EIB GROUP EVALUATION

# Evaluation of EIB Group equity and quasi-equity support for small businesses and mid-caps

November 2022

European Investment Bank | Group

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# ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| **ACP** | African, Caribbean and Pacific |
| **COVID** | Coronavirus Disease 2019 |
| **DPI** | Distributed Value to Paid-In |
| **EC** | European Commission |
| **ECB** | European Central Bank |
| **EFSI** | European Fund for Strategic Investments |
| **EFTA** | European Free Trade Area |
| **EIB** | European Investment Bank |
| **EIF** | European Investment Fund |
| **EU** | European Union |
| **GDP** | Gross Domestic Product |
| **ICT** | Information and Communications Technology |
| **IFI** | International Financial Institutions |
| **IG/EV** | EIB Group Evaluation Function of the EIB Group |
| **IPO** | Initial Public Offering |
| **IRR** | Internal Rate of Return |
| **MC** | Management Committee of the EIB |
| **NAV** | Net Asset Value |
| **NPB** | National Promotional Bank |
| **NPI** | National Promotional Institution |
| **OECD** | Organisation for Economic Co-operation and Development |
| **OPS** | EIB Operations Directorate |
| **PE** | Private Equity |
| **PMM** | EIB Portfolio Management and Monitoring Directorate |
| **PPG** | Public Policy Goal of the EIB Group |
| **RCM** | Risk Capital Mandate |
| **RCR** | Risk Capital Resources Mandate |
| **RMA** | EIF Research and Market Analysis |
| **RVPI** | Residual Value to Paid-In |
| **SG/ECON** | EIB Economics Department |
| **SME** | Small and Medium-sized Enterprise |
| **TF** | Thematic Finance |
| **TVPI** | Total Value to Paid-In |
| **UK** | United Kingdom |
| **US** | United States |
| **VC** | Venture Capital |
| **VD** | Venture Debt |

# KEY TERMS

| | |
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| **Business angel** | A private individual, often with high net worth, and usually with business experience, who directly invests part of his/her assets in new and growing private businesses. |
| **Buyout capital** | Financing provided to acquire a company. Typically involves purchasing majority or controlling stakes. |
| **Captive fund** | A fund in which the main shareholder of the management company contributes most of the capital. The funds are "captive" since they are limited in terms of who can invest and in their transferability. The parent organisation allocates money to a captive fund from its own internal sources and reinvests realised capital gains into the fund. In the EIB Group's context, captive funds are typically investment vehicles sponsored by NPBs. |
| **Diversified loan fund** | A closed-end fund or investment vehicle with an investment strategy focused on providing debt finance primarily to SMEs and small mid-caps, targeting a (relatively) granular portfolio (typically from 40 to 100+ investments). The debt financing (mainly senior) provided to the SMEs or mid-caps can be in the form of loans, bonds, uni-tranche or asset-backed finance facilities such as leases and trade receivables. |
| **Dry powder** | In venture capital and private equity funds, "dry powder" is cash that has been committed by investors but has yet to be allocated to a specific investment. |
| **Growth capital** | A type of private equity investment (often a minority investment) in relatively mature companies that are looking for primary capital to expand and improve operations or enter new markets to accelerate the growth of the business. |
| **InvestEU** | The InvestEU Programme builds on the successful model of the Investment Plan for Europe, the Juncker Plan. It will bring together, under one roof, the European Fund for Strategic Investments and 13 other EU financial instruments.<br>The InvestEU Programme supports sustainable investment, innovation and job creation in Europe. It aims to trigger more than €372 billion in additional investment over the period 2021-27. |
| **Invest Europe** | Invest Europe — formerly known as European Private Equity and Venture Capital Association (EVCA) — is a trade association representing Europe's private equity, venture capital and infrastructure sectors, as well as their investors. Invest Europe contributes to policy affecting private capital investment in Europe, providing information on its members' role in the economy and publishing research on industry trends and developments. It also publishes a comprehensive set of standards and guidelines for the private equity industry. |
| **Later-stage venture** | Financing provided for an operating company, which may or may not be profitable. Later-stage venture tends to involve financing into companies already backed by venture capital. |
| **Lower mid-market** | Market segment that covers growth, expansion, mid-market and funds investing into buyout-stage firms. |

