ECONOMICS – IMPACT STUDIES

Impact assessment of the EIB's intermediated lending to businesses

European Investment Bank

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About the Economics Department
The mission of the EIB Economics Department is to provide economic analyses and studies to support the Bank in its operations and in the definition of its positioning, strategy and policy. The department, a team of 40 economists, is headed by Director Debora Revoltella.

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EXECUTIVE SUMMARY

A quantitative analysis was carried out to evaluate the impact of the EIB's financing for small and medium enterprises (SMEs) and mid-caps. The EIB supports access to finance and business development through intermediated lending, in particular Multiple Beneficiary Intermediated Loans (MBILs). Under this scheme, the EIB provides loans to financial intermediaries under more favourable conditions compared to the market, either directly or indirectly (through public promotional institutions). This impact assessment addresses the following question: what is the impact of EIB intermediated lending on recipient firms' performance relative to similar firms that did not receive an EIB intermediated loan (but may still receive other forms of finance)?

To assess the impact of the EIB intermediated lending on firms in the EU, this report presents a statistical analysis that measures the performance of supported firms relative to similar firms that did not access an EIB loan. The impact assessment encompasses loans provided to 96,830 businesses between 2008 and 2017, i.e. the largest sample of EIB beneficiaries analysed to date. Data on the EIB loan beneficiaries is linked to firm-level data providing balance sheet and other economic information. A counterfactual analysis is then carried out selecting a comparable control group from over two million firms for which data is available.

The counterfactual analysis involves selecting a control group of firms that are similar to the ones that received EIB intermediated lending. Specifically, the analysis selects peers that are SMEs and mid-caps that have been active over a six-year window between 2008 and 2017 in the same EU Member State as the loan beneficiary. Moreover, comparable peers are selected across economic dimensions, namely industry and firm size, and comparable in their financials (including firms' total assets, tangible fixed assets ratio, cash ratio, current ratio, leverage ratio, turnover ratio, sales growth and patenting activity).

The impact of EIB intermediated lending is estimated empirically using data for the treated EIB loan beneficiaries and the control group before and after receiving an intermediated loan. The results show that, relative to their peers EIB loan beneficiaries:

- **Experience significantly higher employment growth.** EIB intermediated lending beneficiaries report employment numbers that are 5.4% higher on average in the three years after the loan. The impact shows a positive trend across time. In the year of the loan, beneficiaries report employment to be 2.5% higher than before the credit line. This impact increases to 7.7% three years after the loan signature.

- **Show significantly faster firm growth** upon receiving the EIB loan. EIB beneficiaries' growth, as measured by total assets, increases by 6.0% relative to that of the control group in the three years after the loan.

- **Substantially increase their investment** in the years following the loan. On average, beneficiary firms report 15.3% higher investment, as measured by the increase in their tangible fixed assets in the three-year period after the loan. As for the

observed employment growth after loan receipt, the investment impact increases over time, reaching up to 21.5% three years after the loan.

- **Experience a significant, but limited increase in leverage**. Beneficiary firms´ leverage ratios show an increase between 1.9 and 2.5 percentage points after receiving the loan. Therefore, the substantial investment push is associated with a limited, but significant increase in firms´ leverage.

- **Benefit from both an increase in productivity and an increase in earnings**. Despite the absence of a direct, significant impact on recipients' profitability, MBIL beneficiaries report significant increases in both their earnings and productivity, as measured by value added. EIB loan recipients' financial statements show an increase in their earnings of 4.7% in the three years after the loan as well as a coinciding increase of 5.3% in productivity.

- **Show a significant increase in their innovative capacity**. The magnitude differs according to the measure used. Beneficiaries are more likely to submit patents, resulting in a small, yet statistically significant impact (of 1.1%) in patent filings in the three years after the loan is received. Nevertheless, EIB beneficiaries report considerably higher (13.3%) intangible fixed assets than their peers in the three years after the loan.

In addition to the baseline impact estimates, the analysis finds heterogeneity in the impact across different subgroups of loan beneficiaries.

- **Firms in less developed regions benefit substantially more from EIB intermediated lending.** Grouping recipients using the 2014-2020 Cohesion Region classification, results show that relative to beneficiaries located in more developed regions, beneficiaries in less developed regions experience a higher impact on employment, firm growth, investment, earnings and productivity (by 2 to 5%). Recipients in transition regions report increases in employment that are about 2% higher than those in more developed regions.

- **Additionality is significantly higher for micro, small and medium enterprises**. Relative to mid-cap beneficiaries, micro, small and medium-sized EIB loan recipients show significantly higher growth in employment, firm size, investment, leverage, earnings and productivity in the three years after the loan. Relative to mid-cap beneficiaries, micro, small and medium-sized EIB loan recipients invest 11%, 9% and 6% more, respectively. Given the close link between firms' size and their ability to access to finance, separate results also show that beneficiaries that classify as financially constrained grow faster upon receiving an EIB intermediated loan.

- **Younger firms invest more upon receiving an EIB intermediated loan.** Relative to beneficiary firms that have been in existence for ten years or more, younger beneficiaries show stronger growth in investment and increased leverage.

Financial data become available with a two-year lag, thus leaving us with data up to 2020. Consequently, the ex-post impact analysis has to be limited to loans up to 2017 for now. A follow-up study when further years of financial data are available would allow a deeper investigation of the impact of the instrument in a low interest rate environment. Moreover, a further study on the impact of EIB intermediated lending on financial intermediaries activities in the EU is under preparation. Nevertheless, the current study confirms the strong impact of the EIB's financing for SMEs and mid-caps via intermediated loans.

1 INTRODUCTION

Small and medium enterprises (SMEs) constitute the backbone of the EU economy.[1] They account for more than half of the value added generated by the non-financial business sector and close to 70 per cent of total employment in Europe. Despite their importance, SMEs' activities have long been affected by credit constraints, which pose a significant barrier to their activity and to their growth. As limited access to finance for SMEs is primarily due to greater asymmetric information costs and lack of sufficient collateral, national and international public financial institutions have been supporting SMEs' access to finance in various forms, including direct lending, loan guarantees, micro-credit and intermediated loans.

The EIB supports access to finance and SME sector development through intermediated lending, in particular Multiple Beneficiary Intermediated Loans (MBILs). Under this scheme, the EIB provides loans to financial intermediaries—banks, leasing companies or other financial institutions—under more favourable conditions compared to the market, either directly or indirectly (through public promotional institutions). The financial intermediaries are then mandated to use the funds to extend loans to SMEs, and to partially transfer to them the financial advantage they benefit from in the form of an interest rate reduction and/or provision of longer tenors.

To assess the impact of the EIB intermediated lending on firm performance in the EU, we merge the internal loan data with financial statements and patent data from Bureau van Dijk's Orbis database. Orbis is widely used for microeconometric analysis as it contains firm-level financial statements and ownership data, comparable across jurisdictions. Whereas the underlying database covers over 60% of firms that received an EIB intermediated loan in the period 2008-2020, the statistical analysis requires the availability of data on firms' financials in a 3-year window post the loan receipt. Financial data become available with a two-year lag, thus leaving us with data up to 2020. Consequently, the impact analysis (Section 4 and 5) has to be limited to 2017 loans. Nevertheless, the descriptive statistics (Section 3) are largely based on data for the EIB's intermediated lending portfolio over the 2008-2020 period.

The analysis presented in this report updates and extends earlier impact assessments of the EIB's intermediated lending instrument. Earlier analyses of the EIB's SME financing focused on multiple beneficiary intermediated loans between 2008 and 2014 to recipient firms in Central and Eastern Europe (Amamou et al., 2020) or recipients across the EU (Barbera et al., 2021). This report adds to this work by extending coverage by three years as well as improving coverage for some of the years considered earlier. Furthermore, this report presents new estimation results for subsamples of beneficiaries.

2 BACKGROUND

Credit constraints have long been considered as posing a potentially significant barrier to SMEs activity and growth. According to the literature, in particular small and young firms

[1] See European Commission (2018). Following EU recommendation 2003/361/EC, the term SME refers to firms with up to 249 employees. In accordance with the European Commission's recommendation, the European Investment Bank defines mid-caps as firms with 250 to 3000 employees

have difficulties accessing external finance (Ferrando and Mulier, 2015), facing a lack of sufficient collateral (Beck and Demirguc-Kunt, 2006) and comparatively more asymmetric information problems (Berger and Udell, 2006; Rauh, 2006; Hadlock and Pierce, 2010). This is particularly troublesome, as financing constraints have been shown to hamper SMEs' growth (Rahaman, 2011; Moscalu et al., 2020), employment (Cornille et al., 2017) and likelihood to invest (Gerlach-Kristen et al., 2015). Moreover, due to market failure, the private sector may not bridge the financing gap.

To make financing available to small and medium businesses, the EIB cooperates with financial intermediaries that offer products targeting small and medium firms and micro-enterprises.[2] A primary tool for the EIB to support access to finance is through intermediated lending, Multiple Beneficiary Intermediated Loans (MBILs). MBILs are EIB credit lines to financial institutions, which then lend directly the proceeds made available by the EIB to a large number of final beneficiaries such as SMEs and mid-caps, private sector entities, or public sector entities. In addition to expanding the pool of finance made available to small and medium businesses, one of the key benefits of an EIB-funded loan is that it provides favourable financing terms in the form of lower interest rates and/or longer maturities. The EIB's financial advantage is passed on to small and medium firms directly.

The EIB's intermediated lending grew both in number and volume between 2008 and 2015, but has shown a downward trend since 2016. The steady growth in MBIL activities led the EIB to support a record number of firms in 2015, providing new loans to over 100,000 SMEs and mid-caps. The subsequent reduction of MBIL activities is consistent with a general slowdown in GDP growth in the European Union in 2018-2019 and the erosion of firms' competitiveness. More recently, the main challenges included a drop in demand for funded products due to the impact of numerous EU, national and regional Covid-19 relief schemes on liquidity of intermediaries and direct support to SMEs. Nevertheless, as support schemes are being phased out and the market interest rates are rising again, demand for MBILs will likely pick up again as the economy grows.

Assessing the impact of public support programmes is key to fine-tune their design, increase their accountability and to assess their performance. Following the example by Brown and Earle (2017) for the US Small Business Administration's loan guarantee programme, European evidence attributes positive employment, firm growth and investment impacts to support schemes in the form of direct lending (e.g., Erhardt, 2017), loan guarantees (e.g., Bertoni et al., 2019), venture capital (e.g. Pavlova and Signore, 2019) and venture debt (EIB, 2022).

There is little empirical evidence, however, on the impact of intermediated lending activities and their heterogeneous effect across SMEs. Recent impact studies of the EIB Group's multiple beneficiary intermediated loan (MBIL) activities (Gereben et al., 2019; Amamou et al., 2020; Barbera et al., 2021) exploit data on EIB funding for the period from

[2] Supporting SMEs (including micro-enterprises) and mid-caps stands as EIB Group's largest Public Policy Goal ('SME PPG') in terms of volume and outreach to local enterprises. The EIB Group supports businesses with an extensive range of mainly intermediated products, including loans, guarantees and securitisation, equity and quasi-equity financing. To do so, the EIB Group partners with a wide network of commercial banks, National Promotional Banks and Institutions, leasing companies, venture capital and private equity funds, angel investors and other providers.

2008 to 2014. Gereben et al. (2019) showed that EIB lending in Central and Eastern Europe had a positive effect on employment, revenues and profitability, with effect holding irrespective of the business cycle in the years following EIB funding. Amamou et al. (2020) extended the analysis to the EU, confirming the positive effect on employment. Additionally, they find a positive effect on firm growth, investment, innovation capacity and firms' leverage. Barbera et al. (2022) further differentiate the impacts, showing that the positive effects of EIB-supported lending on job creation and investments were larger for smaller and younger firms. Moreover, they find evidence that the longer maturities and more advantageous loan pricing of EIB supported loans are associated with larger employment and investment effects.

This report extends earlier work and presents new estimation results for subsamples of beneficiaries. The analysis builds on earlier work by Amamou et al. (2020) and Barbera et al. (2022), by significantly extending the time and country coverage, to close to 100,000 beneficiaries over the period 2008-2017. In addition, by zooming in on the difference in impact across different beneficiary groups, our results show differences in impact for, for example, firms in less developed versus developed regions.

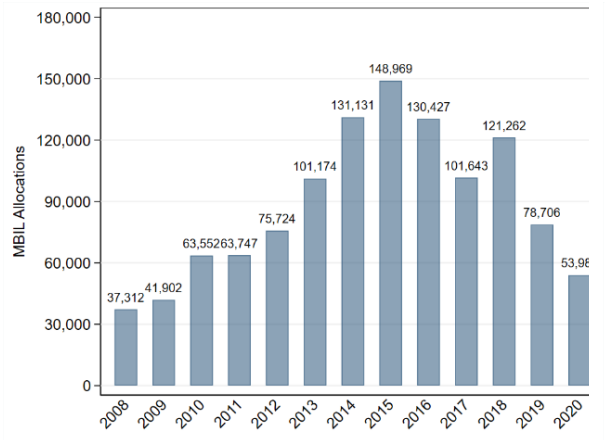
3 DATA AND DESCRIPTIVES

This report builds on a unique dataset that combines information from two main sources: administrative data on EIB intermediated loans and loan beneficiaries' financials from Bureau van Dijk's Orbis database. In terms of EIB credits to businesses, the analysis considers Multiple Beneficiary Intermediated Loans (MBILs) operations to SMEs and mid-caps in the EU and the UK between 01-01-2008 and 31-12-2020. The internal loan data is relatively granular and consists of information on single loans on variables such as loan dates, loan volumes, maturity, financial advantage transferred (ToFA) from the financial intermediaries to final beneficiaries, and fiscal identities of all parties involved. To measure beneficiaries' financial performance, we also rely on firms' financial and economic performance from Orbis, a widely used firm-level dataset containing balance sheet and income statement information. This section provides descriptive statistics on both data sources. More details on the datasets are provided in Annex 1.

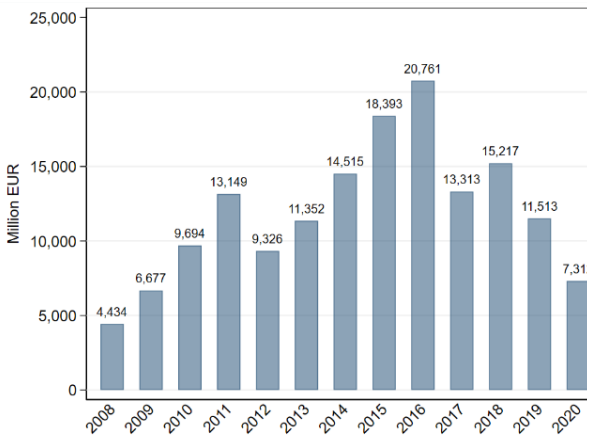
The evolution of contracts' characteristics over time shows an exponential increase in both the number and volume of loans between 2008 and 2015. Figure 1 shows the number of loans in panel (a) and the loan volumes in panel (b). Both number and volume increased by a factor of 5 between 2008 and 2016, but have shown a decreasing trend since. The reduction in MBIL activities is consistent with a general slowdown in GDP growth in the European Union between 2018 and 2019, the erosion of firms' competitiveness and the availability of alternative funding sources and of national support programs. The additional drop in 2020 reflects unprecedented credit market conditions dictated by the COVID-19 pandemic.

Figure 1. Number of MBIL signatures and volumes over time

(a) Number of loans



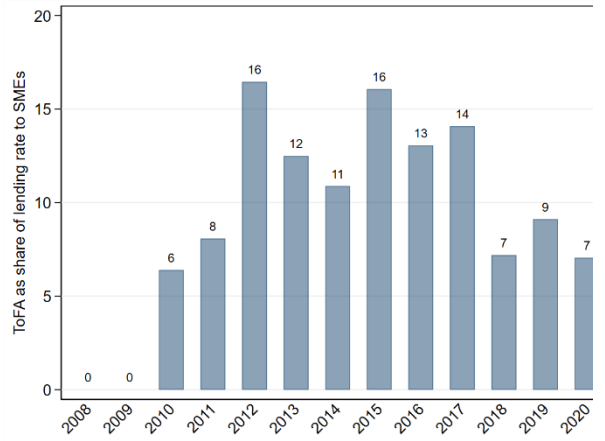
(b) Loan volumes



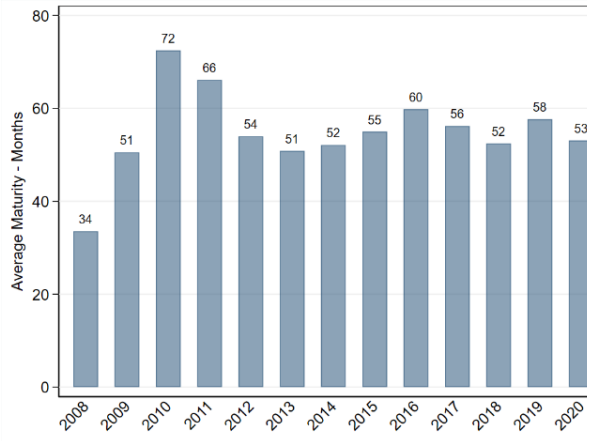
Notes: The graph reports the total number of MBIL loans in panel (a) and the total loan volumes in panel (b). The number of loans and volumes have been computed by year of loan allocation. The increase up to 2016 has been balanced across sectors, and by firm size. It has been driven by a larger exposure to Spain from 2012.
Source: Calculations based on internal EIB loan data.

Figure 2. Average ToFA and average maturity by year

(a) Average ToFA as a share of lending rate



(b) Average Maturity



Notes: The graph reports the average Transfer of Financial Advantage (ToFA) in panel (a) and the average maturity in panel (b). Average ToFA is presented as the share of total SME lending rate defined as the sum of total cost of borrowing to non-financial corporations (source) and the interest rate spread between loans to SMEs and to large firms (source). Both ToFA and maturity have been computed as simple averages by year and across countries. The decline in ToFA follows a general reduction in interest rates from 2016, while the average loan maturity has remained stable over time.
Source: Calculations based on internal EIB loan data, ECB Statistical Data Warehouse and OECD scoreboard data.

While the average loan maturity remained stable over time, the transfer of financial advantage (ToFA) measured as a share of lending rates to SMEs peaked in 2012 and 2016, to then decline. ToFA indicates the financial advantage, or benefit, that commercial banks pass on to final beneficiaries when allocating them a MBIL loan. Panel (a) in Figure 2 shows the financial advantage as a share of the lending rate to SMEs.[3] A high value indicates that

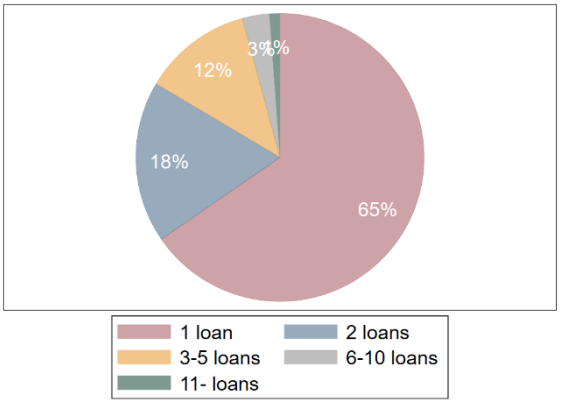
[3] SMEs lending rate is computed as the sum of total cost of borrowing to non-financial corporations (source) and the interest rate spread between loans to SMEs and to large firms (source).

intermediaries pass on a larger financial advantage as a share of total financing costs. While ToFA's evolution is relatively volatile over time, there are some clear trends. It increased in the years following the global financial crisis reaching peaks of 16% of total SME lending costs in 2012 and 2016, to then decline to approximately 8% in 2018. Its evolution over time mirrors financial markets liquidity and credit market conditions to firms. In addition, the financial advantage passed on to beneficiaries was higher in the early years of the global financial crisis, but it declined following the announcement of ECB measures to foster liquidity in financial markets (LTRO and OMT in 2012 and QE in 2015). Differently from the ToFA, the average loan maturity increased from 2008 to 2010 and remained stable over time to approximately five to six years of maturity (50-60 months).

