WORKING PAPER

The SME Finance Gap in The European Union

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Abstract

This paper presents SME financing gaps across European countries over the period 2013 to 2020, using two different methodologies, one reliant on firm balance sheets and one on firm-level surveys. We show significant variation in financing gaps across countries and sectors. Variation over time, on the other hand, is not as strong or intuitive. The account- and survey-based measures are only weakly correlated with each other, reflecting their different nature, and both are only weakly correlated with a survey-based measure of self-reported firm financing constraints.

Keywords

Disclaimer

Acknowledgements

1 Introduction

Small and medium-sized enterprises (SMEs) are at the core of the European Union's (EU) economy, representing 99 percent of all businesses. They employ around 100 million people and account for more than half of the EU's GDP. At the same time, their access to external finance is limited, compared to larger enterprises, related to their lack of longer track records, opaque business structures and financial statements, and higher costs and risks for financial institutions when dealing with them. An expansive academic literature has documented the financing constraints experienced by SMEs and the negative repercussions for their operation and growth and, ultimately, for economic growth (e.g., (Beck et al., 2005)). Efficient resource allocation and economy-wide innovation suffer as a consequence of SMEs' financing constraints and SME finance has therefore been long high on policymakers' agenda in developing and developed countries alike. This paper focuses on quantifying SMEs' financing gap across a number of EU countries and sectors and over time.

An extensive literature has focused on institutions and policies to mitigate SMEs' financing constraints, including contractual institutions, credit registries and other policies that help deepen financial systems. Beyond these 'market-developing' policies (Beck and De La Torre, 2007), there has been an increasing focus on government-support programmes that mitigate the frictions preventing SMEs from accessing external finance. Among such policies are credit guarantee programmes that address the lack of collateral and credit history of SMEs and SME funding programmes for financial institutions that aim to reduce the cost of lending to SMEs. The European Investment Bank offers both such programmes and a companion paper explores theoretically and empirically the circumstances under which such programmes can help mitigate SME financing constraints (Freixas and Peydro, 2022).

Designing policies and support programmes to mitigate SMEs' financing constraints should be based on quantitative evidence. This includes assessing (bankable) demand by SMEs that is not satisfied by financial institutions in a country. This paper focuses on quantifying the SME financing gap, i.e., the gap between demand and supply of external financing for SMEs across a number of European countries, across sectors and over time. In doing so, it builds on previous efforts at quantifying a financing gap, including Stein et al. (2010) who estimate the global SME credit gap surpassing 2 trillion USD, Abraham and Schmukler (2017) and Ayyagari et al. (2017) who follow up on these efforts, and Lopez-de Silanes et al. (2018) who compute SME financing gaps for European countries.

Estimating an SME financing gap comes with a number of methodological challenges. First,

there are differences between self-stated and actual financing needs by firms; a gap between the two might reflect demand for an additional buffer as well corporate governance problems (management asking for additional cash to fund perks, not necessarily in the interest of shareholders). Second, there is a difference between firm-level financing needs and bankable financing needs, related to the external finance wedge: what is profitable for firms to fund with internal resources (cash) is not necessarily profitable for external funders, including banks, to finance.

This also implies that we cannot completely isolate the issue of access to external funding from other dimensions of loan contracting, including pricing, maturity and collateral requirements. While funding might be available for SMEs, pricing, maturity and collateral requirements might not meet the firms' needs.

We use two different methodologies and datasets to compute the financing gap. The two methodologies have both their advantages and shortcomings as we will discuss below and complement each other. Table 1 summarises the advantages and shortcomings of both.

First, we compute proxies for how much SMEs in a certain industry/sector typically borrow under "ideal", i.e., friction-free conditions using Orbis balance sheet information. We assume that the demand is similar across different countries and sectors with financial market frictions as in the benchmark country, given similar technologies and investment cycles. If actual financing is below the benchmark, i.e., if actual supply is lower than the potential demand (as found in benchmark country), this would suggest a financing gap. Obviously, there is the possibility that actual supply is higher than potential demand, so carefully controlling for business cycle effects, subsidised lending programmes and other government support factors is important. The difference between the potential demand and actual supply would be the financing gap. Because this methodology uses firm-level financial statement data, it has the advantage that we can compute it for a large number of firms with financial statements and it can be considered objective as based on accounting data rather than self-reported. It has the downside that it relies on a specific benchmark and estimates of financing gaps rely on such a benchmark being relevant across different firms within the same sector. Further, it does not take into account demand- and supply-side differences in the use of external funding.

The second methodology relies on firm-survey data collected via the SAFE survey (European Central Bank, 2022), and explores the difference between the self-reported desired and actual bank financing that firms receive. These gaps can then be aggregated on the country-level using survey weights that indicate the representativeness of each firm. This methodology has

the advantage that it allows to isolate demand from supply-side constraints and thus firm-idiosyncratic circumstances. On the downside, it focuses on self-assessed and not bankable demand, is subjective, as based on survey and available for a much smaller sample than the first methodology.

Table 1: (Dis-)Advantages of Different Measures of the SME Financing Gap

	Advantages	Disadvantages
Survey Based Measures	+ Takes demand directly into account demand. + Allows to explore differences between demand- and supply-side constraints	- Even though it is self-stated and not necessarily bankable demand - Available only for surveyed firms, which raises questions on how representative these firms are - Includes subjective element, as survey-based
Balance Sheet Based Measures	+ Observable for a large number of enterprises with financial statements + Objective as not self-reported by firms	- Rely on specific benchmark for 'natural level of external funding - Do not take into account explicitly demand-side and other firm-specific factors

We show significant variation in financing gaps across countries and sectors. The account-based measures point to Czech Republic, Latvia, Hungary, Sweden, Poland and Bulgaria as the countries where firms have largest financing gaps, while the survey-based measures point to Greece and Slovenia as countries with firms' largest financing gaps. Variation over time, on the other hand, is not as strong or intuitive. The account- and survey-based measures are only weakly correlated with each other, reflecting their different nature, and both are only weakly correlated with a survey-based measure of self-reported firm financing constraints.

The remainder of the paper is structured as follows. The next section introduces the different data sources we use. Section 3 focuses on financing gaps computed with firms' financial statements, while section 4 discusses financing gaps based on survey data. Section 5 decomposes financing gaps into a structural and a cyclical component and section 6 concludes.

2 Data

This section presents the data that underpins our two methodologies to compute financing gaps across Europe. We first describe the financial statement data obtained from Orbis before discussing the firm-survey data from SAFE. Finally, we will compare whether our measures capture general patterns identified in the EIBIS question on whether SMEs are financially constrained.

2.1 Financial Statement Data

Our primary data source for the first analysis are firms' annual balance sheet data downloaded from Orbis for the years 2013-2020. Here, we restrict our initial sample to all active firms registered in the EU with less than 350 employees in the last observable year: 5,425,835 companies in total. In a first step, we exclude all firms working in typically heavily regulated and/or subsidised sectors according to their NACE Rev. 2 classification: Agriculture, Mining and quarrying; Electricity, gas, steam and air conditioning supply; Water supply, sewerage, waste management and remediation activities; Financial and insurance activities; Public administration and defense, compulsory social security; Activities of the household; Activities of extraterritorial organisations and bodies. Additionally, we exclude all NACE Rev. 2 Level 4 sectors that are not eligible to EIB funding. Table 2 summarises all remaining sectors, which we will frequently refer to throughout the remainder of the paper.

Table 2: Included Nace Revision 2 Industry Codes

Letter	Level 2 Codes	Industry
C	10-33[1]	Manufacturing
F	41-43[2]	Construction
G	45-47[3]	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	49-53[4]	Transportation and storage
I	55,56	Accommodation and food service activities
J	58-63	Information and communication
L	68	Real estate activities
M	69-75	Professional, scientific and technical activities
N	77-82	Administrative and support service activities
P	85	Education
Q	86-88	Human health activities
R	90-93[5]	Arts, entertainment and recreation
S	94-96[6]	Other services activities

Using the remaining firms' annual balance sheets, we apply all SME criteria as defined in the EU Recommendation 2003/361 to be found in Table 3 (European Commission, 2003). Here, we would like to highlight that we consider each firm-year combination independently and do *not* utilize the panel component. Hence, certain firms may comply only in some of the years but not all.

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[1]We follow EIB guidelines and exclude the following Level 4 sectors: 1200, 1910, 1920, 2013, 2014, 2015, 2016, 2051, 2351, 2410, 2420, 2430, 2431, 2432, 2433, 2434, 2442, 2446, 2540, 3031, 3040.

[2]We follow EIB guidelines and exclude the following Level 4 sector: 4110

[3]We follow EIB guidelines and exclude the following Level 4 sectors: 4635, 4726

[4]We follow EIB guidelines and exclude the following Level 4 sectors: 4950, 5100, 5110, 5121, 5221, 5223

[5]We follow EIB guidelines and exclude the following Level 4 sectors: 9200.

[6]We follow EIB guidelines and exclude the following Level 4 sectors: 9411, 9412, 9420, 9491, 9492, 9499.

Table 3: SME Definitions in the EU Recommendation 2003/361 (European Commission, 2003)

	Staff Headcount	and	Turnover	or	Assets
Medium-sized	< 250		$\leq 50m$		$\leq 43m$
Small	< 50		$\leq 10m$		$\leq 10m$
Micro	< 10		$\leq 2m$		$\leq 2m$

From the initial SME sample, we further exclude firms with non-SME global ultimate owners (GUO), motivated by the fact that small subsidiaries owned by global MNEs are not subject to the same financing constraints as true SMEs. For similar reasons, we exclude firms owned by banks, financial companies and public authorities. Unfortunately, all GUO related variables are only downloadable for the last available year, wherefore the same criteria are applied in retrospect to all years a firm shows up as an SME in our sample.

Table 4: Summary Statistics

	all SMEs	Medium	Small	Micro
Nr. of Employees	11.08	70.24	18.32	3.21
	(20.93)	(48.18)	(10.28)	(2.26)
Assets (th€)	1426.39	8605.03	2393.37	438.79
	(4746.39)	(14128.21)	(4367.92)	(1528.70)
Turnover (th€)	1654.24	10896.10	2937.47	368.75
	(4228.06)	(11231.23)	(3560.10)	(684.56)
Long-Term Debt (th€)	169.31	894.23	290.98	60.76
	(1210.14)	(4079.36)	(1097.32)	(399.45)
Current Liabilities (th€)	563.93	3540.00	969.22	152.89
	(1843.91)	(5592.83)	(1652.66)	(424.31)
Debt-to-Sales Ratio	0.52	0.26	0.25	0.64
	(20.45)	(14.36)	(9.37)	(23.62)
Sales (th€)	1608.84	10553.69	2865.12	359.39
	(4130.04)	(10994.65)	(3511.24)	(676.85)
Observations	7467656	452015	1884685	5130956

Note: The top value in every cell is the mean and the bottom value in parentheses is the standard deviation of the variable stated in the row label for the (sub-)set of firms stated in the column label.

Next, we consider the actual values in the balance sheets. First, we exclude obvious misreporting by dropping all observations with negative or missing values for our main variables of interests: total assets, long-term debt, current liabilities, non-current liabilities, total shareholder funds, and sales. Then, we exclude potential mailbox companies by excluding firms with unusually high total asset to employees ratios (above the 99th percentile in a country-industry letter combination). Further, we exclude all observations with total sales below €1000 to avoid a too low denominator for the debt-to-sales ratio. Finally, we exclude all year-country-industry letter combinations with less than a 100 observations. Table 4 presents the average and standard deviations across different firm characteristics within our sample and Table 5 the total observations per country and industry. In the next section we discuss the construction of benchmark and financing gaps across countries and sectors.

