

# SME Lifecycle and Non-Bank Financing in Europe: What Determines Usage?

Conor O'Toole *a*

October 2014

*a Financial Stability Division, Central Bank of Ireland*

## Abstract

Using the ECB SAFE survey this paper explores whether the usage of non-bank debt and equity finance by SMEs differs a) across their lifecycle b) with financial distress, bank lending conditions, credit access and trading risk and c) with time-varying country factors. Small young firms are less likely to use issued debt, trade credit and leasing/factoring/hire-purchase and more likely to use other loans from companies or friends and family. Mezzanine is more likely used by medium-sized SMEs. Informal loans are particularly important for young firms. We find trading risk is negatively correlated with the usage of trade credit, factoring, hire-purchase, leasing, equity and mezzanine financing. It is not correlated with issued debt or other loans. Financial distress is negatively associated with using all non-bank finance. We find a positive association between tightened bank lending conditions and the usage of all non-bank financing sources. Credit constraints are positively associated with the use of trade credit, factoring/leasing/hire-purchase, other loans, equity and mezzanine. SMEs are less likely to use trade credit, other loans, leasing but more likely to use equity or mezzanine as sovereign stress increases. Equity usage by SMEs is increasing with GDP growth and falling with inflation growth.

**Keywords:** Capital structure; SME lifecycle; financing hierarchy; non-bank finance

Contact: conor.otoole@centralbank.ie. I would like to thank Fergal McCann, Paul Lyons, and Martina Lawless for comments. The views presented in this paper are those of the authors alone and do not represent the official views of the Central Bank of Ireland or the ESCB. Any remaining errors are our own.

# 1 Introduction

Since the financial crisis, there has been considerable focus from both policymakers and researchers on the issue of access to finance for European enterprises. Much of the research and policy debate has been centered on ensuring an adequate supply of bank credit in an environment where banking sector distress is heightened and supply-side credit constraints have been identified (Ferrando and Griesshaber, 2011; Holton et al., 2013; Gerlach-Kristen et al., 2014). This issue is even more salient for micro-, small-, and medium-sized enterprises (SMEs) who, even in non-crisis times, faced difficulties in accessing external financing. This is mainly due to a lack of collateral, high level of asset intangibility or information asymmetries (Beck et al., 2008a,b; Carpenter and Petersen, 2002).

The crisis has also raised concerns about the over reliance of European SMEs on banks for external financing. This lack of diversification leaves SMEs particularly vulnerable to the adverse effects of shocks to bank-credit supply. Developing alternative sources of financing for SMEs, and reducing the share of bank finance in the capital structure, should help support financial stability through improving the resilience of firms to banking sector shocks. Indeed, recent research by McCann and McIndoe-Calder (2012) indicates that firm default increases as bank debt relative to total assets increases. Lowering bank leverage and balancing capital structures with more non-bank financing can therefore promote financial resilience. Within this context, policy makers and European institutions have called for the introduction of structural capital market reforms to help develop alternative financing instruments for SMEs.<sup>1</sup> However, this debate must be conducted with an evidence backdrop highlighting how SMEs use non-bank financing across their lifecycle.

Within the broader debate on non-bank financing for European SMEs, this paper addresses the following questions: a) how does the usage of non-bank financing differ across SMEs lifecycle? b) does financial distress, bank-finance conditionality and access to credit as well as trading risk affect the probability of using alternative financing? and c) do time-varying country factors impact the usage of SME non-bank financing? This research uses the ECB/EC survey on access to finance for SMEs to estimate the determinants of using a range of non-bank debt finance (issued debt, trade credit, leasing/factoring/hire-purchase, and other loans) and equity (pure equity and mezzanine finance).

This research is linked to a number of literatures. Firstly our work is complementary to the general debate on the capital structure of small firms. The original work in this area by Myers and Majluf (1984) highlights a ‘pecking order theory’ of financial usage whereby firms preferences run from internal financing to external debt then equity. This theory was based on an evaluation of the associated cost of capital between internal and external financing as well as the ownership implications

---

<sup>1</sup>See (ESCB, 2013; *Green Paper on the Long-Term Financing of the European Economy*, 2013; *Investment and Investment Finance in Europe*, 2013).

of accepting equity investment. More recent research in this area uses a lifecycle approach to the firm's financing. [Berger and Udell \(1998\)](#) state that small firms go through a financial growth cycle whereby their financing options change as the firm gains experience, grows and becomes more informationally transparent. [Kaplan and Stromberg \(2004\)](#) highlight the role that changing degrees of information, internal finance generating capacity and growth opportunities have on the firms' financing choices across their lifecycle.

In general, this literature suggests that in the early stages of the lifecycle, when informational opacity is high, firms are reliant on insider financing, informal financing, trade credit and occasionally angel or seed capital investment ([Berger and Udell, 1998](#); [Gartner et al., 2012](#)). As firms grow in size, or age, it becomes easier to access bank credit, financing from other financial intermediaries or private equity through venture funds (for high-growth, high margin firms) ([Berger and Udell, 1998](#); [Chittenden et al., 1996](#); [Sahlman, 1990](#)). Larger, medium-sized firms eventually may gain access to issued debt markets or public equity issuance. This research posits that leverage ratios increase as the firm ages due to financing constraints for younger firms and better access to external debt for older firms ([La Rocca et al., 2011](#)). These findings co-incide with the reputational nature of leverage ratios as discussed in [Fluck \(1998\)](#) and [Diamond \(1989\)](#). ([Petersen and Rajan, 1994](#)) and (?) highlight that young firms rely on close domestic sources of financing and bank capital that is collateralised on personal or family assets. The moral hazard associated with all debt contracts is exacerbated with younger firms if their total debt is large relative to inside finance. This makes external 'patient' equity capital (venture or angel) more important for younger firms.

Despite this literature, there are relatively few studies that specifically focus on how small firms actually use different types of financing across their lifecycle. Research that does follow a lifecycle approach mainly model debt to equity or leverage ratios using balance sheet data ([La Rocca et al., 2011](#); [Jeeveer, 2013](#)) or have single country studies which do not distinguish between numerous non-bank debt instruments ([Bhaird and Lucey, 2010](#)). The first contribution of this paper adds to this literature in two ways: a) we look at a range of non-bank debt financing namely issued debt, trade credit, other loans from informal or business sources or leasing/factoring/hire-purchases as well as considering equity and mezzanine usage; b) we explore the usage of financing across 20 European countries which ensures the findings are not country specific. The model of what finance is used employs binary indicators across a wider range of financing types than are used in the existing literature. Our analysis draws on the ECB/EC SAFE survey which provides a new data source to consider the usage of non-bank finance. This study is the first estimate the determinants of usage of non-bank financing in a lifecycle context using such survey data. The lifecycle categories used are also novel, combining both age and size groups. The cross-country aspect of the research is also novel. To date, there is limited research that focuses on usage rates of non-bank finance in a cross country context. This research fills a gap in

the literature in this area.

Our second main contribution emerges from disentangling borrower related risk factors. We separate trading risk, financial distress, and changes to bank credit conditions and credit constraints. Indices of trading risk, borrower distress, and changes to bank lending conditions are developed to separate out these factors. These results can provide important insights into the correlation of using different types of financing and the various types of risk or financial challenges that SMEs face. We also control for bank credit constraints to test for substitution between financing sources by constrained borrowers (Clarke et al., 2006). To our knowledge, no previous research has disentangled these factors. Including controls for bank credit constraints and bank lending conditions capture potential substituting relationships between bank and non-bank sources. For example Maier and Walker (1987) note that venture capital is a substitute form of financing for bank credit for small firms. Casey and O'Toole (2014) and Guariglia and Mateut (2006) highlight the substitutable nature of bank credit and trade credit. Berger and Udell (1998) outline three specific relations which are interconnected: a) trade credit increases in importance when firms face bank financing difficulties b) issued debt can reduce debt financing costs and c) bank borrowers who do not pledge collateral may send a favorable signal about quality that lowers the cost of other types of funding.

Three further studies are close to our research. Casey and O'Toole (2014) use the SAFE data to test the effect of bank lending constraints on using alternative financing. They find that bank constrained firms are more likely to use and apply for trade credit but do not substitute to formal market financing. This research however, does not focus on the firms' lifecycle nor does it disaggregate the types of non-bank financing as widely as this paper. Lawless et al. (2014) also use the SAFE data to consider small firm capital structures. However, their focus is on the number of sources that firms use including bank and non-bank financing. They do not focus on the lifecycle determinants of using specific non-bank alternatives. (O'Toole et al., 2014) focus on non-bank financing in Ireland and use similar data and methodological approach. However, their focus is purely providing an overview to inform Irish policy makers and to present a comparative statistical overview for Ireland. Their study is country specific.

The final contribution is to test the sensitivity of SME usage of non-bank finance to time-varying country factors. Existing research indicates that numerous country-specific factors can determine the choice of capital structure by small firms (Beck et al, 2003a;b; Beck et al, 2004a;b; ?). These include institutional and legal structures, competition in banking markets and the degree of bank-based or market-based financing. Many country specific factors that influence the financing choices of small firms are potentially structural in nature and change slowly over time. Given the time series spanning the data set, and the small number of countries, it is not possible to identify many of these factors in our analysis and much of their effect would be subsumed in the country dummies. However, we can

test whether some more short term channels are operating as in Holton et al. (2014). We therefore include: a) GDP growth b) sovereign bond yield c) inflation levels to capture their impact on SMEs use of non-bank financing. Controls for log of GDP and bank loan-deposit mark-ups are also included.

A number of findings emerge from the analysis. We find that issued debt is much more likely to be used later in the firm's lifecycle in line with (Berger and Udell, 1998). The usage rates are higher for small developing companies as well as small mature and medium-sized mature firms. In relation to trade credit, the results indicate it is more widely used by small and medium-sized firms than micro firms. This is especially the case for young small and medium firms. The importance of trade credit for managing growth has been highlighted in Ferrando and Mulier (2013). Other loans, which includes informal lending from friends and family are very important for young micro firms. This is in line with research highlighting the importance of informal finance early in the lifecycle (Petersen and Rajan, 1994; Hamilton and Fox, 1998). On factoring, leasing and hire purchase, the effects appear to increase with size with less variance across age within size categories. It is most important for young medium sized firms.

Interestingly, we do not identify many differential effects across the lifecycle regarding equity usage. As we are unable to split our equity finance between insider equity, angel investment, venture capital and public equity, it may be unsurprising that such effects are not identified. The only finding that is statistically significant indicates that young, micro-sized enterprises are more likely to use equity than mature-firms. For mezzanine financing, we find that all three medium-sized age categories are positive and statistically significant. Within these categories, young medium-sized firms have the highest likelihood of using mezzanine finance and this decreases with age.