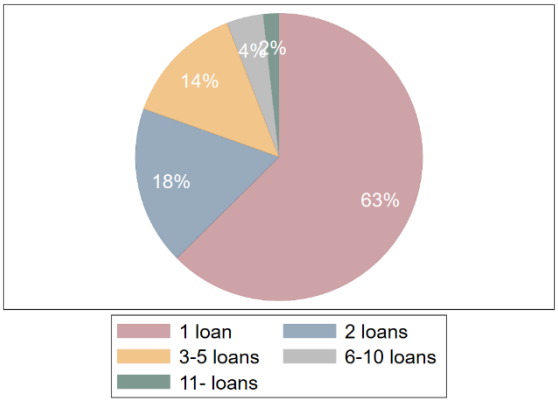
Finally, an additional source of heterogeneity is the number of loans per beneficiary. Figure 3 reports the share of beneficiaries by number of loans per beneficiary (panel a) and the share of volumes by number of loans per beneficiary (panel b). When considering the number of loans per beneficiary, 35% of loans are by firms that already received a loan either in the same year or in previous years. Nevertheless, the distribution of number of loans per beneficiary is not excessively skewed: although 65% of clients receive one loan, only 83% of beneficiaries receive at most two loans and only 4% receive more than five loans. Beneficiaries with more than five loans include, for example, car rental companies which take individual loans for every new car they purchase. A similar share is obtained when considering loan volumes. Panel (b) shows a similar share for volumes by number of loans per beneficiary, suggesting that 81% of volumes are going to beneficiaries signing at most two loans.

Figure 3. Loans per beneficiary

(a) Number of loans per beneficiary



(b) Volumes by no. of loans per beneficiary



Notes: The graph reports the share of beneficiaries and volumes by number of loans. Shares are based on loans between 2008 and 2020. Panel (a) shows that 65% of EIB beneficiaries sign one loan only, while 83% sign at most two loans. Panel (b) shows that 63% of volumes are by beneficiaries signing one loan only, while 18% of volumes are allocated to beneficiaries signing two loans.
Source: Calculations based on internal EIB loan data.

Number of signatures and loan volumes vary across different dimensions including firm size, sectors and geographical locations. The remainder of this section explores the importance of these three dimensions and shows that MBILs beneficiaries are on average micro and small firms, active in the manufacturing sector and located in Italy and Spain.

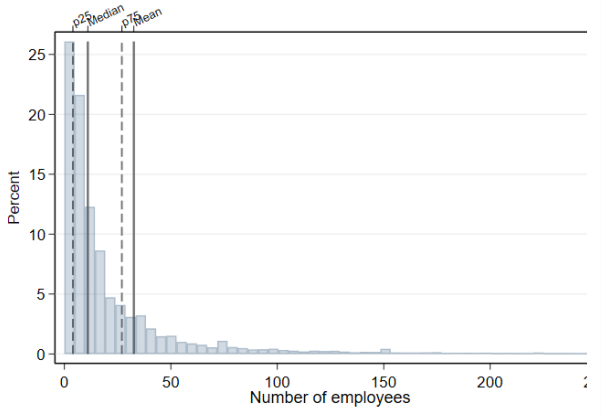
3.1 Firm size

Inspecting the heterogeneity of the credits across firm size allows a better insight into the type of loans final beneficiaries were able to secure based on their characteristics. As discussed in the previous section, MBILs' primary purpose is to provide favourable financing terms in the form of lower interest rates and/or longer maturities to firms that would have otherwise limited access to finance. Since access to finance is not directly observable from balance sheets and income statements, firm size is a first, widely used proxy to assess firms' borrowing capacity.

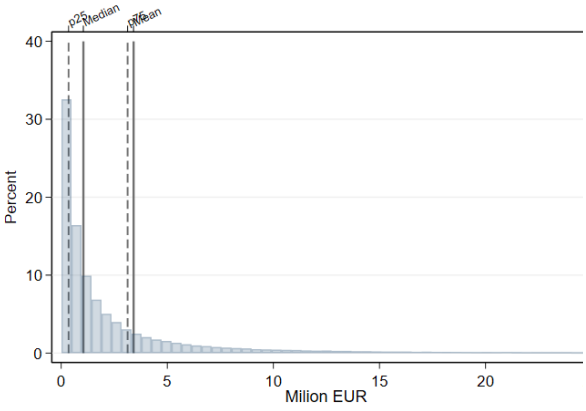
MBIL beneficiaries are predominantly small firms, which employ on average 32 workers and have EUR 3.4 million in total assets. Figure 4 shows the distribution of the number of employees and of total assets for EIB beneficiaries before loan signature. Both graphs report firm-level variables available from Orbis, which are truhncated to report the most significant 90% of the distribution. As a result, the number of employees and total assets size for mid-caps are not reported in the graph below. Panel (a) shows that medium-sized enterprises and mid-caps raise the average number of employees above the median and the 75th percentile (12 employees and 28 employees, respectively). Similarly, panel (b) shows that the average asset value of EUR 3.4 million is higher than the 75th percentile of the distribution (EUR 3.8 million).

Figure 4. Distribution of number of employees and total asset

(a) Number of employees



(b) Total assets



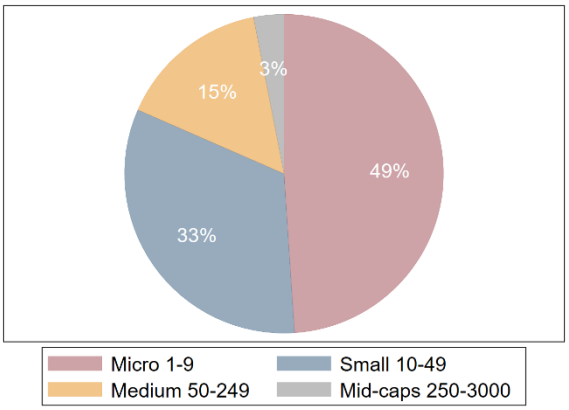
Notes: Number of employees and total assets are from Orbis. Distributions are based on observations at the treatment year, between 2008 and 2020. Graphs have been truncated to report at least 90% of the distribution.
Source: Calculations based on internal EIB loan data and Bureau van Dijk's Orbis database.

To ease firms' comparison across different sizes, beneficiaries have been grouped into four different categories according to EIB classification.[4] The EIB definition is similar to the one adopted by other organisations, including the OECD. According to this definition, SMEs have been classified into micro-enterprises (1-9 employees), small-enterprises (10-49 employees), medium-enterprises (50-249 employees) and mid-caps (250-3000 employees).

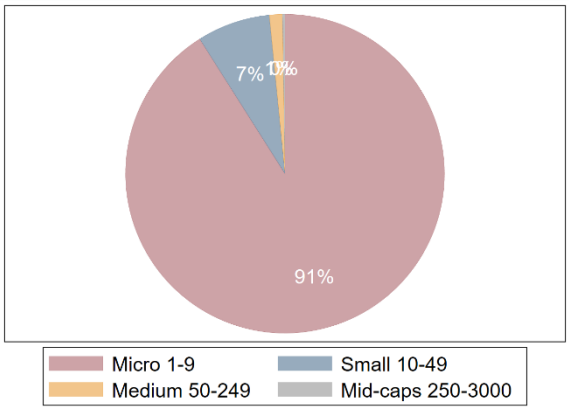
[4] https://www.eib.org/en/about/priorities/sme/index.htm

Figure 5. Representativeness of beneficiaries by size

(a) Number of loans by size (EIB)



(b) Number of firms by size (Eurostat)



Notes: Firm size is defined using the number of employees reported in the EIB's internal loan data, not using Orbis data. Shares are based on loans between 2008 and 2020. Number of EU firms by size has been computed using Eurostat data. In order to allow comparability between the two groups, we only considered the following sectors: Manufacturing, mining, trade, electricity & gas, water supply (NACE codes B-E, G).
Source: Calculations based on internal EIB loan data and Eurostat.

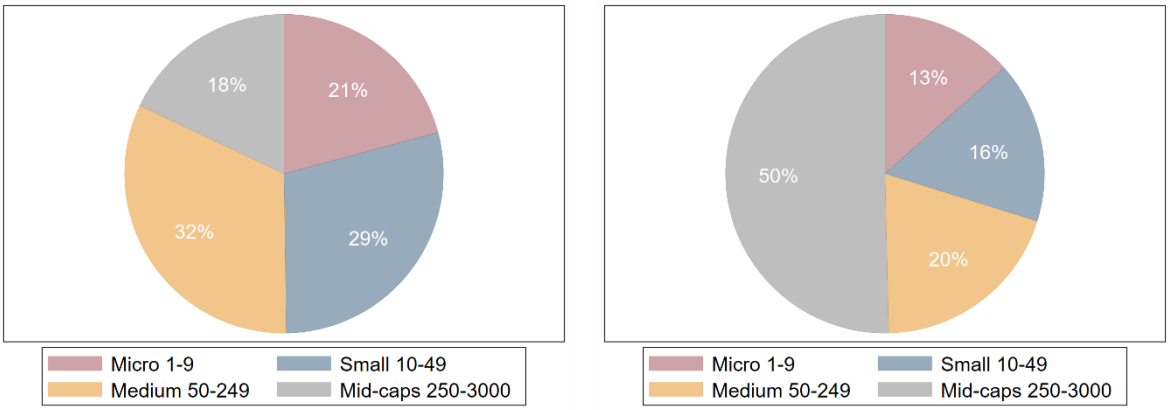
When considering the number of loans, approximately half of loans are issued to micro enterprises, well below the EU average. When benchmarked to Eurostat data, EIB micro beneficiaries are underrepresented in terms of number of loans, as only 49% of credits are issued to micro-enterprises (panel a in Figure 5), although these consist of 91% of total EU SMEs (Eurostat panel b in Figure 5). [5] A more meaningful comparison, however, should consider that only 10% of micro-enterprises in the EU have access to finance. [6] When accounting for this, micro-enterprises benefitting from EIB MBILs are overrepresented with respect to the rest of the firm population.

At the same time, micro firms are overrepresented in terms of loan volumes when compared to the EU average. Figure 6 shows that micro-firms represent approximately 21% of the total loan volume, while the share of micro firms measured in form of value added is approximately 13%. Moreover, small enterprises (10-49 employees) are also overrepresented. They receive approximately 29% of the loan volume, although they only account for 16% of the economy's value added. Instead, mid-caps are underrepresented, as their share of loan volumes is approximately 18%, well below their 50% share of total value added. The comparison between panel (a) in Figure 5 and panel (a) in Figure 6 shows that loan size is larger for larger firms.

[5] To ensure comparability between EIB and Eurostat data, we only considered the following sectors: Manufacturing, mining, trade, electricity & gas, water supply (NACE codes B-E, G).
[6] Recent ECB evidence shows that only 10% of micro firms does rely on bank loans as a form of external finance.

Figure 6. Representativeness of beneficiaries by volume

(a) Loan volumes by size (EIB) (b) Value added by size (Eurostat)



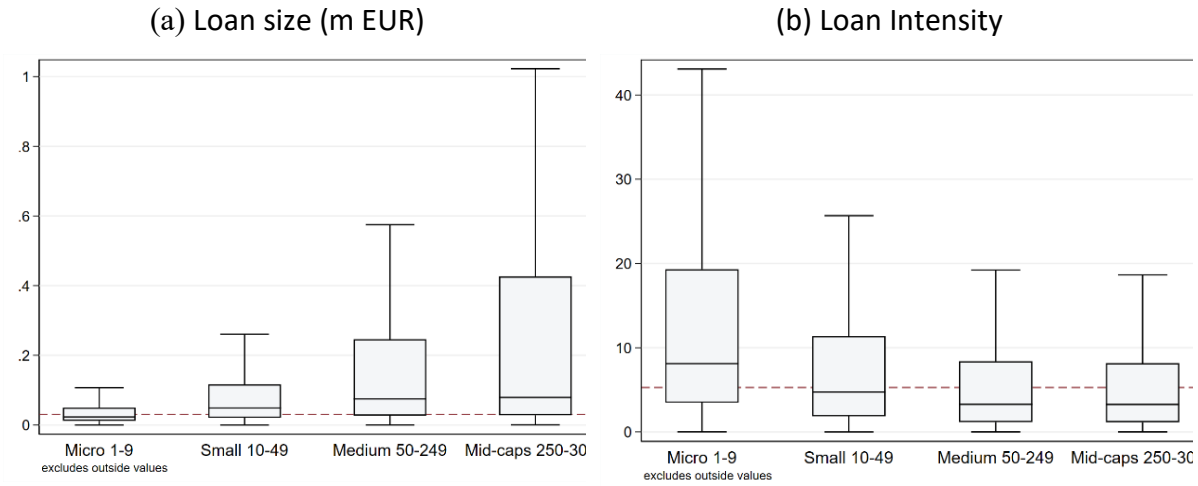
Notes: Firm size is defined using number of employees reported in the EIB's internal loan data, not using Orbis data. Shares are based on loans between 2008 and 2020. Value added of EU firms by size has been computed using Eurostat data. In order to allow comparability between the two groups, we only considered the following sectors:
Manufacturing, mining, trade, electricity & gas, water supply (NACE codes B-E, G).
Source: Calculations based on internal EIB loan data and Eurostat.

Moving from aggregate figures to more granular ones, the distribution of loan volumes show that larger firms benefit from larger loan sizes. To explore the business credits' characteristics in greater detail, the distribution of variables such as loan size has been reported in form of box plots. A boxplot is composed of a box, which refers to the interquartile range of the distribution, defined as the range between the 75th and 25th percentile of the distribution, and of adjacent values. Upper and lower adjacent values show part of the distribution that extend by 1.5 times the width of the interquartile range. Box plots also include median values, represented by a horizontal line within the box.

Although micro enterprises benefit from smaller loan volumes, these account for a larger share of their total assets, if compared to firms in other size classes. Figure 7 reports loan characteristics for firms in different asset classes. Loan sizes increase with firm sizes (panel a), although it represents a lower share of existing debt for larger firms. MBIL intensity is defined as the loan volume over a firm's total assets in the year before signing the loan (panel b).

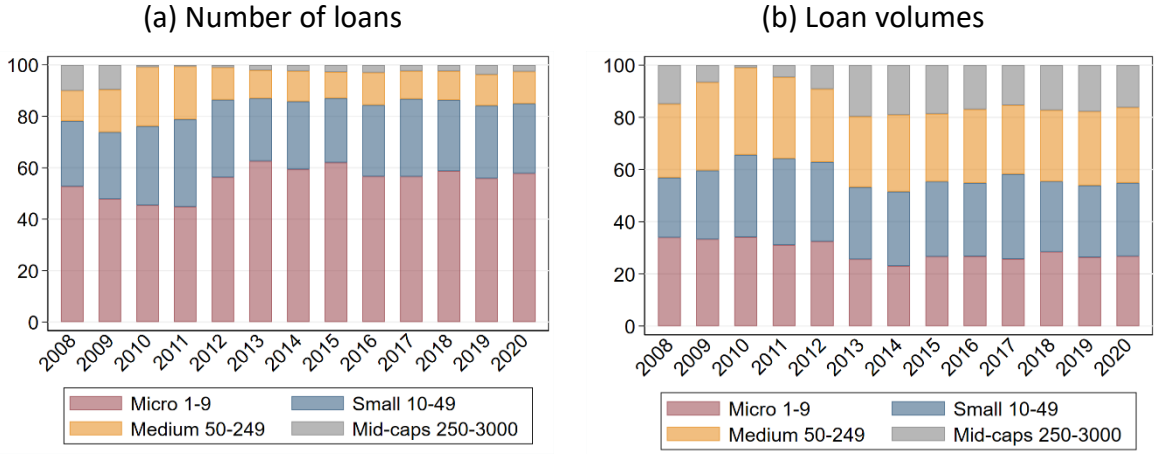
The heterogeneity across the time dimension proves of limited importance, as contract shares and loan volumes show a stable pattern over time. Panel (a) in Figure 8 shows that more than half of MBIL signatures is issued to micro firms. The share increased from 45% in 2011 to 62% in 2013 and remained stable in the following years. Loan volumes are more equally distributed across size classes, with the exception of volumes to mid-caps. Panel (b) shows that the share of volumes to mid-caps is the smallest and the most volatile, ranging from almost 0% in 2010 to 20% in 2013. Instead, loan share to micro enterprises is approximately equal to 30%, lower than the share of contracts.

Figure 7. Distribution of loan characteristics by size class



Notes: The graph shows the distribution of loan-level characteristics by firm size. Distributions are based on loans between 2008 and 2020. Panel (a) reports the distribution of loan volumes; panel (b) shows the distribution of loan intensity, defined as loan volume over total assets. The figure excludes outside values, defined as value smaller than the lower quartile minus 1.5 times the interquartile range, or larger than the upper quartile plus 1.5 times the interquartile range.
Source: Calculations based on internal EIB loan data.

Figure 8. Number of loans and volumes by year and firm size



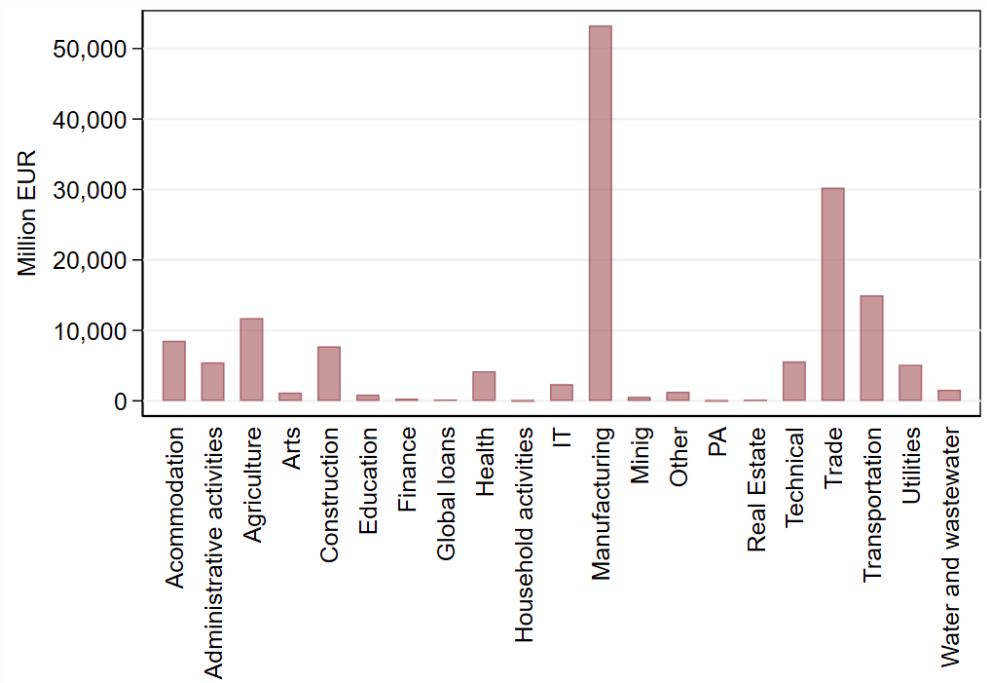
Notes: The graph reports the total number of loans in panel (a) and loan volumes in panel (b) by year and firm size. The number of loans and loan volumes have been computed by year of loan allocation. Shares remain stable over time from 2013 onwards.
Source: Calculations based on internal EIB loan data.

3.2 Sector

The sectorial distribution of loans to SMEs and mid-caps is skewed towards manufacturing and trade industries. Manufacturing refers to sector labelled with NACE section code C, while trade refers to sector labelled with NACE section code G. Figure 9 shows the distribution of loan volumes across sectors for all credits extended between 2008 and 2020. Manufacturing is the sector benefitting from the largest amount of volumes, which sum up to a total figure of more than EUR 50 billion. Loan volumes to businesses in Trade account for approximately EUR 30 billion. Transportation, agriculture and accommodation are other relevant sectors reporting volumes of 15bn, 11bn and 9bn EUR, respectively. Figure 10 provides additional

evidence on the sectorial distribution of volumes over time. Panel (a) shows the evolution of volumes in euros, while panel (b) shows the contribution of each sector to the total volume in every year. Manufacturing and trade are the sectors obtaining the largest volumes between 2008 and 2020. Sectors labelled as "other" represent those sectors that represent the smallest quartile of the distribution over the whole time period.

