities are not sufficient to finance their growth ambitions (Carpenter and Petersen 2002b; Cassar 2004; Rogers 2014). Therefore, we

expect that firms with high growth in the past and higher growth expectations in the future are more likely to use a broader range of financing instruments.

Profitability: The development of profitability can also be obtained from the survey. Respondents were asked to indicate whether their profit margin increased, remained unchanged or decreased over the past six months. Previous research found that an increase in profitability results in higher retained profits enhancing the self-financing capabilities of the firm. In addition, firms with a higher profitability are likely to substitute long-term debt with internal financing, short-term debt and trade financing to reduce leverage and increase flexibility (Cosh et al. 2009; Demirgüç-Kunt and Maksimovic 2001). Even though banks have been found to be less likely to provide credit to unprofitable companies (Ferrando and Mulier 2013; Walker 1989), empirical research provides evidence that profitability and debt are negatively related (Cole 2008; Michaelas et al. 1999; Romano et al. 2001). According to these results, firms with an increase in profitability should be more likely to be internally financed using retained earnings. Furthermore, we expect that these firms use more short-term debt and trade financing.

Product-specific variables

The SAFE survey contains a variable about the product-related innovativeness of the firm by asking if the firm has introduced a new or significantly improved product or service to the market within the past 12 months. Previous research has shown that firms with more innovation activity are more risky and hence experience more financial constraints. This is explained by the high failure risk of innovations, the informational opaqueness of the projects for external capital providers and the low diversification possibilities of SMEs (Ang 1992; Carpenter and Petersen 2002a; Fazzari et al. 1988; Hall 2010; Magri 2009; Mina et al. 2013). Hence, external capital is typically more expensive for these firms and internal resources such as retained earnings are important financing instruments (Hall 2010; Magri 2009). However, as internal financing capabilities are often scarce, innovative firms are more likely to seek external capital to finance the innovation. It has been shown that high information asymmetries and moral hazard problems make external debt an often unsuitable source of financing for innovative companies (Carpenter and Petersen 2002a; Jensen and Meckling 1976; Magri 2009; Mason and Harrison 2003). High-risk projects increase the probability of bankruptcy of the firm, whereas the higher risks are not offset by potentially higher returns for debt providers (Brown and Degryse 2012; Magri 2009). Equity investors, however, participate in the success of the firm and can compensate the higher risks with a potential higher return in the case of success (Carpenter and Petersen 2002a; Hall 2010). Furthermore, VC investors have been found to be better equipped to deal with the higher risks due to their comprehensive due diligence procedures, personal contacts with the entrepreneurs and direct involvement in the firm (Block and Sandner 2009; Carpenter and Petersen 2002a; Cosh et al. 2009; Hall 2010; van Osnabrugge 2000). Hence, we expect that firms with more product and service innovation are more likely to use internal finance and equity, but also to be financed by a larger variety of capital sources.

Industry-specific variables

The SAFE dataset contains information about the main activities of the firms: industry, construction, trade and services. Even though the survey obtains information about a larger number of different industries, this information is merged into these four categories to ensure representativeness and anonymity of the survey (ECB 2014a). A number of studies in the past were concerned with the industry effect on the capital structure of firms (Degryse et al. 2012; Hall et al. 2000; Harris and Raviv 1991; La Rocca et al. 2009). It has been shown that different industries vary in asset types, asset risks, requirement for external capital and debt ratios (Hall et al. 2000; Harris and Raviv 1991; van der Wijst and Thurik 1993). Furthermore, firms tend to follow the golden rule of capital structure, which means that long-term assets are more likely to be financed with long-term capital and short-term assets with short-term capital (Hall et al. 2000; van der Wijst and Thurik 1993). As a consequence, we expect that capital-intensive industries with more assets (which can also be used as collateral) are more likely to use long-term financing, especially bank loans and leasing agreements (Cosh et al. 2009). Industries with higher working capital requirements (i.e., trade and service sector) are expected to use short-term and trade-related financing instruments (Klapper et al. 2002).

Country-specific variables

The SAFE survey used for this study comprises 37 European countries. We consider all countries, where the original weights could be restored (see Section 3.1). Hence, 28 European countries are included, where 27 countries are members of the EU (excluding Malta) and Norway, which is a member of the European Economic Area (EEA) and therefore closely linked to the EU. The importance of the macroeconomic, legal and institutional environment and their impact on firm financing has been shown in a number of studies (Cull et al. 2006; Demirgüç-Kunt and Levine 1999; La Porta et al. 1997; Levine 2002; Rajan and Zingales 1995). Previous research found that countries with more developed financial markets and better protection of property rights provide a broader range of financing instruments (Beck et al. 2008; Chavis et al. 2011; Jõeveer 2012). Even though financial markets in Europe have converged, there are still a number of country-specific differences (Guiso et al. 2004; Mullineux and Murinde 2010). As SMEs are more dependent on national financial markets due to the size of their financial requirements (Guiso et al. 2004), we expect that there are still significant differences in SME financing across Europe. To investigate these differences, we classify the countries based on several distinguishing factors, which are expected to have an impact on SME financing such as geography, prevailing financial market systems, the effects of the financial market crisis and financial market integration in Europe.

4 Results

4.1. Description of the sample

The aim of this study is to investigate financing patterns of European SMEs. Hence, using the employee threshold provided by the European Commission to define SMEs, all firms with more than 250 employees are excluded from the analysis (European Commission 2005). The final sample we use consists of 12,726 SMEs in 28 European countries (27 countries in the EU excluding Malta and including Norway). The largest numbers of SMEs are from Italy (17.3%), France (11.3%), Spain (11.1%), Germany (9.2%) and the United Kingdom (7.4%)[7]. Nearly 93% of the companies are micro firms with less than ten employees and about 90% generate an annual turnover of less than EUR 2m (see Table 3). Around 64% of the companies are mature with an age of ten years or more and only 3.3% are very young firms. Regarding ownership, very few firms are listed (1.3%) and the majority belongs to families or groups of entrepreneurs (46.6%) or are single-owner companies (45.1%). Only around 25% of the firms hired additional employees but over 40% had a positive turnover development. Future growth expectations are also positive with more than half of the firms expecting a turnover growth over the next two to three years (around 51%). Within the past 12 months, around one third (31.1%) brought a new or significantly improved product or service to the market. The largest number of companies is active in the service sector (44.6%), the smallest group has its main activity in industry (10.3%).

[7] For more details about the country distribution, please compare Table A 1.