To provide additional insight from a research and policy perspective, we also specifically focus on small young firms. Recent research has highlighted the importance of such young firms for employment creation (Haltiwanger et al., 2013; Fort et al., 2013; Lawless, 2014). Identifying this group specifically, we find that small young firms are less likely to use issued debt, trade credit and leasing/factoring/hire-purchase, and are more likely to use other loans. There does not appear to be any differential usage of equity or mezzanine financing. The higher usage of other loans, which includes loans from friends and family, is further evidence of potential start-up enterprise reliance on informal funding.

A number of findings emerge in relation to the variables for trading risk, financial distress, bank lending conditions and bank credit constraints have been included. First, it appears that trading risk is negatively correlated with the usage of trade credit, factoring, hire-purchase, leasing, equity and mezzanine financing. It is not correlated with issued debt or other loans. In each of the aforementioned cases, counterparty trading risk must be evaluated to appropriately allocate credit. However, other loans, if they come from friends or family or other informal sources, may be provided in response to poor current trading conditions as part of an informal support package. This may be why no effect

is identified. This is in line with research by O'Toole et al. (2014) on Ireland who find that loans from friends and family and informal loans are to prop up distressed borrowers. A negative effect of financial distress is identified on the usage of all non-bank financing types.

The final two indicators on bank lending conditions and credit constraints capture the availability of new bank financing and the restrictiveness of the terms applied to existing facilities. The estimates suggest that there is a positive and statistically significant impact of bank lending conditions on the usage of all non-bank financing sources. While this is not a clear causal statement, this suggests that where bank lending conditions become restrictive and terms are punitive, enterprises are more likely to substitute to alternatives. The magnitude of the effect is highest for trade credit, factoring/leasing/hire-purchase and other loans respectively. Potential substitution patterns are also clear in relation to firms who are credit constrained. These firms are more likely to use all alternatives bar issued debt. The effect is largest for other loans, trade credit and factoring/leasing/hire-purchase respectively.

Finally, we explore whether or not time-varying country controls impact on the usage of non-bank financing by SMEs. Over and above borrower risk and bank financing conditions, enterprises are less likely to use some non-bank debt instruments (trade credit, other loans, leasing) as sovereign stress increases and are more likely to use equity or mezzanine financing. This could reflect a desire to balance capital structures during periods of widescale financial distress. Trade credit and other loan usage is also lower in countries with higher inflation environments. Equity usage by SMEs is increasing with economic growth and falling with inflation growth. In countries with higher growth rates, expected returns are potentially better therefore encouraging both investors and enterprises to use equity finance. As inflation erodes real expected returns this may deter equity usage.

This paper is structured as follows: Section 2 presents the data and methodological approach. Section 3 outlines the empirical results and section 4 concludes.

## 2 Data and Methodology

### 2.1 Data Overview and Key Variables

The data for this paper is taken from the ECB/European Commission Survey on Access to Finance for SMEs (SAFE). Following the financial crisis, European policymakers became concerned with obtaining accurate information on the financing conditions of small and medium sized enterprises. Within this mandate, and to also test the monetary policy transmission mechanism to small business, the ECB and European Commission conduct a bi-annual survey of companies in the Eurozone and a biennial survey of companies in the broader European Union and European Economic Community. The survey

begins in 2009 so no precrisis comparison data is available. The sample used in this paper excludes the first round of the survey due to small sample sizes so runs from July 2009 until the wave ending in March 2014. In terms of the distribution of observations across countries, the survey captures approximately 1,000 observations per survey round for the large Eurozone countries (Germany, Spain, Italy, France) and 500 observations or less for the smaller Eurozone and non-Eurozone economies. The data is cross-sectional.

The survey captures data on a range of borrower-specific information relating to the performance of the business as well as its financing conditions, trading performance, age, size, sector, and ownership. Information is also collated on how the firm views the evolution of its financial status such as changes to capital positions, debt to asset ratios and credit history.

The main objective of this research paper is to model the determinants of SME usage of non-bank financing. The SAFE survey has a unique set of questions which facilitate this research. In SAFE, firms are asked whether or not they used the following types of financing instruments in the past six months: retained earnings, bank loans, bank overdrafts or short term bank facilities, issued debt, trade credit, other loans, leasing/factoring/hire purchase, equity, subordinated debt or mezzanine financing, or government grants/other government financing.

Excluding the retained earnings, bank financing instruments and government grants, we are left with six financing types of which 4 are debt facilities and 2 are equity/quasi equity.<sup>2</sup> The dependent variables in our analysis are binary and take the value of 1 if any of the financing instruments are used by firms and 0 otherwise. Table 1 outlines each of the variables.

Table 1: Definition of Dependent Variables

Variable	Measurement	Financing Instruments
Usage	Dep Var = 1 if firm indicated using a instrument in the past 6 months 0 otherwise 1 if Q4(instrument) in SAFE = 1 0 if Q4(instrument) in SAFE = 2, 4	<b><i>Non-Bank Debt</i></b> Issued Debt Trade Credit Other Loans <sup>3</sup> Leasing, Hire-Purchase, Factoring <b><i>Equity/Quasi-Equity</i></b> Equity Mezzanine

These data provide a range of indicators of usage across non-bank debt and equity finance that is broader than used in the existing literature.

One focus of this research is to explore the usage of non-bank financing across firms lifecycle. In the

<sup>2</sup>In this paper, we exclude government financing as the public provision of funding is a different literature. Our focus is on non-public funds: market intermediated, informal, business-to-business and equity financing.

SAFE survey, there is no continuous information available on the firm age or size. Instead age category variables are available: 0-5 years, 5-10 years and 10 years plus.<sup>4</sup> Additionally, the traditional Berger and Udell (1998) model of firm lifecycle indicates that firms requirements change not only as they age but also as they size. To measure firm size, categorical variables are available to identify micro, small and medium-sized firms.<sup>5</sup> To capture both the size and age effects, we create a categorical variable which combines age and size. It is presented in table 2:

Table 2: Measuring Firm Lifecycle

Category	Measurement
Micro Young	Age: 0-5 Size: Micro
Micro Developing	Age: 6-10 Size: Micro
Micro Mature	Age: 10 plus Size: Micro
Small Young	Age: 0-5 Size: Small
Small Developing	Age: 6-10 Size: Small
Small Mature	Age: 10 plus Size: Small
Medium Young	Age: 0-5 Size: Medium
Medium Developing	Age: 6-10 Size: Medium
Medium Mature	Age: 10 plus Size: Medium

These categories increase in size and age and can be used to identify how firms usage of non-bank financing changes across these categories. This methodology differs from studies which focus just on age and size separately.

In this research, one focus is also on disentangling the risk faced by firms from both trading performance and financial factors while controlling for a) the conditions they face on their existing bank finance and b) access to new bank credit. It is aimed that this will disentangle substitution effects with bank financing from firm trading risk and financial health. Isolating each of these factors is also important to distinguish the types of borrowers that are using non-bank debt and equity. For example, firms that face increased risk to their trading performance may be less likely to use bank or

<sup>4</sup>A category is available for 0-2 years however there are two few observations in this category to analyse as a stand alone group. It is merged with category age 2-5.

<sup>5</sup>These are defined as per the European Commission definition:1-9 employees Micro, 10- 49 employees Small, 50-250 employees Medium.



formal market debt or equity investment but may squeeze supply chains or apply for informal loans from business partners or family firms (O'Toole et al., 2014).

The majority of borrower specific variables in SAFE are measured as categorical variables with three categories either: 1) increased 2) unchanged or 3) decreased or 1) improved 2) unchanged 3) deteriorated. This relates to controls for firm performance (profits, costs, turnover), financing situation (debt to asset ratio, capital position, credit history) and access to, and terms of, bank financing. To control for all these influences, the standard option is to omit one category and include all controls. An alternative option is to aggregate sets of categorical variables to an index. Depending on the combination of variables, this groups firms into "risk" buckets and can provide better identification in comparison to having large numbers of binary indicators.

In this research, we include the following three indices: 1) trading risk 2) financial distress and 3) bank lending conditions. Each of the variables in the indices are given values of (-1,0,1) to represent the categories 1) increased 2) unchanged or 3) decreased or 1) improved 2) unchanged 3) deteriorated. The variables are then summed to give an overall index. The first index relates to '*Trading Risk*'. This is a composite of the following factors: turnover, labour costs, non-labour costs, profitability, profit margins, and trading outlook. This index is designed to capture the factors that determine the trading performance of the firm outside its financial health and access to bank finance.

The second index, '*Financial Distress*', captures the firms financial health excluding its access to bank finance and the conditionality of its bank facilities. The component variables in the index include the firms' credit history, debt to asset ratio, own capital position, financial costs and requirements for corporate restructuring or M&As.

Given the scale of the financial crisis and the findings of the existing literature highlighting substitution between bank and non-bank financing (Love et al., 2007; Guariglia and Poncet, 2006; Casey and O'Toole, 2014) it is interesting to explore whether changes to the conditionality of firms bank terms and conditions or access to bank finance encourages their use of non-bank financing. To further the existing literature, we split out access to bank credit and the terms and conditions of existing facilities. It is possible that firms may chose alternatives when either their a) access and b) conditionality of bank terms changes.

To capture these influences, two variables are included. First we include an index which captures changes to the terms and conditions of existing bank facilities '*Bank Lending Conditions*'. It includes the following factors: interest rates, and interest/non-interest costs, loan volumes, maturity changes, collateral requirement changes, and changes to other terms and conditions. As this variable increases, the conditions on existing bank finance have tightened or gotten worse for the firm.

Second, we simply include a dummy for whether or not the firm has applied, and been rejected, for bank finance i.e. '*Credit Constrained*'. This is a standard credit constraint dummy as in O'Toole

Table 3: Risk Indices

Index	Components
Trading risk	<ol style="list-style-type: none"> <li>1. Turnover change</li> <li>2. Labour cost change</li> <li>3. Non-labour cost change</li> <li>4. Profitability change</li> <li>5. Profit margin change</li> <li>6. Firms outlook change</li> </ol>
Index Values	- 6 (low risk) to 6 (high risk)
Financial Distress	<ol style="list-style-type: none"> <li>1. Credit history change</li> <li>2. Debt to asset ratio change</li> <li>3. Own capital change</li> <li>4. Financial costs change</li> <li>5. Corporate restructuring requirements change</li> </ol>
Index Values	- 5 (low risk) to 5 (high risk)
Bank Lending Conditions	<ol style="list-style-type: none"> <li>1. Interest rate change</li> <li>2. Non-interest cost change</li> <li>3. Loan volumes change</li> <li>4. Maturity change</li> <li>5. Collateral change</li> <li>6. Other terms change</li> <li>7. Interest costs</li> </ol>
Index Values	- 7 (low risk) to 7 (high risk)
Credit Constrained	1 if rejected for bank finance 0 otherwise

(2014), Holton et al. (2014), and Byiers et al. (2010).