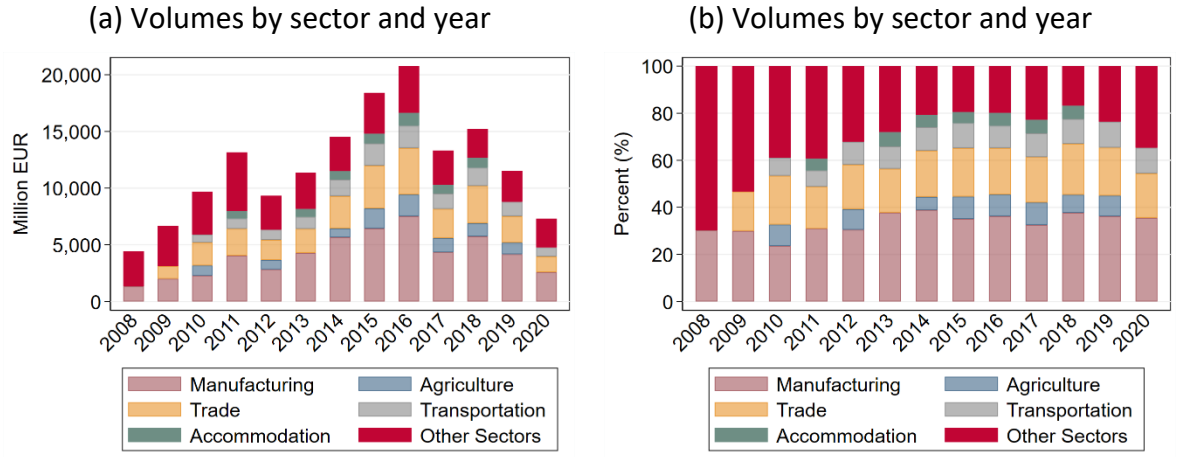
Figure 9. Loan volumes by sector



Notes: Sectors are defined as reported in the EIB's internal loan data. Volumes are aggregated by country based on loans between 2008 and 2020.
Source: Calculations based on internal EIB loan data.

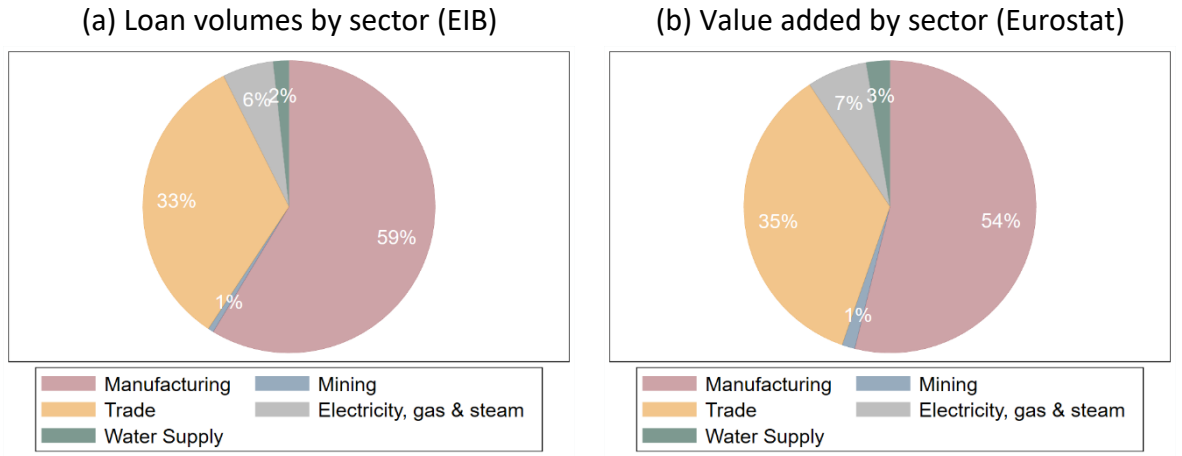
Moreover, MBILs' sectorial distribution mirrors the EU sectoral distribution measured in terms of value added. Figure 11 compares the sectoral distribution of loan volumes for EIB beneficiaries against the ones for EU enterprises. The EU information from Eurostat excludes relevant sectors such as agriculture, transportation and accommodation, which account for a relevant share of the EIB's lending. Thus, to ensure comparability with the sectors included in Eurostat, these have also been excluded from descriptive statistics reported here. Figure 11 shows that manufacturing and trade industries are the largest beneficiaries among the ones considered. These two industries receive approximately 59% (manufacturing) and 33% (trade) of disbursed loans. Electricity, gas and steam is the next largest sector, accounting for circa 6% of total volumes.

Figure 10. Loan volumes by year and sector



Notes: Sectors are defined as reported in the EIB's internal loan data, not using Orbis data. "Other sectors" refers to all remaining sectors not included in the other categories. A full list of sectors is reported in Figure 9. Panel (a) reports volume amounts in million EUR on loans by sector for each year. Panel (b) reports the share composition of loan volumes by sector and for each year.
Source: Calculations based on internal EIB loan data.

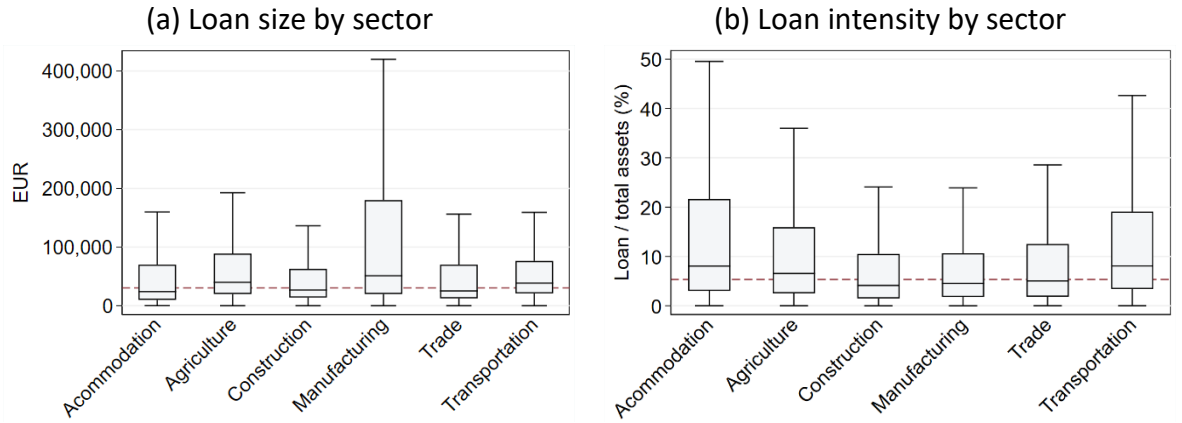
Figure 11. Representativeness of beneficiaries by sector



Notes: Sectors are defined as reported in the EIB's internal loan data, not using Orbis data. Shares are based on loans between 2008 and 2020. Value added of EU firms by size has been computed using Eurostat data. In order to favour comparability between the two groups, we only considered the following sectors: Manufacturing, mining, trade, electricity & gas, water supply (NACE codes B-E, G).
Source: Calculations based on internal EIB loan data and Eurostat.

Zooming in on loans across sectors in greater detail, manufacturing shows on average larger loan sizes. Panel (a) in Figure 12 shows the size distribution across the largest industries benefitting from MBILs. While the range of loan size across most industries ranges between EUR 15,000 and EUR 80,000, loan size for manufacturing industry ranges between EUR 20,000 and EUR 180,000. Panel (b) shows instead the distribution of loan intensity, defined as loan volume over total assets. Interestingly, while firms in manufacturing receive the largest loans in nominal terms, they account for the smallest share in terms of total assets.

Figure 12. Distribution of loan size by sector

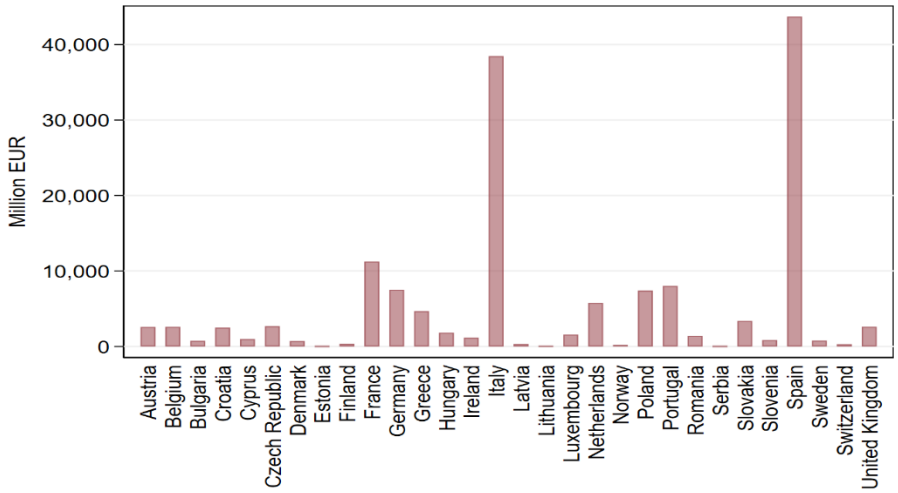


Notes: Distributions are based on loans between 2008 and 2020. Sectors are defined as reported in the EIB's internal loan data. Panel (a) shows the distribution of loan size, while panel (b) shows the distribution of loan intensity, defined as loan volume over total assets. The figures exclude outside values, defined as value smaller than the lower quartile minus 1.5 times the interquartile range, or larger than the upper quartile plus 1.5 times the interquartile range.
Source: Calculations based on internal EIB loan data and Orbis.

3.3 Geographical location

As with sectors, the geographical distribution of MBIL activity in terms of loan volumes is uneven across countries. Figure 13 reports the geographical distribution of loan values across EU countries and it shows Spain and Italy as the two countries receiving the largest volume amounts (EU 44bn and EU 39bn, respectively). France, Portugal, Poland and Germany are other EU countries receiving sizeable, although smaller, loan amounts. When considering the time dimension, panel (a) in Figure 15 reports the share of loan volumes based on beneficiaries' country of residence. Loans to firms located in Spain and Italy account for the largest share of loans especially during the sovereign debt crisis (2011-2013).

Figure 13. Loan volumes by country

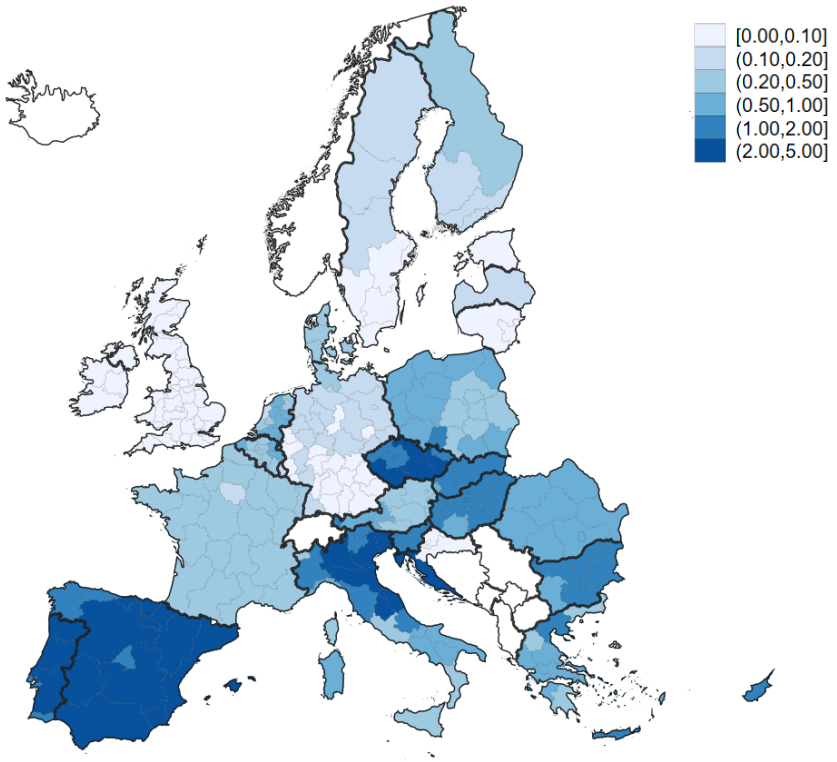


Notes: Countries are defined as reported in the EIB's internal loan data. Volumes are aggregated by country based on loans between 2008 and 2020.
Source: Calculations based on internal EIB loan data.

Relative to GDP, regions in Spain, Portugal, northern Italy, coastal Croatia and Czechia are the principal recipients. Figure 14 plots the total loan volumes between 2008 and 2020 as a

percentage of regional GDP in 2019.[7] This measure provides an indication of the intensity of the intermediated loan volumes in the regions' overall economies. The regions with the relatively highest intensity of MBILs in the local economy were Jadranska Hrvatska (HR), La Rioja (ES), Centro (PT) and Aragón (ES), each with a share over 3.5% over the 2008-2020 period. Overall, regions in Spain, Portugal, Italy, Croatia and Czechia show the highest intensity. Regions in Bulgaria, Cyprus, Hungary, Slovakia and Slovenia follow with a medium to high intensity (1 to 2% of yearly regional GDP). Followed by regions in Greece, Poland and Romania with a medium intensity (0.5 to 1% of yearly regional GDP).

Figure 14. Loan volumes by region (as % of GDP)[7]



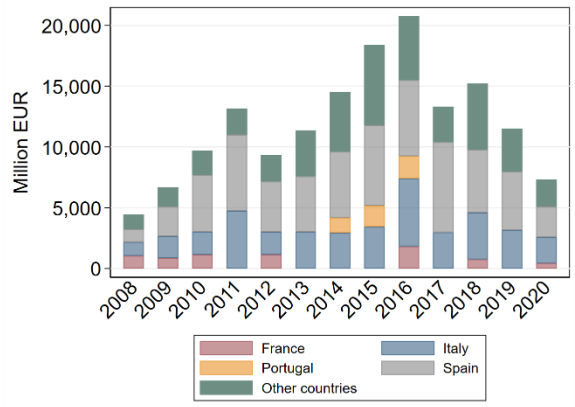
Notes: The figure plots loan volumes between 2008 and 2020 as a percentage of regional GDP. Regional classifications are based on the NUTS2 classification of beneficiary firms as reported in Orbis, therefore some caution is required. For countries with comparatively worse coverage in Orbis there may be a downward bias in the reported shares. The matched data cover less than 50% of loan volumes in Estonia, Greece, Ireland, Latvia, Lithuania and the UK (see Annex 1).
Source: ECON calculations based on internal EIB loan data, Bureau van Dijk's Orbis database and Eurostat.

When considering the distribution of loan size across countries, Greek firms received on average larger loans than firms in other EU countries. While loan size for Greek firms ranges between EUR 10,000 and EUR 500,000 (Figure 16), size for firms in other countries is significantly smaller (between EUR 10,000 and EUR 100,000).

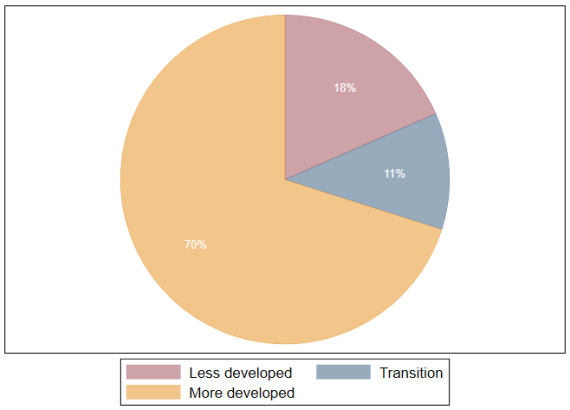
[7] The graph relies on the EIB loan data matched to their Orbis records. As a result, caution is needed when interpreting the results for countries with comparatively worse coverage in Orbis, as this may cause a downward bias on the reported shares. The matched data cover less than 50% of loan volumes in Estonia, Greece, Ireland, Latvia, Lithuania and the UK (see Annex 1).

Figure 15. Representativeness of beneficiaries by country and cohesion region

(a) Loan volumes by country



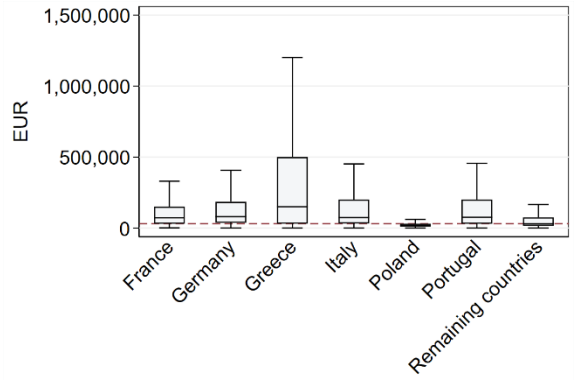
(b) Loan volumes by cohesion region



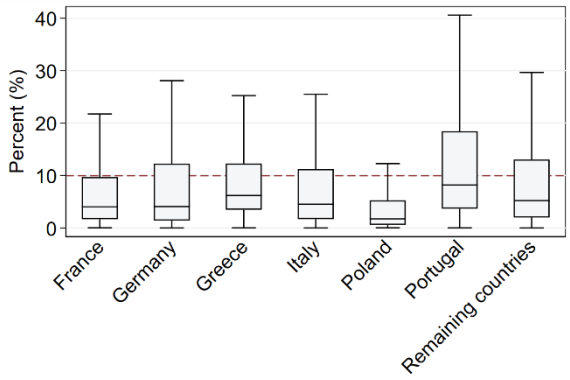
Notes: Countries are defined as reported in the EIB's internal loan data, not using Orbis data. Shares are based on loans between 2008 and 2020. Cohesion regions are based on NUTS2 classification.
Source: Calculations based on internal EIB loan data.

Figure 16. Distribution of loan size by country

(a) Loan size by country



(b) Loan intensity by country



Notes: Countries are defined as reported in the EIB's internal loan data. Distributions are based on loans between 2008 and 2020. Panel (a) shows loan sizes, while panel (b) shows loan intensity, defined as loan volume over total assets. The figure excludes outside values, defined as value smaller than the lower quartile minus 1.5 times the interquartile range, or larger than the upper quartile plus 1.5 times the interquartile range.
Source: Calculations based on internal EIB loan data and Orbis.

Moreover, although a larger share of volumes is by EIB beneficiaries in more developed regions, less developed regions are overrepresented in terms of GDP. Panel (b) in Figure 15 reports the distribution of loan volumes across cohesion regions classified as less developed, in transition and more developed according to the 2014-2020 cohesion definition.[8] It shows that 70% of volumes are allocated to firms in more developed regions. Loans to businesses in less developed and transition regions make up 18% and 11%, respectively. However, since 80%[9] of EU economic activity (GDP) is produced in more developed regions, while only 12%

[8] The 2014-2020 cohesion definition divides NUTS2 regions in three categories depending on the magnitude of the regional GDP per capita relative to the EU average. Regions are classified as less developed regions where GDP per inhabitant was less than 75 % of the EU average, as transition regions where GDP per inhabitant was between 75 % and 90 % of the EU average, and as more developed regions where GDP per inhabitant was more than 90 % of the EU average.

[9] European Investment Bank Cohesion Orientation 2021-2027 (eib.org), Figure 5 page 15.

of GDP is produced in less developed regions, EIB lending is overrepresented in less developed regions as opposed to more developed ones.

Table 1. Summary statistics of loan size by cohesion regions

	N	Mean	Median	Standard deviation	Min	Max
Less developed regions	62,196	219,000	56,880	474,003	4,767	3,114,697
Transition regions	48,118	174,816	59,000	342,262	2,987	2,300,000
More developed regions	202,350	255,129	69,000	549,979	3,000	3,699,479

Notes: Summary statistics are based on observations at the treatment year, between 2008 and 2020. Values are trimmed at the 1% and 99% level to limit outliers. Loan size refers to the size of the loan to the beneficiary.
Source: Calculations based on internal EIB loan data.