Table 5: Number of Observations per Country and Industry Letter Level

	AT	BE	BG	CZ	DE	EE	ES	FI	FR	GR	HU	IT	LT	LV	PL	PT	RO	SE	SI	SK	Total
C	8813	13751	113443	18735	60432	11348	159983	17356	33644	11784	20666	467821	1733	29877	15319	77947	40390	30302	27580	17232	1178156
F	11542	9933	72232	9078	55740	13710	112997	29047	26926	2724	13028	292119	113	29822	5243	70326	43686	35714	23143	10594	867717
G	13867	24991	448094	20274	75064	18436	299271	29709	68129	19851	38841	556086	2556	75224	19566	189110	146358	56758	30050	32731	2164966
H	3270	4729	82524	4276	15383	9763	54016	12079	10462	1738	7539	98209	1019	20571	3567	30967	40268	10817	14729	6477	432403
I	1271	4072	80764	3551	7179	4141	70723	7014	13388	2823	6142	187136	0	10610	2132	59183	20267	17689	12014	5185	515284
J	2773	3819	48861	2416	12696	2944	26383	7163	9892	1617	4049	106693	0	19259	3559	17272	18399	15451	4605	4260	312111
L	991	1586	67172	4701	12099	6095	53328	4990	5829	0	7770	62654	0	24594	3388	26666	10066	18698	3358	4574	318559
M	2877	5565	162939	7870	28820	8345	74416	22367	21146	1667	11977	131370	0	51690	5558	66241	62997	43007	17611	14654	741117
N	1421	3164	41167	1876	19871	4108	40787	7970	13645	1672	4516	103928	0	19030	2463	24032	17673	12325	4762	7864	332274
P	0	2726	14775	0	1725	534	13614	1540	2143	0	871	20982	0	5662	515	10006	4492	4178	828	778	85369
Q	0	6725	41202	2404	6569	1621	25037	6042	7834	0	6347	63372	0	7081	1806	38701	12783	8608	2229	4860	243221
R	0	1152	16928	0	2042	1068	12125	2826	1957	0	1238	29935	0	7429	530	11093	4662	4244	871	812	98912
S	0	524	70306	0	4938	2276	13631	2647	2810	0	1479	34368	0	10766	134	15026	11210	2923	3297	1232	177567
Total	46825	82737	1260407	75181	302558	84389	956311	150750	217805	43876	124463	2154673	5421	311615	63780	636570	433251	260714	145077	111253	7467656

Note: During the cleaning process, we completely dropped HR, CY, DK, IE, LU, MT and NL.

2.2 SAFE Survey

Our second data source is the firm-level version of the Survey on the Access to Finance of Enterprises (SAFE), collected in a joint effort by the European Commission and European Central Bank (2022). Here, a (non-representative) sample of SMEs are questioned on their needs and usage of different financing sources, including bank loans, (private) equity, family loans, and grants and subsidised loans. Additionally, weights are provided to obtain a representative sample on the country level when producing aggregates on the country level. Unfortunately, the SMEs' sectors are not revealed. To be consistent, we use the survey waves between 2013 and 2020 for the above described countries.

In each wave, we first use question Q2 a) on turnover growth to identify and consequently keep only viable firms. Here, we follow the methodology suggested by the European Investment Fund fi-compass (2019) and keep only those firms with either constant or increased turnover. For those firms, we combine the information from questions Q4 d) (irrelevance of bank loans) and Q8 a) (loan applications) to compute each SME's loan demand. Specifically, we take the average of the in Q8 a) reported loan range as the loan value demanded, except for the highest category (above 1m €) where we set the loan value to 1.5m €. Further, we use question Q7 a) to calculate the actually obtained loans. Here, we assume demanded and obtained loans are equal for a 100% success rate, demanded loans are 12% larger than obtained loans for a 75%-99% percent success rate, demanded loans are 50% larger than obtained loans for a below 75% success rate, and zero otherwise. Finally, we keep only SMEs where neither loans demanded nor loans obtained are missing (see Table 6). These data then form the foundation for our country level analysis in Section 5.

Table 6: SAFE Summary Statistics (2013-2020 waves)

	Mean	SD	Min	Max	N
Loans Demanded (th€)	183.80	438.88	0.00	1,500.00	40,648.00
Loans Obtained (th€)	151.07	403.24	0.00	1,500.00	40,648.00

2.3 EIBIS

As part of the EIB Investment Survey (EIBIS), firms in the EU and closely aligned countries are questioned whether they perceive themselves as financially constrained. The EIBIS consequently aggregates the responses to obtain a (representative) share of firms within a certain category that perceive themselves as constraint. Among several other dimensions, size is also considered. Figure 1 shows the percentage of SME firms that are credit constrained in a given year for the years 2015-2020. Unfortunately, such results do not cover any year

prior to 2015 and do not come with an industry and size breakdown. Therefore, we utilize the EIBIS results mainly as a comparative metric.

Figure 1: EIBIS: SME credit constraints
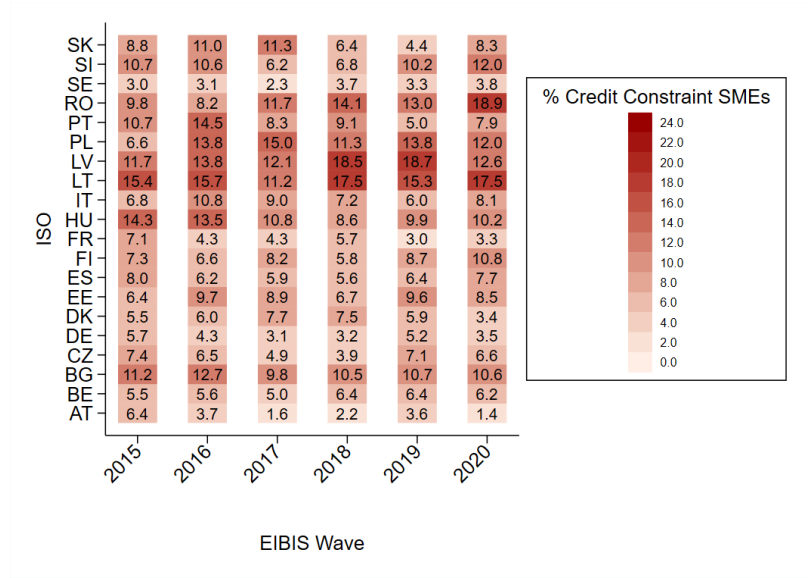
3 SME Financing Gaps across Sectors and Countries

In the following section, we describe our baseline methodology using firms' financial statements in detail and show the resulting financing gaps on a country-sector-year level. Subsequently, we discuss several intuitive extensions.

3.1 Baseline Analysis

Degree of Debt Financing In this report, we analyse SMEs' ability to source the debt financing they require to successfully run their business. To obtain a firm's actual degree of debt-financing, we focus on long-term debt in our baseline analysis. We refrain from using non-current liabilities, even though this variable is better filled, as this measure includes additional long term commitments to e.g. pension schemes, that are not necessarily credit in a traditional sense. Using this debt measure we, then, compute the median debt-to-sales ratio of all N firms in a given a country c, industry letter l and year y:

$$\frac{Debt}{Sales}_{c,l,y} = Median\left(\frac{Debt_1}{Sales_1}, ..., \frac{Debt_n}{Sales_n}, ..., \frac{Debt_N}{Sales_N} \mid \forall\, n\ in\ c, l, y\right) \quad (1)$$

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The Benchmark   We identify the the benchmark ratio as the highest debt-to-sales ratio within a given industry letter l across all countries c and years y, where the country-letter-year combination covers at least 1000 firms. Table 7 presents the benchmark countries for the different sectors.

$$\frac{Debt}{Sales}_{B,l} = Max\left(\frac{Debt}{Sales}_{c,l,y} \mid N \geq 1000\right) \tag{2}$$

Table 7: Benchmark Debt-to-Sales Ratios per NACE2 Letters

letter	ISO	Year	Obs.	Benchmark Ratio
C	AT	2015	1450	0.270
F	AT	2015	1726	0.250
G	AT	2015	2239	0.220
H	PT	2019	5143	0.160
I	ES	2013	6208	0.250
J	ES	2014	2612	0.150
L	SE	2014	1496	2.390
M	ES	2013	7126	0.190
N	ES	2013	3826	0.150
P	ES	2013	1232	0.200
Q	ES	2014	2625	0.190
R	ES	2013	1016	0.320
S	ES	2013	1249	0.230

As we can see, Spain is the benchmark country for eight of the fourteen sectors, with Austria being it for three. A likely reason behind the frequency of Spain as the benchmark is that Spanish SMEs typically engage with more than one bank (Jiménez et al., 2012). Naturally, this implies higher competition and better policy path through, leading to overall lower credit constraints.

The Financing Gap   The financing gap is then computed as the difference between the benchmark ratio and the median in a given country-year-sector. The gap represents the shortfall between what an unconstrained firm should borrow at the median (i.e., the benchmark) and what the median firm de-facto borrows in a given country-letter-year cell. In some cases negative values occur, indicating that in that specific country-letter-year combinations firms were actually able to borrow more than the benchmark. By construction, those cells contain less than 1000 observations and were excluded when identifying the benchmark.

$$Gap_{c,l,y} = \frac{Debt}{Sales_{B,l}} - \frac{Debt}{Sales_{c,l,y}} \tag{3}$$

Choice of Debt Measure As noted above, the debt of a firm is calculated exclusively using the long-term debt. We additionally explored both using current liabilities alone and in long-term debt plus current liabilities as alternative debt measures (see Appendix A). Repeating the exact methodology as just described allows us to derive three different gap measures based on: long-term debt, current liabilities, sum of current liabilities and long-term debt. The corresponding benchmark country-year-industry combinations can be found in Appendix A for completeness.

Next, we aggregate the three gap measures by computing an industry weighted average on the country-year level. Figure 2 displays these weighted average gaps for the main gap measure using long-term debt only..

Figure 2: Industry Weighted Average Country-Year Gaps (Long-Term Debt)
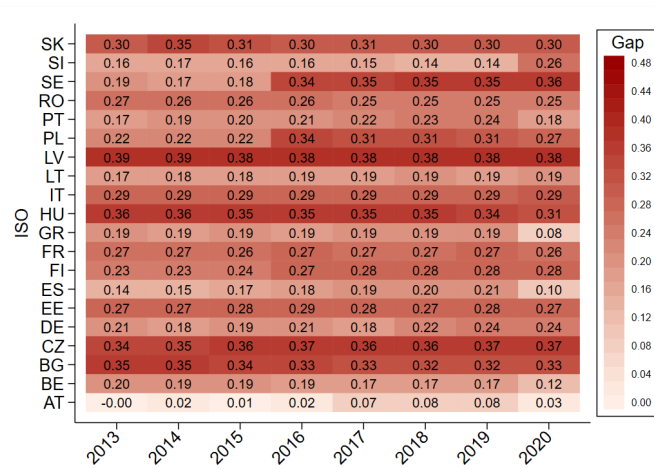
The aggregation to the country-year level allows us to compute the Spearman's correlations (rank correlations) between the gap measures and the share of credit constrained firms (as reported in the EIBIS). The aim is to identify which debt-approach best captures the spirit of such survey. Results displayed in Table 8 show that the long-term debt based gap is the only measure with a significant rank correlation.

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Table 8: Spearman Correlations Between EIBIS Credit Constrain and the Orbis Gap Measures

		Debt Measure	
	Long-Term Debt	Current Liabilities	Total Liabilities (Sum of both)
Spearman's rho	0.304	-0.011	0.136
P-value	0.001	0.910	0.139

Note: The Spearman's rho and p-value are calculated based on the average gaps in 120 ISO-year combinations.