For each of the indices outlined above, by construction, the underlying components have been given equal weighting. As they underlying data are categorical, equal weighting appears acceptable as the variables in essence just group firms into ‘risk buckets’. In the regression analysis, the coefficients on these indices capture the responsiveness of transitioning through the categories on the usage of non-bank financing.

## 2.2 Summary Statistics

For this specific paper, the sample covers 20 countries as listed in table 4.<sup>6</sup> These are unevenly distributed across the sample waves as Eurozone members are better represented due to their bi-annual sampling. In total our sample contains approximately 49,348 observations.

A description of the our sample across key borrower characteristics is presented in table 5. Across

<sup>6</sup>The number of countries is limited from the overall sample due to missing values for the country-time controls which are discussed in the next section.

Table 4: Number of Observations by Country

country	Freq.	Percent	Cum.
AT	2,476	5.02	5.02
BE	2,992	6.06	11.08
BG	559	1.13	12.21
CZ	497	1.01	13.22
DE	5,445	11.03	24.25
DK	656	1.33	25.58
ES	6,889	13.96	39.54
FI	2,511	5.09	44.63
FR	6,908	14.00	58.63
GR	623	1.26	59.89
HU	588	1.19	61.08
IE	2,974	6.03	67.11
IT	6,823	13.83	80.94
NL	3,008	6.10	87.03
PL	1,263	2.56	89.59
PT	2,687	5.45	95.04
SE	670	1.36	96.39
SI	127	0.26	96.65
SK	400	0.81	97.46
UK	1,252	2.54	100.00
Total	49,348	100.00	

Table 5: Share of Firms by Sector and Group

Variable	Freq.	Percent	Cum.
Manufacturing	13,483	27.32	27.32
Construction	5,473	11.09	38.41
Trade	12,892	26.12	64.54
Other	17,500	35.46	100.00
Medium	15,258	30.92	30.92
Small	18,203	36.89	67.81
Micro	15,887	32.19	100.00
Young	4,416	8.95	8.95
Developing	6,894	13.97	22.92
Mature	38,038	77.08	100.00
Family or entrepreneur	27,327	55.38	
Listed	1,788	3.62	59.00
Single owner	12,514	25.36	84.36
Other	7,719	15.64	100.00
Total	49,348	100.00	

industrial sectors, 27 percent of enterprises are in manufacturing, 11 percent in construction, 26 in wholesale or retail trade with 35 in other sectors. The size distribution is 30 percent medium, 38 percent small and 32 percent micro. Nearly 9 percent are young firms (less than 5 years), 14 percent are developing (between 5 and 10 years) and the majority of enterprises are mature in age ( > 10 years).

Reflecting the age and size distributions presented, the share of enterprises in each of the categories of the ‘lifecycle’ variable are presented in table 6. The fewest firms are in the young categories with the majority in the older groups. This reflects the large number of older firms in the sample. The smallest category are young, medium-sized firms. This group is interesting from a policy perspective as these firms would have achieved very high growth to have established a workforce of over 50 employees in under 5 years.

To explore the type of financing used across firms lifecycle, table 7 presents a heatmap of the percentage of the usage intensity of each financing source. While the focus of this paper is on non-bank external financing, internal sources (retained earnings RE), and bank financing (working capital and loan finance) are included in the chart for comparison. There is a clear pattern in regard to internal financing. Retained earnings have the highest usage intensity as firm age and size increases. This is intuitive as many firms require scale and time to build up cash balances. Early lifecycle stages can be characterised by negative cash flow for many enterprises. Bank working capital credit (short term overdrafts and lines of credit) is the source with the largest usage intensity of all external finance. This is followed by bank loans.

Focusing on the non-bank debt financing instruments. Across all categories trade credit is very

Table 6: Breakdown of Observations Across Lifecycle

Lifecycle stage	Freq.	Percent	Cum.
Young Micro	2,387	4.84	4.84
Developing Micro	3,085	6.25	11.09
Mature Micro	10,415	21.11	32.19
Young Small	1,343	2.72	34.92
Developing Small	2,391	4.85	39.76
Mature Small	14,469	29.32	69.08
Young Medium	686	1.39	70.47
Developing Medium	1,418	2.87	73.34
Mature Medium	13,154	26.66	100.00
Total	49,348	100.00	

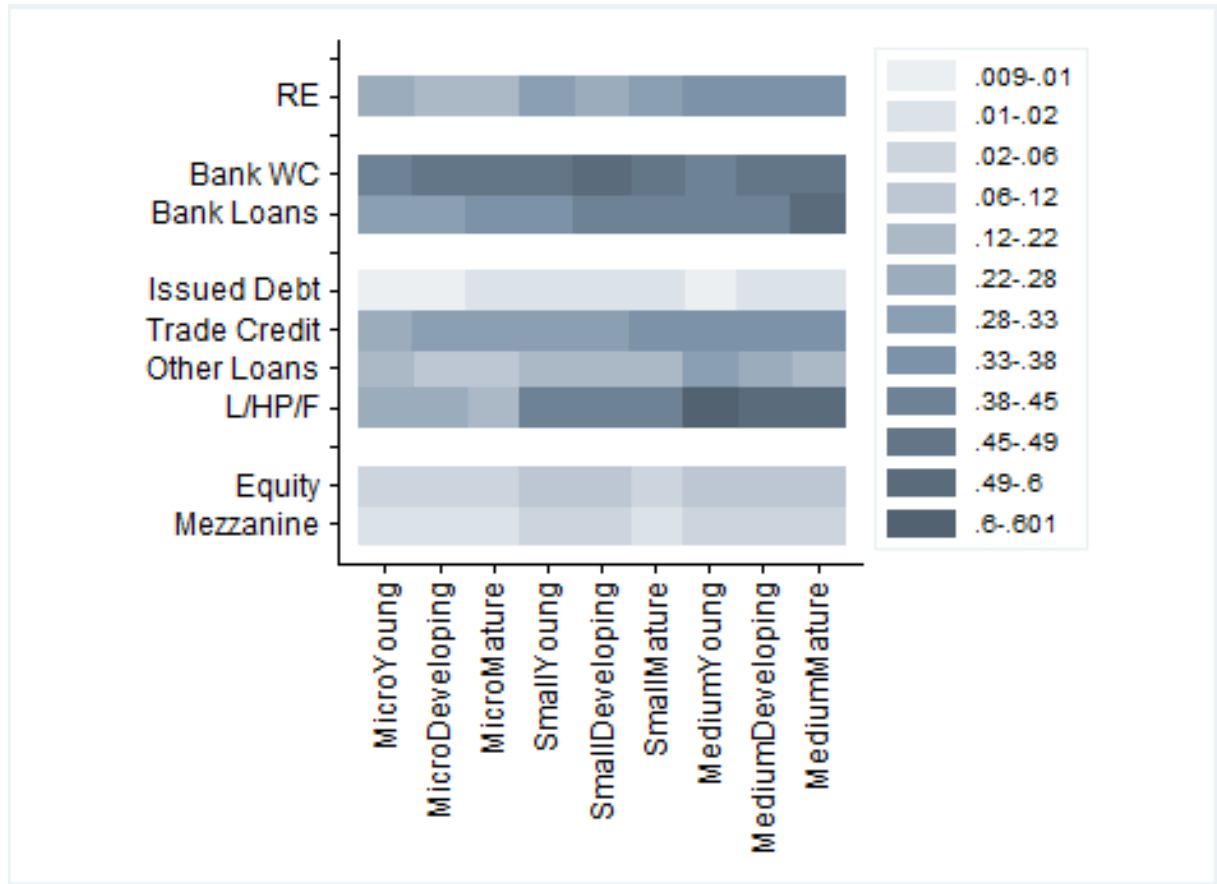
widely used. Leasing, hire-purchase, and factoring appear to be used to a greater extent as age and size increase. Other loans (which include loans from friends, family, business partners and other companies) appear to be important for young firms. Formal market debt issuance is not widely across the lifecycle but it does appear greater for mature firms with scale.

The final non-bank financing instruments included are equity and mezzanine. The percentage of firms using this type of financing across the firm lifecycle is lower than both bank and all non-bank debt financing other than issued debt. Equity finance usage appears higher for medium-sized firms as is mezzanine finance. Mezzanine has very low usage levels amongst micro-sized firms. While these summary statistics are informative, formally modelling the determinants of usage is important to disentangle the borrower-specific characteristics associated with non-bank financing.

The mean values of the control indices by lifecycle are presented in table 8. Focusing on trading risk, it appears that while trading risk is higher on average for micro firms, this risk is higher for older firms. This may be due to the fact that many younger firms that established since the crisis have build business models that are suitable to the post-crisis economic environment. Older firms may have business models that are suffering in the lower demand environment currently. Credit constraints are higher for micro-sized firms and appear to fall with age for small and micro firms. This is in line with the literature on constraints (Beck and Demircuc-Kunt, 2006; Beck et al., 2008; O'Toole, 2014). Similar patterns emerge for bank lending conditions as micro firms are associated with higher levels of tightening bank lending conditions. Financial distress also appears to be greatest for micro firms and declines with size.

In the event that concerns may arise as to whether these indices are in fact highly collinear, the correlation coefficients are presented in Appendix 1. These are relatively low which mitigates the concern of collinearity in these indices. Additional summary statistics describing the country variation for key variables are included in Appendix 1.

Table 7: Use of Financing by Source



Source: ECB SAFE

## 2.3 Methodological Approach and Research Hypotheses

### 2.3.1 Methodological Approach

The methodological approach used in this paper is simple and draws on the work of Casey and O'Toole (2014), Holton et al. (2014), Lawless et al. (2014) and O'Toole (2014). To estimate the determinants of usage of non-bank financing, a standard probit model is estimated on the cross-sectional data. The probability of using a particular non-bank financing sources is modelled as:

$$Pr [Use(n)_{ijt} = 1] = \Phi (\mathbf{X}_{ijt}\theta + TR_{ijt}\beta_{TR} + FD_{ijt}\beta_{FD} + CC_{ijt}\beta_{CC} + BLC_{ijt}\beta_{BLC} + \tau_t + C_j + \epsilon_{ijt})$$

where  $n = 1, \dots, 6$  are the each of the non-bank debt and equity financing types for firm  $i$  in country

Table 8: Mean of Control Indices by Lifecycle

	Trading Risk	Credit Constrained	Bank Lending Conditions	Financial Distress
Young Micro	1.39	0.14	0.75	-0.07
Developing Micro	1.98	0.14	0.89	0.01
Mature Micro	2.44	0.13	0.87	0.12
Young Small	0.93	0.12	0.69	-0.39
Developing Small	1.46	0.12	0.75	-0.30
Mature Small	1.69	0.11	0.73	-0.16
Young Medium	0.60	0.11	0.45	-0.46
Developing Medium	0.96	0.13	0.61	-0.47
Mature Medium	1.23	0.11	0.52	-0.31

$j$  in survey wave  $t$ . The vector  $\mathbf{X}_{ij}$  contains the firm-specific borrower controls that we include in our baseline models. These are firm age and size categories or the lifecycle categories depending on the regression. The following are also included: industrial sector controls (manufacturing, construction, wholesale and retail, and other), firm ownership (publicly listed, single-owner, family or entrepreneur-owned, and other) and a control for whether or not the firm is a subsidiary.