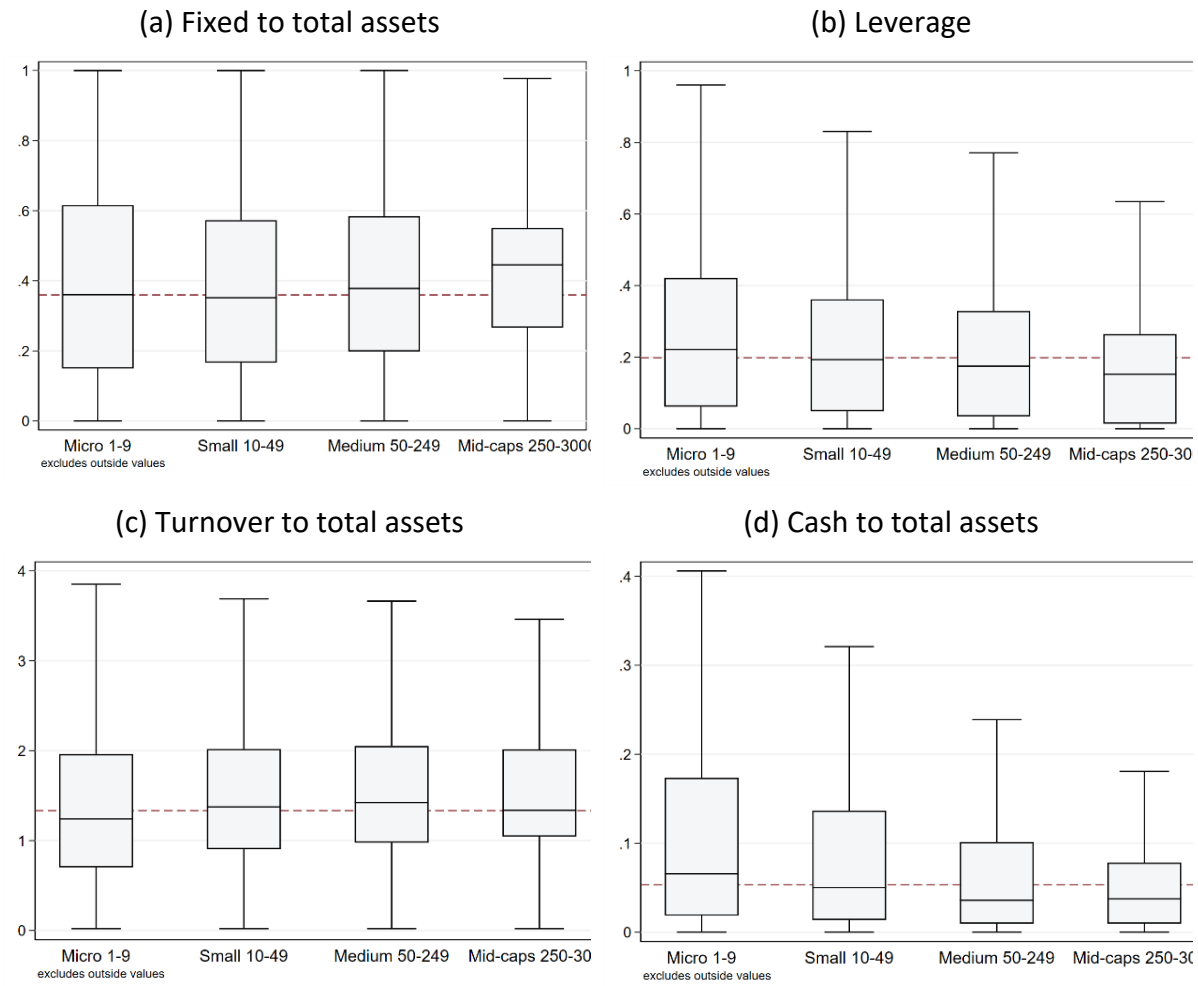
Data by cohesion region show that firms in less developed regions typically receive loans of smaller sizes. Table 1 shows summary statistics for loans by type of cohesion region. Consistently with panel (b) in Figure 15, firms in more developed regions are the largest share of beneficiary recipients, as they account for approximately 63% of the total. In terms of loan size, the median loan size is approximately EUR 57,000 for firms located in less developed regions and it increases to EUR 69,000 for firms located in more developed ones.

3.4 Firm financials

To gain a better understanding of beneficiaries' characteristics, the last part of the data description section compares beneficiaries across different size classes on a set of relevant financial ratios. Firms' financials are obtained from Orbis (Bureau van Dijk), a widely used firm-level dataset containing balance sheet and income statement information. Financial ratios have been reported to ensure comparability across beneficiaries of different size classes.

Firms' financials show that EIB beneficiaries have similar financial ratios across different size classes. Figure 17 reports the distribution of financial ratios for EIB beneficiaries in the year before receiving an MBIL loan. Panel (a) shows the distribution for fixed assets to total assets ratio across firm size classes. Fixed assets ratio equals 0.37 for micro, small and medium businesses, while it is higher for mid-caps. Figure 17 also shows a homogeneous distribution of leverage (panel b), turnover-to-total-assets (panel c) and cash-to-total-assets (panel d), although mid-caps report a smaller interquartile range. The smaller range is explained by a lower number of mid-caps in the sample.

Figure 17. Firms' financials at time of treatment by size class



Notes: The graph shows the distribution of firms' financials by firm size in the year before receiving the loan. Distributions are based on loans between 2008 and 2020. Panel (a) reports the distribution of total assets; panel (b) shows the distribution of leverage, defined as total debt over total assets; panel (c) shows the distribution of turnover-to-total assets ratio; panel (d) shows the distribution of cash to total assets. The figure excludes outside values, defined as value smaller than the lower quartile minus 1.5 times the interquartile range, or larger than the upper quartile plus 1.5 times the interquartile range.

Table 2 gives a broad overview of other key financial variables. The table reports EIB beneficiaries' summary statistics on a number of key financial variables, where these are available in Orbis. The variables are winsorized to limit the effect of outliers on key statistics. The table shows the average and median size of EIB beneficiaries in terms of total assets and employment. In addition, it reports on beneficiaries' investment, leverage, earnings and profitability in the year of treatment.

Table 2. Summary statistics of EIB beneficiaries

	Obs.	*Mean*	*Median*	*St.dev.*	*Min.*	*Max.*
Firm age	221,004	15.51	13.00	11.75	0.00	65.00
Number of employees	183,691	25.69	10.00	44.13	1.00	398.00
Total assets (m EUR)	218,537	3.41	1.05	6.94	0.01	67.42
Tangible fixed assets (m EUR)	216,970	1.05	0.24	2.39	0.00	23.23
Tangible assets ratio	216,422	0.32	0.28	0.25	0.00	0.95
Leverage ratio	216,503	0.70	0.71	0.27	0.05	2.18
Earnings (m EUR)	196,314	0.32	0.08	0.73	-0.36	7.23
Profitability	204,362	0.14	0.09	0.45	-2.97	2.92
Value added (m EUR)	140,798	4.17	1.30	8.39	0.03	78.53
Intangible fixed assets (m EUR)	214,759	0.06	0.00	0.21	0.00	2.55
Patent filings, dummy	224,341	0.01	0.00	0.07	0.00	1.00

Notes: Summary statistics are based on observations at the treatment year, between 2008 and 2020. Values are trimmed at the 99% level to limit outliers. The tangible assets ratio is defined as tangible fixed assets over total assets. The leverage ratio is defined as current and non-current liabilities over total assets. Earnings are expressed as the EBITDA. Profitability is defined as the firm's profit over shareholder funds. Value added comprises the sum of a firm's net income, taxation, cost of materials, cost of labour, depreciation and interests paid.

4 METHODOLOGY

To assess the impact of EIB intermediated lending on firm performance, we carry out a counterfactual analysis that compares EIB MBIL beneficiaries to a group of firms that did not receive any MBIL (but may have still received other forms of financing).[10] Our methodology consists of three steps: (*i*) merging the internal EIB loan data with detailed information on firms' financials; (*ii*) defining a "good" control group; and (*iii*) estimating the impact of EIB intermediated lending using an econometric model.

4.1 Database

The starting point of the analysis of this report is the administrative database of EIB lending. We start from all EIB loans to SMEs and mid-caps located in the EU27 and the UK between 01-01-2008 and 31-12-2020. This is narrowed down by excluding loans that were cancelled after signature. Furthermore, guarantees are excluded from the data.[11]

To track financial performance of firms with EIB support, we merge the EIB loan data with data on individual SMEs' financial and economic performance. We obtain information on the financial and economic performance of firms from Bureau van Dijk's Orbis data, a widely

[10] The approach follows a broadly similar methodology as previous impact assessments of the EIB Group's multiple beneficiary intermediated loan (MBIL) activities (Amamou et al., 2020; Barbera et al., 2021), loan guarantees (Bertoni et al., 2018, 2019; Brault and Signore, 2019), venture capital (Pavlova and Signore, 2019, 2021) and venture debt (Sinnott et al., 2022).

[11] The focus of the analysis is on intermediated lending via Multiple Beneficiary Intermediated Loans (MBILs). In addition to plain vanilla MBILs (79% of all included allocations), the analysis includes intermediated SME financing under the "Loan for SMEs, Mid-Caps & other priorities" via both the granular asset backed securities (ABS) senior and mezzanine tranches (11%) and Covered Bonds (10%).

used firm-level database containing balance sheet information. The balance sheet information in Orbis comes from business registers collected by the local chambers of commerce to fulfil legal and administrative requirements.[12] Financial data typically become available with a two-year lag, thus leaving us with data up to 2020. Nevertheless, the statistical analysis requires the availability of data on firms' financials for a three-year window post the loan receipt. Consequently, the impact analysis had to be limited to 2017 loans.

In addition to the availability of data on firms' financials for a three-year window after the loan receipt, the sample used for analysis is limited by the coverage of some key variables in Orbis. As Orbis is not uniformly well-populated in some countries and company categories, data attrition occurs. Annex 1 reports the coverage of the database, both in terms of loan volumes and individual beneficiary firms, by country and year at different stages of the data preparation. Overall, the ability to link beneficiaries to their financial data has been steadily improving over time, with coverage for the full sample now reaching almost 80% of loan volumes and around 50% of beneficiary firms.[13] However, the analysis imposes relatively strong data requirements in terms of the minimum available observations of the variables used in the estimation process. Lack of Orbis coverage in some key variables results in certain countries dropping out of the sample altogether, like in the case of Cyprus, Estonia, Ireland, Lithuania or the UK. However, most of the largest beneficiary countries have good Orbis coverage. The exception is Poland, where less than three percent of the volumes are successfully matched and populated with data.[14]

Despite the attrition due to its limited coverage, the Orbis database provides relevant information on beneficiaries' financials and their distribution. Figure 18 shows the distribution of value added (panel a) and ROE (panel b) for EIB beneficiaries at the time of the loan. The median beneficiary has a value added of EUR 0.4 million, well below the average (EUR 1.1 million) as shown in the right-skewed distribution. Panel (b) shows instead the distribution of firms' return on equity (ROE) centred around 11%. Unlike firms' value added, the distribution of firms' ROE is less skewed to the right and the median and average values almost coincide. Finally, value added across beneficiaries ranges between EUR -0.1 million and EUR 6 million, while firms' ROE shows a much wider range.

Firms' financial variables show a high importance of the EIB financing in their business. Figure 19 reports the distribution of two financial variables of EIB beneficiaries. Panel (a) shows the distribution of MBIL intensity, defined as the share between the loan size that beneficiaries secure under the MBIL contract and the existing stock of debt. This variable

[12] Specifically, firms' unconsolidated accounts are used, with all monetary values expressed in euro and monetary variables deflated using the country-year specific Harmonised Index of Consumer Prices. In addition, we clean the data following the seminal approach by Kalemli-Ozcan et al. (2015), e.g., excluding observations with odd or inconsistent values and dropping firm-year financial statements which violate the basic balance-sheet equivalences by more than 10%. Finally, we winsorize the series by year at the 1%-level.

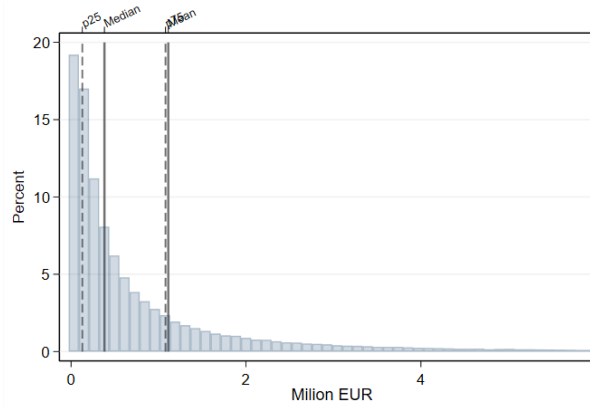
[13] The availability of the fiscal identifiers in the internal EIB loan data has benefitted the coverage for these years in particular. That the coverage of the data with BvD IDs is lower when measured in terms of number of recipients rather than volumes can be explained by the limited coverage of the smallest firms in some of the countries in the sample. Companies that are not legally required to submit or publish financial statements are unlikely to be covered.

[14] While the coverage for Poland remains unfortunately low, there has been noticeable improvement since previous impact assessments, where the final coverage was below 1%.

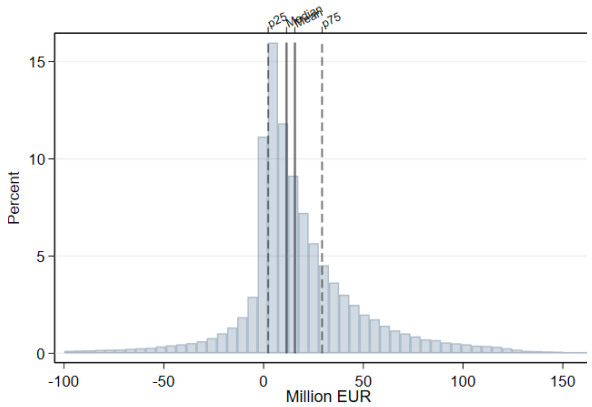
shows a high importance of the MBILs financing relative to pre-existing levels debt: the median MBIL intensity is approximately 40%, while the average value is 70%, suggesting that EIB financing under the form of MBIL accounts for approximately 50% of existing financing. Panel (b) shows instead the distribution of the interest coverage ratio (ICR), defined as EBIT over interest paid. A high ICR shows that firms' business generates enough liquidity to service their debt, while a low ICR suggests that a firm might be facing financing difficulties. The ICR distribution is centred around 3% and the inter-quartile range (the distribution between the 25th and the 75th percentile) is greater than one.

Figure 18. Value added and ROE distribution for EIB beneficiaries

(a) Value added EIB beneficiaries



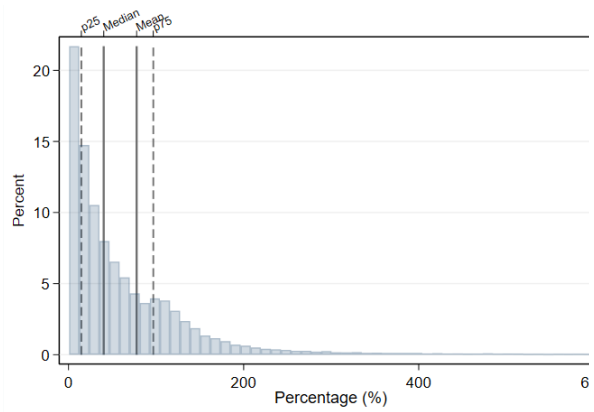
(b) ROE EIB beneficiaries



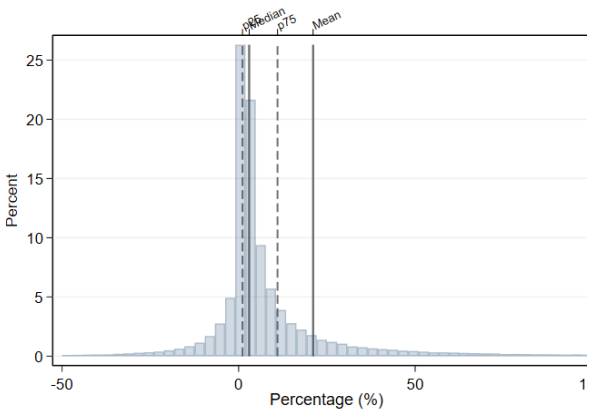
Notes: Distributions are based on observations at the treatment year, between 2008 and 2020. Graphs have been truncated to report at at least 90% of the distribution.

Figure 19. MBIL intensity and interest coverage ratio for EIB beneficiaries

(a) MBIL intensity EIB beneficiaries



(b) Interest coverage ratio EIB beneficiaries



Notes: Distributions are based on observations at the treatment year, between 2008 and 2020. Graphs have been truncated to report at at least 90% of the distribution.

4.2 Identifying the control group

We define a control group as a group of firms similar to the EIB beneficiaries ("treated group"), but that did not receive any EIB intermediated loan. Ideally, a control group would be composed of the same EIB beneficiaries observed under a hypothetical scenario where they did not sign any loan contract ("counterfactual"). Since counterfactuals are not

observable, we approximate this "ideal" control group with a group of firms that are similar to the treated ones. Importantly, we require the treated and control group to show *parallel trends* on a set of predetermined characteristics measured in the years before signing the MBIL contract ("pre-period"). Ensuring parallel trends in the pre-period supports the assumption that, in the absence of a loan, treated firms would have behaved as the ones in the control group.

To construct a control group that could credibly act as a counterfactual to the group receiving EIB intermediated loans, we rely on stratified sampling. In theory, the pool of potential counterfactuals should contain all EU SMEs and mid-caps that have been active between 2008 and 2017. However, to better reflect the characteristics of the treated firms, we create a control group by a stratified sampling approach. We create strata along the dimension of the country, year of the loan, firm size (0-9, 10-49, 50-250 and 250+ employees) and industry. We populate the potential control pool by drawing for each stratum a random sample from the same stratum in the full Orbis data set, which is approximately twenty times bigger than the number of treated firms in the data (Table 3, first column).[15]

Table 3. Control firms

	Potential	**With propensity score**		**Matched**
	(# firms)	*(# firms)*	*(in %)*	*(# firms)*
2008	71,454	64,171	89.81	3,005
2009	93,877	88,405	94.17	4,531
2010	122,184	116,856	95.64	6,422
2011	150,456	143,632	95.46	7,495
2012	105,307	99,763	94.74	6,148
2013	153,978	148,331	96.33	8,940
2014	327,656	311,135	94.96	18,088
2015	358,311	336,948	94.04	19,005
2016	326,035	302,104	92.66	13,646
2017	355,923	327,330	91.97	9,550
Total	2,065,181	1,938,675	93.87	96,830

Notes: The table reports the number of control firms at the different stages of analysis: the initially extracted pool of potential controls, the subset of this pool for which the propensity score can be calculated and the final sample of control firms matched to the treated firms in the impact assessment.
Source: ECON calculations based on internal EIB loan data and Bureau van Dijk's Orbis database.

We restrict the set of control firms by selecting those firms that are closest to the set of treated firms based on their key characteristics prior to receiving an intermediated loan. We select firms using propensity score matching (PSM), a multidimensional statistical methodology that choses as controls those firms with the closest likelihood (or score) of receiving an EIB loan based on the following variables: number of employees, total assets, leverage ratio, cash ratio, current ratio, asset turnover ratio, tangible fixed assets over total

[15] A pre-condition for a firm to be drawn into a sample of potential counterfactuals is that it has not received funding and that it has data for seven consecutive years, centred around a given strata year.

assets, sales growth and patent applications.[16] We were able to estimate the score based on the balance sheet variables over a three-year period for 94% of the identified potential control firms (Table 3, columns two and three).[17] Finally, we use the estimated scores to select the 96,830 control firms (Table 3, last column) that are the most similar to the set of treated firms in our final sample prior to the EIB loan.

We assessed the quality of the matching of EIB beneficiaries to control firms based on likelihood scores of obtaining an EIB loan. Figure 20 compares the distribution of the score, the likelihood of being treated, for both the group of potential controls and the group of matched controls to that of the treated firms. Panel (a) shows the distribution of the estimated propensity score for the EIB beneficiaries (full line) and the group of potential control firms available prior to the matching (dashed line). It shows that the group of potential controls still contains comparatively more firms that are unlikely to be considered for a loan, i.e., with a low score. Panel (b) shows the sample after matching, i.e., the distribution of the estimated propensity score for the EIB beneficiaries (full line) and the matched control firms (dashed line) used in the analysis. The graph shows that the scores obtained for each of the firm groups have a comparable, but small probability of obtaining an EIB loan.