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| **Medium-sized enterprises** | Enterprises that employ fewer than 250 persons and either have an annual turnover that does not exceed €50 million, or an annual balance sheet not exceeding €43 million. |
| **Micro-enterprises** | Enterprises that employ fewer than ten persons and whose annual turnover or annual balance sheet total does not exceed €2 million. |
| **Mid-cap enterprises** | Enterprises that employ between 250 and 3 000 people. They are not micro, small or medium-sized enterprises as defined in the Commission Recommendation 2003/361/EC. Criteria relating to balance sheet total or turnover are not relevant in the context of this mid-cap definition. |
| **Private debt** | Private debt refers to loans to companies which are not provided by banks or public markets, and instead are provided by private investors and markets. |
| **Private equity** | Private equity is an alternative investment class that invests in or acquires private companies that are not listed on a public stock exchange. Private equity funds invest in private companies or engage in buyouts of public companies. |
| **Quasi-equity** | Quasi-equity is a category of "debt" which bears equity-type risks, but does not carry all the risks of pure equity. Quasi-equity investments can assume different forms/names, including, but not limited to mezzanine debt, subordinated debt, profit-participating debt and high-risk yield senior debt, possibly combined with warrants or stock options and convertible debt. These instruments may, de facto, be considered quasi-equity if they expose the holder to equity-type risk. They rank between equity and debt, having a higher risk than senior debt and a lower risk than common equity and whose return for the holder is predominantly based on the profits or losses of the underlying target undertaking and which are unsecured in the event of default.[1] |
| **Replacement capital** | Minority stake purchase from another private equity investment organisation or from another shareholder or shareholders. |
| **Rescue/turnaround capital** | Financing made available to an existing business, which has experienced financial distress, with a view to re-establishing prosperity. |
| **Seed** | Funding provided before the investee company has started mass production/distribution with the aim to complete research, product definition or product design, also including market tests and creating prototypes. This funding will not be used to start mass production/distribution. |
| **Selective loan fund** | A closed-end fund or investment vehicle that provides senior and/or uni-tranche financing primarily to SMEs and mid-caps. Managers of selective loan funds target a non-granular portfolio of typically 10-30 investments and follow a private equity-like approach, taking investment decisions based on detailed due diligence on each investee company and actively supporting investees' delivery of their business strategy. |
| **Small and medium-sized enterprises** | Businesses that employ fewer than 250 persons and have an annual turnover not exceeding €50 million, and/or an annual balance sheet total not exceeding €43 million. |

[1] Commission Regulation (EU) No 651/2014 of 17 June 2014.

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| **Startup** | Funding provided to companies, once the product or service is fully developed, to start mass production/distribution and to cover initial marketing. Companies may be in the process of being set up or may have been in business for a shorter time, but have not yet sold their product commercially. Use of the capital would be mostly to cover capital expenditure and initial working capital. |
| **Technology transfer** | Technology transfer describes the process of converting scientific findings from research organisations and universities into marketable products with the help of the private sector. Investors can pool investments in tech transfer funds investing into a broad range of projects, inventions and research results. The transfer process can involve the establishment of new companies (spin-out companies/startups) and various forms of collaboration between universities, research organisations, industry partners through research contracts, or the licensing or sale of intellectual property. |
| **Venture capital** | Venture capital is a form of private equity and a type of financing that investors provide to startup companies and small businesses that are believed to have long-term growth potential. |
| **Venture debt** | Venture debt is a particular type of quasi-equity: a type of loan offered by banks and non-bank lenders that is designed specifically for young, high-growth companies, in most cases that already have existing venture capital backing. The features of the loan are adapted for high-growth companies such as with bullet repayments and flexible collateral requirements. In most cases, venture debt contracts include an equity 'kicker' in the form of warrants entitling the investor to acquire shares in the target company. |
| **Warrant** | Warrants are derivatives issued by a company that give the right, but not the obligation, to buy equity at a certain price before expiration. They provide venture debt investors with an opportunity to participate in the company's growth potential and returns. |