Table 3: Sample description (passive variables)

Variable			N	in %
Number of companies in the sample			**12,726**	
Size	Number of employees	1 - 9 employees	11,794	92.7
		10 - 49 employees	801	6.3
		50 - 249 employees	131	1.0
		Total	**12,726**	**100**
	Turnover	≤ EUR 2m	11,025	89.6
		> EUR 2m – EUR 10m	1,031	8.4
		> EUR 10m – EUR 50m	214	1.7
		> EUR 50m	36	0.3
		Total	**12,306**	**100**
Firm age		≥ 10 years	7,855	64.4
		5 to less than 10 years	2,456	20.1
		2 to less than 5 years	1,487	12.2
		< 2 years	404	3.3
		Total	**12,202**	**100**
Ownership		Public shareholders	163	1.3
		Family or entrepreneurs	5,923	46.6
		Other firms or business associates	686	5.4
		Venture capital firms or business angels	40	0.3
		Natural person, one owner only	5,740	45.1
		Other	166	1.3
		Total	**12,718**	**100**
Past growth rate (average p.a. over past 3 years)	Employee growth	High growth > 20% p.a.	1,122	9.2
		Moderate growth < 20% p.a.	1,885	15.3
		No growth	6,211	50.6
		Got smaller	3,063	24.9
		Total	**12,281**	**100**
	Turnover growth	High growth > 20% p.a.	1,589	12.9
		Moderate growth < 20% p.a.	3,890	31.7
		No growth	3,015	24.6
		Got smaller	3,778	30.8
		Total	**12,272**	**100**
Growth expectation (turnover) (average p.a. over next 2-3 years)		High growth > 20% p.a.	1,296	10.6
		Moderate growth < 20% p.a.	4,888	40.2
		No growth	4,231	34.7
		Got smaller	1,760	14.5
		Total	**12,175**	**100**
Profitability (Profit margin)		Increased	1,691	13.7
		Remained unchanged	4,511	36.6
		Decreased	6,119	49.7
		Total	**12,321**	**100**
Product-related innovativeness (Product or service innovation)		Yes	3,929	31.1
		No	8,721	68.9
		Total	**12,650**	**100**
Main activity		Industry	1,310	10.3
		Construction	2,074	16.6
		Trade	3,607	28.5
		Services	5,735	44.6
		Total	**12,726**	**100**

Source: SAFE 2013H1

The largest number of firms in the sample used short-term financing in form of bank overdrafts, credit card overdrafts and credit lines (34.8%) and trade credit (29.8%) in the past six months. Bank loans were used by 25.3% of the SMEs, 20.4% used leasing, hire-purchase or factoring and 20% used retained earnings. The least used financing instruments in the past six months were government subsidies (10.2%), equity (4.4%), debt securities issued (1.6%) and subordinated loans, participating loans, preferred stocks or similar financing instruments (1.4%)[8]. A detailed overview of the financing instruments used by SMEs provides Table 4.

Table 4: Sample description (active variables)

Source of financing	used in the past 6 months	did not use in the past 6 months but have experience	not relevant to the firm
Retained earnings or sale of assets	20.0%	16.1%	63.9%
Grants or subsidised bank loans	10.2%	25.3%	64.5%
Bank overdraft, credit card overdrafts, credit lines	34.8%	21.0%	44.2%
Bank loans	25.3%	38.5%	36.2%
Trade credit	29.8%	13.9%	56.4%
Other loans	12.4%	15.4%	72.2%
Leasing, hire-purchase or factoring	20.4%	26.7%	52.9%
Equity	4.4%	10.7%	84.9%
Debt securities issued	1.6%	4.6%	93.8%
Subordinated loans, participating loans, preferred stocks or similar financing instruments	1.4%	4.3%	94.3%
No external financing used	26.8%		

Source: SAFE 2013H1

4.2. Cluster analysis

To identify groups of SMEs with similar financing patterns we perform a cluster analysis using the different financing instruments as active cluster variables (see Section 3.3). The final sample for the cluster analysis comprises 12,312 SMEs, as 414 SMEs (around 3.3%) did not provide information on at least one financing instrument. The results of the cluster analysis are summarised in Table 5.

[8] Due to the low relevance of debt securities issued and subordinated loans, participating loans, preferred stocks or similar financing instruments in the dataset, these groups were merged in the analysis into the category 'Other' (debt securities, subordinated/participating loans, preferred stock).

Table 5: Cluster results

	Clusters						
Financing instruments	**Mixed-financed SMEs**	**State-subsidised SMEs**	**Debt-financed SMEs**	**Flexible-debt-financed SMEs**	**Trade-financed SMEs**	**Internally-financed SMEs**	**Pearson Chi²**
Retained earnings or sale of assets	27.9%	22.7%	20.6%	14.7%	25.5%	14.0%	236.9***
Grants or subsidised bank loans	14.9%	100%	1.6%	0.0%	1.9%	0.0%	8750.7***
Bank overdrafts, credit lines or credit card overdrafts	45.0%	54.0%	56.2%	100%	6.3%	0.0%	6443.2***
Bank loans (new or renewal)	36.3%	55.2%	95.2%	0.0%	0.0%	0.0%	8160.2***
Trade credit	41.3%	32.1%	41.4%	20.8%	70.7%	0.0%	3498.2***
Other loans	72.5%	1.2%	0.0%	0.0%	0.0%	0.0%	8391.2***
Leasing, hire-purchase or factoring	27.9%	24.4%	30.4%	20.4%	41.2%	0.0%	1702.8***
Equity	24.1%	3.6%	0.0%	0.0%	0.0%	0.0%	2387.2***
Other[(a)]	17.1%	0.0%	0.0%	0.0%	0.0%	0.0%	1803.4***
No external finance	0.0%	0.0%	0.0%	0.0%	0.0%	100%	12312.0***
N	2,060	887	1,981	1,627	1,888	3,869	
Percentage of firms	16.7%	7.2%	16.1%	13.2%	15.3%	31.4%	
Description	Firms that use a large variety of financing instruments	Firms that use grants / subsidised loans and other debt	Firms that use all types of debt with a strong focus on bank loans	Firms that use only flexible, short-term debt	Firms that use mainly trade-related types of financing	Firms without external financing	

Notes: N = 12,312; Pearson's chi-square test: ***p < 0.01, **p < 0.05, *p < 0.1.

[(a)] Other financing instruments = debt securities issued, subordinated/participating loans, preferred stocks or similar instruments

Cluster 1 (Mixed-financed SMEs): Firms in this cluster use a broad range of financing instruments. It is the second largest cluster including 2,060 SMEs (16.7%). A large number of SMEs in this group (72.5%) used other loans such as loans from related companies or family and friends. Furthermore, this cluster has the highest percentage of SMEs using retained earnings and sale of assets (27.9%). Bank overdrafts, credit lines or credit card overdrafts (45.0%) as well as bank loans (36.3%) play an important role in this group. In addition, trade related forms of financing such as trade credit (41.3%), leasing, hire-purchase or factoring (27.9%) were used. The mixed-financed SME cluster is the only group where equity (24.1%) and other financing instruments (i.e., debt securities, subordinated and participating loans and preferred stocks) (17.1%) are of

importance. Grants and subsidised bank loans were the least important financing instruments in this cluster (14.9%).

Cluster 2 (State-subsidised SMEs): This cluster is characterised by its utilization of government-supported forms of financing. All of the SMEs in this cluster used this type of financing over the previous six months. It is the smallest cluster with 887 SMEs (7.2%). State-subsidised forms of financing were combined in particular with short-term (54.0%) and longer-term bank financing (55.2%). Trade credit (32.1%) and leasing, hire-purchase and factoring (24.4%) were also important sources of financing. Other loans (1.2%) as well as equity (3.6%) were of less importance.

Cluster 3 (Debt-financed SMEs): SMEs in this group (1,981 firms, 16.1%) used all forms of debt financing but with very little importance of grants and subsidised bank loans (1.6%). This group is characterised by the very large number of SMEs using bank loans (95.2%). They further relied on short-term bank financing (56.2%), trade credit (41.4%) and leasing, hire-purchase or factoring (30.4%). Retained earnings were less important in comparison with the mixed-financed and state-subsidised SME clusters (20.6%).