The indices and controls presented earlier for trading risk (TR), financial distress (FD), credit constraints (CC), and bank lending conditions (BLC) are included in the specification. As these indices enter contemporaneously, it is not possible to establish causal inference from the estimated coefficients. However, we can explore whether groups of firms with higher or lower levels of each index have a robust correlation with using particular types of non-bank financing which is still of interest.

While the data is cross sectional and we cannot employ an econometric methodology to remove firm-specific heterogeneity, including the range of firm-level control variables can ensure that sufficient firm variance is captured. In the initial analysis, we also include wave dummies  $\tau_t$ , country dummies  $C_j$  and country-time interactions.

Exploring the cross-country aspects of usage of non-bank financing is also of interest as research suggests structural factors have an important bearing on the financing choices of SMEs (Beck et al, 2003a;b; Beck et al, 2004a;b; Ryan et al., 2014). These include institutional and legal structures, competition in banking markets and the degree of bank-based or market-based financing. It is also interesting to disentangle whether time-varying country factors are important in determining SME finance such as established in Holton et al. (2014). To consider these issues, we re-estimate the probit including the following time-varying country controls. Excluding the country-time interactions, we include the following time-varying country controls: a) GDP growth to capture changes to demand conditions b) sovereign 10 year bond yield to capture financing stress and c) inflation growth. We also control for level of GDP to capture country size, bank lending-deposit margins to capture market

power concerns and the level of inflation. GDP and inflation data is taken from Eurostat, bond data from Bloomberg and bank lending margins from the ECB.

$$Pr [Use(n)_{ijt} = 1] = \Phi (\mathbf{X}_{ijt}\theta + \mathbf{Z}_{jt}\lambda + \mathbf{H}_{jt}\beta_H + \tau_t + C_j + \epsilon_{ijt}) \quad (1)$$

These variables enter the specification in the vector  $\mathbf{Z}_{jt}$ . The vector  $\mathbf{H}_{jt}$  is used for brevity to represent the four controls for borrower risk discussed above.

### 2.3.2 Research Hypotheses

To begin the formal modelling of the usage of non-bank financing it is useful to identify a number of research hypotheses to guide the empirical analysis. These hypothesis are formed given the extant literature and the focused contribution of this particular paper. While the estimation results may provide additional insight not listed in these specific hypotheses, using a structured approach in this manner can ensure the discussion is targeted.

The first set of research hypothesis relate to the firms' use of finance across its lifecycle:

- H1: Early stage firms have an increased likelihood of using informal sources of finance.<sup>7</sup>
- H2: Issued debt finance is used by larger, mature firms.
- H3: Trade credit is used across the lifecycle except for very young firms.
- H4: Equity can be used across the lifecycle but the source of equity finance differs.
- H5: Mezzanine finance is more suited to medium-sized firms.

These hypotheses are motivated by Berger and Udell (1998) and Beck et al. (2008) as discussed in literature and context piece in section 1.

The second group of hypotheses relate to the control indices and measures of bank constraints:

- H6: Both trading risk and financial distress should lower the usage of formal non-bank finance.
- H7: Tightened bank lending conditions or credit constraints should increase the use of non-bank finance

H6 indicates that counterparties evaluate credit risk of potential SME borrowers and are less inclined to provide financing in the case where borrower fundamentals are poor. H7 tests whether bank and non-bank finance are substitutes.

## 3 Empirical Results

In this section the results of the econometric estimations are outlined. In all cases, standard probit models are used and the marginal effects are presented. Standard errors are robust to heteroskedasticity and clustered at the country year level. The first results presented are the baseline findings including



the firm controls, risk indices and time-country dummies (own effects and interactions). Secondly, the lifecycle categories are included and the usage across the lifecycle is tested. Thirdly, differences across countries are explored. Stratified sampling weights are provided in the data and these have been used in all regressions through a weighted probit model.

### 3.1 Baseline findings

Table 9 presents the results of the baseline probit marginal effects. In all regressions, country controls, time controls and country time interactions are included. Each of the financing sources has two columns. The first column includes estimates with only the standard firm group controls (age, size, ownership, subsidiary, time, country) while the second column introduces the indices for trading risk, financial distress, bank lending conditions and bank credit constraints. By splitting these two groups of variables out, it is possible to test whether the heterogeneity across groups differs when borrower-risk is controlled for.

Focusing first on issued debt, there does not appear to be considerable variation across groups. Given the low usage rates in general for this financing type it is not surprising that cross-group variation is not evident. Micro-sized firms are less likely to use this financing type relative to medium-sized firms. This finding holds controlling for the risk indices. There does not appear to be any robust correlation of using debt financing and trading risk. Firms in financial distress are less likely to apply for issued debt financing. This finding is intuitive as issued debt is mainly suited to larger, well performing companies. On the substitution between bank financing and issued debt, we also do not identify any correlation between firms facing bank lending constraints and using issued debt, however, we do find a positive effect of bank lending conditions on using issued debt. This suggests that if banks are tightening the conditionality of lending, firms are more likely to use issued debt, controlling for other borrower characteristics.

Columns (3) and (4) present the regression results for trade credit usage. Across sectors we find that trade credit usage is higher amongst construction and wholesale and retail trade firms relative to manufacturing. This finding is robust to including the borrower risk controls. There appears to be some differences across ownership with family or entrepreneur-owned firms more likely to use trade credit as compared to other groups except listed firms. No differences across age are evident. The dummies for small and micro-sized firms are negative, significant and increasing in magnitude i.e. small firms are 6 percent less likely while micro-sized firms are nearly 12 percent less likely to use trade credit. As firm size increases, the business opacity reduces and the likelihood of repayment for suppliers increases. Therefore counterparties may be more likely to agree to provide goods on credit. However, with dependent variables on usage it is not possible to disentangle supply and demand side

factors. Subsidiary firms are less likely to use trade credit. These firms may be more likely to rely on inter company financing flows which mitigate the requirement to use supplier financing. In relation to the firm risk indices, trade credit usage is decreasing with trading risk and financial distress but increasing as bank lending conditions tighten or if enterprises are credit constrained. This suggests that borrowers are less likely to use trade credit if the quality of the firm is lower (counterparty enterprises screen by quality).

In columns (5) and (6) the determinants of other loans are tested. This loan category is a composite of loans from family and friends or business and company loans which are not through trading books. Loans to and from subsidiaries and intra group loans are included in this category. While there does not appear to be considerable variation across sectors, listed firms are the most likely to use this financing type. This may suggest group transfers or intercompany loans are captured through this channel. This result is supported by the fact that subsidiaries also have a higher probability of using other loans. The usage of other loans also decreases with firm age and increases with firm size. There is no significant correlation between trading risk and the usage of other loans. If these are intra-group loans or loans from friends and family, they may be allocated regardless of trading risk e.g. if firms are struggling with trading conditions, they may access informal capital to get through periods of stress. We do find a negative effect of financial distress with using other loans. We also find a significant and positive effect of both being credit constrained and a tightening of bank lending conditions. In fact the coefficient on credit constraints is higher for other loans than any other financing type: bank credit constrained SMEs are nearly 6 percent more likely to use other loans. This finding is in line with the existing literature (Casey and O'Toole, 2014).

The estimated effects of covariates on the usage of leasing, factoring and hire-purchase are presented in columns (7) and (8). Focusing on column (8) containing all controls, it can be observed that construction, wholesale and retail and other sectors all have lower usage rates of these financing types relative to enterprises in the manufacturing sector. There do not appear to be clear patterns across ownership and age but usage is lower for smaller firms e.g. micro-sized firms are nearly 30 percent less likely to use these financing instruments. We also find a negative correlation with trading risk and financial distress and a positive correlation with bank lending conditions and credit constraints. This is evidence of substitution from bank financing as well as counterparties screening/selecting by borrower quality.

The final columns (9)-(12) estimate the probability of using equity and mezzanine financing respectively. Increasing the use of these non-bank, non-debt sources is of importance for both financial stability as well as capital structure balance. On equity, we find that equity usage is highest amongst listed firms which is unsurprising. We also find that mature firms are less likely to use equity relative to young firms while equity usage increases with firm size. The findings relating to the risk indices

indicate a negative correlation with trading risk and financial distress and a positive correlation with bank lending conditions and credit constraints. These findings also hold for mezzanine finance.