Findings The financing gaps are presented in Figure 3. Colours indicate the size of the financing gaps, with darker red indicating a larger financing gap. We can see that the real estate sector (letter L) shows high financing gaps across countries and over the years, which can be explained by an especially high value for Sweden in this sector in 2013 (the benchmark country/year). Another sector, which shows high financing gaps across countries and over the years is Arts, Entertainment and Recreation (letter R). In manufacturing, Bulgaria is the country with the highest median financing gap across the years, although German manufacturing firms also show a surprisingly high financing gap, as do Czech Republic, Estonia and Austria. Bulgarian firms typically show the highest financing across sectors, followed by other Central European countries.

Several cells in Figure 3 display gaps that are of equal value to the benchmark for the given industry letter. This implies that the median debt-to-sales ratio is zero. Of course this is partially driven by institutional peculiarities in some countries, such as , where long-term debt is not typically offered to SMEs. Our reason to not drop these cells is two-fold. For one, these firms may still prefer to have some long term debt if offered by e.g. the EIB. Second, inclusion of these observations allows to maintain comparability in particular to the short-term credit measure gap that is filled with non-zeros in more cells.

Figure 3: The SME Financing Gaps from 2013-2020

(a) 2013 Gaps

(b) 2014 Gaps

(c) 2015 Gaps

(d) 2016 Gaps

(e) 2017 Gaps

(f) 2018 Gaps

(g) 2019 Gaps

(h) 2020 Gaps

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To compare the degree of dispersion in the financing gap, we create a box plot over the different years (see Figure 4). The box plot shows that the dispersion in financing gap has been relatively stable over the years.

Figure 4: Boxplots of Gaps over the Years (All Countries and Sectors)
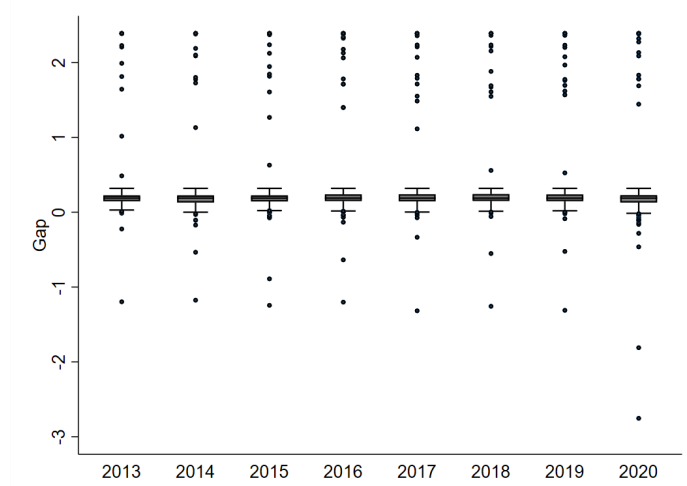
3.2 Extensions

Comparing Medium, Small and Micro Firms In a next step, we run separate analyses for mid-sized, small and micro companies. To identify the category of a firm, we apply the EC definitions as shown in Table 3. Then, we repeat the steps described above on how to derive the financing gap for each subset of firms separately. Hence, we obtain new benchmarks for every of the three categories. Detailed breakdown of the benchmarks can be found in Appendix B.

For comparison, we subsequently compute for each *size* category a country's average gap across sector and years, where we use the relative number of firms in each cell as a weight:

$$Gap_c^{size} = \sum_{l,y} w_{c,l,y}^{size} Gap_{c,l,y}^{size} \tag{4}$$

where

$$w_{c,l,y}^{size} = \frac{N_{c,l,y}^{size}}{\sum_{l,y} N_{c,l,y}^{size}}. \tag{5}$$

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Comparing the three categories in Figure 5, it becomes clear that the financing gaps are larger for micro than for small enterprises and for small than mid-sized enterprises (Figure 5). It also becomes clear that countries, where small firms suffer the most, are not necessarily those where medium-sized firms struggle to obtain financing.

Figure 5: Countries' Average Gaps By Firm Size
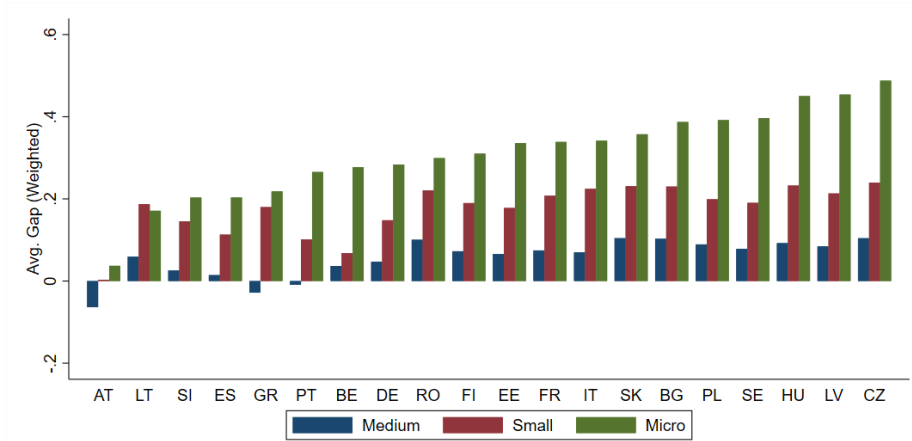
Other Extensions In Appendix C, we present the results on firms' financing gap using Spain as benchmark across all countries, given that Spain is the most frequently used benchmark. Additionally, we display an re-estimated gap in Appendix D, where we exclude micro firms from the analysis all together. The Tables displaying the benchmarks can be found in the Appendices, respectively. Below, Table 9 displays the Spearman correlations between the above proposed baseline Orbis gap and the just described two alternatives. Both alternative methods result in measures that are positively and significantly correlated with the baseline.

Table 9: Rank Correlations Baseline and Alternatives

| | Alternative Gaps | |
	Spain as Benchmark	No Micro Firms
Spearman's rho	0.663	0.834
P-value	0.000	0.000

*Note:* The Spearman's rho and p-value are calculated based on the average gaps in 1770 ISO-letter-year combinations.

4 Decomposition into Structural and Cyclical Component

To provide further insights into the dynamics of the financing gap, we provide a decomposition into a structural and cyclical component that we consequently regress on GDP. As it allows for a more detailed analysis, we use the Orbis financing gap for this exercise.

Structural Component The structural component of the financing gap is computed by taking the the average of the debt-to-sales ratio in a given country-sector combination over time and subtracting the benchmark:

$$SGap_{c,l} = Mean\left(\frac{Debt}{Sales}_{c,l,y} \mid \forall n \in c,l\right) - \frac{Debt}{Sales}_{B,l}. \tag{6}$$

Mirroring the baseline analysis, we can produce a similar heatmap over the country-level dimension (see Figure 6). We find the largest structural financing gap in the real estate sector (letter L), with the notable exception of Denmark where we find a negative structural financing gap. Similarly, firms in Arts, Entertainment and Recreation (letter R) show high structural financing gaps. In manufacturing, the highest structural financing gaps are in Bulgaria, Germany, Czech Republic, Sweden, Estonia, and Austria. Bulgarian firms across sectors face among the highest structural financing gaps in our sample.

Figure 6: Structural Component Orbis Financing Gap

ISO	C	F	G	H	I	J	L	M	N	P	Q	R	S
SK	0.27	0.25	0.22	0.16	0.25	0.15	2.39	0.19	0.15	0.20	0.19	0.32	0.23
SI	0.17	0.20	0.15	0.05	0.13	0.09	1.38	0.10	0.10	0.09	0.06	0.17	0.10
SE	0.25	0.24	0.21	0.08	0.25	0.15	1.42	0.19	0.14	0.20	0.18	0.30	0.22
RO	0.27	0.25	0.22	0.16	0.25	0.15	2.39	0.19	0.15	0.20	0.19	0.32	0.23
PT	0.14	0.17	0.13	0.02	0.11	0.11	2.14	0.13	0.05	0.02	0.12	0.13	0.10
PL	0.24	0.24	0.21	0.15	0.07	0.15	2.14	0.18	0.14	0.14	0.11	0.24	0.09
LV	0.27	0.25	0.22	0.16	0.25	0.15	2.39	0.19	0.15	0.20	0.19	0.32	0.23
LT	0.23	0.23	0.20	0.07									
IT	0.27	0.25	0.22	0.16	0.25	0.15	2.39	0.19	0.15	0.20	0.19	0.32	0.23
HU	0.25	0.24	0.21	0.14	0.25	0.15	2.26	0.19	0.15	0.20	0.19	0.32	0.23
GR	0.22	0.24	0.21	0.16	-0.33	0.15		0.19	0.14				
FR	0.25	0.24	0.21	0.16	0.20	0.15	2.38	0.19	0.15	0.20	0.17	0.30	0.21
FI	0.22	0.22	0.20	0.11	0.23	0.14	2.31	0.18	0.13	0.20	0.16	0.27	0.20
ES	0.14	0.14	0.13	0.01	0.04	0.02	1.36	0.03	0.00	0.01	0.03	0.02	0.02
EE	0.22	0.22	0.19	0.07	0.15	0.12	1.73	0.13	0.09	0.15	0.16	0.23	0.13
DE	0.20	0.19	0.17	0.06	0.15	0.13	1.20	0.16	0.09	0.16	0.13	0.18	0.17
CZ	0.26	0.24	0.22	0.16	0.25	0.15	2.39	0.19	0.15		0.19		
BG	0.27	0.25	0.22	0.16	0.25	0.15	2.39	0.19	0.15	0.20	0.19	0.32	0.23
BE	0.24	0.21	0.21	0.12	0.21	0.15	1.95	0.19	0.15	-1.43	0.14	0.32	0.14
AT	0.05	0.04	0.03	-0.03	-0.56	0.01	1.49	-0.03	-0.04				

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SGap scale: 2.9, 2.5, 2.1, 1.7, 1.3, 0.9, 0.5, 0.1, -0.3, -0.7, -1.1, -1.5, -1.9, -2.3, -2.7

To provide further insights, we provide a box plot across sectors (Figure 7a) and a bar plot

Figure 7: Structural Component Orbis Financing Gap

(a) Boxplot over Sectors   (b) Barplot over Countries
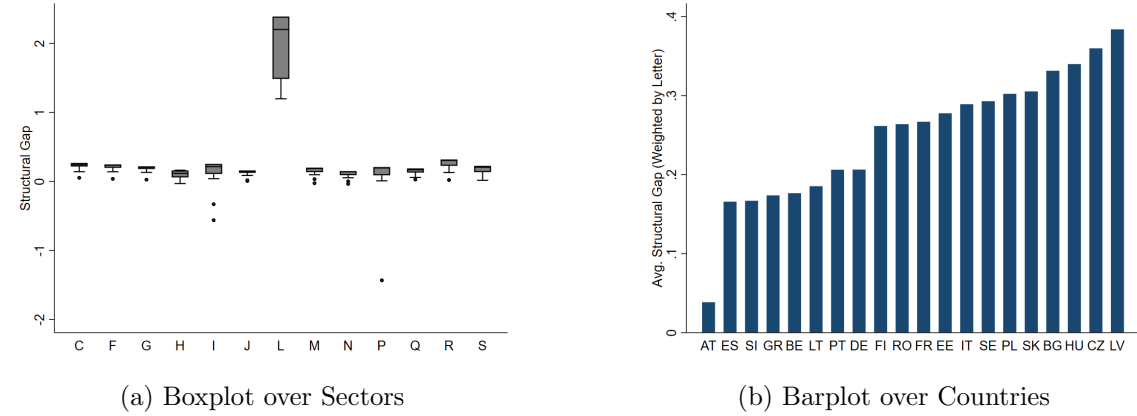
across countries (Figure 7b). The box plot confirms that sectors I, L and R suffer from higher structural gaps. In the bar plot, we display the average structural gap of a country, weighted by the average number of firms in a sector. Accounting for the different sizes in sectors across countries, we can see that especially countries in Central Europe and the Baltic countries suffer from high structural gaps.