Cluster 4 (Flexible-debt-financed SMEs): This cluster is characterised by SMEs focusing on short-term debt financing, in particular institutional short-term debt. It is the second smallest cluster with 1,627 SMEs (13.2%). Most important were bank overdrafts, credit lines and credit card overdrafts (100%). In addition, firms in this cluster used to a lesser extent trade credit (20.8%) and leasing, hire-purchase or factoring (20.4%). Retained earnings were only used by 14.7% of SMEs.

Cluster 5 (Trade-financed SMEs): Firms in this group relied in particular on trade credit (70.7%) to finance their operations and 41.2% used leasing, hire-purchase or factoring. Alongside these sources of financing, retained earnings (25.5%) were important for SMEs in this cluster. 1,888 SMEs (15.3%) belong to this group.

Cluster 6 (Internally-financed SMEs): This cluster is the largest group in the sample with 3,869 SMEs (31.4%). SMEs in this cluster did not use any sources of external financing in the past six month. Furthermore, only a small number of firms in this group used retained earnings or sale of assets (14.0%).

4.3. Comparison of clusters

4.3.1. Firm-, product- and industry-specific characteristics

The cluster analysis reveals that SMEs are not equally distributed across clusters according to their firm-, product- and industry-specific characteristics ($p < 0.01$) (see Table 6).[9]

[9] Test statistics are provided in form of Pearson's chi-square and Cramer's V. Whereas the Pearson's chi-square test evaluates how likely it is that the observed differences arose by chance or, in other words, whether the distribution across the clusters differs significantly from its distribution in the total sample, Cramer's V measures the strength of association between the passive variable and the cluster affiliation (between 0 and 1) (Backhaus et al., 2013).

Table 6: Cluster comparison: Firm-, product- and industry-specific characteristics

Variable	Categories	Total sample[a]	N	Mixed-financed SMEs	State-subsidised SMEs	Debt-financed SMEs	Flexible-debt-financed SMEs	Trade-financed SMEs	Internally-financed SMEs	Test Statistic	
										Pearson Chi²	Cramer's V
	SMEs per cluster			16.7%	7.2%	16.1%	13.2%	15.3%	31.4%		
Firm characteristics											
Size											
Number of employees	1 - 9 employees	92.8%		16.3%	6.9%	15.7%	13.3%	15.2%	32.5%		
	10 - 49 employees	6.2%		20.7%	10.4%	21.4%	12.1%	17.2%	18.1%		
	50 - 249 employees	1.0%	12,312	28.8%	12.8%	21.6%	8.0%	16.0%	12.8%	120.8***	0.070
Turnover	≤ € 2m	89.5%		15.6%	6.6%	16.0%	13.6%	15.4%	32.7%		
	> € 2m - € 10m	8.4%		24.4%	11.6%	19.6%	9.9%	13.9%	20.6%		
	> € 10m - € 50m	1.8%		25.8%	13.4%	17.7%	4.8%	21.1%	17.2%		
	> € 50m	0.3%	11,920	37.1%	2.9%	31.4%	5.7%	8.6%	14.3%	208.4***	0.076
Firm age	≥ 10 years	64.5%		15.4%	7.2%	17.3%	13.5%	14.9%	31.8%		
	5 to less than 10 years	20.1%		17.8%	7.4%	15.4%	15.5%	15.1%	28.9%		
	2 to less than 5 years	12.0%		19.5%	6.9%	13.7%	9.2%	17.8%	33.0%		
	< 2 years	3.3%	11,813	26.1%	9.1%	6.8%	5.8%	10.4%	41.8%	149.7***	0.065
Ownership	Public shareholders	1.2%		47.0%	2.6%	11.3%	4.0%	16.6%	18.5%		
	Family or entrepreneurs	46.6%		18.0%	8.1%	17.5%	12.9%	17.3%	26.2%		
	Other firms or business associates	5.3%		23.4%	5.9%	14.4%	10.3%	18.7%	27.2%		
	Venture capital firms or business angels	0.3%		59.0%	15.4%	12.8%	0.0%	5.1%	7.7%		
	One owner only	45.2%		13.5%	6.4%	15.3%	14.2%	13.1%	37.5%		
	Other	1.3%	12,305	17.1%	9.8%	6.1%	13.4%	12.2%	41.5%	431.6***	0.084
Growth rate p.a. (average p.a. over past 3 years)											
Employment	High growth > 20% p.a.	9.2%		16.9%	10.3%	12.2%	15.5%	17.9%	27.2%		
	Moderate growth < 20% p.a.	15.2%		16.0%	8.6%	19.1%	12.9%	15.3%	27.9%		
	No growth	50.5%		12.1%	6.8%	16.7%	13.3%	15.1%	35.9%		
	Got smaller	25.1%	11,885	25.4%	6.1%	15.4%	13.5%	15.0%	24.5%	365.6***	0.101
Turnover	High growth > 20% p.a.	13.1%		18.6%	8.2%	15.1%	13.6%	15.7%	28.8%		
	Moderate growth < 20% p.a.	31.4%		12.2%	7.9%	17.5%	12.8%	18.5%	31.1%		
	No growth	24.6%		14.1%	6.1%	14.7%	14.6%	13.5%	37.1%		
	Got smaller	30.9%	11,904	21.6%	7.3%	17.5%	13.3%	13.4%	26.9%	237.4***	0.141
Growth rate p.a. - Expectation (next 2-3 years)											
	High growth > 20% p.a.	10.6%		24.6%	9.8%	11.0%	13.0%	14.7%	26.9%		
	Moderate growth < 20% p.a.	40.2%		18.9%	8.7%	15.8%	13.4%	16.0%	27.2%		
	No growth	34.7%		11.3%	5.7%	16.8%	13.2%	16.6%	36.4%		
	Get smaller	14.5%	11,795	19.4%	5.8%	17.2%	14.8%	11.0%	31.8%	300.7***	0.092
Profitability											
Profit margin	Increased	13.6%		21.0%	5.3%	16.9%	13.9%	18.0%	24.9%		
	Remained unchanged	36.5%		14.3%	6.5%	15.4%	12.0%	15.1%	36.7%		
	Decreased	49.9%	11,937	17.7%	8.4%	16.9%	13.9%	15.1%	28.1%	160.5***	0.082
Product characteristics											
	Product or service innovation	31.0%	12,246	19.2%	9.0%	14.1%	13.4%	15.2%	29.0%	67.3***	0.074
Industry characteristics											
	Industry	10.3%		17.3%	8.6%	18.1%	14.8%	16.0%	25.2%		
	Construction	16.6%		19.5%	6.5%	18.6%	12.2%	13.5%	29.8%		
	Trade	28.5%		17.1%	7.0%	16.2%	13.7%	16.4%	29.7%		
	Services	44.6%	12,309	15.3%	7.3%	14.6%	13.0%	15.2%	34.6%	90.9***	0.050

Notes: Pearson's chi-square test and Cramer's V for categorical variables. ***p < 0.01, **p < 0.05, *p < 0.1.

[a] Slight deviations between Table 3 and Table 6 are explained by the slightly smaller sample used in the cluster analysis (due to missing values).

Firm- and product-specific characteristics

Whereas larger and more mature firms are more likely to use a larger number of financing instruments including bank loans, state-subsidised financing and equity, smaller firms are more likely to use internal financing and flexible short-term debt.[10] This result is in line with prior research which found that larger and more mature firms have lower information asymmetries and can therefore access a broader range of financing sources, whereas smaller and younger firms are more likely to use less external capital or—if external capital is required—tend to use more flexible short-term debt (Artola and Genre 2011; Berger and Udell 1998; Holmes and Kent 1991; Hutchinson 1995; Huyghebaert and van de Gucht 2007).