# EXECUTIVE SUMMARY

## Context

**Young, fast-growing, innovative SMEs play a crucial role as key drivers of growth, yet they are often unable to access funding to develop their business through the banking system.** Empirical evidence shows that young, small firms are the largest contributors to net employment growth in the European Union. However, banks are generally unable to fund the investment needs of such firms. Innovative firms usually run more risky business models, which contribute to their growth potential, but they are also more difficult for banks to assess and monitor. These firms therefore rely on equity-type financing through business angels, or in the form of venture capital, hybrid debt/equity or growth capital. As these instruments are often not supplied sufficiently from private sources due to market failures and externalities,[2] public sector involvement is often warranted.

**For some more mature firms, private equity can also play an important role in unlocking growth potential beyond innovation, such as regional or international expansion, mergers, transfer of ownership, etc.** For many such firms, equity-type financing is more suitable than loans. Public sector intervention in these cases is often justified from the viewpoint of industrial strategy considerations, for instance to keep such high-growth companies in European ownership.

**To address these funding needs, the EIB Group has been offering a broad variety of equity and quasi-equity products since the mid-1990s, and has rapidly increased the supply of such products over the last decade:**

- For the EIF, these include investments intermediated through private investment funds covering a wide spectrum of investment stages from technology transfer and business angel funding, early-stage and later-stage venture capital, growth capital, hybrid debt/equity and private equity targeting firms at the buyout stage.
- As for the EIB, it has been providing growth capital to innovation-driven SMEs and mid-caps in the form of direct quasi-equity support (internally classified as venture debt and thematic finance) as well as funding to SMEs and mid-caps via indirect investments into captive funds and investment platforms in cooperation with other public sector entities such as NPBs.
- Both the EIF and the EIB have been increasing the volume of equity/quasi-equity operations targeting SMEs and mid-caps over the last ten years.

## About this evaluation

**The objective of this evaluation is to ensure accountability towards EIB Group stakeholders and share lessons learned from the equity and quasi-equity support that the Group provides to SMEs.** It aims to examine the relevance of the equity and quasi-equity products in addressing the evolving needs of SMEs and mid-caps, and the extent to which they address market failures. The evaluation also looks at the efficiency and additionality of these operations and the impact achieved. In addition, it also considers the effects of these operations on the long-term financial sustainability of the EIB Group. Based on this analysis, the evaluation formulates evidence-based recommendations for EIB and EIF management to improve ongoing and future policy, equity and quasi-equity activities.

**The evaluation covers operations of the EIF and the EIB that have provided equity and quasi-equity financing to EU SMEs and mid-caps since 2010.** In the case of the EIF, this includes almost the complete indirect equity/quasi-equity portfolio fronted by the EIF. Debt funds are treated differently depending on their nature: selective debt funds are

[2] Private investors cannot fully assess the societal benefits of the innovation activities generated by the investee companies.

included in the scope of this evaluation while diversified debt funds are not. In the case of the EIB, the evaluation considers direct quasi-equity operations as well as indirect operations through 'captive funds', which are typically investment vehicles sponsored by NPBs.[3] The scope includes all operations targeting small businesses, and is not restricted to transactions in the EIB's equity and quasi-equity portfolio that are reported under the SME Public Policy Goal (PPG), since a considerable share of transactions classified under other PPGs — innovation in particular — are also targeting SMEs and/or mid-caps.