Table 9: Baseline Findings: Probit Marginal Effects

	Non-bank debt														
	Issued Debt			Trade Credit			Other Loans			F, HP, L			Equity/ Quasi-Equity		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)			
Construction	-0.001 (0.002)	-0.001 (0.002)	0.031*** (0.011)	0.034*** (0.012)	0.008 (0.008)	0.013* (0.007)	-0.033*** (0.013)	-0.033*** (0.012)	-0.003 (0.005)	-0.003 (0.005)	0.001 (0.003)	0.001 (0.003)			
Trade	-0.000 (0.003)	-0.000 (0.003)	0.046*** (0.010)	0.051*** (0.010)	0.008 (0.009)	0.014* (0.008)	-0.074*** (0.009)	-0.072*** (0.009)	-0.003 (0.004)	-0.002 (0.004)	-0.002 (0.003)	-0.002 (0.003)			
Other	0.001 (0.002)	0.001 (0.002)	-0.081*** (0.010)	-0.077*** (0.011)	-0.007 (0.008)	-0.002 (0.007)	-0.035*** (0.010)	-0.033*** (0.010)	-0.008** (0.004)	-0.008** (0.004)	-0.003 (0.003)	-0.003 (0.003)			
Listed	-0.002 (0.004)	-0.002 (0.004)	-0.023 (0.014)	-0.021 (0.014)	0.064*** (0.013)	0.072*** (0.013)	0.005 (0.016)	0.006 (0.015)	0.041*** (0.012)	0.041*** (0.011)	0.014** (0.006)	0.016** (0.006)			
Single-owned	-0.003* (0.002)	-0.003 (0.002)	-0.041*** (0.005)	-0.040*** (0.005)	-0.032*** (0.005)	-0.031*** (0.005)	-0.031*** (0.007)	-0.032*** (0.007)	-0.012*** (0.004)	-0.012*** (0.004)	-0.003* (0.002)	-0.003 (0.002)			
Other	-0.000 (0.002)	-0.000 (0.002)	-0.019*** (0.007)	-0.014* (0.007)	0.051*** (0.008)	0.056*** (0.008)	-0.002 (0.009)	0.000 (0.009)	0.007 (0.005)	0.008* (0.005)	0.013*** (0.003)	0.015*** (0.003)			
Developing	0.001 (0.004)	0.002 (0.004)	-0.017 (0.013)	-0.013 (0.012)	-0.031*** (0.010)	-0.030*** (0.010)	0.005 (0.010)	0.008 (0.010)	-0.012 (0.008)	-0.009 (0.007)	-0.005 (0.005)	-0.004 (0.005)			
Mature	0.002 (0.003)	0.004 (0.003)	-0.017 (0.011)	-0.012 (0.011)	-0.057*** (0.007)	-0.053*** (0.008)	-0.024*** (0.009)	-0.013 (0.009)	-0.019*** (0.007)	-0.017** (0.007)	-0.010** (0.004)	-0.008* (0.004)			
Small	-0.003 (0.002)	-0.003 (0.002)	-0.064*** (0.006)	-0.062*** (0.006)	-0.041*** (0.005)	-0.039*** (0.005)	-0.100*** (0.007)	-0.095*** (0.007)	-0.012*** (0.003)	-0.011*** (0.004)	-0.011*** (0.003)	-0.011*** (0.003)			
Micro	-0.008*** (0.002)	-0.008*** (0.003)	-0.122*** (0.009)	-0.116*** (0.008)	-0.054*** (0.005)	-0.051*** (0.005)	-0.275*** (0.008)	-0.264*** (0.008)	-0.024*** (0.005)	-0.022*** (0.005)	-0.017*** (0.003)	-0.016*** (0.003)			
Subsidiary	0.001 (0.002)	0.001 (0.002)	-0.038*** (0.008)	-0.034*** (0.008)	0.065*** (0.010)	0.071*** (0.011)	-0.010 (0.010)	-0.005 (0.010)	-0.008* (0.005)	-0.007 (0.004)	-0.002 (0.003)	-0.001 (0.003)			
Trading risk	-0.001 (0.000)	-0.001 (0.000)	-0.005*** (0.001)	-0.005*** (0.001)	-0.005*** (0.001)	0.000 (0.001)	-0.006*** (0.001)	-0.006*** (0.001)	-0.001** (0.001)	-0.001** (0.001)	-0.001** (0.001)	-0.001** (0.001)			
Lending Cntds	0.001** (0.000)	0.001** (0.000)	0.017*** (0.003)	0.017*** (0.003)	0.014*** (0.001)	0.014*** (0.001)	0.015*** (0.002)	0.015*** (0.002)	0.002** (0.001)	0.002** (0.001)	0.003*** (0.001)	0.003*** (0.001)			
Financial Distress	-0.001** (0.001)	-0.001** (0.001)	-0.008*** (0.002)	-0.008*** (0.002)	-0.007*** (0.002)	-0.007*** (0.002)	-0.012*** (0.002)	-0.012*** (0.002)	-0.004*** (0.001)	-0.004*** (0.001)	-0.001** (0.001)	-0.001** (0.001)			
Credit Constrained	0.002 (0.002)	0.002 (0.002)	0.054*** (0.011)	0.054*** (0.011)	0.069*** (0.007)	0.069*** (0.007)	0.048*** (0.010)	0.048*** (0.010)	0.022*** (0.005)	0.022*** (0.005)	0.010*** (0.003)	0.010*** (0.003)			
N 4	48,788	46,084	49,166	49,166	49,148	49,148	49,238	49,238	49,051	49,051	48,843	47,544			

Notes: Time controls and country controls included in all regressions. Standard errors are robust to heteroskedasticity and clustered at the country-time level.

Notes: Omitted categories are: Sector - Manufacturing; Ownership - Family or entrepreneur; Age - Young; Size - Medium

### 3.2 Exploring usage across the lifecycle

One of the contributions of this research is to explore the lifecycle usage of non-bank financing across European SMEs. Table 10 includes our indicators for the firms lifecycle, combining age and size groups. Using this approach provides a better test of how firms at different stages of growth use different financing instruments. The controls included in table 10 models are as in the baseline above. To evaluate the firm lifecycle, our base category are micro-sized young firms (start-ups). These are the firms who traditionally have difficulties accessing external credit and have the lower level of financing diversification (Berger and Udell, 1998; Lawless et al., 2014).

The results for issued debt indicate that it is a financial product that is much more likely to be used later in the firm's lifecycle. This is in line with Berger and Udell (1998). The usage rates are higher for small developing companies as well as small mature and medium-sized mature firms. Given proposals in many European countries to develop SME bond instruments, this evidence would suggest that such financing instruments would be targeted at these borrower groupings.

Trade credit financing is found to increase in importance following financial crisis (Casey and O'Toole, 2014; Garcia-Appendini and Montoroil-Garriga, 2013). However, Berger and Udell (1998) note that its usage should be distributed across the lifecycle. The baseline results suggest that trade credit usage increases as firms get larger but does not appear to vary by age. The lifecycle categories provide more granular insight. While there does not appear to be any differences across the micro-sized-age categories, all three categories are positive and significant for small and medium firms. In fact the highest coefficients are for the small young firms within small firms, and for young firms within medium-sized firms.

In section 1, we noted friends and family loans are traditionally important for start-ups. The estimates of the effect of lifecycle categories on other loan usage appears to capture this, in particular across micro firms. Young micro-sized firms are more likely to use other loans relative to developing and mature micro firms. They are also more likely to use other loans relative to mature small firms. Interestingly, young medium sized firms are more likely to use other loans.

On factoring, leasing and hire purchase, the effects appear to increase with size with less effects evidence across age within size categories. The highest use group is again the young medium sized firms. These firms must be very fast growing to achieve medium size withing 5 years and are very likely heavy users of external financing from a number of sources.

Interestingly, we do not identify many differential effects across the lifecycle regarding equity usage. The only finding that is statistically significant indicates that young, micro-sized enterprises are more likely to use equity than mature-firms. For mezzanine financing, we find that all three medium-sized age categories are positive and statistically significant. Within these categories, young medium-sized

firms have the highest likelihood of using mezzanine finance and this decreases with age.

In all regressions testing for lifecycle effects, the controls for trading risk, financial distress, bank lending conditions and bank credit constraints have been included. The patterns identified in the baseline regressions hold in all cases. A number of insights can be gleaned from these results. First, it appears that trading risk is negatively correlated with the usage of trade credit, factoring, hire-purchase, leasing, equity and mezzanine financing. It is not correlated with issued debt or other loans. In each of the aforementioned cases, counterparty trading risk must be evaluated to appropriately allocate credit. However, other loans, if they come from friends or family or other informal sources, may be provided in response to poor current trading conditions as part of an informal support package. This may be why no effect is identified and is in line with research by O'Toole et al. (2014) on Ireland who find that loans from friends and family and informal loans are to prop up distressed borrowers. A negative effect of financial distress is identified on the usage of all non-bank financing types.

The final two indicators on bank lending conditions and credit constraints capture the availability of new bank financing and the restrictiveness of the terms applied to existing facilities. The estimates suggest that there is a positive and statistically significant impact of bank lending conditions on the usage of all non-bank financing sources. While this is not a clear causal statement, this suggests that where bank lending conditions become restrictive and terms are punitive, enterprises are more likely to substitute to alternatives. The magnitude of the effect is highest for trade credit, factoring/leasing/hire-purchase and other loans respectively. Potential substitution patterns are also clear in relation to firms who are credit constrained. These firms are more likely to use all alternatives bar issued debt. The effect is largest for other loans, trade credit and factoring/leasing/hire-purchase respectively.