The cluster analysis further reveals that the financing patterns of SMEs significantly differ depending on the ownership structure of the company. It has been found in the past that owner-managed firms try to avoid heteronomy through external parties (Cressy 1995). They prefer debt over equity and in particular short-term debt after internal financing capabilities are depleted (Holmes and Kent 1991; Hutchinson 1995; Huyghebaert et al. 2007). Short-term financing is typically more flexible, requires less collateral and covenants and is hence, more attractive for smaller, owner-managed firms (Hutchinson 1995). The cluster analysis supports these findings for single-owner companies. Family-owned firms and firms with more than one owner seem to use a broader range of financing instruments.

Furthermore, we find that past growth rates, innovation activity and future growth expectations seem to be closely related to the financing of SMEs. The cluster analysis reveals that firms with higher growth rates and higher levels of innovation activity are more likely to use a broader range of financing instruments and in particular alternative[11] and short-term financing. Hence, they tend to be more often in the mixed-financed, flexible-debt-financed and trade-financed[12] SME cluster. This result is likely to be related to the higher risks of high-growth, innovative firms and the reluctance of banks to finance these companies (Degryse et al. 2012; Michaelas et al. 1999; Myers 1977; Vanacker and Manigart 2010). However, the number of firms with high and moderate past growth rates and a higher level of innovation activity are comparatively high in the state-subsidised SME cluster using government subsidies but also bank debt. SMEs in this cluster seem to have a distinctive decrease in profitability but are very positive about their future growth. Even though the specific characteristics of SMEs in this cluster would suggest that access to bank debt for these firms is difficult, they use comparatively more often bank financing. This could be

[10]Table 6 should be read by comparing the share of SMEs per cluster and the share of SMEs in each category of passive variables. For example, 32.5% of all SMEs with 1-9 employees are internally-financed SMEs even though only 31.4% of all SMEs belong to this cluster. This result suggests that smaller firms are more likely to be internally-financed SMEs. Due to the large sample size even small differences are noteworthy. However, as in this working paper different variables are sometimes considered together, the numbers should not always be compared in isolation from each other. For a more detailed analysis please compare Moritz (2015).

[11]Based on the SAFE survey, alternative instruments include trade credit, leasing, factoring and hire-purchase.

[12]SMEs in the trade-financed SME cluster show more often than the average high to moderate past growth rates. Regarding innovation activity they are in the average compared to the other clusters.

explained by the argument that the involvement of government agencies might provide a positive signal for other capital providers, especially financial institutions.[13]

Industry-specific characteristics

The cluster analysis further reveals that service firms seem to rely strongly on internal financing and are less likely to use external financing instruments. As tangible assets and hence capital requirements in the service sector are typically comparatively low, financing from turnover and bootstrapping (Bhide 1992; Freear et al. 1995; Harrison et al. 2004) have been found to be a suitable way to finance these firms (Chavis et al. 2011; Ebben and Johnson 2006; Klapper et al. 2002). The cluster analysis also demonstrates that trade finances and flexible debt financing are more common for SMEs in the trade sector compared to SMEs in other sectors. This is in line with previous research, which found that firms with a lower maturity structure of assets and a higher requirement for working capital financing are more likely to be short-term financed (Chavis et al. 2011; Hutchinson 1995; Klapper et al. 2002; Michaelas et al. 1999; Myers 1977; Petersen and Rajan 1997). Firms from the industry sector are more likely to be debt-financed and state-subsidised SMEs. This again is as expected: firms from capital-intensive industries require longer term financing and—at the same time—can provide more collateral, thereby reducing information asymmetries and agency risks for capital providers, as collateral secures their interests in the case of repayment problems (Degryse et al. 2012; Hall et al. 2000; Michaelas et al. 1999).

4.3.2. Country-specific characteristics

To investigate differences in SME financing across countries, we build country classifications based on several distinguishing factors, which are expected to have an impact on SME financing such as geography, prevailing financial market systems, the effects of the financial market crisis and financial market integration in Europe. We find that the financing patterns of SMEs differ significantly between different country groups. Furthermore we find that the differences by country group are higher (reflected in the size of Cramer's V) than the differences by firm-, product- and industry-specific characteristics.

[13]For a more detailed analysis please compare Moritz (2015).

Table 7: Cluster comparison: Country-specific characteristics

Groups of countries by region (UNSD)	Mixed-financed SMEs	State-subsidised SMEs	Debt-financed SMEs	Flexible-debt-financed SMEs	Trade-financed SMEs	Internally-financed SMEs	Test Statistic	
							Pearson Chi²	Cramer's V
Eastern Europe[a]	14.4%	6.3%	11.4%	9.8%	12.3%	45.8%		
Northern Europe[b]	23.7%	3.5%	11.2%	11.6%	22.6%	27.4%		
Southern Europe[c]	16.1%	9.8%	17.3%	12.4%	17.5%	26.8%		
Western Europe[d]	15.6%	6.2%	20.2%	17.4%	10.8%	29.8%		
Total sample	16.7%	7.2%	16.1%	13.2%	15.3%	31.4%	659.0***	0.134

Notes: N = 12,310; Pearson's chi-square test and Cramer's V for categorical variables. ***p < 0.01, **p < 0.05, *p < 0.1.

[a] BG, CZ, HU, PL, RO, SK; [b] DK, EE, FI, IE, LT, LV, NO, SE, UK; [c] CY, ES, GR, HR, IT, PT, SI; [d] AT, BE, DE, FR, LU, NL

Groups of bank-based, market-based and former socialist countries	Mixed-financed SMEs	State-subsidised SMEs	Debt-financed SMEs	Flexible-debt-financed SMEs	Trade-financed SMEs	Internally-financed SMEs	Test Statistic	
							Pearson Chi²	Cramer's V
Bank-based countries[a]	15.8%	8.5%	18.6%	14.8%	15.1%	27.1%		
Market-based countries[b]	23.7%	2.9%	12.1%	11.4%	21.2%	28.6%		
Former socialist countries[c]	15.0%	6.0%	11.2%	9.6%	12.1%	45.9%		
Total sample	16.7%	7.2%	16.1%	13.2%	15.3%	31.4%	548.8***	0.149

Notes: N = 12,312; Pearson's chi-square test and Cramer's V for categorical variables. ***p < 0.01, **p < 0.05, *p < 0.1.

[a] AT, BE, CY, DE, ES, FI, FR, GR, IE, IT, LU, NO, PT; [b] NL, SE, UK, FI (Allard and Blavy, 2011; Bijlsma and Zwart, 2013; Saillard and Url, 2011; Demirgüc-Kunt and Levine, 1999); [c] BG, CZ, EE, HR, HU, LT, LV, PL, RO, SI, SK

Groups of non-distressed vs. distressed countries	Mixed-financed SMEs	State-subsidised SMEs	Debt-financed SMEs	Flexible-debt-financed SMEs	Trade-financed SMEs	Internally-financed SMEs	Test Statistic	
							Pearson Chi²	Cramer's V
Non-distressed countries	17.0%	5.6%	15.4%	13.6%	13.8%	34.6%		
Distressed countries[a]	16.3%	9.8%	17.3%	12.6%	17.8%	26.2%		
Total sample	16.7%	7.2%	16.1%	13.2%	15.3%	31.4%	176.0***	0.120

Notes: N = 12,312; Pearson's chi-square test and Cramer's V for categorical variables. ***p < 0.01, **p < 0.05, *p < 0.1.