Finally, we regress the structural gap measure on each countries' average GDP over the sample period and a set of regional indicator variables. Western EU countries (AT, BE, DE and FR) serve as the baseline. Here, we observe no significant correlation between the GDP (measured in bn €) and the structural financing gap component (see Table 10).

Cyclical Component The deviation between the actual financing gap in a given country-sector-year from the structural component can be attributed to cyclical drivers:

$$CGap_{c,l,y} = Gap_{c,l,y} - SGap_{c,l}. \tag{7}$$

The box plot shown in Figure 8 illustrates the deviation over time. No apparent cyclicality arises in any of our sample countries. When splitting the sample into two periods, 2013-16 and 2017 to 2020, however, we see some striking differences across a small number of countries (Figure 9). Austria has a large negative cyclical financing gap in the first and a large positive in the second period, while Belgium shows the opposite pattern. Similarly, Spain and Finland show negative cyclical financing gaps in the first and large positive gaps

Table 10: Regression of Structural Gap Component on Average GDP

Dependent Variable	$SGap_{c,l}$	
	(1)	(2)
Avg. GDP (bn €)	-0.000009	
	(0.000039)	
Baltics		0.072554
		(0.121914)
Northern EU		0.087008
		(0.127555)
Southeastern EU		0.089899
		(0.112926)
Southern EU		0.003417
		(0.107493)
Visegrad		0.132095
		(0.106379)
Constant	0.302693***	0.236439**
	(0.041243)	(0.075608)
Observations	239	239

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

in the second period. Most prominently, Sweden shows the largest cyclical negative financing gap in the first and largest positive gap in the second period.

We further run a regression of the cyclical component on both year and sector dummies, as well as their interaction terms. Table 11 shows the variables with significant coefficients (at least at the 10% level). All others are zero (and omitted to manage the table size). With two exceptions, only interactions of the real estate sector enter significantly in the regression, which shows the high sensitivity of this specific sector to business cycle variations. Additionally, we regress the cyclical component on the GDP and log GDP in a given country and year (see Table 11 below). We find that GDP but not log GDP enters significantly. No further insights are reached, when interacting GDP with sector dummies, which are all insignificant. This output is thus omitted here.

Finally, we compare the average cyclical gaps in earlier years (2013-2016) and later year

Figure 8: Cyclical Component Orbis Financing Gap
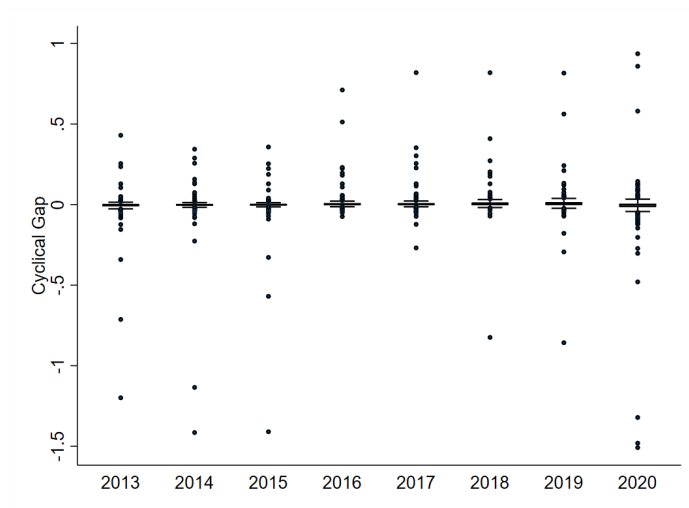
Figure 9: Avg. Cyclical Gap (Weighted) Before and After 2016

(a) 2013-2016
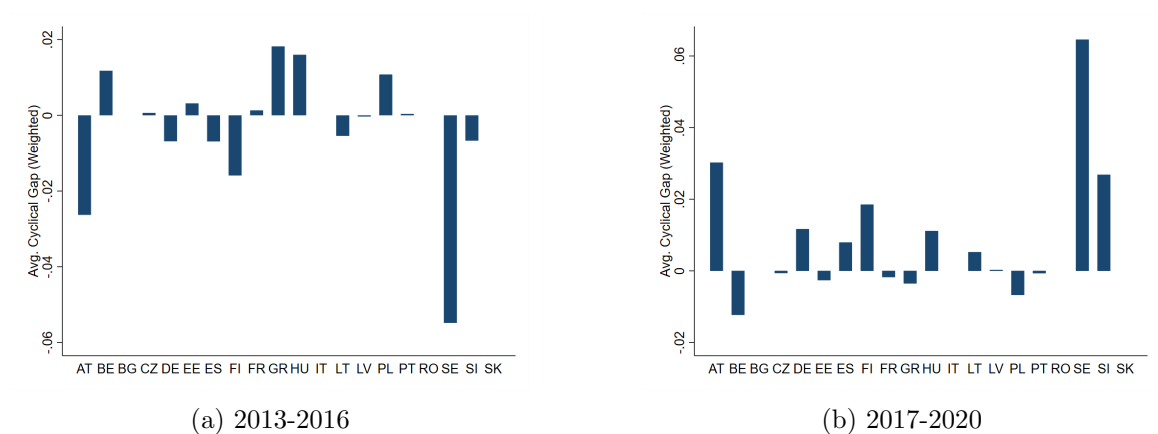
(b) 2017-2020

years (2017-2020) in Figures 9a and 9b respectively. Here, we can see that SMEs in most countries suffer from less financing constraints in the early 2010s and more in the late 2010s. A notable, and not so surprising, exception is Greece suffering more in the earlier years. This is likely due to the sovereign debt crisis, which was at its peak in 2013. We are surprised by both Austria and Sweden displaying large cyclical components, despite both serving as a benchmark country in different sectors. A likely explanation is that countries with relatively frictionless financial markets, the business cycle might be passed-through quicker to SMEs.

Table 11: Regression Of Cyclical Gap Component on GDP and Indicators

Dependent Variable	$CGAP_{c,l,y}$		
	(1)	(2)	(3)
GDP (bn €)	0.000189***		
	(0.000045)		
log GDP (bn €)		0.042825	
		(0.031054)	
L			-0.107701**
			(0.039554)
year=2016 × L			0.219949***
			(0.054762)
year=2017 × L			0.185212***
			(0.055166)
year=2018 × L			0.156201**
			(0.055166)
year=2019 × L			0.127307*
			(0.055166)
year=2020 × I			-0.097463
			(0.055166)
year=2020 × L			0.133031*
			(0.055166)
year=2020 × P			-0.114534
			(0.060005)
Observations	1770	1770	1770

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

5 SAFE Financing Gap

While the above methodology allows for industry level analysis, it limits us to only obtaining a proxy for the financing gap. Specifically, we consider the demand to be the same across all firms across countries within a specific sector. Utilising firm-level data from the SAFE survey ,on the other hand, we can compute the actual financing gap between loans demanded and loans obtained on a firm level:

Figure 10: SME Financing Gap (SAFE)

ISO	2013h1	2013h2	2014h1	2014h2	2015h1	2015h2	2016h1	2016h2	2017h1	2017h2	2018h1	2018h2	2019h1	2019h2	2020h1	2020h2
SK	7.85		14.91	42.30	59.05	58.70	61.26	35.96	35.86	65.42	20.07	24.60	7.08	5.63		174.73
SI	2.55		163.91		161.37		138.83	52.22		98.46		32.56				101.15
SE	11.97		19.23		31.08		13.38	11.11		9.75		23.45		0.56		6.48
RO	94.07		42.32		31.55		6.96	17.07		32.25		17.07		6.48		
PT	28.15		147.03	93.46	82.74	17.92	18.38	25.22	47.82	62.21	40.03	60.50	16.97	2.02		19.37
PL	13.75		72.41		48.69		29.26	8.67		8.84		17.86		49.18		
LV	0.25		72.61		4.57		147.64	30.62		32.58		21.03		45.67		
LT	62.15		22.47		54.53		20.98	24.51		143.55		7.37		39.50		
IT	64.53		64.64	79.16	67.57	37.08	73.72	60.28	51.20	62.56	40.85	30.56	72.18	103.60		21.97
HU	24.60		26.89		10.75		37.88	19.61		7.70		0.35		30.79		
GR	72.29		133.44	235.30	199.12	106.01	222.64	74.36	80.13	50.70	80.23	21.30	85.63	194.15		13.07
FR	55.67		155.96	27.70	36.16	52.86	30.50	25.19	37.62	42.91	27.09	8.74	48.66	43.32		3.25
FI	10.62		93.18	99.58	76.03	97.67	162.10	79.65	59.49	72.83	64.69	11.45	11.66	77.74		280.65
ES	89.54		74.97	34.95	97.05	81.15	61.97	47.97	67.80	45.80	53.00	73.33	47.83	51.05		43.18
EE	2.48		3.12		2.41		4.10	87.12		38.23		4.57				
DE	28.12		19.05	42.45	2.63	28.65	57.81	16.32	11.84	31.67	58.98	23.37	45.29	101.48		22.36
CZ	73.66		43.22		22.24		1.17	90.88		52.46		4.38				134.25
BG	102.26		42.40		0.72		19.89	38.57		66.50		13.85		8.75		
BE	24.66		19.44	67.30	8.89	41.04	93.04	27.15	36.21	11.59	15.97	6.07	44.79	8.48		37.67
AT	103.81		82.67	24.57	38.23	56.64	43.11	10.60	11.08	10.71	22.33	44.71	3.54	27.29		1.72

Debt Gap th€: 293.7, 278.6, 263.5, 248.5, 233.4, 218.4, 203.3, 188.2, 173.2, 158.1, 143.1, 128.0, 112.9, 97.9, 82.8, 67.8, 52.7, 37.6, 22.6, 7.5

Survey Wave

$$Gap_n = Demand_n - Obtained_n. \tag{8}$$

As already discussed above, it is important to stress self-stated loan demand is not the same as bankable loan demand. Further, the sample of SMEs' is not representative and naively computing the mean (median) would result in biased aggregates. To overcome this bias and recreate a representative sample, we use the provided common weights in the data to calculate the average gap by country and wave.[7]

Figure 10 shows the average financing gap per country across years. Notice here that the financing gap is now the difference between demanded and obtained loans and by definition bounded below at zero and denominated in €. A higher value, indicated by a more intense red, means that demanded substantially exceeds obtained loans. Unlike in the previous sections, we have no benchmark here, as we directly compare self-reported demand and actual supply of external funding. This also means that while we explicitly take into account the demand for external finance (unlike in the balance sheet-based measures in the previous section), we cannot differentiate between actual and bankable demand, i.e., demand that would be satisfied in a developed financial market.

We note that across most waves, the financing gap is highest for firms in Greece, followed in

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[7]There are no weights for individual sectors, so that we can only compare financing gaps across countries but across countries and sectors.

several waves by Slovenia. In several waves, firms in Estonia shows the smallest financing gap. Financing gaps seem to be highest in the middle of the last decade while somewhat easing towards the end of the 2010s, as shown in Figure 11. We also note that the variation across countries decreases substantially after 2016, but increasing again in 2020, at the onset of the pandemic, most likely reflecting different intensities of government support programmes for enterprises.