Table 10: Model Estimates with Lifecycle

	Non-bank debt													
	Issued Debt			Trade Credit			Other Loans			F, HP, L			Equity/ Quasi-Equity	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)		
Construction	-0.000 (0.002)	-0.001 (0.002)	0.031*** (0.011)	0.034*** (0.012)	0.008 (0.008)	0.013* (0.007)	-0.033*** (0.013)	-0.033*** (0.012)	-0.003 (0.005)	-0.003 (0.005)	0.001 (0.003)	0.001 (0.003)		
Trade	-0.000 (0.003)	-0.000 (0.003)	0.046*** (0.010)	0.051*** (0.014)	0.008 (0.009)	0.014* (0.008)	-0.074*** (0.010)	-0.072*** (0.009)	-0.003 (0.004)	-0.002 (0.004)	-0.002 (0.003)	-0.001 (0.003)		
Other	0.001 (0.002)	0.001 (0.002)	-0.080*** (0.010)	-0.077*** (0.011)	-0.006 (0.008)	-0.002 (0.007)	-0.035*** (0.010)	-0.033*** (0.010)	-0.008** (0.004)	-0.008** (0.004)	-0.003 (0.003)	-0.003 (0.003)		
Listed	-0.002 (0.004)	-0.002 (0.004)	-0.023 (0.014)	-0.021 (0.015)	0.064*** (0.013)	0.072*** (0.013)	0.004 (0.016)	0.005 (0.015)	0.044*** (0.012)	0.041*** (0.011)	0.014** (0.006)	0.016** (0.006)		
Single-owned	-0.003* (0.002)	-0.003 (0.002)	-0.041*** (0.005)	-0.040*** (0.005)	-0.032*** (0.005)	-0.031*** (0.005)	-0.031*** (0.007)	-0.032*** (0.008)	-0.012*** (0.004)	-0.012*** (0.004)	-0.003* (0.002)	-0.003 (0.002)		
Other	-0.000 (0.002)	-0.000 (0.002)	-0.019** (0.007)	-0.014* (0.007)	0.051*** (0.008)	0.056*** (0.008)	-0.002 (0.009)	0.000 (0.009)	0.007 (0.005)	0.008* (0.005)	0.013*** (0.003)	0.014*** (0.003)		
Developing Micro	-0.001 (0.004)	-0.000 (0.004)	-0.012 (0.016)	-0.006 (0.016)	-0.030* (0.016)	-0.029* (0.016)	0.014 (0.014)	0.015 (0.015)	-0.011 (0.008)	-0.009 (0.008)	-0.004 (0.006)	-0.003 (0.006)		
Mature Micro	0.003 (0.003)	0.004 (0.003)	-0.018 (0.014)	-0.011 (0.014)	-0.055*** (0.011)	-0.053*** (0.011)	-0.014 (0.011)	-0.004 (0.011)	-0.020*** (0.006)	-0.019*** (0.006)	-0.007 (0.005)	-0.005 (0.005)		
Young Small	0.007 (0.006)	0.006 (0.006)	0.054*** (0.020)	0.055*** (0.019)	0.014 (0.015)	0.007 (0.014)	0.185*** (0.019)	0.174*** (0.020)	0.010 (0.010)	0.008 (0.010)	0.008 (0.008)	0.007 (0.007)		
Developing Small	0.013*** (0.004)	0.013*** (0.004)	0.040** (0.021)	0.043** (0.021)	-0.011 (0.015)	-0.013 (0.014)	0.194*** (0.015)	0.192*** (0.015)	-0.000 (0.009)	0.009 (0.009)	0.004 (0.006)	0.003 (0.006)		
Mature Small	0.005* (0.003)	0.007** (0.003)	0.042*** (0.016)	0.045*** (0.015)	-0.042*** (0.011)	-0.041*** (0.011)	0.159*** (0.012)	0.162*** (0.012)	-0.007 (0.008)	-0.006 (0.007)	-0.002 (0.005)	-0.001 (0.005)		
Young Medium	0.005 (0.009)	0.005 (0.009)	0.130*** (0.027)	0.132*** (0.026)	0.058** (0.023)	0.055** (0.023)	0.325*** (0.026)	0.316*** (0.026)	0.025** (0.019)	0.014 (0.016)	0.025** (0.011)	0.022** (0.010)		
Developing Medium	0.007* (0.004)	0.007 (0.004)	0.089*** (0.021)	0.085*** (0.020)	0.018 (0.015)	0.013 (0.015)	0.277*** (0.017)	0.268*** (0.017)	0.008 (0.012)	0.007 (0.012)	0.017** (0.009)	0.016* (0.009)		
Mature Medium	0.010*** (0.003)	0.012*** (0.004)	0.106*** (0.016)	0.108*** (0.016)	-0.001 (0.011)	-0.001 (0.011)	0.258*** (0.011)	0.257*** (0.012)	0.005 (0.008)	0.005 (0.008)	0.009** (0.005)	0.009** (0.004)		
Subsidiary	0.001 (0.002)	0.001 (0.002)	-0.037*** (0.008)	-0.034*** (0.008)	0.065*** (0.010)	0.072*** (0.011)	-0.010 (0.010)	-0.005 (0.010)	-0.008* (0.005)	-0.006 (0.004)	-0.002 (0.003)	-0.001 (0.003)		
Trading risk	-0.001 (0.000)	-0.001 (0.000)	-0.005*** (0.001)	-0.005*** (0.001)	0.000 (0.001)	0.000 (0.001)	-0.006*** (0.001)	-0.006*** (0.001)	-0.001** (0.001)	-0.001** (0.001)	-0.001*** (0.000)	-0.001*** (0.000)		
Lending Cntds	0.001** (0.000)	0.001** (0.000)	0.017*** (0.003)	0.017*** (0.003)	0.014*** (0.001)	0.014*** (0.001)	0.015*** (0.002)	0.015*** (0.002)	0.002** (0.001)	0.002** (0.001)	0.003*** (0.001)	0.003*** (0.001)		
Financial Distress	-0.001** (0.001)	-0.001** (0.001)	-0.008*** (0.002)	-0.008*** (0.002)	-0.007*** (0.002)	-0.007*** (0.002)	-0.012*** (0.004)	-0.012*** (0.004)	-0.004*** (0.001)	-0.004*** (0.001)	-0.001* (0.001)	-0.001* (0.001)		
Credit Constrained	0.002 (0.002)	0.002 (0.002)	0.054*** (0.011)	0.054*** (0.011)	0.069*** (0.007)	0.069*** (0.007)	0.048*** (0.010)	0.048*** (0.010)	0.022*** (0.005)	0.022*** (0.005)	0.010*** (0.003)	0.010*** (0.003)		
N	48,788	46,084	49,166	49,166	49,148	49,148	49,238	49,238	49,051	49,051	48,843	47,544		

Notes: Time controls and country controls included in all regressions. Standard errors are robust to heteroskedasticity and clustered at the country-time level.

Notes: Omitted categories are: Sector - Manufacturing; Ownership - Family or entrepreneur; Age - Young; Size - Medium

### 3.2.1 Are small young firms different?

While a full lifecycle approach provides insight across firms, one particular group of enterprises that have received policy attention are small young firms. Recent academic research has highlighted that young firms are the important drivers of employment creation (Haltiwanger et al., 2013a;b; 2014). Additionally, the access to finance literature indicate that these firms are the most likely to face financing constraints through banking channels (Beck et al., 2008).

To explore whether small, young firms have different uses of non-bank financing, we re-run our baseline model but remove age and size and instead include a dummy for small young firms (less than 5 years and are either micro or small sized). The results are presented in table 11.

Table 11: Are Small Young Firms Different?

	Issued Debt	Trade Credit	Other Loans	F, HP, L	Equity	Mezzanine
Small Young	-0.004** (0.002)	-0.020* (0.011)	0.033*** (0.009)	-0.068*** (0.009)	0.008 (0.005)	0.001 (0.003)
N	48,788	49,166	49,148	49,238	49,051	48,843

We find that small young firms are less likely to use issued debt, trade credit and leasing/factoring/hire-purchase, and are more likely to use other loans. These findings hold controlling for borrower distress, trading risk, and other firm controls. There does not appear to be any differential usage of equity or mezzanine financing. This may highlight the importance of informal loans for funding start ups.

### 3.3 Are there differences across countries?

Having explored the differences across groups of firms through their lifecycle, this section attempts to provide some evidence as to whether or not there are empirically identifiable cross-country differences. Many country specific factors that influence the financing choices of small firms are potentially structural in nature and change slowly over time. Given the time series spanning the data set, and the small number of countries, it is not possible to identify many of these factors in our analysis as they are subsumed in the country dummies.

However, the financial crisis may have altered some of these relationships sovereign stress or changing bank market competition. There may also be factors relating to the macroeconomic growth and inflation prospects that alter both enterprises and financing providers decisions on capital allocation and structure.

To test whether these factors in fact explain a portion of the cross-country variation, we re-estimate the baseline model without country-time dummies but include six factors a) GDP growth to capture macroeconomic developments b) sovereign bond yield to capture crisis severity c) log of GDP to capture country scale effects d) the lending margin between corporate loans and deposits to capture



Table 12: Do Time Varying Country Factors Matter?

	Issued Debt	Trade Credit	Other Loans	Leasing	Equity	Mezzanine
GDP Growth	0.000 (0.004)	-0.019* (0.010)	-0.001 (0.007)	-0.011 (0.010)	0.025** (0.012)	-0.000 (0.004)
Sovereign Bond Yield	-0.001 (0.001)	-0.010** (0.005)	-0.005* (0.003)	-0.012*** (0.005)	0.007* (0.004)	0.002** (0.001)
Inflation Growth	0.002 (0.002)	-0.002 (0.004)	-0.002 (0.005)	0.009 (0.006)	-0.014** (0.006)	0.000 (0.002)
Inflation Level	0.001 (0.001)	-0.012*** (0.004)	-0.006* (0.003)	-0.005 (0.004)	-0.001 (0.004)	-0.001 (0.002)
Ln GDP	-0.235*** (0.056)	-1.372*** (0.303)	-0.374 (0.243)	0.139 (0.259)	-0.590*** (0.147)	-0.009 (0.086)
Bank Lending Margins	0.000 (0.002)	-0.039*** (0.009)	0.008 (0.009)	-0.020 (0.018)	-0.015 (0.009)	0.004 (0.003)
N	48,788	49,166	49,148	49,238	49,051	48,843

Notes: Borrower-specific controls included in all regressions as in baseline.

bank-market power effects e) inflation growth and f) the level of inflation. The results are presented in table 12.

Issued debt usage does not appear to be significantly affected by short term sovereign stress, growth or inflation. There is a negative correlation with log GDP.

The results indicate that trade credit usage is lower in countries with slower economic growth. Trade credit usage is also lower if sovereign stress is higher. This may indicate that in countries with greater sovereign financial challenges since the crisis, firm-to-firm credit provision is lower reflecting the overall country risk position. Trade credit usage is also lower in higher inflation environments and falls with country size.

Other loan usage and leasing/factoring/hire purchase are also negatively related to sovereign stress. Other loans are also lower if the level of inflation is higher.

For equity financing, the results suggest that equity usage increases in countries with higher growth and decreases with inflation growth. In countries with higher growth rates, expected returns are potentially better therefore encouraging both investors and enterprises to use equity finance. As inflation erodes real expected returns this may deter equity usage. For both equity and mezzanine financing the results suggest that sovereign stress (increasing bond yields) has a positive and significant effect on their usage levels. Firms may be balancing capital structures away from leverage in heightened stress environments.

In conclusion, the findings in this section suggest that, over and above borrower risk and bank financing conditions, enterprises are less likely to use some non-bank debt instruments (trade credit, other loans, leasing) as sovereign stress increases but are more likely to use equity or quasi-equity financing. This could reflect a desire to balance capital structures during periods of widescale financial distress. Trade credit and other loan usage is also lower in countries with higher inflation environments.

Equity usage by SMEs is increasing with economic growth and falling with inflation growth.

## 4 Conclusions and Policy Implications

Within the broader debate on non-bank financing for European SMEs, this paper addresses the following questions: a) how does the usage of non-bank financing differ across SMEs lifecycle? b) does financial distress, bank-finance conditionality and access to credit as well as trading risk affect the probability of using alternative financing and c) do time-varying country factors impact the usage of SME non-bank financing? This research uses the ECB/EC survey on access to finance for SMEs to estimate the determinants of using a range of non-bank debt finance (issued debt, trade credit, leasing/factoring/hire-purchase, and other loans) and equity (pure equity and mezzanine finance).

We find that issued debt is much more likely to be used later in the firm's lifecycle. Trade credit is more widely used by small and medium sized firms than micro firms. This is especially the case for young small and medium firms who have the highest trade credit usage rates. Other loans, which includes informal lending from friends and family are very important for young micro firms. On factoring, leasing and hire purchase, the effects appear to increase with size. There does not appear to be much variance across age within size categories. It is most important for young medium sized firms.

Interestingly, we do not identify many differential effects across the lifecycle regarding equity usage. This may be driven by the fact the data does not disentangle the sources of equity finance (venture, angel, public, insider). Mezzanine is much more likely to be used by medium-sized firms, in particular if they are young. Focusing specifically on the important group of small young firms, we find this group are less likely to use issued debt, trade credit and leasing/factoring/hire-purchase debt sources and less likely to use other loans from companies or friends and family. No differences are evidence for this group across equity or mezzanine.

Focusing on the borrower-specific risk factors, we find that deter trading risk is negatively correlated with the usage of trade credit, factoring, hire-purchase, leasing, equity and mezzanine financing. It is not correlated with issued debt or other loans. In the case of other loans, it may be the case that these are provided by informal sources or provided intra group in response to adverse trading conditions. Such loans may have heightened default risk. Financial distress is negatively related to the usage of all non-bank finance.