[a] CY, ES, GR, IE, IT, PT, SI (ECB, 2014b, 2014c)

Groups of 'old' vs. 'new' EU member countries[a]	Mixed-financed SMEs	State-subsidised SMEs	Debt-financed SMEs	Flexible-debt-financed SMEs	Trade-financed SMEs	Internally-financed SMEs	Test Statistic	
							Pearson Chi²	Cramer's V
EU members before 2004 ('old' members)[b]	16.9%	7.6%	17.6%	14.4%	16.3%	27.3%		
Accession countries since 2004 ('new' members)[c]	15.0%	6.1%	11.2%	9.6%	12.3%	45.8%		
Total sample	16.5%	7.2%	16.2%	13.3%	15.4%	31.4%	354.5***	0.171

Notes: N = 12,165; Pearson's chi-square test and Cramer's V for categorical variables. ***p < 0.01, **p < 0.05, *p < 0.1.

[a] excl. Norway (NO); [b] AT, BE, DE, DK, ES, FI, FR, GR, IE, IT, LU, NL, PT, SE, UK; [c] BG, CY, CZ, EE, HR, HU, LT, LV, PL, RO, SI, SK

Groups of euro vs. non-euro countries[a]	Mixed-financed SMEs	State-subsidised SMEs	Debt-financed SMEs	Flexible-debt-financed SMEs	Trade-financed SMEs	Internally-financed SMEs	Test Statistic	
							Pearson Chi²	Cramer's V
Euro countries[b]	16.4%	8.2%	18.1%	14.5%	14.8%	28.0%		
Non-euro countries[c]	16.8%	4.9%	11.5%	10.5%	16.8%	39.5%		
Total sample	16.5%	7.2%	16.2%	13.3%	15.4%	31.4%	250.3***	0.142

Notes: N = 12,163; Pearson's chi-square test and Cramer's V for categorical variables. ***p < 0.01, **p < 0.05, *p < 0.1.

[a] excl. Norway (NO); [b] AT, BE, CY, DE, EE, ES, FI, FR, GR, IE, IT, LT, LU, LV, NL, PT, SI, SK; [c] BG, CZ, DK, HR, HU, PL, RO, SE, UK

Regional differentiation of European countries: To differentiate country groups by region we use the classification by the United Nations Statistics Division (UNSD). Accordingly, Europe is divided in Eastern Europe, Northern Europe, Southern Europe and Western Europe. Internally-financed SMEs are the largest group within each geographical region. However, Eastern European countries stand out, showing a much higher percentage of firms using internal financing (45.8%). An explanation for this result is likely to be the countries' history as former socialist countries with their historically underdeveloped financial markets and the importance of internal financing sources (Aidis 2005; Klapper et al. 2002). However, the cluster analysis also indicates that SMEs in Eastern European countries seem to be as likely to be debt-financed (11.4%) as Northern European SMEs (11.2%), even though debt financing is of much less importance in both country groups compared to Southern (17.3%) and Western European SMEs (20.2%). Northern European SMEs are to a large degree mixed-financed SMEs (23.7%). This result is likely due to the fact that Northern European countries tend to have comparably well-organised and efficient financial markets, including stock markets (Guiso et al. 2004). The other country groups show significantly lower percentages of SMEs in this cluster but with relatively similar proportions (between 14% and 16%). Compared to the other country groups, Southern European SMEs more often tend to be state-subsidised SMEs (9.8%). This result might be explained by the fact that a number of countries in this region were particularly affected by the financial market crisis (e.g., Greece, Italy, Portugal, Spain) and financing for SMEs from banks in these countries tended to be more difficult (Belke 2013; Ferrando and Mulier 2013).

The strong banking system in continental Europe is likely to be an important explanation for the strong debt orientation in Western and Southern Europe (Allard and Blavy 2011; Bijlsma and Zwart 2013; Demirgüç-Kunt and Maksimovic 1999). For Western Europe, this finding is supported by the large number of SMEs in the flexible-debt-financed SME cluster (17.4%). In the South, SMEs more often tend to be in the trade-financed SME cluster (17.5%). This result can be explained by the generally longer payment periods in these countries (EPI 2014; Garcia-Teruel and Martinez-Solano 2010; Marotta 2005; Psillaki and Eleftheriou 2014). The finding that 22.6% of SMEs in Northern Europe are trade-financed SMEs is in line with the results of Demirgüç-Kunt and Maksimovic (2001). They have shown that firms in countries with well-developed financial market systems use trade credit comparatively more often (e.g., in Canada, the UK and Ireland). Furthermore, although initial payment periods might be shorter in Northern European countries (Garcia-Teruel and Martinez-Solano 2010), as long as late payment penalties are not enforced, trade credit might be an attractive option in comparison to other forms of short-term debt financing (Marotta 2005). In addition, leasing is a financing instrument which is used to a larger degree in some Northern European countries (Oxford Economics 2011) and might be a further explanation for this result.

Bank-based, market-based and former socialist countries: Looking deeper at the differences of SME financing in market-based, bank-based and former socialist countries, we find significant differences between these country groups. Whereas in bank-based financial systems, banks play the dominant role in mobilizing and allocating capital, monitoring firms and facilitating risk management systems, market-based financial systems rely on the securities markets to allocate capital and exert control (Demirgüç-Kunt and Levine 1999; Levine 2002). The financial markets in former socialist countries are strongly influenced by their history. State-owned firms and banks,

corruption and low levels of investor protection characterised many former socialist countries until the 1990s (Nivorozhkin 2005). As a consequence, financial markets were underdeveloped, the banking system was inefficient and mostly state-owned (Aidis 2005; Haas and Peeters 2006; Klapper et al. 2002). For firms, it was difficult to attract external finance and they often relied on internal financing and loans from related parties like family and friends (Aidis 2005; Haas and Peeters 2006; Hutchinson and Xavier 2006). In line with these results, the cluster analysis reveals that SMEs in former socialist countries more often tend to be internally-financed SMEs. In contrast to prior findings, the cluster analysis indicates that SMEs in these transition economies less often seem to be flexible-debt-financed and trade-financed SMEs (Delcoure 2007; Klapper et al. 2002).

Market-based countries (Finland, the Netherlands, Sweden and the UK (Allard and Blavy 2011; Bijlsma and Zwart 2013; Demirgüç-Kunt and Levine 1999; Saillard and Url 2011) significantly more often seem to have mixed-financed SMEs. This result indicates that SMEs in market-based economies are more likely to use a broader range of financing sources, including equity investors and the securities market, to finance their businesses. In addition, SMEs in market-based countries more often tend to be trade-financed SMEs. This result indicates that SMEs in market-based countries seem to prefer covering their financing needs with trade credit, leasing or factoring instead of using institutional sources of financing (Demirgüç-Kunt and Maksimovic 2001; Oxford Economics 2011). SMEs in bank-based countries more often tend to be debt-financed and flexible-debt-financed. This is not surprising, as these economies are characterised by a strong banking sector. Furthermore, SMEs in bank-based economies are more likely to use state-subsidised financing. This finding might be the result of the European financial market crisis, where banks reduced their credit engagement, especially in regard to smaller and riskier creditors (Casey and O'Toole 2014; Ferrando and Griesshaber 2011; Ferrando and Mulier 2013) and government support was required to overcome these access to finance problems.