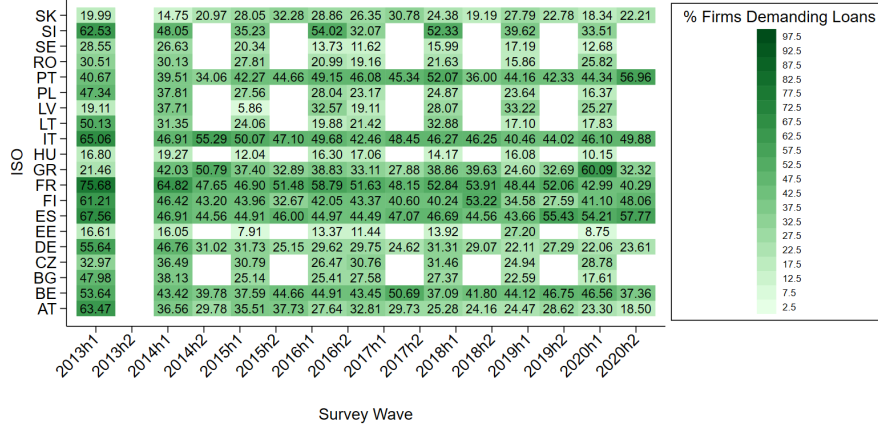Figure 11: Boxplots of Debt Gaps (th€) First SAFE Survey Wave Each Year
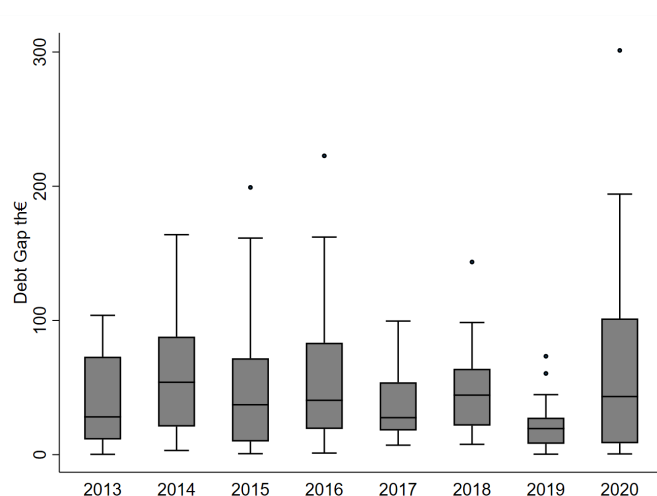
The SAFE data allow us to derive two additional measures regarding SMEs usage of bank loan financing. First, we can check what percentage of firms have a positive loan demand. Again, we use the provided weights to obtain a representative sample. Consequently, we can also compute the share of failed attempts: How many of those SMEs with positive loan demand failed to obtain any lending? Both variables are plotted in Figure 12.

In the first semester of 2019, loan demand seemed highest in France, Belgium and Portugal and lowest in Sweden and several Central European countries. In the same semester, the share of SMEs denied any loan was highest in Greece and Slovak Republic and lowest in Hungary, Belgium, Czech Republic, Finland and Germany.

Finally, the survey allows is to study how many SMEs are already utilising grants and subsidised loans (Q4 b) as an alternative funding source to traditional bank loans. Here, we code the survey responses **Used in the past 6 months** and **Relevant but do not know if used** as utilising such public sources, and all other categorical responses as not. We omit missing values and again use the the provided weights to obtain a representative sample. Figure 13 illustrates the results. We first note that the share of SMEs using grants

Figure 12: Share of SMEs Demanding Loans and Failing (SAFE 2013-2020)

% Firms Demanding Loans

ISO	2013h1	2013h2	2014h1	2014h2	2015h1	2015h2	2016h1	2016h2	2017h1	2017h2	2018h1	2018h2	2019h1	2019h2	2020h1	2020h2
SK	19.99		14.75	20.97	28.05	32.28	28.86	26.35	30.78	24.38	19.19	27.79	22.78	18.34	22.21	
SI	62.53		48.05		35.23		54.02	32.07			52.33		39.62		33.51	
SE	28.55		26.63		20.34		13.73	11.62			15.99		17.19		12.68	
RO	30.51		30.13		27.81		20.99	19.16			21.63		15.86		25.82	
PT	40.67		39.51	34.06	42.27	44.66	49.15	46.08	45.34	52.07	36.00	44.16	42.33	44.34	56.96	
PL	47.34		37.81		27.56		28.04	23.17			24.87		23.64		16.37	
LV	19.11		37.71		5.86		32.57	19.11			28.07		33.22		25.27	
LT	50.13		31.35		24.06		19.88	21.42			32.88		17.10		17.83	
IT	65.06		46.91	55.29	50.07	47.10	49.68	42.46	48.45	46.27	46.25	40.46	44.02	46.10	49.88	
HU	16.80		19.27		12.04		16.30	17.06			14.17		16.08		10.15	
GR	21.46		42.03	50.79	37.40	32.89	38.83	33.11	27.88	38.86	39.63	24.60	32.69	60.09	32.32	
FR	75.68		64.82	47.65	46.90	51.48	58.79	51.63	48.15	52.84	53.91	48.44	52.06	42.99	40.29	
FI	61.21		46.42	43.20	43.96	32.67	42.05	43.37	40.60	40.24	53.22	34.58	27.59	41.10	48.06	
ES	67.56		46.91	44.56	44.91	46.00	44.97	44.49	47.07	46.69	44.56	43.66	55.43	54.21	57.77	
EE	16.61		16.05		7.91		13.37	11.44			13.92		27.20		8.75	
DE	55.64		46.76	31.02	31.73	25.15	29.62	29.75	24.62	31.31	29.07	22.11	27.29	22.06	23.61	
CZ	32.97		36.49		30.79		26.47	30.76			31.46		24.94		28.78	
BG	47.98		38.13		25.14		25.41	27.58			27.37		22.59		17.61	
BE	53.64		43.42	39.78	37.59	44.66	44.91	43.45	50.69	37.09	41.80	44.12	46.75	46.56	37.36	
AT	63.47		36.56	29.78	35.51	37.73	27.64	32.81	29.73	25.28	24.16	24.47	28.62	23.30	18.50	

Survey Wave

Legend (% Firms Demanding Loans): 97.5, 92.5, 87.5, 82.5, 77.5, 72.5, 67.5, 62.5, 57.5, 52.5, 47.5, 42.5, 37.5, 32.5, 27.5, 22.5, 17.5, 12.5, 7.5, 2.5

(a) Share of SMEs Demanding Loans

% Failed Requests

ISO	2013h1	2013h2	2014h1	2014h2	2015h1	2015h2	2016h1	2016h2	2017h1	2017h2	2018h1	2018h2	2019h1	2019h2	2020h1	2020h2
SK	34.29		10.45	27.71	23.12	28.78	26.60	32.61	16.98	30.42	18.19	30.30	11.52	11.56	67.58	
SI	5.43		44.09		38.19		28.53	34.37			26.01		28.85		59.93	
SE	11.33		14.93		17.55		15.18	13.43			27.95		21.75		11.68	
RO	20.55		20.66		23.47		15.61	25.52			25.39		13.92		23.78	
PT	10.37		35.63	31.19	31.37	15.51	16.96	11.55	18.01	18.68	21.60	12.73	18.34	5.25	6.12	
PL	4.02		23.68		20.30		15.85	14.18			5.83		13.26		30.63	
LV	10.46		59.11		20.13		52.45	16.52			29.45		29.28		22.77	
LT	21.97		44.43		30.18		35.11	41.46			55.20		22.83		35.40	
IT	13.06		27.01	19.41	18.82	15.41	18.42	20.91	16.66	16.83	13.47	15.28	31.26	25.19	6.49	
HU	23.83		29.72		18.79		23.27	23.64			21.13		4.36		21.68	
GR	27.52		39.27	56.55	69.55	48.22	67.98	39.97	43.09	29.81	40.36	38.46	38.04	38.12	12.96	
FR	4.11		21.81	11.68	12.78	14.77	9.62	8.71	11.21	11.19	8.06	8.92	14.74	10.96	4.05	
FI	3.63		15.94	22.30	14.98	24.64	25.77	19.16	12.54	22.38	10.98	7.56	21.82	17.62	43.15	
ES	17.75		24.81	19.99	27.08	21.21	18.92	16.62	22.15	18.81	19.33	26.72	19.16	24.14	11.98	
EE	19.87		25.92		40.60		16.01	66.63			18.31		15.45		0.00	
DE	4.79		9.93	14.16	5.54	13.14	19.73	8.47	8.04	11.52	15.79	7.59	14.82	35.18	14.52	
CZ	24.83		14.34		19.51		6.78	19.70			25.80		6.28		57.61	
BG	22.54		18.74		10.55		27.68	16.30			25.02		11.38		23.95	
BE	6.66		17.27	19.00	14.51	14.75	25.81	9.34	11.98	10.38	7.18	7.38	8.41	10.67	10.17	
AT	15.39		22.67	10.38	11.06	18.06	10.24	4.30	7.56	7.46	10.02	12.18	8.71	5.86	4.34	

Survey Wave

Legend (% Failed Requests): 97.5, 92.5, 87.5, 82.5, 77.5, 72.5, 67.5, 62.5, 57.5, 52.5, 47.5, 42.5, 37.5, 32.5, 27.5, 22.5, 17.5, 12.5, 7.5, 2.5
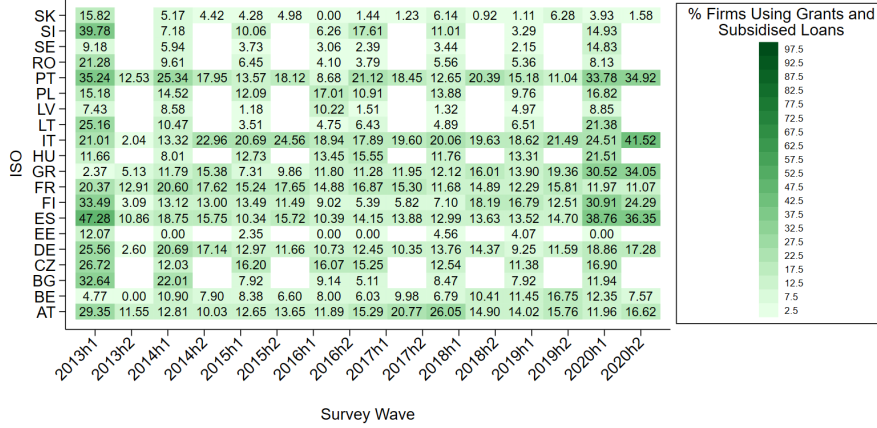
(b) Share of Failed Demands

and subsidies increased substantially in 2020 compared to 2019, related to the pandemic and government support programmes. In the first wave of 2019 the share of SMEs using grants and subsidies was highest in Italy, Finland and Portugal and lowest in Slovak Republic and Sweden.