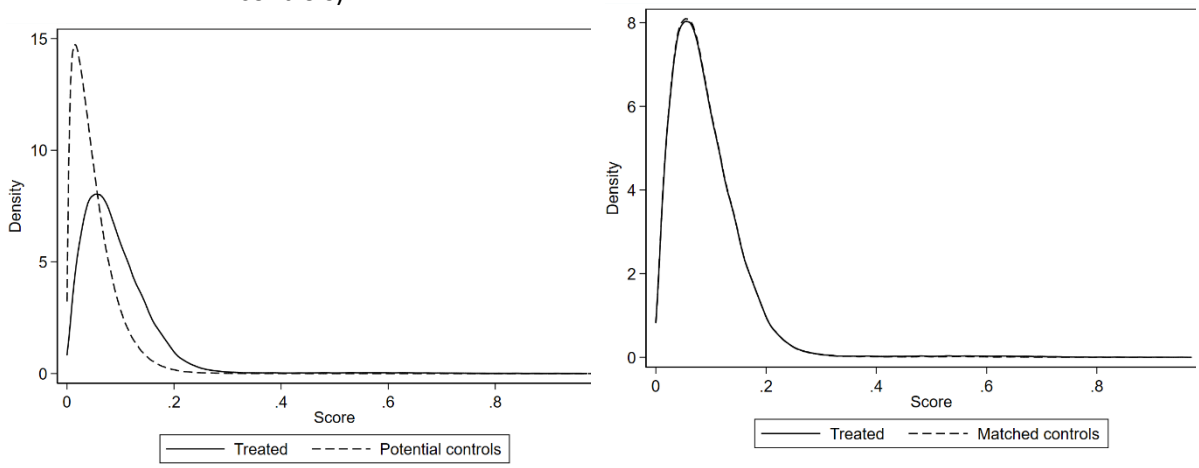
We further assessed the quality of the control group selected with propensity score matching. Figure 21 assesses the performance of the matching by plotting the comparability of the matched and unmatched control groups to the EIB beneficiaries.[18] The figure shows that the matched sample experienced a large reduction in the standardized bias between treated and control group, if compared with the unmatched sample. Dots show the standardized percentage bias between treated and control groups across covariates, while crosses show the same standardized bias when the matched control group is considered. The figure thus shows a consistent drop in the standardized bias following the selection of the control group via the propensity score matching. Therefore, it is safe to say that Figure 20 and Figure 21 validate the matched sample for use in the analysis.

[16] See Caliendo and Kopeinig (2008) for a detailed overview of method and its possible applications.
[17] Table 18 in Annex 3, moreover, shows the results of the probability model estimation used for matching our treated firms to comparable controls. It can be considered as the optimal compromise between improving the fit between treated and controls on the one hand, e.g. by including multiple lags and non-linear terms, and maximizing the final number of matched firms available for analysis.
[18] The summary statistics for key variables for both the matched and unmatched control groups as well as the treated group in the years prior to treatment are also include in Table 19 in Annex 3. The table confirms the observations from Figure 21.

Figure 20. Matching of the control group based on propensity scores

(a) Probability density of scores prior to matching (full = EIB recipients, dash = potential controls)

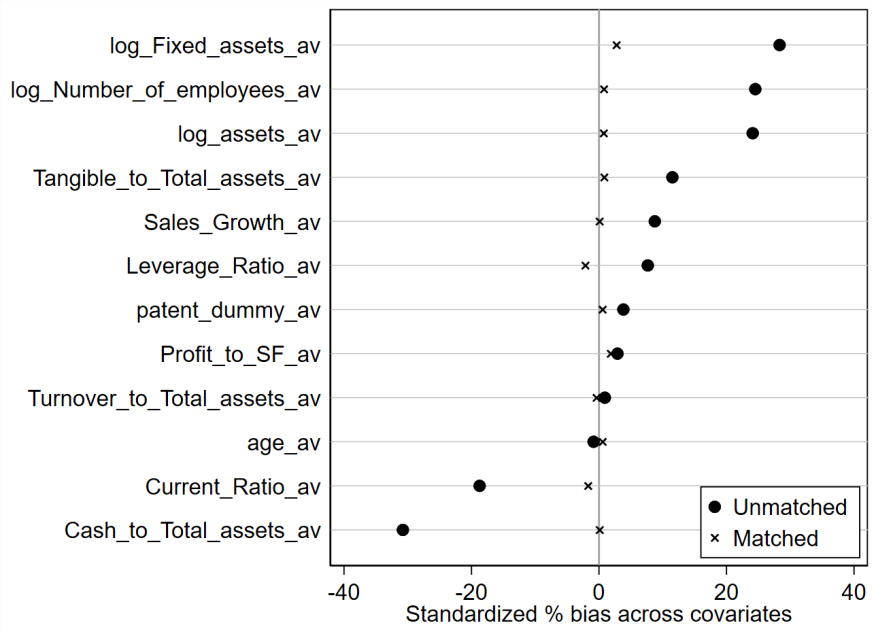
(b) Probability density of scores after matching (full = EIB recipients, dash = matched controls)



Notes: The two graphs report on the matching of the EIB beneficiaries (i.e. treated firms) to a control group. Panel (a) reports the distribution of the estimated propensity score, the likelihood of being treated, for both the EIB beneficiaries (full line) and the group of potential control firms available prior to the matching (dashed line). Panel (b) reports the distribution of the estimated propensity score for the EIB beneficiaries (full line) and the matched control firms (dashed line) used in the analysis.

Source: ECON estimations based on internal EIB loan data and Bureau van Dijk's Orbis database.

Figure 21. Performance of the matching of the control group



Notes: The graph reports the standardized bias of the matched and unmatched control groups.

Source: ECON estimations based on internal EIB loan data and Bureau van Dijk's Orbis database.

4.3 Estimation approach

As a third step, we estimate an econometric model that compares the treatment and control groups before and after receiving the intermediated loan (so-called difference-in-differences estimation). This model compares firms in the treated and control groups, before and after treatment. The causal interpretation of our results is ensured by testing whether the estimated effects can be explained by any alternative mechanisms at different points in time. A detailed description of this approach and other notes on the methodology can be found in Annex 2.

We estimate the difference-in-differences model using the following specification:

$$y_{it} = \beta(T_i \times post_t) + \gamma_i + \delta_{cts} + \varepsilon_{it} \qquad \text{(eq. 1)}$$

where y_{it} is the outcome variable of interest for firm i in year t, with subscript t denoting time relative to the year of treatment, namely standardized to 0 in the year the treated firms got their EIB loan. Dummy variable T_i equals 1 for the firms that received EIB financing, and zero otherwise. The dummy $post_t$ defines pre- and post-periods and it equals 1 when $t \geq 0$ and 0 otherwise. The coefficient β is the coefficient of interest, as it quantifies the causal effect of receiving EIB lending on the outcome variable of interest, e.g. a firm's assets. In addition, the model also controls for firm fixed effects (γ_i) and country-year-sector fixed effects (δ_{cts}). Finally, ε_{it} denotes the idiosyncratic errors. More methodological details are provided in Annex 2. The results of the difference-in-differences estimation are included below (Section 5) and indicate that EIB's financing goes hand in hand with higher firm growth.

We also estimate an event-study that formally tests for parallel trends in the pre-period. For example, a positive effect found in the estimation of equation (1) could be explained by the fact the EIB selects firms that are already growing, irrespectively of whether they receive intermediated lending. To rule this out and to claim a causal effect of the EIB's loans on firms' performance, we test whether the effect estimated in the difference-in-differences predates the time when firms receive intermediated loans. We do this by estimating the following model, which deviates from a plain difference-in-differences specification as it includes time varying coefficients:

$$y_{it} = \sum_{\tau=-3}^{-2} \beta_\tau T_i 1(t=\tau) + \sum_{\tau=0}^{3} \beta_\tau T_i 1(t=\tau) + \gamma_i + \delta_{cts} + \varepsilon_{it} \qquad \text{(eq. 2)}$$

Where (β_τ) are the time-varying coefficients estimated separately for each point in time.[19] We normalized the coefficient at time *t*=-1, β_{-1}, equal to 0 coefficients so that the other coefficients can be interpreted as the cumulative impact with respect to this baseline. Results of the event study estimation are discussed in detail below (Section 5). In short, they confirm the positive impact of EIB lending on firm growth, employment, investment, leverage, earnings and value added. Moreover, the lack of a clear trend prior to the time of the loan, supports a causal interpretation.

[19] The indicator function $1(t=\tau)$ equals one when *t* equals τ.

5 IMPACT ASSESSMENT

5.1 Baseline Results

We produce a variety of different sets of results that assess the impact of EIB intermediated loans on employment, firm growth, investment, innovativeness and other financial variables. This subsection (5.1) presents in detail the baseline results for the full sample. Section 5.2 explores further which particular types of firms drive the impact, by splitting the impact by subgroup (e.g. SMEs vis-à-vis mid-caps; firms in less developed regions relative to those in more developed regions).

The baseline results show a significant and positive impact of EIB intermediated lending on beneficiaries' employment, growth, investment, leverage, earnings, productivity and innovative capacity. Figure 22 summarizes the average impact for each of the variables in the three years after receiving the loan. The positive impact on employment, firm growth and investment (5.4%, 6.0% and 15.3%, respectively) are closely in line with the findings of the previous impact assessments of the EIB MBIL activities. Similarly, our results confirm an average 2 percentage point increase in beneficiaries leverage ratio in the years after loan receipt and no significant impact on beneficiaries' profitability. Nevertheless, our results extend earlier findings by exploring the impact on firms' earnings and productivity, both showing significant increases upon receiving a loan (4.7% and 5.3%, respectively). Finally, EIB beneficiaries show a significant increase in their innovative capacity. However, the magnitude differs substantially according to the measure used. We discuss each result in more detail below.

Table 4 reports the detailed estimation results for the difference-in-differences model.[20] The coefficients reported in the table are semi-elasticities and need to be multiplied by 100 for an easier interpretation. For example, EIB loan beneficiaries' total assets are on average 6.0% larger than that of their peers following the receipt of the EIB loan. By contrast, the interpretation of the impact on profitability and leverage is in percentage points, as the variables of interest are ratios. For example, EIB loan beneficiaries' leverage ratio is on average 1.8 pp. higher than that of their peers.

Our results show a significant and positive impact on employment in the years after signature. Firms receiving EIB lending report 5.4% higher employment numbers on average compared to firms that did not sign any EIB intermediated loan contract (Table 4). To put this into context, EIB-loan recipients have circa 26 full-time employees on average. Therefore, a 5.4% increase implies an average increase of staff by 1.4 full-time equivalents (FTE) in the three years after the loan.[21] Panel (a) of Figure 23 shows this impact over time. Dots in Figure 23 represent the estimated effect of EIB loans on total assets for EIB beneficiaries, with

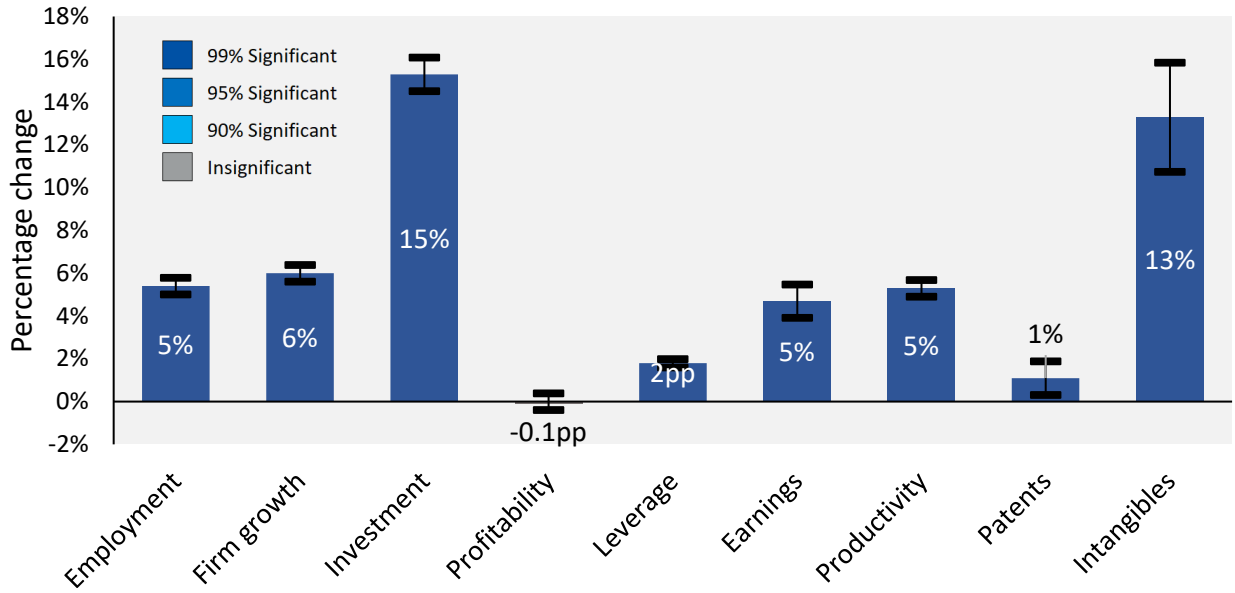
[20] Table 12 in annex also reports the estimation results for a subsample of matched firms for which the long-term debt of the control firm is at least as high as that of the treated firm. Imposing this additional restriction ensures that all firms in the control group can secure long-term debt from commercial banks. The results confirm the robustness of the results in the baseline sample, with the exception of the impact on the number of patents filed, which is insignificant for the subsample.

[21] Over the period 2008-2020 the EIB supported an average of 159 employees per million euro of intermediated loan. Broadly speaking, the 5.4% employment impact estimate suggests that every million euro of lending resulted in 8.6 (FTE) additional jobs on average in the three years following the loan.

respect to their peers in the control group, at each point in time. The effects are normalised to zero in the year prior to loan signature (t=-1) and can thus be interpreted as relative to the year immediately before signing the contract. For example, in the year the credit is obtained (t=0) the average EIB loan beneficiary reports employment to be 2.5% higher than in the year prior to signature. This impact increases to 7.7% three years after signature.[22] The bands around the dots show the 95% confidence intervals of the estimates.

The results also show a significant and positive impact on firm growth, as measured by total assets, in the years after signature. Panel (b) of Figure 23 shows that as soon as the year of the loan beneficiaries report total assets that are 5.7% higher vis-à-vis their peers. This impact increases to 8.8%, or approximately EUR 300,000 in assets on average, three years after signature. Taken together, the results in panels (a) and (b) of Figure 23 support the conclusion that MBIL beneficiaries grow faster than their counterparts that did not get an EIB intermediated loan.

Figure 22. Average impact of EIB loan in the three years after the loan



Notes: The graph reports the average impact for MBIL recipients relative to their peers in the three years after the loan. Employment is measured as the number of employees. Firm growth is measured by total assets. Investment is measured by tangible fixed assets. Profitability is measured by the share of profits to shareholder funds. Leverage is measured as a share of current and non-current liabilities to total assets. Earnings are measured by the earnings before income, taxes, depreciation and amortization (EBITDA). Productivity is measured by value added, which is defined as the sum of a firm's net income, taxation, cost of materials, cost of labour, depreciation and interests paid. Patents are measured as the number of patent applications in a given year. Intangibles are measured by intangible fixed assets. The whiskers around the bars show the 95% confidence intervals.

Source: ECON estimations based on internal EIB loan data and Bureau van Dijk's Orbis database.

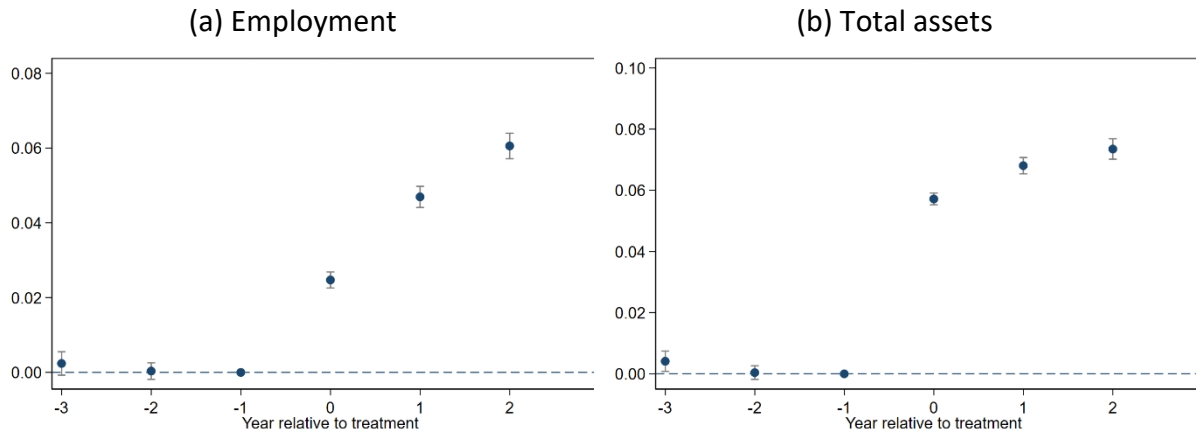
[22] Three years after the loan the "jobs multiplier" thus reaches 12.3 (FTE) additional jobs on average for every million euro of lending.

Table 4. Difference-in-differences estimation results – Baseline

	(1) Employment (log)	(2) Total assets (log)	(3) Tangible fixed assets (log)	(4) Profit to shareholder funds ratio	(5) Leverage ratio	(6) Earnings (log)	(7) Value added (log)	(8) Patents filed	(9) Intangible fixed assets (log)
Post	-0.065***	-0.090***	-0.174***	0.006***	-0.010***	-0.067***	-0.069***	-0.010***	-0.127***
	(0.001)	(0.001)	(0.003)	(0.002)	(0.001)	(0.003)	(0.002)	(0.003)	(0.010)
Treated x Post	0.054***	0.060***	0.153***	-0.001	0.018***	0.047***	0.053***	0.011***	0.133***
	(0.002)	(0.002)	(0.004)	(0.002)	(0.001)	(0.004)	(0.002)	(0.004)	(0.013)
Fixed Effects:									
Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year x Sector	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.949	0.971	0.924	0.268	0.821	0.880	0.964	0.943	0.846
Observations	1,296,337	1,302,480	1,285,955	1,300,327	1,301,386	1,133,915	977,528	1,303,184	1,292,867

Notes: Estimation results of the main treatment effects model. Employment is measured as the number of employees. The leverage ratio is measured as a share of current and non-current liabilities to total assets. Earnings are measured by the earnings before income, taxes, depreciation and amortization (EBITDA). Value added is defined as the sum of a firm's net income, taxation, cost of materials, cost of labour, depreciation and interests paid. Patents are measured as the number of patent applications in a given year. Standard errors, clustered at the firm level, are noted in parentheses: * p<0.10, ** p<0.05, *** p<0.01.
Source: ECON estimations based on internal EIB loan data and Bureau van Dijk's Orbis database.

Figure 23. Effect of MBILs on firm growth



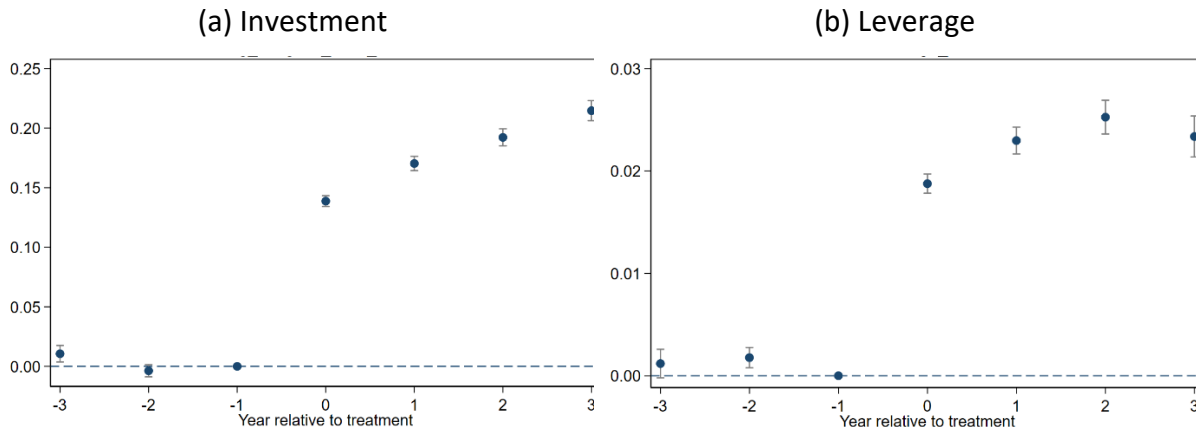
Notes: The graph on the left reports the effect of EIB intermediated loans on employment, defined as the log number of employees. The graph on the right shows the effect of EIB intermediated loans on total assets (in logs). Coefficients are normalised with respect to the year prior to loan allocation (t=-1) and can be interpreted as the cumulative effect of the loan with respect to this baseline. The bands around the dots show the 95% confidence intervals of the estimates.