The estimates suggest that there is a positive and statistically significant impact of tightened bank lending conditions on the usage of all non-bank financing sources. As bank lending conditions become restrictive and terms are punitive, enterprises are more likely to substitute to alternatives. However, this statement in our research is non-causal. The magnitude of the effect is highest for trade credit,

factoring/leasing/hire-purchase and other loans respectively. Potential substitution patterns are also clear in relation to firms who are credit constrained. These firms are more likely to use all alternatives bar issued debt. The effect is largest for other loans, trade credit and factoring/leasing/hire-purchase respectively.

Over and above borrower risk and bank financing conditions, we focus on a number of macroeconomic drivers of non-bank finance namely inflation, GDP growth and sovereign distress (10 yr bond yields). We find that enterprises are less likely to use some non-bank debt instruments (trade credit, other loans, leasing) as sovereign stress increases but are more likely to use equity or quasi-equity financing. The heightened sovereign risk could encourage SMEs to try balance out of leverage towards equity. Trade credit and other loan usage is also lower in countries with higher inflation environments. Equity usage by SMEs is increasing with economic growth and falling with inflation growth. In countries with higher growth rates, expected returns are potentially better therefore encouraging both investors and enterprises to use equity finance. As inflation erodes real expected returns this may deter equity usage.

This evidence provides some insights for European policy makers as they attempt to follow objectives of broadening and widening the financing ecosystem for SMEs. Recent ECB research (ECB, 2013) calls for a raising the proportion of risk capital in the financial structure of firms to encourage more moderate and stable recourse to loans. However, this will require the development of a range of equity financing supports that provide different investment types (with exit strategies) across the firms lifecycle. It must be also noted that many firms do not fit the high margin, high profit hurdles set by venture capital, private equity or angel investors so risk capital must come from other sources. This may require structural changes across European member states.

Given proposals in many European countries to develop SME bond instruments (EC, 2013), this evidence would suggest that such financing instruments would be targeted mainly at medium-sized firms but could be important for such firms if they are younger in their lifecycle and have grown quickly. However, the benefits of this type of finance may be limited to such groups. As the number of SMEs in this category may be small in smaller EU member states, a pan-European market may be a more viable structure to provide balanced liquidity, market turnover and capital depth. Additionally, reducing the stress and bottlenecks in bank financing may reduce the reliance on trade credit and informal loans. In summary, while funding diversification is an important objective, bank financing will remain an very important component of the capital structure of European SMEs going forward.

## References

**Beck, Thorsten, Asli Demirguc-Kunt, and Vojislav Maksimovic,** "Financing patterns around

- the world: Are small firms different?," *Journal of Financial Economics*, 2008, *89* (3), 467–487.
- , —, **Luc Laeven, and Ross Levine**, "Finance, Firm Size, and Growth," *Journal of Money, Credit and Banking*, 2008, *40* (7), 1379–1405.
- Berger, Allen N. and Gregory Udell**, "The economics of small business finance: The roles of private equity and debt markets in the financial growth cycle," *Journal of Banking & Finance*, 1998, *22* (6-8), 613–673.
- Carpenter, Robert E. and Bruce Clayton Petersen**, "Is The Growth Of Small Firms Constrained By Internal Finance?," *The Review of Economics and Statistics*, 2002, *84* (2), 298–309.
- Casey, Eddie and Conor O'Toole**, "Bank lending constraints, trade credit and alternative financing during the financial crisis: Evidence from European SMEs," *Journal of Corporate Finance*, 2014, *27* (C), 173–193.
- Chittenden, Francis, Graham Hall, and Patrick Hutchinson**, "Small Firm Growth, Access to Capital Markets and Financial Structure: Review of Issues and an Empirical Investigation," *Small Business Economics*, 1996, *8* (1), 59–67.
- Clarke, George R.G., Robert Cull, and Maria Soledad Martinez Peria**, "Foreign bank participation and access to credit across firms in developing countries," *Journal of Comparative Economics*, 2006, *34* (4), 774–795.
- Diamond, Douglas W.**, "Reputation Acquisition in Debt Markets," *Journal of Political Economy*, 1989, *97* (4), 828–62.
- ESCB**, "Corporate finance and economic activity in the euro area," Occasional Paper Series 151, European Central Bank 2013.
- Ferrando, Annalisa and Klaas Mulier**, "Do firms use the trade credit channel to manage growth?," *Journal of Banking & Finance*, 2013, *37* (8), 3035–3046.
- **and Nicolas Griesshaber**, "Financing obstacles among euro area firms: Who suffers the most?," Working Paper Series 1293, European Central Bank 2011.
- Fluck, Zsuzsanna**, "Optimal Financial Contracting: Debt versus Outside Equity," *Review of Financial Studies*, 1998, *11* (2), 383–418.
- Fort, Teresa C., John Haltiwanger, Ron S. Jarmin, and Javier Miranda**, "How Firms Respond to Business Cycles: The Role of Firm Age and Firm Size," *IMF Economic Review*, 2013, *61* (3), 520–559.

- Gartner, William, Casey Frid, and John Alexander**, “Financing the emerging firm,” *Small Business Economics*, 2012, 39 (3), 745–761.
- Gerlach-Kristen, P, Brian O’Connell, and Conor O’Toole**, “Do Credit Constraints Affect SME Investment and Employment?,” *Economic and Social Review*, 2014.  
*Green Paper on the Long-Term Financing of the European Economy*
- Green Paper on the Long-Term Financing of the European Economy*, European Commission, 2013.
- Guariglia, Alessandra and Simona Mateut**, “Credit channel, trade credit channel, and inventory investment: Evidence from a panel of UK firms,” *Journal of Banking & Finance*, 2006, 30 (10), 2835–2856.
- Haltiwanger, John, Ron S. Jarmin, and Javier Miranda**, “Who Creates Jobs? Small versus Large versus Young,” *The Review of Economics and Statistics*, 2013, 95 (2), 347–361.
- Holton, Sarah, Martina Lawless, and Fergal McCann**, “SME Financing Conditions in Europe: Credit Crunch or Fundamentals?,” *National Institute Economic Review*, 2013, 225 (1), R52–R67.  
Investment and Investment Finance in Europe
- Investment and Investment Finance in Europe*, European Investment Bank, 2013.
- Jeveer, Karin**, “What do we know about the capital structure of small firms?,” *Small Business Economics*, August 2013, 41 (2), 479–501.
- Kaplan, Steven Neil and Per Stromberg**, “Characteristics, Contracts, and Actions: Evidence from Venture Capitalist Analyses,” *Journal of Finance*, 2004, 59 (5), 2177–2210.
- Lawless, M., B. O’Connell, and C. O’Toole**, “Financial Structure and Diversification of European Firms,” Technical Report WP492, Economic and Social Research Institute 2014.
- Lawless, Martina**, “Age or size? Contributions to job creation,” *Small Business Economics*, 2014, 42 (4), 815–830.
- mac an Bhaird, Ciarn and Brian M. Lucey**, “Determinants of capital structure in Irish SMEs,” *Small Business Economics*, 2010, 35 (3), 357–375.
- Maier, John and David A. Walker**, “The role of venture capital in financing small business,” *Journal of Business Venturing*, 1987, 2 (3), 207–214.

- McCann, Fergal and Tara McIndoe-Calder**, “Determinants of SME Loan Default: The Importance of Borrower-Level Heterogeneity,” Research Technical Papers 06/RT/12, Central Bank of Ireland 2012.
- Myers, Stewart C. and Nicholas S. Majluf**, “Corporate financing and investment decisions when firms have information that investors do not have,” *Journal of Financial Economics*, June 1984, *13* (2), 187–221.
- O’Toole, C., M. Lawless, and D. Lambert**, “Non Bank Financing in Ireland: A Comparative Perspective,” *ESRI Working Papers*, 2014.
- Petersen, Mitchell and Raghuram G. Rajan**, “The Benefits of Lending Relationships: Evidence from Small Business Data,” *Journal of Finance*, 1994, *49* (1), 3–37.
- Rocca, Maurizio La, Tiziana La Rocca, and Alfio Cariola**, “Capital Structure Decisions During a Firm’s Life Cycle,” *Small Business Economics*, 2011, *37* (1), 107–130.
- Ryan, R., C. O’Toole, and F. McCann**, “Does Bank Market Power Affect SME Financing Constraints?,” *Journal of Banking & Finance*, 2014, *forthcoming*.
- Sahlman, William A.**, “The structure and governance of venture-capital organizations,” *Journal of Financial Economics*, 1990, *27* (2), 473–521.

## 5 Data Appendices

	Trading risk	Bank Lending Conditions	Financial Distress	Credit Constrained	GDP Growth	Sov Bond Yield	Debt to GDP
AT	1.00	0.28	-0.34	0.07	0.4	2.8	3.3
BE	1.46	0.34	-0.23	0.08	0.3	3.3	2.5
BG	1.06	0.23	-0.16	0.09	0.3	4.6	0.7
CZ	0.55	0.05	-0.27	0.08	0.2	3.1	0.9
DE	0.89	0.05	-0.36	0.06	0.6	2.3	2.8
DK	-0.35	0.34	-0.37	0.06	0.2	2.4	2.0
ES	2.30	1.51	0.06	0.19	-0.2	5.1	1.3
FI	0.95	0.31	-0.15	0.04	0.0	2.5	1.5
FR	1.88	0.66	-0.03	0.11	0.3	3.0	4.3
GR	2.60	1.19	0.19	0.17	-1.1	9.1	1.4
HU	1.97	0.69	-0.10	0.07	0.3	6.8	0.7
IE	1.55	0.89	-0.06	0.13	0.4	6.5	4.0
IT	2.12	1.17	-0.17	0.17	-0.2	4.9	1.5
NL	0.92	0.22	-0.24	0.08	-0.1	2.6	1.6
PL	1.04	0.22	-0.27	0.06	0.9	5.0	0.3
PT	2.15	0.91	0.02	0.12	-0.3	8.1	1.1
SE	-0.02	0.17	-0.33	0.03	0.6	2.4	1.3
SI	1.04	1.29	-0.03	0.10	0.2	6.2	0.7
SK	0.54	0.15	-0.55	0.13	0.6	3.8	0.3
UK	0.99	0.58	-0.31	0.09	0.6	2.9	2.6

Table 13: Country Means of Control Variables

Trading risk	1.00						
Credit Constrained	0.09	1.00					
Bank Lending Conditions	0.20	0.46	1.00				
Financial Distress	0.28	0.01	0.04	1.00			
Sovereign Bond Yield	0.16	0.09	0.20	0.08	1.00		
GDP Growth	-0.18	-0.09	-0.15	-0.07	-0.36	1.00	
Debt to GDP	-0.01	-0.04	-0.07	0.01	-0.25	0.20	1.00