Structural and Cyclical Component We undertake a similar exercise of decomposition for the financing gap based on the SAFE survey, by computing the average financing gap over all years as structural component and the cyclical component as the difference between actual value and structural component. We find that the structural financing gap is highest in Greece, followed by Slovenia, while lowest in Sweden, Hungary and Estonia (Figure 14a) We find that the cyclical components were highest 2014, 2016 and 2020 and lowest in 2019

Figure 13: SME usage of Grants and Subsidies (SAFE)

ISO	2013h1	2013h2	2014h1	2014h2	2015h1	2015h2	2016h1	2016h2	2017h1	2017h2	2018h1	2018h2	2019h1	2019h2	2020h1	2020h2
SK	15.82		5.17	4.42	4.28	4.98	0.00	1.44	1.23	6.14	0.92	1.11	6.28		3.93	1.58
SI	39.78		7.18		10.06		6.26	17.61			11.01		3.29		14.93	
SE	9.18		5.94		3.73		3.06	2.39			3.44		2.15		14.83	
RO	21.28		9.61		6.45		4.10	3.79			5.56		5.36		8.13	
PT	35.24	12.53	25.34	17.95	13.57	18.12	8.68	21.12	18.45	12.65	20.39	15.18	11.04		33.78	34.92
PL	15.18		14.52		12.09		17.01	10.91			13.88		9.76		16.82	
LV	7.43		8.58		1.18		10.22	1.51			1.32		4.97		8.85	
LT	25.16		10.47		3.51		4.75	6.43			4.89		6.51		21.38	
IT	21.01	2.04	13.32	22.96	20.69	24.56	18.94	17.89	19.60	20.06	19.63	18.62	21.49		24.51	41.52
HU	11.66		8.01		12.73		13.45	15.55			11.76		13.31		21.51	
GR	2.37	5.13	11.79	15.38	7.31	9.86	11.80	11.28	11.95	12.12	16.01	13.90	19.36		30.52	34.05
FR	20.37	12.91	20.60	17.62	15.24	17.65	14.88	16.87	15.30	11.68	14.89	12.29	15.81		11.97	11.07
FI	33.49	3.09	13.12	13.00	13.49	11.49	9.02	5.39	5.82	7.10	18.19	16.79	12.51		30.91	24.29
ES	47.28	10.86	18.75	15.75	10.34	15.72	10.39	14.15	13.88	12.99	13.63	13.52	14.70		38.76	36.35
EE	12.07		0.00		2.35		0.00	0.00			4.56		4.07		0.00	
DE	25.56	2.60	20.69	17.14	12.97	11.66	10.73	12.45	10.35	13.76	14.37	9.25	11.59		18.86	17.28
CZ	26.72		12.03		16.20		16.07	15.25			12.54		11.38		16.90	
BG	32.64		22.01		7.92		9.14	5.11			8.47		7.92		11.94	
BE	4.77	0.00	10.90	7.90	8.38	6.60	8.00	6.03	9.98	6.79	10.41	11.45	16.75		12.35	7.57
AT	29.35	11.55	12.81	10.03	12.65	13.65	11.89	15.29	20.77	26.05	14.90	14.02	15.76		11.96	16.62

Survey Wave

% Firms Using Grants and Subsidised Loans: 97.5, 92.5, 87.5, 82.5, 77.5, 72.5, 67.5, 62.5, 57.5, 52.5, 47.5, 42.5, 37.5, 32.5, 27.5, 22.5, 17.5, 12.5, 7.5, 2.5

(Figure 14b). However, there is no clear synchronisation across countries in the financing gap cycles.

Figure 14: Decomposing the SAFE Financing Gap

(a) Structural Component

(b) Cyclical Component
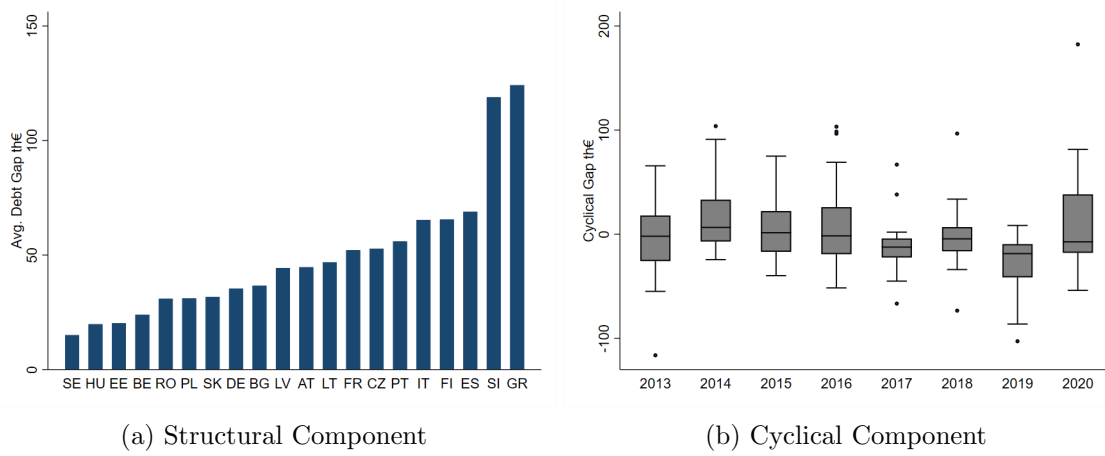
Comparison with Orbis Gap and EIBIS The SAFE financing gap comes with two important caveats. For one, the SMEs' loan demand may be influenced by their perception of the business cycle. Hence, the SAFE survey gap measures the failure rate in demanded loan, but not what the firm ideally should have demanded in the absence of any constraints. Figure 15 illustrates the relationship between the average loan demand (country-year level) and the countries' GDPs over the years and shows a weak positive correlation. The Orbis gap, instead, focuses on the balance sheet implied distance to the least financially constrained firm or the firm with the highest use of debt finance relative to sales. It therefore does not suffer from the same implicit impact of firms' adjustment in loan demand to the business cycle.

Figure 15: The Relationship Between Loan Demand and log GDP
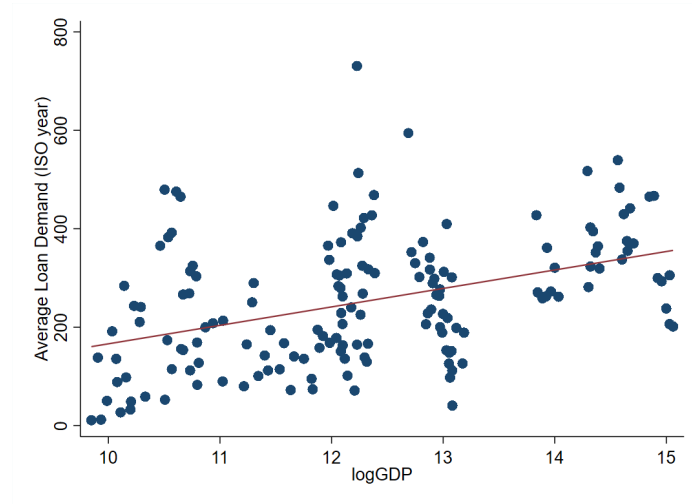
Second, the SAFE survey only asks for firms' loan demand within the last 6 month prior to the survey. The Orbis gap, however, focuses on the credit constraints experiences over the long run, as it uses stock variables of firm debt. As the two measures of financing gaps are constructed very differently, we test the rank correlation (Spearman correlation) between the two financial gap measures (Table 12).[8] We find a week negative correlation between the Orbis financing gap and the SAFE financing gap with $\rho_s = -0.202$, statistically significant on the 5% level, while there is no significant correlation between the share of SMEs financially constrained from the EIBIS and the SAFE financing gap measure. This is likely due to the different focus of both measures.

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[8]For the SAFE survey, we keep the first half-year for every year-country combinations and match that one-to-one onto the Orbis financing industry-weighted average gap on the country-year level.

Table 12: Spearman Correlations Between SAFE Survey and other Measures

| | Gap Measure | |
	Orbis Gap	EIBIS Constraint
Spearman's rho	-0.199	-0.001
P-value	0.012	0.996

Note: The Spearman's rho and p-value between SAFE and Orbis gaps is calculated based on the average gaps of 159 ISO–year combinations; the values between SAFE and EIBIS gaps are calculated based on the average gaps of 113 ISO-year combinations.

6   Conclusion

This paper presented estimates of SMEs' financing gaps across European countries over the period 2013 to 2020, using two different methodologies, one relying on firms' balance sheets and the other on firm-level survey data. The two datasets provide very different results, which can be explained with different assumptions that one makes when computing the respective financing gaps. One important insight coming out of the analysis is the persistence in such financing gaps, with the cyclical element constituting only a small part and not always varying in a meaningful way with business cycles.

In terms of countries with the highest financing gaps, we get diverging findings. The account-based measures point to Czech Republic, Latvia, Hungary, Sweden, Poland and Bulgaria as the countries where firms have largest financing gaps, while the survey-based measures point to Greece and Slovenia as countries with firms' largest financing gaps. In the case of survey-based measures, Hungary and Sweden show the lowest financing gaps.

What can we learn from our analysis? First, there is not ONE correct financing gap measure. Each measure we presented captures a different dimension; the ORBIS measure a technological distance from a given benchmark and the SAFE measure distance from self-reported demand. Second, financing gap is not necessarily the same as financing constraint. Self-reported financing constraints refer to access to and conditionality of funding, while financing gap is purely focused on loan amounts. Third and consequently, properly capturing financing gaps across countries and sectors requires the simultaneous use of different methodologies and metrics.

We would like to end on one final note of caution: we presented the financing gaps across countries, sectors, years and methods as analytical exercise. While these measures can be operationalised, it is important to consider the representativeness of data for each country, sector and year before drawing specific policy conclusions.

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A Different Debt Measures for Orbit Financing Gap

In the main analysis, we use long-term debt as the debt measure to compute the Orbis financing. This decision is based on Spearman correlations between the share of credit constraint SMEs identified by the EIB Survey and three Orbis financing gap: The one based on long-term debt, one based on current liablities and one based on total liabilties (sum of long-term debt and current liabilities). For this purpuse, we compute the financing gap for each debt measure using the same methodology. Hence, we derive three different benchmarks selections. The benchmark selections for the long-term debt based measure can be found in the main text. Below, you find the selected benchmarks in the two alternative cases.

Table 13: Benchmark Debt-to-Sales Ratios - Current Liabilities

Nace2 Letter	ISO	Year	Obs.	Benchmark Ratio
C	GR	2013	1482	0.500
F	IT	2014	27753	0.560
G	RO	2013	31704	0.570
H	RO	2013	7853	0.470
I	RO	2013	4192	0.760
J	IT	2014	10398	0.470
L	IT	2013	5370	0.710
M	IT	2013	10732	0.470
N	IT	2013	8466	0.430
P	IT	2013	1785	0.420
Q	IT	2013	5968	0.350
R	IT	2013	2408	0.490
S	RO	2013	2204	0.560

Table 14: Benchmark Debt-to-Sales Ratios - Total Liabilties

Nace2 Letter	ISO	Year	Obs.	Benchmark Ratio
C	GR	2013	1482	0.650
F	ES	2013	10486	0.660
G	RO	2013	31704	0.570
H	ES	2016	6629	0.480
I	RO	2013	4192	0.760
J	ES	2013	2387	0.520
L	SE	2015	1606	3.260
M	ES	2013	7126	0.640
N	ES	2013	3826	0.570
P	ES	2013	1232	0.630
Q	ES	2013	2459	0.470
R	ES	2013	1016	0.870
S	ES	2013	1249	0.700

B   Medium, Small and Micro Firms

B.1   Medium Sized Firms

Table 15: Benchmark Debt-to-Sales Ratios per NACE2 Letters - Medium Firms

Nace2 Letter	ISO	Year	Obs.	Benchmark Ratio
C	PT	1026	2016	0.140
F	DE	619	2017	0.100
G	PT	520	2013	0.0600
H	ES	682	2018	0.120
I	ES	534	2013	0.210
J	DE	535	2019	0
M	ES	508	2016	0.0600
N	ES	571	2016	0.0500
Q	DE	662	2017	0.0600