Distressed versus non-distressed economies in Europe: The recent economic, financial and debt crisis has affected countries in Europe to varying degrees. Over the last years, especially Cyprus (CY), Greece (GR), Ireland (IE), Italy (IT), Portugal (PT), Slovenia (SI) and Spain (ES) (ECB 2014b, 2014c) faced many difficulties on the sovereign level but also in the banking sector. Banks in Europe and in particular in distressed countries reacted with a reduction of their credit risk exposure, which resulted in a decrease of supply and an increase of costs for bank loans (Drakos 2012). Previous research found that SMEs suffered the most due to their informational opacity and their inherent higher risks (Ferrando and Griesshaber 2011; Öztürk and Mrkaic 2014). Furthermore, it has been discovered that firms which are more bank-lending constrained are more likely to use alternative sources of financing such as trade credit (Casey and O'Toole 2014). The cluster analysis supports these findings by revealing that SMEs in distressed economies in particular seem to be more likely to be state-subsidised and trade-financed SMEs. As expected, deteriorations in financial markets seem to increase the utilization of alternative financing instruments such as trade credit, leasing and factoring (Casey and O'Toole 2014). Furthermore, it is not surprising that SMEs in distressed countries are more likely to be in need of and receive government support. State-subsidised SMEs are characterised by the utilization of grants and state-subsidised loans, but also by a high degree of institutional debt financing. The cluster comparison supports the argument that government support is likely to have a positive effect on

firms' access to finance (Freel 2006; Mina et al. 2013; Murray and Lott 1995). Firms that received government subsidies seem to be more likely to obtain other forms of institutional debt, even under difficult financing conditions (Beck et al. 2008; Demirgüç-Kunt and Maksimovic 1999).

European financial market integration: To shed more light on the financial integration in the European Union (excluding Norway) and its impact on SME financing we choose two different country classifications: 'Old' versus 'new' member states and euro versus non-euro countries. The European enlargement since 2004 so far comprises the former socialist countries Bulgaria, the Czech Republic, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia as well as Cyprus and Malta[14] ('new' member states or 'accession' countries).With respect to the second differentiation, not all European countries introduced the euro as their common currency. Starting with 11 EU member states in 1999, the Eurozone comprises today 19 of the currently 28 EU countries. The non-euro EU member states are: Bulgaria, the Czech Republic, Croatia, Denmark, Hungary, Poland, Romania, Sweden and the UK. The results of the analysis show that significant differences in SME financing in these country groups exist (see Table 7).

The cluster analysis reveals that compared to the 'old' EU members, SMEs in the 'new' member states in particular are more likely to be internally-financed SMEs and have a much lower utilization of institutional debt financing (short- and long-term debt). In addition, they tend to use less trade financing. Government subsidies also seem to be less common (or less available). Even though the EU accession countries (mainly former socialist countries) typically still have underdeveloped financial markets (Delcoure 2007; Guiso et al. 2004; Mullineux and Murinde 2010; Murinde et al. 2004; Nivorozhkin 2005), a considerable number of SMEs in these countries are mixed-financed firms. This highlights the fact that financing from related parties such as family and friends seem to be an important financing alternative in these countries (Aidis 2005).

In the Eurozone, the ECB acts as the leading financial authority with the main mission *"to safeguard the financial stability and promote European financial integration."*[15] As a result, economic parties within the Eurozone should face identical rules and equal access to financing instruments or services. In line with this expectation, the cluster analysis indicates that significant differences in SME financing in euro and non-euro countries exist. The results of the cluster analysis reveal that SMEs in non-euro countries more often tend to be internally financed and less often seem to be financed by government subsidies, bank loans and flexible debt financing. These differences support the argument that the launch of the euro increased the degree of financial integration among the member states (Baele et al. 2004). However, looking at the non-euro countries and the specific differences between both country groups, it is unclear whether these differences can be (solely) explained by the Eurozone membership or whether they are the result of the financial systems in the respective countries already discussed in the previous classifications.

[14]Due to a lack of data, Malta is not included in the analysis.

[15]See https://www.ecb.europa.eu/ecb/orga/escb/html/mission_eurosys.en.html (accessed 16 October 2015).

5 Discussion and conclusion

5.1. Summary and implications for theory and practice

Summary of results

The aim of this study was to develop an empirical taxonomy of SME financing patterns in Europe. The results show that SME financing is not homogeneous, but that different SME financing types exist. We identified six distinct SME financing types in Europe: mixed-financed SMEs, state-subsidised SMEs, debt-financed SMEs, flexible-debt-financed SMEs, trade-financed SMEs and internally-financed SMEs. These groups of SMEs differ according to the number of different financing instruments used and the combinations of these instruments. Furthermore, it was analysed how these SME financing types differ according to their firm-, product-, industry- and country-specific characteristics. Table 8 summarises the results.

Table 8: Cluster comparison: Summary

Cluster	Financing in cluster	Characteristics			
		Firm-specific	Product-specific	Industry-specific	Country-specific
Mixed-financed SMEs	SMEs that used a large variety of instruments with a focus on other loans (72%); only cluster with a noteworthy amount of equity financing (24%)	more often younger, small and medium-sized firms with different ownership structures; moderate past growth but with high future growth expectations and more often increased profit margins	more innovation	most likely for construction sector	esp. in Northern European and market-based countries
State-subsidised SMEs	100% of SMEs used subsidised bank loans or grants; large amount of other debt	more often small and in particular medium sized firms; especially family firms or entrepreneurial teams; high to moderate past growth and future growth expectations with decreased profit margins	more innovation	most likely for industry sector	esp. in Southern European, bank-based and distressed countries
Debt-financed SMEs	95% of SMEs used bank loans; all types of debt used	more mature small and medium-sized firms; especially family firms or entrepreneurial teams; low growth in the past and low growth expectations	low innovation	more likely for industry and construction sector	esp. in Western European, bank-based and 'old' EU member countries
Flexible-debt-financed SMEs	100% of group used short-term bank debt; some trade credit and leasing / factoring	more mature micro firms with lower turnover; especially single-owner firms; more often high employee growth; average growth expectations	average innovation	more likely for industry and trade sector	esp. in Western European, bank-based and 'old' EU member countries

Table 8 continued:

Cluster	Financing in cluster	Characteristics			
		Firm-specific	Product-specific	Industry-specific	Country-specific
Trade-financed SMEs	70% of group used trade credit and 40% leasing / factoring	more often younger (2-5 years), small firms in family hands or entrepreneurial teams; moderate turnover growth; moderate to no growth expectations	average innovation	most likely for trade sector	esp. in Northern and Southern European countries; more often in market-based countries
Internally-financed SMEs	100% of group used no external debt; 14% retained earnings	more often very young, micro, single-owner firms with high and moderate employee growth in the past; no turnover growth and expectation to stay the same size	low innovation	most likely for service sector	esp. in Eastern European, former socialist countries

Theoretical contributions

The results of this study provide three main contributions to the SME finance literature. First, it contributes to the literature focusing on substitutive and complementary effects of different financing sources for SME financing. Prior research on the interaction between firms and their sources of capital are either focused on the basic decision between equity and debt or on a single source of capital. Separate streams of literature have emerged on specific financing instruments (Cosh et al. 2009; Hall et al. 2004; Harris and Raviv 1991; Hutchinson 1995; Michaelas et al. 1999; Vanacker and Manigart 2010). Empirical research considering a larger number of financing instruments and their substitutive and complementary effect is still scarce (exemptions are for example Beck et al. 2011; Berger and Udell 2006; Casey and O'Toole 2014; Cosh et al. 2009; Huyghebaert and Van de Gucht 2007; Robb 2002). We contribute to this literature by proposing an empirical taxonomy of SME financing patterns with different combinations of various financing instruments.