Source: ECON estimations based on internal EIB loan data and Bureau van Dijk's Orbis database.

EIB beneficiaries report substantial increases in investment, as measured by tangible fixed assets, upon obtaining a loan. Panel (a) of Figure 24 shows that the MBILs´ impact on investment reaches 21.5% three years after the loan. Similar to the observed firm growth after loan receipt, the investment impact materializes gradually over time. This can indicate that the increase in the level of firm activity happens along with a proportionally higher accumulation of productive assets. At any rate, firms already report a strong initial investment (13.9%) in the year the loan is signed. As shown by panel (b) of Figure 24, the substantial investment push is associated with a limited, but significant increase in firms´ leverage ratio, between 1.9 and 2.5 percentage points.[23]

[23] The leverage ratio is defined as the ratio of a firm's debt over its total assets. EIB-loan recipients hold EUR 3.41 million in total assets on average and have a leverage ratio of 0.7 on average. Consequently, a 2.5 percentage point increase in the leverage ratio implies an increase of approximately EUR 85,000 in beneficiary firms' liabilities on average. At the same time, the 13.9% increase in tangible fixed assets corresponds to an investment of approximately EUR 146,000.

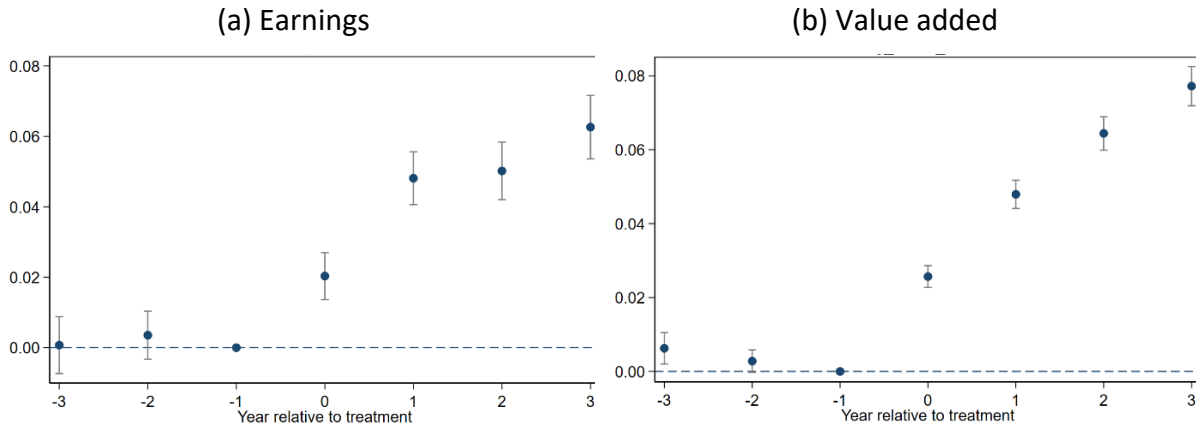
Figure 24. Effect of MBILs on firms' investment and leverage



Notes: The graph on the left reports the effect of EIB intermediated loans on investment, defined as firms' tangible fixed assets (in logs). The graph on the right shows the effect of EIB intermediated loans on the leverage ratio, defined as the ratio of a firm's current and non-current liabilities over its total assets. Coefficients are normalised with respect to the year prior to loan allocation (t=-1) and can be interpreted as the cumulative effect of the loan with respect to this baseline. The bands around the dots show the 95% confidence intervals of the estimates.

Source: ECON estimations based on internal EIB loan data and Bureau van Dijk's Orbis database.

Figure 25. Effect of MBILs on firms' earnings and productivity



Notes: The graph on the left reports the effect of EIB intermediated loans on earnings, defined as earnings before interest, taxes, depreciation, and amortization (EBITDA). The graph on the right shows the effect of EIB intermediated loans on productivity as measured by value added, which comprises the sum of a firm's net income, taxation, cost of materials, cost of labour, depreciation and interests paid. Coefficients are normalised with respect to the year prior to loan allocation (t=-1) and can be interpreted as the cumulative effect of the loan with respect to this baseline. The bands around the dots show the 95% confidence intervals of the estimates.

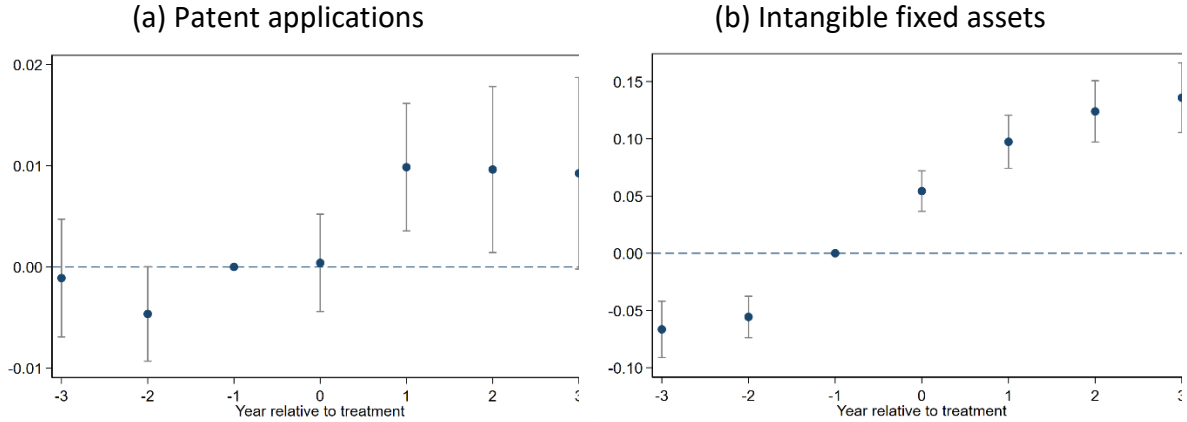
Source: ECON estimations based on internal EIB loan data and Bureau van Dijk's Orbis database.

Our results highlight a significant and positive impact on firms´ earnings and productivity. Despite the absence of an impact on recipients' profitability (Figure 22), MBIL beneficiaries report significant increases in both their earnings and productivity, as measured by value added. Panel (a) of Figure 25 shows a contemporaneous increase in EIB loan recipients´ earnings of 2.0%, increasing to 6.3% three years after (or approximately EUR 20,000 for the

average beneficiary). Panel (b) of Figure 25, in turn, shows a gradual increase in beneficiaries´ productivity from the moment of loan receipt, growing to 7.7% after 3 years.

Relative to that of their peers that did not receive an EIB loan, EIB intermediated loan beneficiaries show a significant increase in their innovative capacity. The magnitude differs according to the measure used. As shown in panel (a) of Figure 26, EIB loan beneficiaries are more likely to submit patents, resulting in a small, yet statistically significant impact (of 1.1% on average) in the number of patent filings in the three year after the loan, with the impact showing as of the first year post loan receipt. On the other hand, EIB beneficiaries report considerably higher (13.3%) intangible fixed assets than their peers in the three years after the loan, see panel (b). The 13.3% corresponds to an additional EUR 8,000 in intangible fixed assets for the average recipients, as the average level of intangible fixed assets prior to treatment remains limited. The difference in magnitudes across both measures could be further explained by data limitations, e.g. the overall share of firms with usable patent data is low in the sample. Moreover, for the intangibles, we observe a small pre-trend in the estimation results, indicating that EIB treated firms' intangibles were growing less fast in the years prior to the loan than those of their counterparts.

Figure 26. Effect of MBILs on firms' innovation activities



Notes: The graph on the left reports the effect of EIB intermediated loans on the number of patent applications by the firms. The graph on the right shows the effect of EIB intermediated loans on intangible fixed assets. Coefficients are normalised with respect to the year prior to loan allocation (t=-1) and can be interpreted as the cumulative effect of the loan with respect to this baseline. The bands around the dots show the 95% confidence intervals of the estimates.

Source: ECON estimations based on internal EIB loan data and Bureau van Dijk's Orbis database.

5.2 Results by subgroups

Next, the analysis looks at heterogeneity in the impact across different subgroups of loan beneficiaries. Specifically, the analyses of subgroups show comparatively higher impacts for younger and smaller EIB beneficiaries, EIB beneficiaries located in less developed regions of the EU and for financially constrained firms.

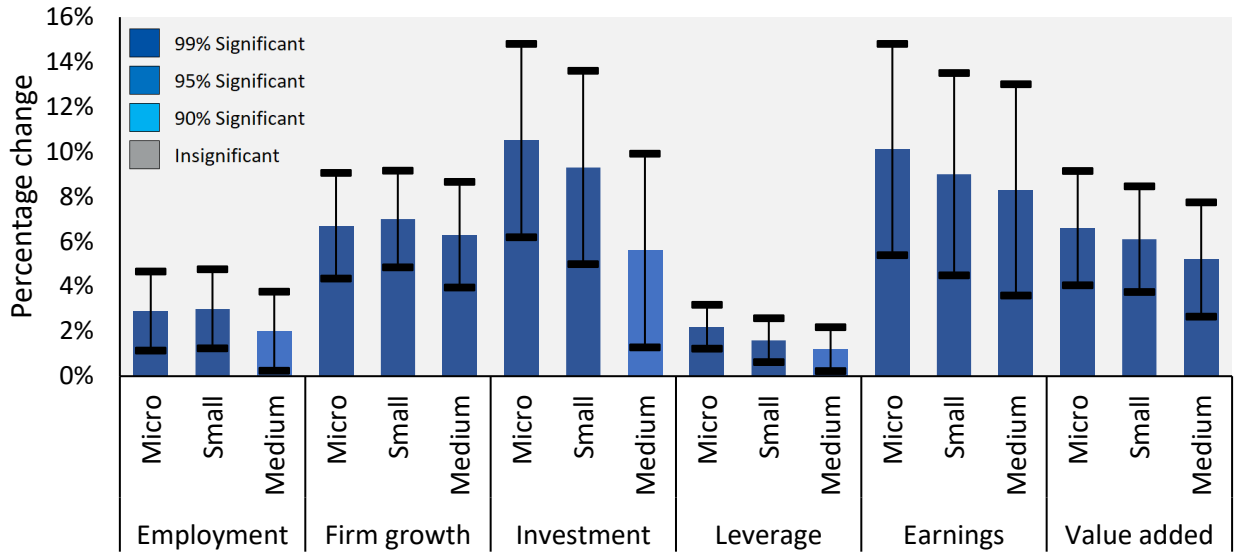
5.2.1 The role of firm size

Additionality is found to be significantly higher for micro, small and medium enterprises. Relative to mid-cap beneficiaries, micro, small and medium-sized EIB loan recipients report

significantly higher growth in employment, firm size, investment, leverage, earnings and productivity in the three years following the loan (Figure 27). This is in line with expectations, as the EIB loan is likely to be larger as a share of the overall balance sheet for smaller firms. Furthermore, smaller firms often face stronger credit constraints.

The results show that the smaller the beneficiary firm, the larger the additional investment impact. For example, relative to mid-cap beneficiaries, micro, small and medium-sized EIB loan recipients invest 11, 9 and 6% more, respectively. However, definite conclusions on the differences among the three SME groups in terms of their investment responses are limited due to the uncertainty around the estimates in Figure 27.

Figure 27. Impact by firm size *(estimates relative to mid-caps)*



Notes: For each output variables, the graph reports the average impact for MBIL recipients of that size relative to their mid-cap peers in the three years after the loan. The whiskers around the bars show the 95% confidence intervals.

Source: ECON estimations based on internal EIB loan data and Bureau van Dijk's Orbis database.

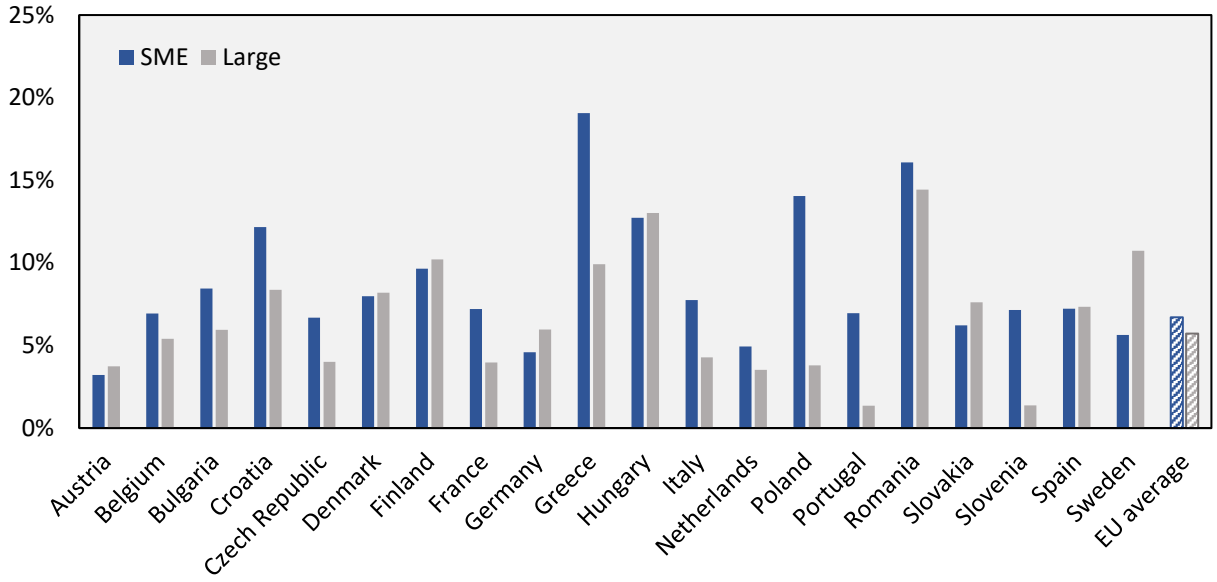
It is important to note that the figures in this and the next subsections show the impact for the subgroups relative to another subgroup. For example, Figure 27 shows the impact of an EIB loan on the different SME groups relative to mid-caps that received an EIB loan. As such, it shows the additional impact observed for these subgroups. The overall positive impact observed in the baseline estimates, including both SMEs and mid-cap beneficiaries and controls, still hold. The focus here, however, is on the impact for SME beneficiaries relative to mid-cap beneficiaries.

We also assessed the differences in impact between SMEs only, i.e. testing the additional impact for micro and small beneficiaries relative to medium-sized beneficiaries. The results confirm the idea that micro and small beneficiaries show higher employment growth, investment, leverage and value added in the three years after the loan, relative to their medium-sized counterparts. The estimation result are reported in Annex 3.

These results are relevant in light of EIB's support to firms' access to finance, as large firms are generally less financially constrained than smaller ones. The literature on access to

finance has shown the importance of firm size in getting access to external finance as financial constraints hinder firm growth and investments. SMEs, in particular, face greater difficulties accessing external finance compared to larger ones.[24] Evidence from the EIB Investment Survey (EIBIS), a firm-level survey on investment and investment finance in the EU, shows that larger firms are less likely to be financially constrained than SMEs (Figure 28). This is particularly true for countries such as Greece, Italy, Poland and Portugal, which are among the largest MBIL recipients. Results reported in Figure 27 can thus be interpreted as being driven by beneficiaries that were financially constrained before receiving a loan.

Figure 28. Share of finance constrained firms in the EU



Notes: Share of financially constrained firms by country and firm size class.

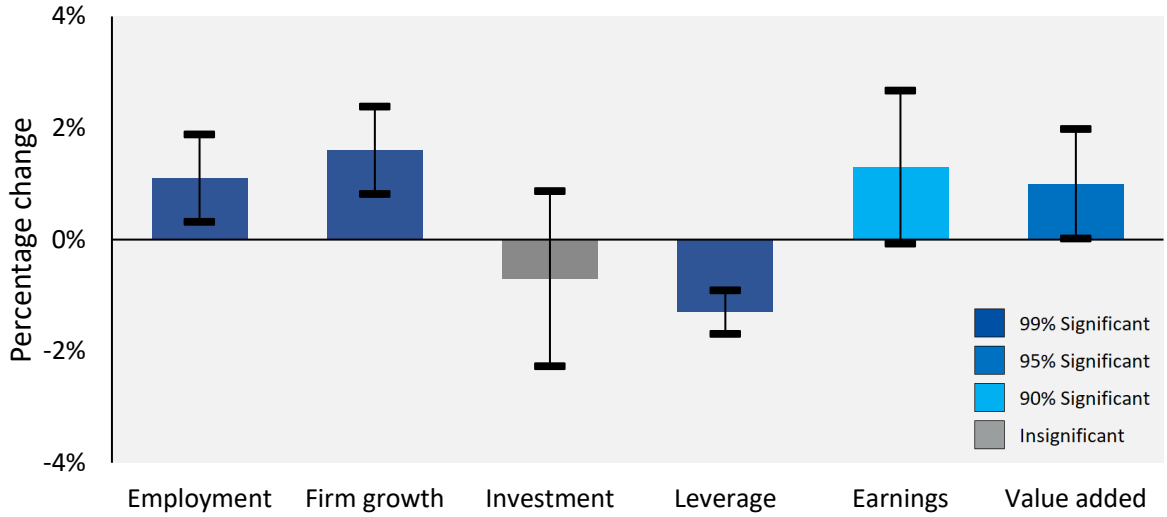
Source: ECON estimations based on the 2022 EIB Investment Survey (EIBIS).

In order to classify the firms in our sample as finance constrained or not, we rely on a proxy heavily used in the literature: the Kaplan-Zingales indicator. Whereas we do not observe banks' true credit scores, this indicator relies on the available information on firms' financials to impute a score. Using US data, the authors estimated the weights for a series of financial variables in predicting whether or not a firm is reporting to be finance constrained or not. Using these weights, firms can be assigned a score (the so-called Kaplan-Zingales indicator) of being finance constrained. We apply this model to the data at hand and use it to classify the firms in our sample as finance constrained if their respective Kaplan-Zingales indicator is higher than the sample median.

The results show that EIB beneficiaries considered financially constrained by the Kaplan-Zingales indicator grow faster upon receiving an EIB intermediated loan, compared to non-constrained counterparts. Figure 29 summarizes the results. Loan beneficiaries who faced financing constraints from the market prior to receiving the loan have limited, but significantly higher growth (between 1.0 and 1.6%) in employment, total assets, earnings and productivity in the three years after the loan.

[24] See e.g., Kaplan and Zingales (1997), Beck and Demirguc-Kunt (2006), Ferrando and Muller (2015) and Ayyagari et al. (2021).

Figure 29. Impact for finance constrained firms *(estimates relative to non-constrained firms)*



Notes: For each of the output variables, the graph reports the average impact for MBIL recipients that were financially constrained upon receiving the loan relative to their non-constrained peers in the three years after the loan. The whiskers around the bars show the 95% confidence intervals. A firm is classified as finance constrained if its respective Kaplan-Zingales indicator is higher than the sample median.