Figure 16: The SME Financing Gaps from 2013-2020 (Medium Benchmark)
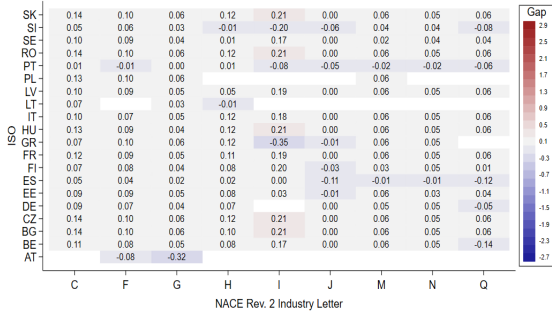
(a) 2013 Gaps
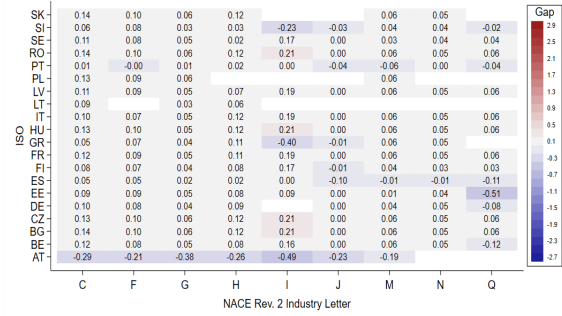
(b) 2014 Gaps

(c) 2015 Gaps

(d) 2016 Gaps

(e) 2017 Gaps

(f) 2018 Gaps

(g) 2019 Gaps

(h) 2020 Gaps

30
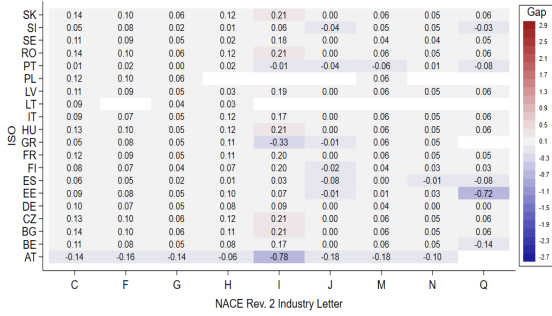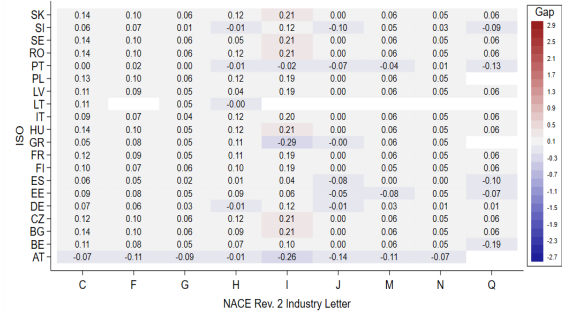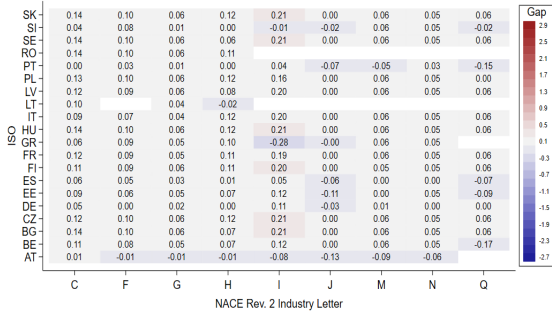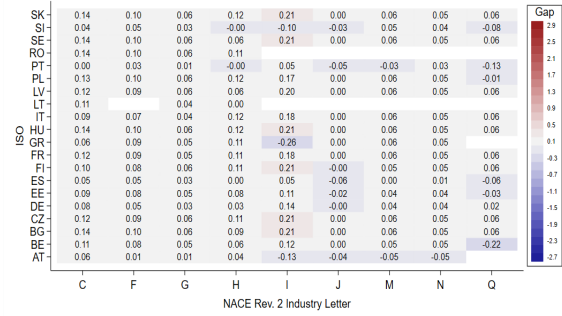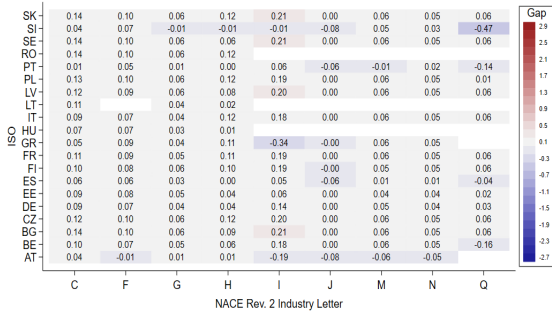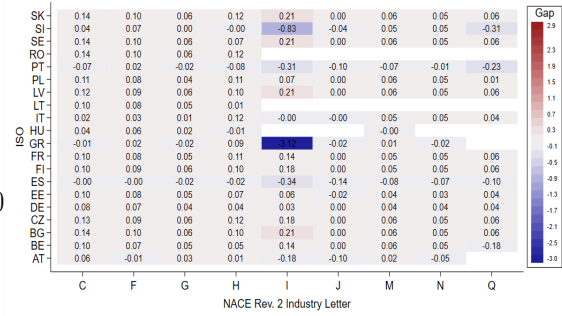
B.2 Small Firms

Table 16: Benchmark Debt-to-Sales Ratios per NACE2 Letters - Small Firms

Nace2 Letter	ISO	Year	Obs.	Benchmark Ratio
C	AT	826	2015	0.270
F	AT	1091	2015	0.250
G	AT	1058	2015	0.210
H	DE	2029	2017	0.170
I	ES	2748	2013	0.210
J	ES	844	2013	0.140
L	ES	773	2013	0.760
M	PT	618	2016	0.120
N	PT	534	2018	0.120
P	ES	533	2017	0.120
Q	ES	838	2013	0.160
R	ES	542	2018	0.190
S	DE	564	2017	0.0900

Figure 17: The SME Financing Gaps from 2013-2020 (Small Benchmark)
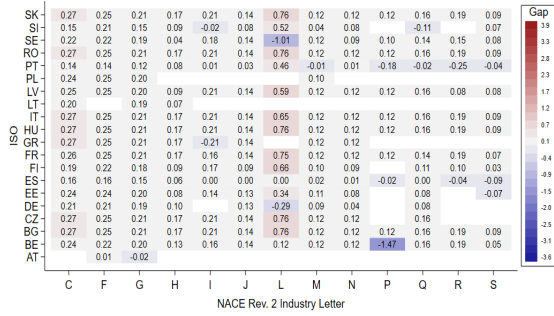
(a) 2013 Gaps
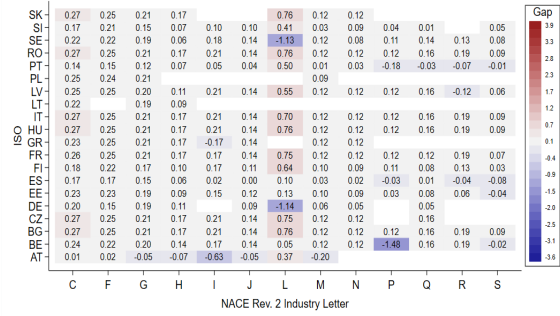
(b) 2014 Gaps

(c) 2015 Gaps

(d) 2016 Gaps

(e) 2017 Gaps

(f) 2018 Gaps

(g) 2019 Gaps

(h) 2020 Gaps

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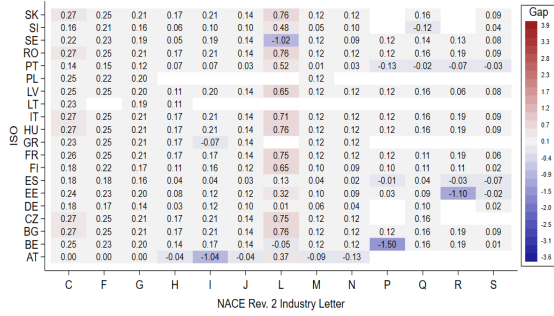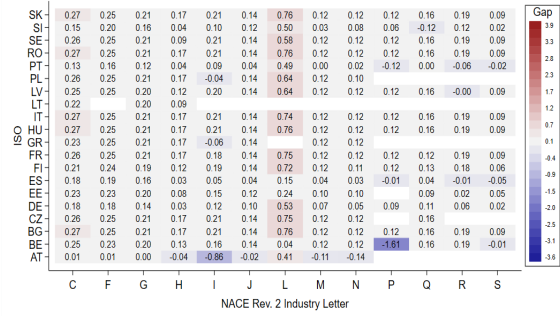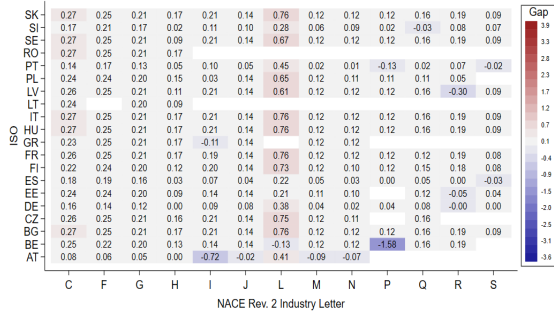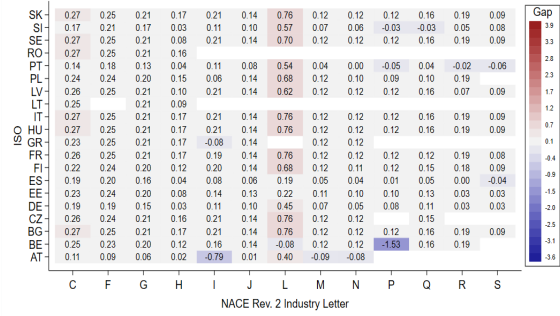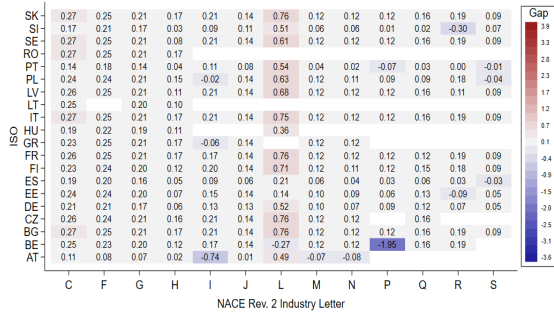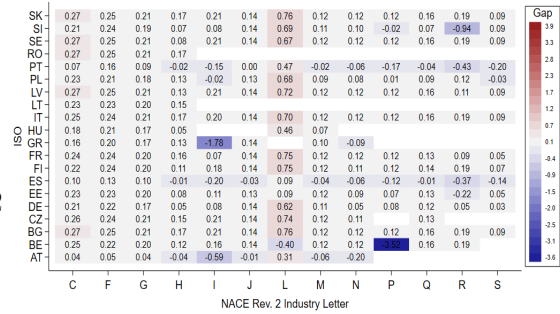
B.3   Micro Firms

Table 17: Benchmark Debt-to-Sales Ratios per NACE2 Letters - Micro Firms

Nace2 Letter	ISO	Year	Obs.	Benchmark Ratio
C	ES	7912	2013	0.200
F	AT	532	2016	0.230
G	AT	977	2015	0.240
H	ES	3367	2016	0.190
I	ES	3037	2013	0.330
J	ES	1288	2013	0.170
L	SE	1042	2015	2.820
M	ES	5193	2013	0.260
N	ES	2240	2013	0.250
P	ES	702	2013	0.300
Q	ES	1503	2014	0.220
R	ES	574	2013	0.410
S	ES	861	2013	0.270