Table 14: Correlation Coefficients for Financial Controls

Table 15: Usage by Financing Source

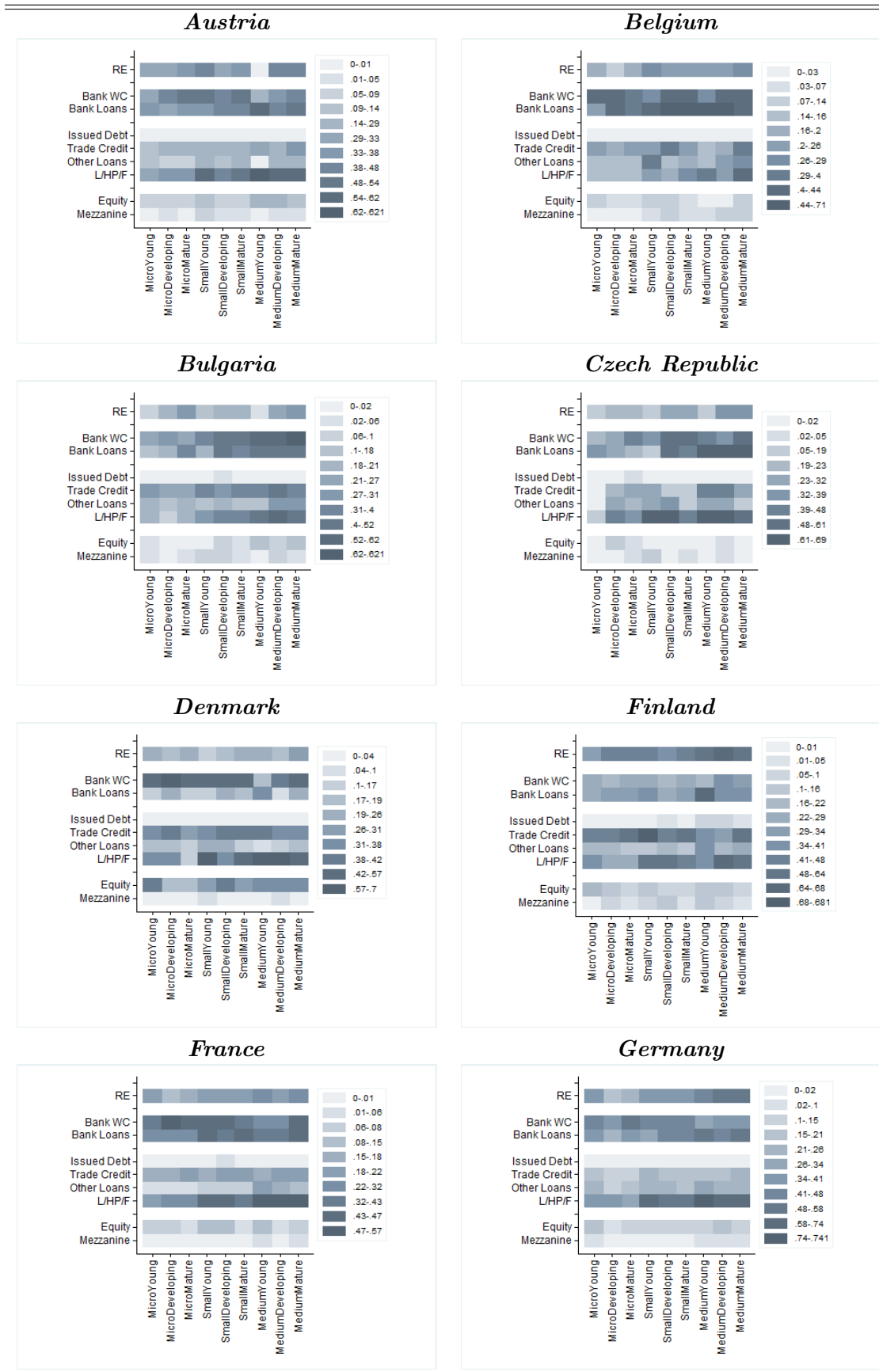
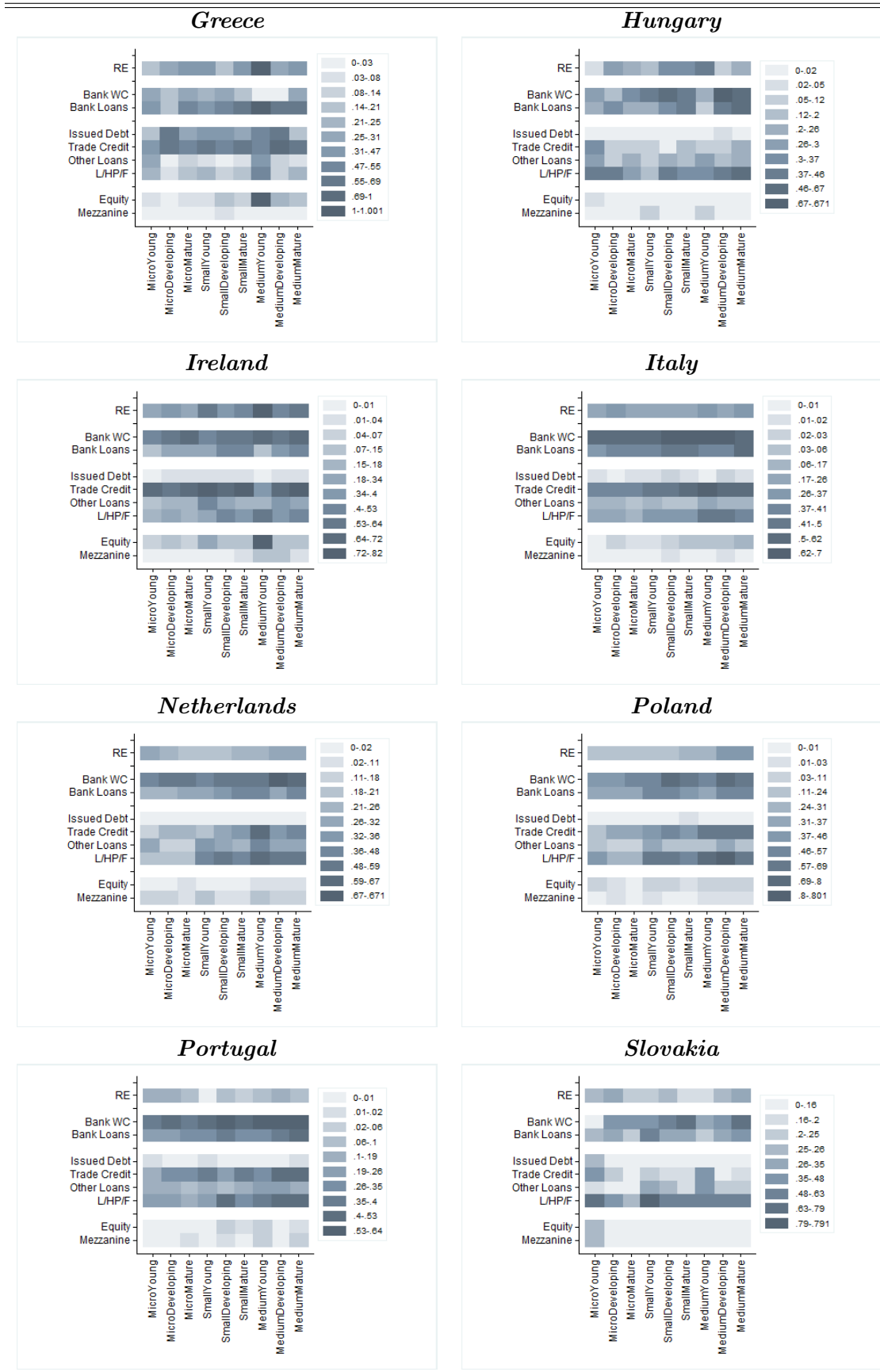


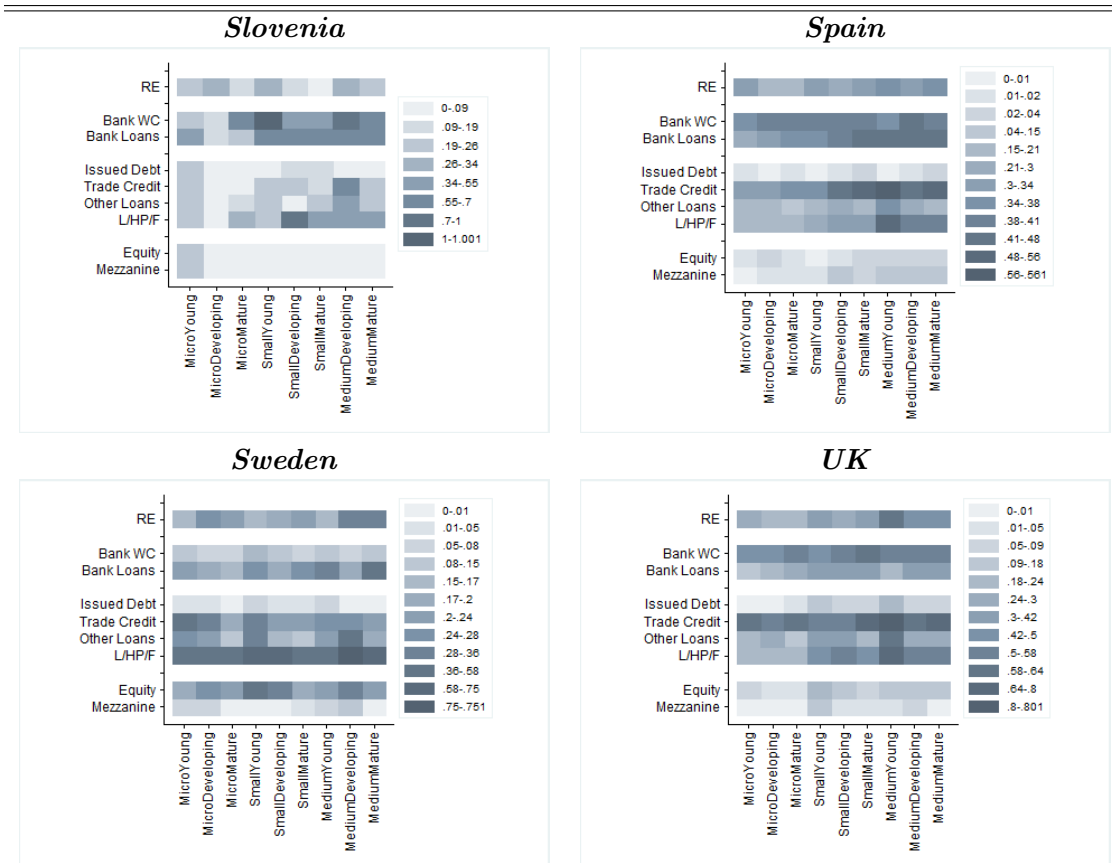


Table 16: Usage by Financing Source



Source: ECB SAFE

Table 17: Usage by Financing Source



Source: ECB SAFE