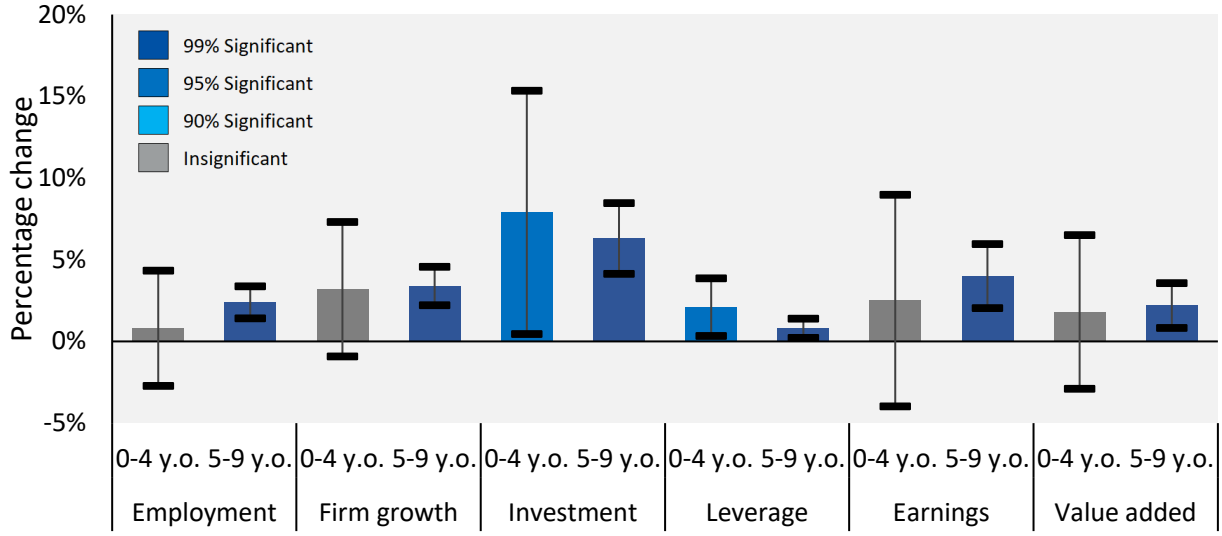
Source: ECON estimations based on internal EIB loan data and Bureau van Dijk's Orbis database.

The negative result on leverage, should not be interpreted as a decrease in leverage, but rather as a lower leverage compared to unconstrained firms. A negative sign shows that leverage for financially constrained firms is smaller than for unconstrained ones after receiving the loan. This could be either because the leverage of constrained firms dropped with respect to unconstrained firms, or because leverage of unconstrained firms increased more, or both.

5.2.1 The role of firm age

Younger firms invest more upon receiving an EIB intermediated loan. Figure 30 reports the impact for two groups of younger EIB beneficiaries, 0-4 years and 5-9 years since incorporation at the moment of receiving the EIB loan, relative to the impact for beneficiaries aged 10 years or older. Relative to beneficiary firms that have been in existence for ten years or more, both groups of younger beneficiaries show stronger responses for investment and leverage. Beneficiaries in the 5-9 year age group also show stronger firm growth, both in terms of assets and employment. This group also reports significantly higher earnings and value added in the three years after receiving the EIB loan, relative to older beneficiaries.

Figure 30. Impact by firm age *(estimates relative to firms with ≥10 years)*



Notes: For each of the output variables, the graph reports the average impact for MBIL firm recipients of that age group relative to their peers that are 10 or more years old in the three years after the loan. Age groups are defined based on the beneficiaries' age at the time of loan allocation. The whiskers around the bars show the 95% confidence intervals.

Source: ECON estimations based on internal EIB loan data and Bureau van Dijk's Orbis database.

Note that an insignificant impact (as indicated by a grey bar) does not mean there is no overall positive impact of EIB lending. It solely indicates that the impact for that subgroup is not statistically different from the comparative group, firms aged 10 or above in this case. Moreover, the statistical insignificance of some of the positive results observed in Figure 30 for the youngest group of beneficiaries (0-4 years) is likely driven by a lack of data. Recall that the analysis requires firms' financials to be observed in a three-year period prior and post treatment. De facto, this requirements limits this group to firms that have been in existence for four years at the time of the loan signature. This group makes up less than 2% of the final sample. Consequently, the fact that the impact for investment and leverage still shows up as statistically significant is a strong signal.

5.2.2 The role of Cohesion policy

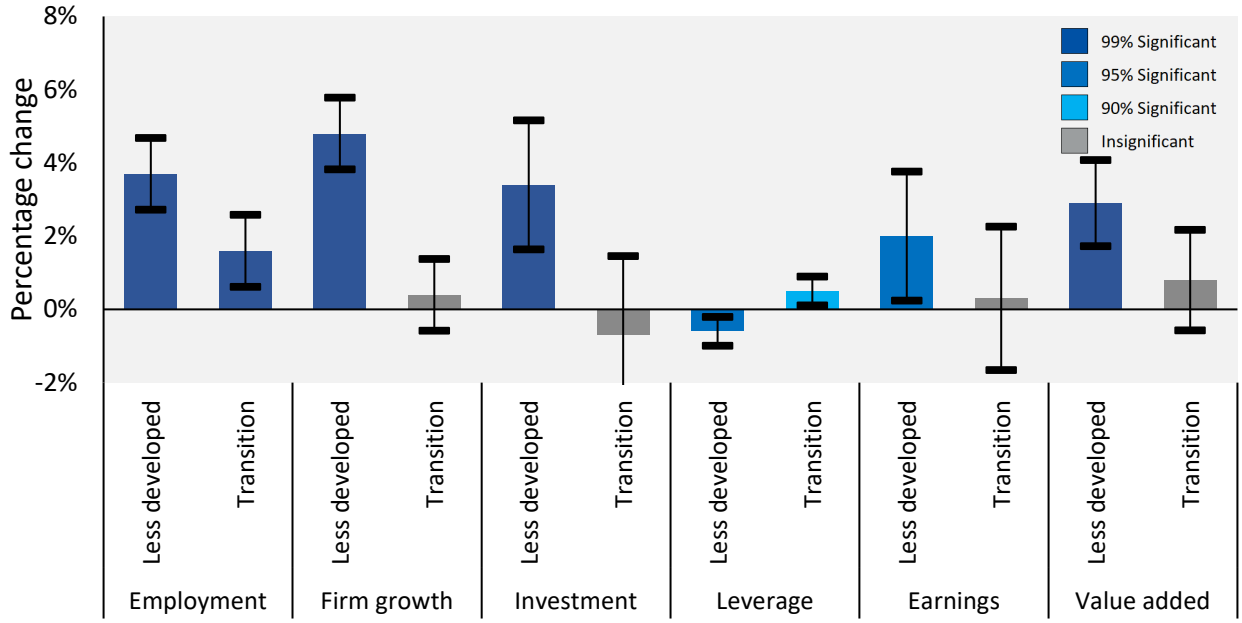
Firms in less developed regions benefit substantially more from EIB intermediated lending. Figure 31 plots the relative impact when we group firms using the 2014-2020 Cohesion Region classification.[25] We observe that beneficiaries in less developed regions experience a higher impact on employment, firm growth, investment, earnings and productivity by 2 to 5%, relative to beneficiaries located in more developed regions. The comparatively higher impact in the EU's less developed regions is in line with expectations. By definition, less developed

[25] The classification is performed based on the firms' NUTS2 location codes as reported in Bureau van Dijk's Orbis database. The 2014-2020 cohesion definition divides NUTS2 regions in three categories depending on the magnitude of the regional GDP per capita relative to the EU average. Regions are classified as less developed regions where GDP per inhabitant was less than 75 % of the EU average, as transition regions where GDP per inhabitant was between 75 % and 90 % of the EU average, and as more developed regions where GDP per inhabitant was more than 90 % of the EU average.

regions have a larger potential for economic growth. At the same time, over the period of analysis they made up less than 20% of all loan volumes (see Figure 15 in Section 3).

Recipients in transition regions report increases in employment that are about 2% higher than those in more developed regions. In addition to the relatively higher employment growth, beneficiaries in transition regions also report a slightly higher leverage ratio (0.5 pp.), relative to their counterparts in more developed regions. The latter effect is only statistically significant at the 90% level. On all other dimensions, no statistical differences from the beneficiaries in more developed regions are observed. It is important to emphasise that an insignificant impact (as indicated by a grey bar) does not mean there is no overall positive impact of EIB lending. It solely indicates that the impact for that subgroup is not statistically different from the comparative group, firms in more developed regions in this case.[26]

Figure 31. Impact by cohesion type region *(relative to firms in more developed regions)*



Notes: For each output variables, the graph reports the average impact for MBIL recipients in less developed regions and transition regions relative to their peers in more developed regions in the three years after the loan. The whiskers around the bars show the 95% confidence intervals. The categorization of MBIL recipients is done at NUTS2 level using the 2014- 2020 Cohesion Region classification.

Source: ECON estimations based on internal EIB loan data and Bureau van Dijk's Orbis database.

6 CONCLUSIONS

The impact assessment in this report finds a significant and positive impact of EIB intermediated lending on recipient SMEs and mid-caps in the EU. The results show that, relative to their peers, EIB loan beneficiaries report higher employment, growth, investment and leverage in the years following the receipt of an EIB loan. For example, EIB beneficiaries' growth, as measured by total assets, increases by 6.0% relative to the control group in the three after the loan. Moreover, the results extend earlier findings by exploring the impact on firms' earnings and productivity, both showing significant increases upon receiving a loan

[26] Interestingly, the lack of statistically significant differences between transition and more developed regions also holds when using the new 2021-2027 Cohesion Region classification.

(4.7% and 5.3%, respectively). Finally, EIB beneficiaries show a significant increase in their innovative capacity.

The analysis also finds heterogeneity in the impact across different subgroups of loan beneficiaries. Additionality is comparatively higher for smaller, younger and financially constrained enterprises. Relative to mid-caps that received an EIB loan, SMEs report higher growth in firm size, employment, investment, leverage, earnings and productivity. Similarly, younger beneficiaries report higher investment responses. Financially constrained beneficiaries, in their turn, grow faster than non-constrained counterparts upon receiving an EIB intermediated loan.

Firms in less developed regions benefit substantially more from EIB intermediated lending. Relative to beneficiaries located in more developed regions, beneficiaries in less developed regions experience a higher impact on employment, firm growth, investment, earnings and productivity. Recipients in transition regions report increases in employment that are higher than those in more developed regions.

ANNEX 1: DATABASE

The tables in this annex report the coverage at three stages: (i) the EIB loans to businesses (i.e. our population of interest); (ii) the subsample of loans for which a counterpart in the Orbis data can be identified (using the so-called BvD ID); and (iii) the coverage of the final sample used in the analysis, i.e. those loans to businesses with the required data.

It is possible that a beneficiary firm received multiple EIB-supported loans in the same year or across multiple years. In line with previous analyses, we employ the first occasion to determine the moment of treatment. Correspondingly, the tables in this annex showing yearly figures refer to this first year of treatment. We treat multiple allocations the following way. In case of multiple loans in the same year, the loans are considered together as one loan. If there are multiple loans in the same year, we pick the one with the earliest date to determine the moment of treatment. Otherwise, for firms which received multiple loans across multiple years, we take the earliest loan. Table 7 shows the share of unique and repeated recipients across the various stages of the database using the above classification. The large majority of firms in the database (85%) received EIB-supported loans in one period only.[27]

Table 5. Loan volumes by year

	Population	**With BvD ID**		**With required data**	
	(m EUR)	*(m EUR)*	*(in %)*	*(m EUR)*	*(in %)*
2008	4,434	1,608	36.26	774	17.46
2009	6,677	2,887	43.24	1,310	19.62
2010	9,694	4,555	46.99	1,819	18.76
2011	13,149	6,492	49.37	3,010	22.89
2012	9,326	4,960	53.18	2,516	26.98
2013	11,352	6,682	58.86	3,732	32.88
2014	14,515	12,404	85.46	6,277	43.25
2015	18,393	15,848	86.16	4,719	25.65
2016	20,761	18,059	86.99	4,414	21.26
2017	13,313	10,028	75.32	1,880	14.12
Total	121,614	83,523	68.68	30,453	25.04

Notes: The table reports the loan volumes by year for the complete database, the subset of loans for which a counterpart can be identified in Orbis and the subset for which all required data for estimation are available.
Source: ECON calculations based on internal EIB loan data and Bureau van Dijk's Orbis database.

[27] Those firms that received multiple EIB-supported loans over time, do so a limited number of times: mean times 2.5 (median times 2). The time between repeated loans varies from 1 to 12 years, with an average (median) of 4 (3) years.

Table 6. Number of recipient firms by year

	Population	With BvD ID		With required data	
	(# firms)	*(# firms)*	*(in %)*	*(# firms)*	*(in %)*
2008	29,219	10,752	36.80	3,005	10.28
2009	33,796	14,950	44.24	4,531	13.41
2010	49,481	20,477	41.38	6,422	12.98
2011	46,186	21,708	47.00	7,495	16.23
2012	54,690	20,231	36.99	6,148	11.24
2013	74,331	26,328	35.42	8,940	12.03
2014	92,212	52,403	56.83	18,088	19.62
2015	100,360	54,618	54.42	19,005	18.94
2016	81,985	52,840	64.45	13,646	16.64
2017	67,520	39,949	59.17	9,550	14.14
Total	629,780	314,256	49.90	96,830	15.38

Notes: The table reports the number of beneficiaries by year for the complete database, the subset of loans for which a counterpart can be identified in Orbis and the subset for which all required data for estimation are available.
Source: ECON calculations based on internal EIB loan data and Bureau van Dijk's Orbis database.

Table 7. Number of unique and repeated recipient firms

		Total	*Unique*	*Multiple*
Population	*(# firms)*	629,780	536,655	93,125
	(in %)		85.21	14.79
With BvD ID	*(# firms)*	314,256	239,405	74,851
	(in %)		76.18	23.82
With required data	*(# firms)*	96,830	61,243	35,587
	(in %)		63.25	36.75

Notes: The table reports the number of beneficiaries for the complete database, the subset of loans for which a counterpart can be identified in Orbis and the subset for which all required data for estimation are available. "Unique" refers to those beneficiary firms that obtained only one EIB-supported loan over the sample horizon. "Multiple" refers to the number of firms that received multiple EIB-supported loans over the years of the sample horizon.
Source: ECON calculations based on internal EIB loan data and Bureau van Dijk's Orbis database.

Table 8. Loan volumes by country

	Population	With BvD ID		With required data	
	(m EUR)	*(m EUR)*	*(in %)*	*(m EUR)*	*(in %)*
Austria	2,295	1,479	64.44	18	0.79
Belgium	3,005	1,994	66.36	483	16.07
Bulgaria	646	480	74.29	176	27.16
Croatia	2,023	1,554	76.81	896	44.29
Cyprus	583	439	75.21	0	0.00
Czechia	3,379	2,754	81.50	1,219	36.09
Denmark	797	533	66.91	6	0.71
Estonia	47	21	44.34	0	0.00
Finland	466	376	80.67	156	33.53
France	9,587	5,825	60.75	1,091	11.38
Germany	6,950	3,898	56.09	519	7.47
Greece	3,187	1,398	43.86	424	13.30
Hungary	1,375	1,060	77.11	612	44.48
Ireland	827	314	38.02	0	0.00
Italy	29,700	21,213	71.43	9,477	31.91
Latvia	131	40	30.31	1	0.58
Lithuania	44	16	37.35	0	0.00
Luxembourg	132	89	67.41	3	2.64
Netherlands	4,596	3,360	73.10	61	1.34
Poland	5,880	3,296	56.05	155	2.64
Portugal	5,927	4,549	76.75	2,828	47.72
Romania	1,025	917	89.47	675	65.89
Slovakia	1,344	1,040	77.42	412	30.68
Slovenia	783	665	85.00	391	49.93
Spain	33,885	24,826	73.27	10,712	31.61
Sweden	372	293	78.83	136	36.64
United Kingdom	2,630	1,094	41.59	0	0.00
Total	121,614	83,523	68.68	30,453	25.04

Notes: The table reports the loan volumes by country for the complete 2008-2017 database, the subset of loans for which a counterpart can be identified in Orbis and the subset for which all required data for estimation are available.
Source: ECON calculations based on internal EIB loan data and Bureau van Dijk's Orbis database.

Table 9. Number of beneficiary firms by country

	Population	With BvD ID		With required data	
	(# firms)	*(# firms)*	*(in %)*	*(# firms)*	*(in %)*
Austria	5,283	3,066	58.04	74	1.40
Belgium	10,905	5,479	50.24	650	5.96
Bulgaria	2,777	2,167	78.03	665	23.95
Croatia	4,036	2,213	54.83	1,423	35.26
Cyprus	962	547	56.86	0	0.00
Czechia	10,718	8,869	82.75	3,325	31.02
Denmark	5,710	4,247	74.38	68	1.19
Estonia	60	25	41.67	0	0.00
Finland	1,377	1,110	80.61	272	19.75
France	35,758	21,803	60.97	3,906	10.92
Germany	23,314	9,160	39.29	354	1.52
Greece	4,686	1,086	23.18	309	6.59
Hungary	4,014	2,783	69.33	1,339	33.36
Ireland	9,409	2,231	23.71	0	0.00
Italy	71,617	37,942	52.98	15,511	21.66
Latvia	1,075	370	34.42	7	0.65
Lithuania	55	28	50.91	0	0.00
Luxembourg	269	163	60.59	5	1.86
Netherlands	7,230	4,062	56.18	23	0.32
Poland	114,324	46,187	40.40	596	0.52
Portugal	18,306	12,644	69.07	8,342	45.57
Romania	7,807	7,274	93.17	5,551	71.10
Slovakia	8,183	6,144	75.08	2,127	25.99
Slovenia	3,472	2,837	81.71	1,486	42.80
Spain	260,891	121,683	46.64	47,727	18.29
Sweden	10,069	7,685	76.32	3,070	30.49
United Kingdom	7,473	2,451	32.80	0	0.00
Total	629,780	314,256	49.90	96,830	15.38

Notes: The table reports the number of beneficiaries by country for the complete 2008-2017 database, the subset of loans for which a counterpart can be identified in Orbis and the subset for which all required data for estimation are available.
Source: ECON calculations based on internal EIB loan data and Bureau van Dijk's Orbis database.

Table 10. Loan volumes by firm size

	Population	With BvD ID		With required data	
	(m EUR)	*(m EUR)*	*(in %)*	*(m EUR)*	*(in %)*
Micro (1-9)	33,298	17,754	53.32	3,455	10.38
Small (10-49)	34,808	25,996	74.68	8,286	23.80
Medium (50-249)	34,007	25,173	74.02	7,236	21.28
Mid-cap (250-3000)	16,293	13,487	82.78	2,642	16.22
Total	118,406	82,410	69.60	21,619	18.26

Notes: The table reports the loan volumes by firm-size class for the complete database, the subset of loans for which a counterpart can be identified in Orbis and the subset for which all required data for estimation are available. Size classes are constructed using the number of employees as reported in the internal EIB loan data. Although missing for a few observations, this is preferred over the Orbis measure as it is available across all three stages of the data, incl. population observations without a BvD ID.
Source: ECON calculations based on internal EIB loan data and Bureau van Dijk's Orbis database.

Table 11. Number of beneficiary firms by firm size

	Population	With BvD ID		With required data	
	(# firms)	*(# firms)*	*(in %)*	*(# firms)*	*(in %)*
Micro (1-9)	406,637	169,854	41.77	38,990	9.59
Small (10-49)	143,733	97,512	67.84	41,421	28.82
Medium (50-249)	53,700	34,257	63.79	13,942	25.96
Mid-cap (250-3000)	11,919	6,963	58.42	1,768	14.83
Total	615,989	308,586	50.10	96,121	15.60

Notes: The table reports the number of beneficiaries by firm-size class for the complete database, the subset of loans for which a counterpart can be identified in Orbis and the subset for which all required data for estimation are available. Size classes are constructed using the number of employees as reported in the internal EIB loan data. Although missing for a few observations, this is preferred over the Orbis measure as it is available across all three stages of the data, incl. population observations without a BvD ID.
Source: ECON calculations based on internal EIB loan data and Bureau van Dijk's Orbis database.