Figure 18: The SME Financing Gaps from 2013-2020 (Micro Benchmark)
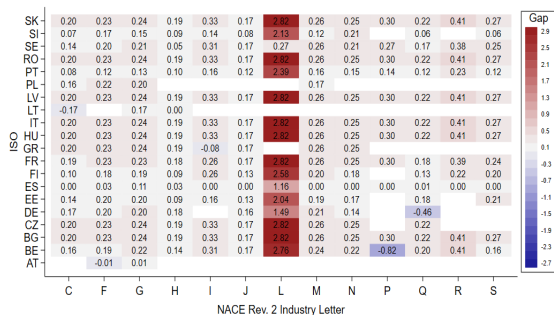
(a) 2013 Gaps
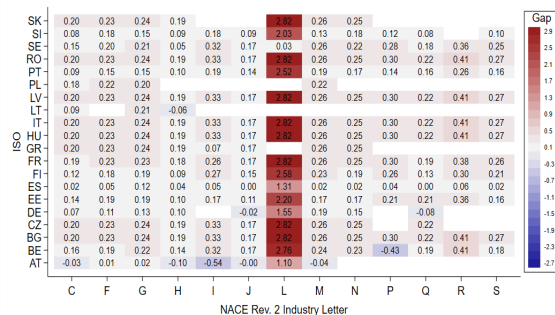
(b) 2014 Gaps

(c) 2015 Gaps

(d) 2016 Gaps

(e) 2017 Gaps

(f) 2018 Gaps

(g) 2019 Gaps

(h) 2020 Gaps

34
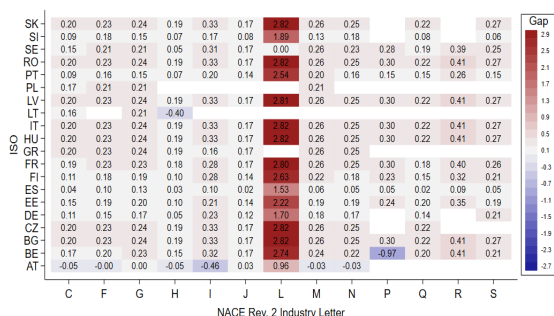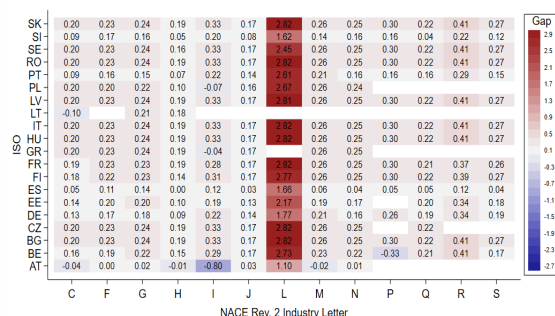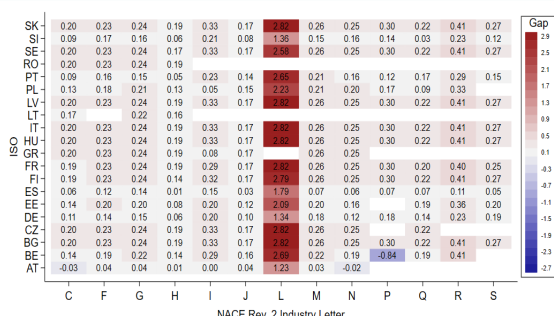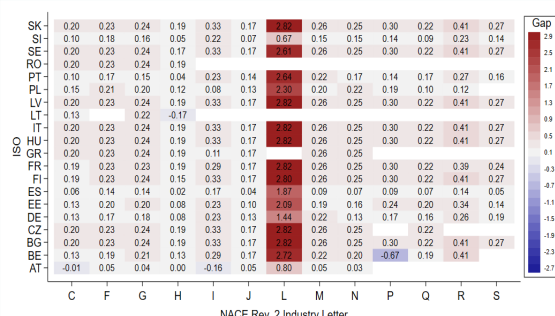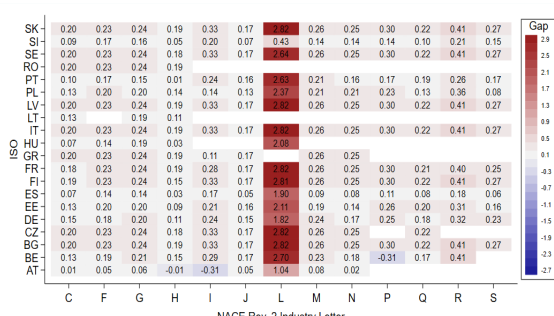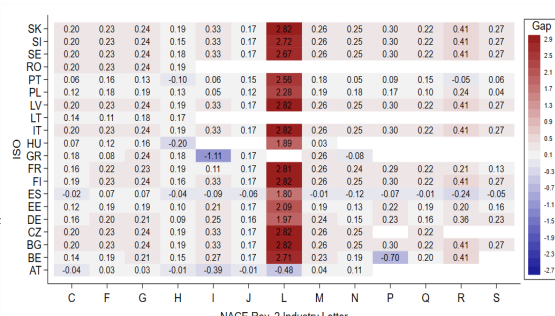
C Spain as Benchmark

In this Appendix, we solely use Spain as a potential benchmark and simply select the letter-year combination with the highest debt-to-sales ratio. We maintain the minium 1000 observations requirement for the benchmark cell. Below, Table 18 displays the alternative benchmark selections.

Table 18: Benchmark Debt-to-Sales Ratios per NACE2 Letters Using Spain

Nace2 Letter	ISO	Year	Obs.	Benchmark Ratio
C	ES	2013	17279	0.140
F	ES	2013	10486	0.150
G	ES	2013	30239	0.0900
H	ES	2016	6629	0.160
I	ES	2013	6208	0.250
J	ES	2014	2612	0.150
L	ES	2013	5240	1.370
M	ES	2013	7126	0.190
N	ES	2013	3826	0.150
P	ES	2013	1232	0.200
Q	ES	2014	2625	0.190
R	ES	2013	1016	0.320
S	ES	2013	1249	0.230

Below, Figure 19 displays the alternative gaps on the country-year-letter level. The reader is kindly asked to refer to the main text for the Spearman correlation between the Spain-based and original gap measure.
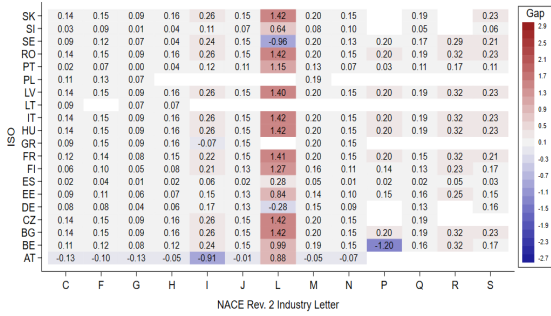
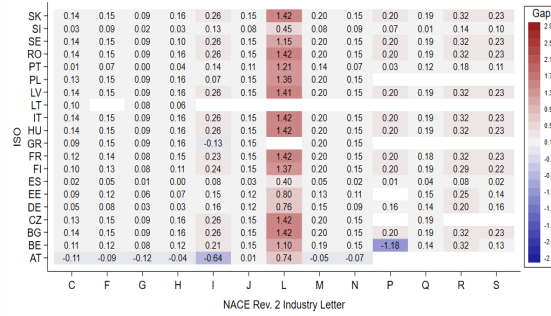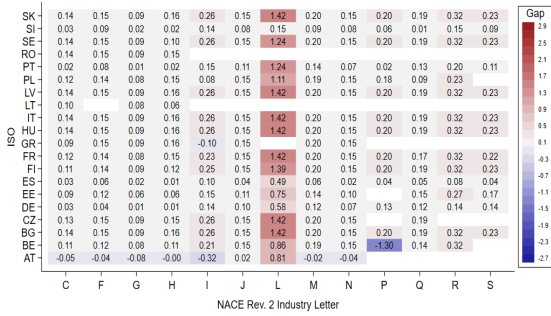Figure 19: The SME Financing Gaps from 2013-2020 (Spain Benchmark)
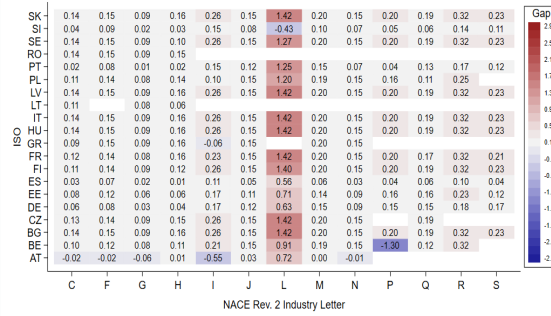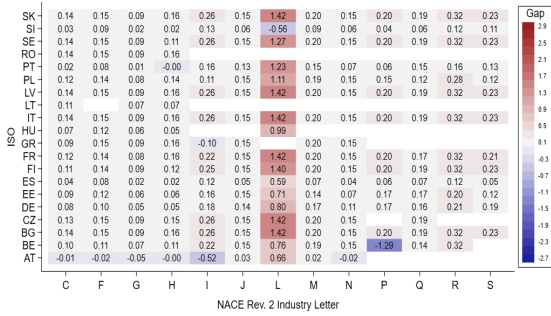
(a) 2013 Gaps
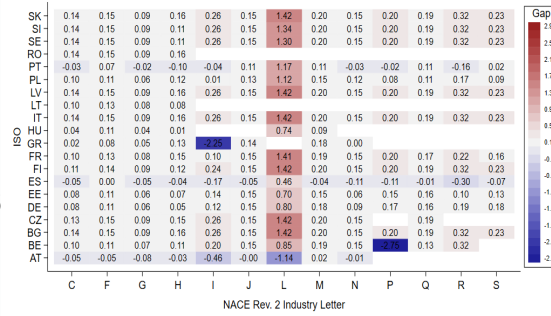
(b) 2014 Gaps

(c) 2015 Gaps

(d) 2016 Gaps

(e) 2017 Gaps

(f) 2018 Gaps

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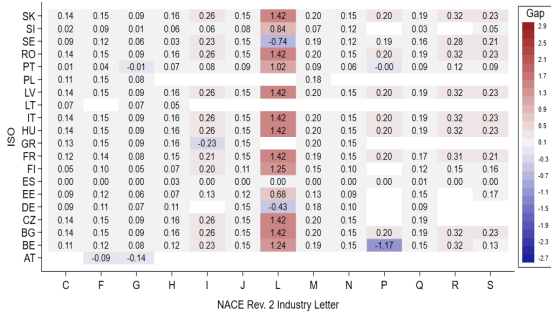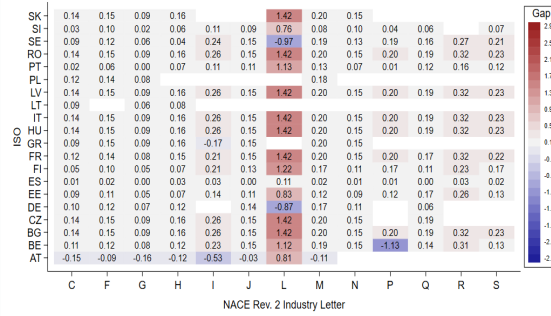
(g) 2019 Gaps

(h) 2020 Gaps

D Excluding Micro-Firms

As an additional robustness, we exclude the micro firms from our sample and recalculate the Orbis debt gap measure. Here, excluding micro firms impacts both the benchmark (see below) and the median debt-to-sales ratio. To be consistent with Appendix B, we set the minimum number of observation for the benchmark cell to 500. The reader is kindly asked to refer to the main text for the correlation between the original gap measure and this robustness.

Table 19: Benchmark Debt-to-Sales Ratios per NACE2 Letters Excluding Micro

Nace2 Letter	ISO	Year	Obs.	Benchmark Ratio
C	AT	2015	1083	0.270
F	AT	2015	1238	0.250
G	AT	2015	1262	0.210
H	DE	2017	2602	0.160
I	ES	2013	3173	0.200
J	ES	2013	1107	0.130
L	SE	2015	564	1.400
M	PT	2016	622	0.120
N	PT	2018	634	0.100
P	ES	2014	558	0.130
Q	ES	2013	1081	0.160
R	ES	2015	518	0.210
S	ES	2017	527	0.110

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