Second, we contribute to research on firm-, product- and industry-specific characteristics of SMEs and their importance for firm financing (Beck et al. 2008; Hall et al. 2004; Howorth 2001; Jõeveer 2012). Empirical studies found that factors such as firm size, firm age, ownership structure, profitability, asset structure and industry are important determinants of the demand for and availability of financing instruments (Chittenden and Hutchinson 1996; Frank and Goyal 2007; Howorth 2001; López-Gracia and Sogorb-Mira 2008; Michaelas et al. 1999; Romano et al. 2001). In addition, a number of studies focused on the financing determinants of specific types of firms like innovative and high-growth companies (Freel 2006; Hall 2010; Mazzucato 2013; Mina et al. 2013; Vanacker and Manigart 2010). The results of the cluster analysis contribute to this literature by disclosing that SME financing types are characterised by specific combinations of firm-, product- and industry-specific factors. Furthermore, our results contribute to the life cycle theory of firm financing (Berger and Udell 1998). The results show that firms tend to use different combinations of financing instruments over the business life cycle. Younger firms seem to be more likely to use informal sources of capital, whereas more mature firms tend to substitute informal sources with more formal sources of capital. However, the cluster analysis indicates that informal sources are still used as complements in later stages of a company's life.

Third, we contribute to cross-country research on SME financing focusing on 28 European countries. Prior empirical research found evidence for the importance of country-specific factors determining the financing of SMEs (Beck et al. 2008; Hall et al. 2004; Jõeveer 2012). It has been shown that corporate market structure, macroeconomic conditions, legal and tax systems, history and culture, relationships with banks and availability of different financing sources influence the financing of firms (Demirgüç-Kunt and Levine 1999; Hall et al. 2004; Kiehlborn and Mietzner 2005). The analysis in this study adds to these findings by illustrating differences in the financing patterns of SMEs in different groups of European countries. Without analyzing country-specific determinants on an individual country level, this study provides insights that country-specific differences are important drivers for SME financing patterns across Europe.

Policy implications

Government support programs can only be effective if they support access to financing instruments that consider both, the specific characteristics of SMEs and their demand for finance as well as the supply conditions in specific countries. The results of our study reveal that SME financing in Europe is not homogenous, but that different financing patterns with different profiles exist. Or to put it differently: various financing instruments are considered as substitutes and complements in SME financing and the different financing patterns are characterised by firm-, product-, industry- and country-specific factors.

One finding with particularly high political relevance is the result of the cluster analysis in regard to government support programs. The cluster analysis reveals that these programs seem to have a positive influence on the firms' access to finance. SMEs in the state-subsidised SME cluster seem to complement government subsidies with the use of a large variety of financing instruments, but with a strong focus on institutional debt. The specific characteristics of SMEs in this cluster, especially their high level of innovation activities, high growth rates and decreased profitability would suggest that access to bank debt for these firms is difficult. Thus, it is very likely that the involvement of government agencies provides a positive signal for other capital providers, especially financial institutions. The cluster comparison also shows that the state-subsidised SME cluster is the smallest group of SMEs, more often comprising small and in particular medium-sized companies and less often micro firms. Micro firms seem to be more likely to finance their firms with internal resources and short-term debt, especially from financial institutions. This financing behavior can have various reasons such as their financing requirements, ownership structure or macroeconomic conditions. To adjust government support to this target group, a deeper analysis of the financing situation of these firms is required. It should be investigated whether the financing of these SMEs is an active choice or the result of financial constraints.[16] This analysis can provide more information whether government support might be of interest for these SMEs, and if so, what types of government programs are appropriate for these firms. The European Union and its executing agencies such as the European Investment Bank Group already provide a number of different support programs (European Investment Fund 2015). The results of our study provide

[16]Table A 2 provides a first indication that especially the financing of internally-financed SMEs is, at least in part, an active choice by the firms. Internally- and trade-financed SMEs seem to have the lowest concerns about access to finance in comparison to other company challenges such as finding customers, competitive pressure or regulation concerns.

further insights into how to adapt these programs to the needs of the SME financing types and to different European countries. In this context, the cluster analysis gives information about possible effects of policy changes (e.g., changes in banking regulations) in Europe on SME financing and which groups of SMEs will be particularly affected by these changes.

5.2. Limitations and future research

Limitations

The analysis in this study has some limitations. First, the results are limited by the questions asked and the method used in the SAFE survey. The question about the utilization of financing instruments only relate to the application but not the significance for the firm. Hence, the taxonomy developed does not account for the importance of the financing instruments (e.g., the amounts financed by each instrument) to each other. Furthermore, in some cases the financing instruments are broad categories (e.g., 'leasing, hire-purchase or factoring' or 'equity'), which makes the interpretation more difficult. An additional limitation is the exclusion of firms without employees from the survey. This restriction is likely to exclude most start-ups in their early phases from the survey, as companies typically start without paid employees.

Second, the approach used in the analysis has some limitations. We defined SMEs according to the threshold provided by the European Commission but—due to a lack of data—only used the number of employees (less than 250 employees). Furthermore, the financing of SMEs in this analysis was restricted to the six months preceding the survey. Even though this restriction is required to avoid distortions over the business life cycle of firms and changes in macroeconomic conditions, the time frame is likely to be too short to provide a complete picture of the firms' financing patterns.[17] In addition, cause-and-effect relationships between the utilization of financing instruments and a company's characteristics cannot always be clearly determined.

Finally, some limitations about the method used in the analysis have to be considered. We used cluster analysis to develop an empirical taxonomy of SME financing patterns. However, cluster analysis has some limitations such as the sensibility in changes to the dataset, the applied clustering algorithm and the number of clusters chosen (Hair et al. 2010; Moritz 2015).

Future research

Our study provides first insights into the financing patterns of European SMEs. However, the limitations of the analysis provide interesting research directions to further investigate SME financing patterns.

[17]Table A 3 provides information about the firms' current debt situation and taking out loans over the past two years. Even though this larger time period supports the general direction of the clusters, it also shows that companies that did not use loans in the past six months are not necessarily without any loans or debt. However, these results can also be caused—at least in part—by different stages in the firms' business cycle and in particular by changing macroeconomic conditions.

1. How did the financing patterns of SMEs change over time?

Even though the cluster analysis provides more information about the financing patterns of SMEs, the results of this study are based on the SAFE survey results in 2013. To shed more light on the stability of the clusters, a comparison of the taxonomy over time should be performed.

2. How do the profiles of SMEs with different financing patterns change over time?

The financing patterns found over time have to be analysed according to their firm-, product-, industry- and country-specific characteristics. This analysis could give some indication on how the financing of SMEs changes in the presence of different economic conditions. However, to enable an in-depth analysis of the influence factors on SME financing, the SAFE data should be combined with additional firm-level data such as the firms balance sheet information (Ferrando and Mulier 2013) and macro-level data such as GDP, inflation rates, private credit allocation and stock market liquidity.

3. Are alternative financing instruments a solution for SMEs experiencing financial constraints?

A further interesting research direction is to analyse if financially constrained SMEs switch to alternative financing sources. The comparison of clusters could be one step to shed more light on this question. However, the SAFE survey used for this research project does not differentiate between some financing alternatives (such as the type of equity used), even though they might have different characteristics. An even greater distinction between different financing instruments and the inclusion of new financing alternatives could further improve the understanding of SME financing patterns.