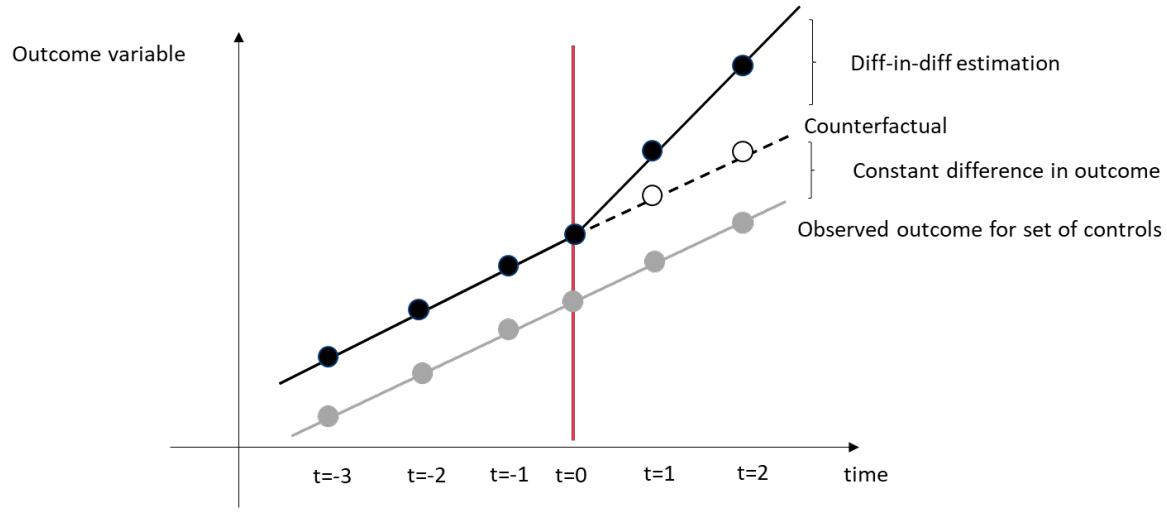
ANNEX 2: METHODOLOGY

A growing body of literature combines data on firms' participation in a specific funding support programme with detailed data of the firms' financials. By gathering similar information on a comparable set of firms (the control group) microeconomic impact evaluation methods, such as difference-in-differences estimation, can be applied to estimate treatment effects (see e.g. Blundell and Costa Dias, 2009; Imbens and Wooldridge, 2009).

We use a difference-in-differences model to estimate the impact of EIB intermediated loans on firm performance. Difference-in-differences models capture the effect of EIB loans (treatment effect) on firm performance by comparing firms that receive intermediated loans (the treatment group) with those firms that do not receive it (the control group), before (pre-period) and after (post-period) treatment.

Figure 32 illustrates the difference-in-differences set-up. The black dotted line represents the outcome variable of interest for the treated group at different points in time. The white dots show the unobservable counterfactuals for the treated group, while the grey line shows the outcome of interest for the control group. The red vertical line at *t=0* shows the moment of treatment. The method estimates the impact of EIB lending as the difference between in outcomes between treatment and control group before and after treatment. In a nutshell, the method assumes that, if the treated and control groups show parallel trends before receiving an intermediated loan in *t=0*, the control group can be used as a good counterfactual to show how the treated group would have behaved in the absence of treatment. As illustrated in Figure 32, the treatment and control groups do not necessarily need to be identical before the treatment. Rather, it is important that the treated and control groups share similar trends in the pre-period.

Figure 32. The difference-in-differences set-up



The casual interpretation of EIB lending in the difference-in-differences models is ensured by a "parallel-trends assumption", which states that firms receiving EIB lending would have behaved similarly to those in the control group in the absence of treatment. As shown in

Figure 32, this assumption relies on evidence showing that treated and control groups shared similar trends in the pre-period. Evidence of parallel trends before treatment (absence of pre-trends) provides supporting evidence that any difference in the post-period between the two groups is due to intermediated lending.

ANNEX 3: Estimation results

Table 12. Difference-in-differences estimation results – Subsample based on long-term debt

	(1) Employment (log)	(2) Total assets (log)	(3) Tangible fixed assets (log)	(4) Profit to shareholder funds ratio	(5) Leverage ratio	(6) Earnings (log)	(7) Value added (log)	(8) Patents filed	(9) Intangible fixed assets (log)
Post	-0.066***	-0.107***	-0.191***	0.020***	-0.010***	-0.056***	-0.066***	-0.005	-0.111***
	(0.002)	(0.002)	(0.005)	(0.005)	(0.001)	(0.006)	(0.003)	(0.005)	(0.021)
Treated x Post	0.059***	0.096***	0.160***	-0.021***	0.011***	0.049***	0.052***	0.008	0.087***
	(0.004)	(0.004)	(0.007)	(0.005)	(0.002)	(0.007)	(0.005)	(0.005)	(0.028)
Fixed Effects:									
Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year x Sector	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.951	0.973	0.927	0.274	0.825	0.881	0.966	0.887	0.851
Observations	304,552	305,997	302,884	305,316	305,909	270,456	234,420	306,110	303,734

Notes: Estimation results of the treatment effects model for the subsample of firms matched to controls with at least as much long-term debt prior to obtaining the loan. Employment is measured as the number of employees. The leverage ratio is measured as a share of current and non-current liabilities to total assets. Earnings are measured by the earnings before income, taxes, depreciation and amortization (EBITDA). Value added is defined as the sum of a firm's net income, taxation, cost of materials, cost of labour, depreciation and interests paid. Patents are measured as the number of patent applications in a given year. Standard errors, clustered at the firm level, are noted in parentheses: * p<0.10, ** p<0.05, *** p<0.01.
Source: ECON estimations based on internal EIB loan data and Bureau van Dijk's Orbis database.

Table 13. Difference-in-differences estimation results – Split by firm size

	(1) Employment (log)	(2) Total assets (log)	(3) Tangible fixed assets (log)	(4) Leverage ratio	(5) Earnings (EBITDA)	(6) Value added (log)
Post	-0.032***	-0.059***	-0.126***	0.008**	-0.018	0.001
	(0.007)	(0.009)	(0.017)	(0.004)	(0.018)	(0.010)
Treated x Post	0.006	-0.011	0.055***	0.000	-0.050**	-0.016
	(0.008)	(0.011)	(0.021)	(0.005)	(0.023)	(0.012)
…						
Post x Size class 5-9	-0.034***	-0.030***	-0.055***	-0.022***	-0.055***	-0.089***
	(0.007)	(0.009)	(0.017)	(0.004)	(0.019)	(0.010)
Post x Size class 10-49	0.004	-0.018**	-0.028*	-0.017***	-0.035*	-0.051***
	(0.007)	(0.009)	(0.017)	(0.004)	(0.019)	(0.010)
Post x Size class 50-249	0.011*	-0.026***	-0.024	-0.010**	-0.039**	-0.033***
	(0.007)	(0.009)	(0.017)	(0.004)	(0.019)	(0.010)
Treated x Post x Size class 5-9	0.029***	0.067***	0.105***	0.022***	0.101***	0.066***
	(0.009)	(0.012)	(0.022)	(0.005)	(0.024)	(0.013)
Treated x Post x Size class 10-49	0.030***	0.070***	0.093***	0.016***	0.090***	0.061***
	(0.009)	(0.011)	(0.022)	(0.005)	(0.023)	(0.012)
Treated x Post x Size class 50-249	0.020**	0.063***	0.056**	0.012**	0.083***	0.052***
	(0.009)	(0.012)	(0.022)	(0.005)	(0.024)	(0.013)
Fixed Effects:						
Firm	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year x Sector	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.966	0.973	0.926	0.823	0.882	0.967
Observations	1,296,337	1,295,837	1,279,857	1,294,805	1,129,414	974,432

Notes: Estimation results of the main treatment effects model including interaction terms for firm size. Mid-cap sized beneficiaries (i.e. with 250-3000 employees) are the reference size class. Standard errors, clustered at the firm level, are noted in parentheses: * p<0.10, ** p<0.05, *** p<0.01.
Source: ECON estimations based on internal EIB loan data and Bureau van Dijk's Orbis database.

Table 14. Difference-in-differences estimation results – Split by firm size (excluding mid-caps)

	(1) Employment (log)	(2) Total assets (log)	(3) Tangible fixed assets (log)	(4) Leverage ratio	(5) Earnings (EBITDA)	(6) Value added (log)
Post	-0.021***	-0.086***	-0.151***	-0.002	-0.058***	-0.032***
	(0.002)	(0.003)	(0.006)	(0.001)	(0.007)	(0.003)
Treated x Post	0.027***	0.052***	0.110***	0.012***	0.034***	0.037***
	(0.003)	(0.004)	(0.008)	(0.002)	(0.008)	(0.004)
…						
Post x Size class 5-9	-0.046***	-0.003	-0.030***	-0.012***	-0.016**	-0.056***
	(0.003)	(0.004)	(0.008)	(0.002)	(0.008)	(0.004)
Post x Size class 10-49	-0.008***	0.008**	-0.004	-0.007***	0.004	-0.018***
	(0.003)	(0.003)	(0.007)	(0.002)	(0.007)	(0.004)
Treated x Post x Size class 5-9	0.008**	0.004	0.050***	0.010***	0.017	0.014**
	(0.004)	(0.005)	(0.010)	(0.002)	(0.010)	(0.006)
Treated x Post x Size class 10-49	0.010***	0.007	0.038***	0.003*	0.006	0.009*
	(0.003)	(0.004)	(0.009)	(0.002)	(0.009)	(0.005)
Fixed Effects:						
Firm	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year x Sector	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.962	0.971	0.923	0.823	0.876	0.964
Observations	1,275,924	1,275,457	1,259,524	1,274,435	1,111,320	957,260

Notes: Estimation results of the main treatment effects model including interaction terms for firm size. Medium-sized beneficiaries (i.e. with 50-249 employees) are the reference size class. Mid-cap sized beneficiaries (i.e. with 250-3000 employees) were excluded from this estimation. Standard errors, clustered at the firm level, are noted in parentheses: * p<0.10, ** p<0.05, *** p<0.01.
Source: ECON estimations based on internal EIB loan data and Bureau van Dijk's Orbis database.

Table 15. Difference-in-differences estimation results – Split by firm age

	(1) Employment (log)	(2) Total assets (log)	(3) Tangible fixed assets (log)	(4) Leverage ratio	(5) Earnings (EBITDA)	(6) Value added (log)
Post	-0.091***	-0.127***	-0.212***	-0.006***	-0.098***	-0.097***
	(0.001)	(0.001)	(0.003)	(0.001)	(0.003)	(0.002)
Treated x Post	0.051***	0.055***	0.143***	0.016***	0.041***	0.051***
	(0.002)	(0.002)	(0.004)	(0.001)	(0.004)	(0.002)
…						
Post x Age class 0-4	0.264***	0.406***	0.413***	-0.021***	0.428***	0.331***
	(0.012)	(0.014)	(0.026)	(0.006)	(0.023)	(0.017)
Post x Age class 5-9	0.121***	0.168***	0.169***	-0.021***	0.126***	0.127***
	(0.004)	(0.004)	(0.008)	(0.002)	(0.007)	(0.005)
Treated x Post x Age class 0-4	0.008	0.032	0.079**	0.021**	0.025	0.018
	(0.018)	(0.021)	(0.038)	(0.009)	(0.033)	(0.024)
Treated x Post x Age class 5-9	0.024***	0.034***	0.063***	0.008***	0.040***	0.022***
	(0.005)	(0.006)	(0.011)	(0.003)	(0.010)	(0.007)
Fixed Effects:						
Firm	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year x Sector	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.949	0.971	0.925	0.821	0.880	0.964
Observations	1,296,337	1,302,480	1,285,955	1,301,386	1,133,915	977,528

Notes: Estimation results of the main treatment effects model including interaction terms for firm age. Age groups are defined based on the beneficiaries' age at the time of the loan. Older beneficiaries (i.e. with 10 or more years of age) are the reference age class. Standard errors, clustered at the firm level, are noted in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

Source: ECON estimations based on internal EIB loan data and Bureau van Dijk's Orbis database.

Table 16. Difference-in-differences estimation results – Split by cohesion region

	(1) Employment (log)	(2) Total assets (log)	(3) Tangible fixed assets (log)	(4) Leverage ratio	(5) Earnings (EBITDA)	(6) Value added (log)
Post	-0.062***	-0.090***	-0.179***	-0.010***	-0.065***	-0.069***
	(0.002)	(0.002)	(0.003)	(0.001)	(0.004)	(0.002)
Treated x Post	0.044***	0.049***	0.147***	0.019***	0.042***	0.046***
	(0.002)	(0.002)	(0.005)	(0.001)	(0.004)	(0.003)
…						
Post x Less developed	-0.017***	-0.012***	-0.007	0.002	-0.015**	-0.005
	(0.004)	(0.004)	(0.008)	(0.002)	(0.007)	(0.005)
Post x Transition	0.003	0.017***	0.045***	-0.004**	0.004	0.005
	(0.004)	(0.004)	(0.008)	(0.002)	(0.008)	(0.005)
Treated x Post x Less developed	0.037***	0.048***	0.034***	-0.006**	0.020**	0.029***
	(0.005)	(0.005)	(0.009)	(0.002)	(0.009)	(0.006)
Treated x Post x Transition	0.016***	0.004	-0.007	0.005*	0.003	0.008
	(0.005)	(0.005)	(0.011)	(0.002)	(0.010)	(0.007)
Fixed Effects:						
Firm	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year x Sector	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.949	0.971	0.924	0.821	0.880	0.964
Observations	1,296,076	1,302,216	1,285,691	1,301,122	1,133,660	977,435

Notes: Estimation results of the main treatment effects model including interaction terms for firm location. Beneficiaries located in more developed regions are the reference group. The categorization of MBIL recipients is done at NUTS2 level using the 2014- 2020 Cohesion Region classification. Standard errors, clustered at the firm level, are noted in parentheses: * p<0.10, ** p<0.05, *** p<0.01.
Source: ECON estimations based on internal EIB loan data and Bureau van Dijk's Orbis database.

Table 17. Difference-in-differences estimation results – Split by finance constraint

	(1) Employment (log)	(2) Total assets (log)	(3) Tangible fixed assets (log)	(4) Leverage ratio	(5) Earnings (EBITDA)	(6) Value added (log)
Post	-0.055***	-0.062***	-0.169***	-0.031***	-0.062***	-0.063***
	(0.002)	(0.002)	(0.004)	(0.001)	(0.004)	(0.002)
Treated x Post	0.044***	0.052***	0.151***	0.023***	0.039***	0.047***
	(0.003)	(0.003)	(0.006)	(0.001)	(0.006)	(0.003)
Post x Fin. constraint	-0.015***	-0.052***	-0.015***	0.040***	-0.011**	-0.014***
	(0.003)	(0.003)	(0.006)	(0.001)	(0.006)	(0.004)
Treated x Post x Fin. constraint	0.011***	0.016***	-0.007	-0.013***	0.013*	0.010**
	(0.004)	(0.004)	(0.008)	(0.002)	(0.007)	(0.005)
Fixed Effects:						
Firm	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year x Sector	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.952	0.972	0.926	0.826	0.883	0.965
Observations	1,096,467	1,101,844	1,091,788	1,101,552	970,504	859,342

Notes: Estimation results of the main treatment effects model including interaction terms for firms' financial constraint. Non-constrained beneficiaries are the reference group. A firm is classified as finance constrained if its respective Kaplan-Zingales indicator is higher than the sample median. Standard errors, clustered at the firm level, are noted in parentheses: * p<0.10, ** p<0.05, *** p<0.01.
Source: ECON estimations based on internal EIB loan data and Bureau van Dijk's Orbis database.

Table 18. Probit model results (Propensity scoring)

	Lag 1	Lag 2	Lag 3	Lag 1 (square)	Lag 2 (square)	Lag 3 (square)	Lag 1 (cubic)	Lag 2 (cubic)	Lag 3 (cubic)
Leverage ratio	2.810***	-0.392***	0.528***	-2.498***	0.031	-0.317***	0.623***	0.019	0.049***
	(0.063)	(0.076)	(0.061)	(0.064)	(0.077)	(0.062)	(0.018)	(0.022)	(0.018)
Employment (log)	0.148***	0.111***	-0.142***	0.003	-0.037**	0.047***	-0.002	0.002	-0.005***
	(0.035)	(0.042)	(0.032)	(0.014)	(0.017)	(0.013)	(0.002)	(0.002)	(0.001)
Total assets (log)	-0.632*	-0.828*	-2.002***	0.088***	0.048	0.140***	-0.002***	-0.001	-0.004***
	(0.339)	(0.431)	(0.297)	(0.025)	(0.032)	(0.022)	(0.001)	(0.001)	(0.001)
Cash ratio	-0.531***	-0.510***	-0.509***	0.407	0.957***	0.504**	-0.005	-0.555**	-0.075
	(0.070)	(0.075)	(0.069)	(0.260)	(0.277)	(0.256)	(0.255)	(0.270)	(0.249)
Tangible assets ratio	2.614***	-0.889***	0.250***	-3.398***	1.002***	-0.810***	1.399***	-0.570***	0.421**
	(0.083)	(0.105)	(0.083)	(0.223)	(0.277)	(0.221)	(0.169)	(0.208)	(0.167)
Current ratio	0.042***	-0.019***	0.003	-0.002***	0.001***	-0.000	0.000***	-0.000***	0.000
	(0.003)	(0.003)	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Turnover ratio	0.199***	0.320***	0.087***	-0.068***	-0.081***	-0.041***	0.006***	0.006***	0.004***
	(0.022)	(0.023)	(0.014)	(0.006)	(0.006)	(0.005)	(0.001)	(0.001)	(0.000)
Sales growth	0.147***			-0.106***			0.017***		
	(0.011)			(0.009)			(0.002)		
Patents	0.072***	0.064***	0.100***						
	(0.017)	(0.018)	(0.017)						
R-squared	0.086								
Observations	2,043,287								

Notes: Estimation results of the probit model of selection into treatment, including fixed effects for firm size class, age class, sector, country and year of the loan. The dependent variable is a dummy for the assignment into treatment. Employment is measured as number of employees. The patent variable is a dummy depending if a company filled at least one patent application or publication in a given year. Standard errors are noted in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

Source: ECON estimations based on internal EIB loan data and Bureau van Dijk's Orbis database.

Table 19. Summary statistics unmatched and matched samples

	Unmatched controls					
	Obs.	*Mean*	*Median*	*St.dev.*	*Min.*	*Max.*
Firm age	2,060,966	18	16	14	1	897
Number of employees (log)	2,063,184	2.40	2.26	1.24	0.69	6.17
Total assets (log)	2,063,901	13.84	13.71	1.82	9.86	18.50
Tangible assets ratio	2,063,892	0.28	0.20	0.25	0.00	0.95
Leverage ratio	2,063,891	0.64	0.63	0.37	0.02	2.41
Cash ratio	2,063,897	0.15	0.09	0.16	0.00	0.81
Current ratio	2,063,492	3.10	1.49	6.10	0.09	61.14
Turnover ratio	1,970,715	1.60	1.29	1.28	0.02	7.45
Sales growth	1,947,592	0.08	0.02	0.47	-0.76	4.17
	Matched controls					
	Obs.	*Mean*	*Median*	*St.dev.*	*Min.*	*Max.*
Firm age	90,653	18	16	13	1	226
Number of employees (log)	90,701	2.66	2.55	1.15	0.69	6.17
Total assets (log)	90,701	14.17	14.15	1.61	9.86	18.50
Tangible assets ratio	90,701	0.30	0.25	0.23	0.00	0.95
Leverage ratio	90,701	0.68	0.68	0.28	0.02	2.41
Cash ratio	90,701	0.11	0.06	0.13	0.00	0.81
Current ratio	90,701	2.18	1.36	3.85	0.09	61.14
Turnover ratio	90,701	1.63	1.41	1.13	0.02	7.45
Sales growth	90,701	0.12	0.04	0.47	-0.76	4.17
	Matched treated					
	Obs.	*Mean*	*Median*	*St.dev.*	*Min.*	*Max.*
Firm age	97,619	18	16	13	1	682
Number of employees (log)	97,663	2.68	2.56	1.15	0.69	6.17
Total assets (log)	97,663	14.22	14.18	1.59	9.86	18.50
Tangible assets ratio	97,663	0.30	0.26	0.23	0.00	0.95
Leverage ratio	97,663	0.67	0.68	0.26	0.02	2.41
Cash ratio	97,663	0.10	0.06	0.12	0.00	0.81
Current ratio	97,663	2.08	1.36	3.46	0.09	61.14
Turnover ratio	97,663	1.62	1.36	1.11	0.02	7.45
Sales growth	97,663	0.12	0.04	0.47	-0.76	4.17

Notes: Summary statistics for unmatched controls, matched controls and matched treated firms in the three years prior to treatment. Firms are paired by the Propensity Score Matching (PSM) technique.

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Impact assessment of the EIB's intermediated lending to businesses

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