5.3. Conclusion

The EU aims, inter alia, at ensuring economic growth, job creation, social integration, innovativeness and global competiveness of the European Union.[18] To be able to achieve this goal, one important objective is to provide easier access to finance for SMEs, innovative and growth-oriented firms. For government support to be effective, SMEs need to be aware of the available programs. Furthermore, the programs need to be of interest for the firms, suitable for their specific business needs and appropriate in the respective national context. The results of this study reveal that SME financing in Europe is not homogeneous, but that different financing patterns with different characteristics exist. This finding can help policy makers to assess possible impacts of intended policy changes on SME financing prior to their implementation. In addition, the results can support policy makers to tailor access to finance programs to the specific context and needs of SMEs.

[18]See http://ec.europa.eu/growth/smes/index_en.htm (accessed 16 October 2015) and http://ec.europa.eu/programmes/horizon2020/en/ (accessed 16 October 2015).

Annex 1: Appendix tables

Table A 1: Country distribution

Country		Number of SMEs	in percent
Austria	AT	171	1.3
Belgium	BE	311	2.4
Bulgaria	BG	278	2.2
Cyprus	CY	26	0.2
Czech Republic	CZ	549	4.3
Germany	DE	1,176	9.2
Denmark	DK	118	0.9
Estonia	EE	30	0.2
Spain	ES	1,419	11.1
Finland	FI	127	1.0
France	FR	1,436	11.3
Greece	GR	511	4.0
Croatia	HR	93	0.7
Hungary	HU	313	2.5
Ireland	IE	86	0.7
Italy	IT	2,196	17.3
Lithuania	LT	64	0.5
Luxembourg	LU	16	0.1
Latvia	LV	46	0.4
Netherlands	NL	445	3.5
Norway	NO	152	1.2
Poland	PL	834	6.6
Portugal	PT	489	3.8
Romania	RO	253	2.0
Sweden	SE	353	2.8
Slovenia	SI	65	0.5
Slovakia	SK	230	1.8
United Kingdom	UK	937	7.4
	Total	12,726	100

Source: SAFE 2013H1

Table A 2: Cluster Comparaison: Most Pressing Problems

Respondents were asked the following question (Q0b): "On a scale of 1-10, where 10 means it is extremely pressing and 1 means it is not at all pressing, how pressing are each of the following problems that your firm is facing." (ECB, 2013).

Most pressing problems	Mixed-financed SMEs		State-subsidised SMEs		Debt-financed SMEs		Flexible-debt-financed SMEs		Trade-financed SMEs		Internally-financed SMEs		Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Finding customers	6.40	2.82	6.32	2.67	6.62	2.58	6.52	2.80	6.35	2.84	6.10	2.91	6.34	2.81
Competition	6.17	2.59	6.19	2.60	6.37	2.47	6.11	2.66	6.10	2.53	5.94	2.74	6.11	2.62
Access to finance	**6.25**	**3.15**	**6.23**	**2.96**	**6.25**	**2.95**	**6.15**	**3.14**	**4.96**	**3.29**	**4.49**	**3.21**	**5.49**	**3.24**
Costs of production or labour	6.15	2.53	6.53	2.64	6.59	2.53	6.31	2.64	5.86	2.86	5.43	2.86	6.00	2.72
Availability of skilled staff or experienced managers	5.13	2.98	5.33	3.04	5.04	3.02	5.13	3.06	5.06	2.98	4.75	3.09	5.00	3.04
Regulation	5.77	2.87	6.03	2.95	5.97	2.90	5.77	2.91	5.97	2.99	5.56	2.99	5.79	2.93

Notes: Likert scale 1 to 10: 1 not at all pressing, 10 extremely pressing; SD = standard deviation.

Source: SAFE 2013H1

Table A 3: Cluster comparison: Firm debt and loan taken

	Mixed-financed SMEs	State-subsidised SMEs	Debt-financed SMEs	Flexible-debt-financed SMEs	Trade-financed SMEs	Internally-financed SMEs
Firm has no debt (Q3)	9.0%	1.5%	3.7%	5.8%	20.2%	59.8%
Firm did not take a loan (in the last 2 years) (Q12)	11.5%	3.2%	7.7%	12.9%	19.2%	45.5%

Note: Q = Question of the SAFE survey

Source: SAFE 2013H1

Annex 2: List of abbreviations

Countries

AT	Austria	FR	France	NL	Netherlands
BE	Belgium	GR	Greece	NO	Norway
BG	Bulgaria	HR	Croatia	PL	Poland
CY	Cyprus	HU	Hungary	PT	Portugal
CZ	Czech Republic	IE	Ireland	RO	Romania
DE	Germany	IT	Italy	SE	Sweden
DK	Denmark	LT	Lithuania	SI	Slovenia
EE	Estonia	LU	Luxembourg	SK	Slovakia
ES	Spain	LV	Latvia	UK	United Kingdom
FI	Finland	MT	Malta	US	United States

Other abbreviations

BLS	Business Longitudinal Survey
DK/NA	Don't know / no answer
EC	European Commission
ECB	European Central Bank
Ed./eds.	Editor / editors
EEA	European Economic Area
E.g.	Exempli gratia (for example)
ENSR	European Network for SME Research
Esp.	Especially
Et al.	Et alii (and others)
EU	European Union
EUR	Euro
Excl.	Excluding
I.e.	Id est (that is)
No.	Number
P.a.	Per anno
P./pp.	Page / pages
Q	Question (of the SAFE survey)
SABE	Sistema de Análisis de Balances Españoles
SAFE	Survey on the access to finance of enterprises
SD	Standard deviation
SME	Small and medium-sized enterprise
SSBF	Survey of Small Business Finance
UNSD	United Nations Statistics Division
VC	Venture capital
Vol.	Volume
Vs.	Versus
WBES	World Business Environment Survey

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About …

… the European Investment Fund

The European Investment Fund (EIF) is the European body specialised in small and medium sized enterprise (SME) risk financing. The EIF is part of the European Investment Bank group and has a unique combination of public and private shareholders. It is owned (data as of Oct 2015) by the EIB (61.4%), the European Union - through the European Commission (26.5%) and a number (28 from 15 countries) of public and private financial institutions (12.1%).

EIF's central mission is to support Europe's SMEs by helping them to access finance. EIF primarily designs and develops venture capital and guarantees instruments which specifically target this market segment. In this role, EIF fosters EU objectives in support of innovation, research and development, entrepreneurship, growth, and employment.

The EIF total net commitments to venture capital and private equity funds amounted to over EUR 8.2bn at end 2014. With investments in over 500 funds, the EIF is the leading player in European venture capital due to the scale and the scope of its investments, especially in the high-tech and early-stage segments. The EIF commitment in guarantees totaled over EUR 5.7bn in over 300 operations at end 2014, positioning it as a major European SME loan guarantees actor and a leading microfinance guarantor.

… EIF's Research & Market Analysis

Research & Market Analysis (RMA) supports EIF's strategic decision-making, product development and mandate management processes through applied research and market analyses. RMA works as internal advisor, participates in international fora and maintains liaison with many organisations and institutions.

… this Working Paper series

The EIF Working Papers are designed to make available to a wider readership selected topics and studies in relation to EIF´s business. The Working Papers are edited by EIF´s Research & Market Analysis and are typically authored or co-authored by EIF staff or are written in cooperation with EIF. The Working Papers are usually available only in English and distributed only in electronic form (pdf).

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