**The evaluation builds the evidence base by using a spectrum of qualitative and quantitative methods, and makes use of a wide range of internal and external data.** The evaluation team reviewed the relevant EIB Group internal documents, and performed an extensive review of the academic literature on venture capital and private equity markets. The evidence base also includes a study on SME equity financing gaps in the European Union. The evaluation used both existing and new survey evidence, to explore the views of intermediaries and final beneficiaries. A range of case studies were carried out and individual interviews with staff and industry experts were conducted. EIB Group equity and quasi-equity portfolios were examined using transaction-level data provided by the EIF and the EIB matched with external firm-level datasets. The evaluation also looked at the historical financial performance of the portfolio. A quantitative analysis of the economic impact was also carried out using counterfactual methods.

## Key findings

### 1. Overall, the EIB Group's support for equity and quasi-equity markets is addressing relevant market gaps and makes a significant contribution to the market in terms of volume, market development and best practices.

**The EIF plays a key role in the underserved venture and growth capital segments — including scaleups — of the EU risk capital markets, providing sizeable funding and mobilising private capital in tandem.** EIF funding amounts to a sizeable part of the EU venture and growth capital markets. In the case of later-stage private equity, which is by far the largest segment in the European Union, the EIF's role is proportionally smaller. Our evidence shows that besides the volume, EIF operations are also efficient in terms of attracting private investors.

**Through its direct quasi-equity operations — venture debt and thematic finance — the EIB is the largest venture debt supplier in the European Union, serving a clear market need and crowding in additional investors.** EIB direct quasi-equity offers an alternative to pure equity-based growth capital to innovative companies in their expansion phase. Quasi-equity is often more suitable to these firms, and supply from private investors is limited. The majority of quasi-equity clients would not have been able to secure alternative financing with the same features. In addition, the EIB's participation also helps to attract other investors by signalling the quality of the project and by decreasing the risk to other investors.

**While the largest recipients of the EIB Group's operations are firms in the Member States with the largest and most developed capital markets, in relative terms operations provide significant support to businesses in Member States with less mature and underserved venture capital/private equity segments.** In absolute terms, the largest recipients of the EIB Group's equity and quasi-equity are firms in countries with more developed risk capital markets, for example France and Germany. However, relative to the shares observed within the overall EU venture capital market, the EIF's risk capital portfolio generally overweights firms in countries and regions characterised with low venture capital and private equity supply, and underweights the more developed ones.

**EIB Group operations have been contributing to the development of the EU venture capital and private equity markets by structuring inputs in multiple ways.** For instance, intermediaries often indicate the EIF's effective support in implementing best market practices, improving governance and reporting, and strengthening the composition of fund

[3] The evaluation did not integrate these transactions into the full analytical framework due to scarcity of available data.

management teams, among others. The EIF also contributes to the development of EU equity markets by giving less experienced fund management teams the opportunity to enter the market.

The EIF's intermediated equity support delivery model — funding through private funds — appears to be successful in overcoming the agency problems generally associated with public interventions on financial markets. Counterfactual analysis conducted as part of the evaluation shows that in the case of the EIF, public funding intermediated through private funds can replicate the benefits generally associated with fully private risk capital. Firms receiving equity funding through EIF-supported funds show growth in employment and innovation activity similar to investees of other, non-EIF supported funds.

## 2. Indirect equity/quasi-equity investments are very heterogeneous and show significant variations along the spectrum of firm stages in terms of relevance, additionality and policy impact.

**The EIF's intermediated investments into venture and growth capital are relevant, additional to the market and have a significant impact.** In these segments there is a clear funding gap, the rationale of public support is well-established, and evidence suggests the EIF's interventions have strong additionality and an impact on the performance of the final beneficiaries in terms of employment and innovation performance.

**A sizeable proportion of EIF operations — funds investing into buyout-stage firms — are targeting more mature firms, mainly through the RCR mandate.** At final beneficiary level, about 30% of the EIF's support in volume terms is being channelled into investments targeting mature companies at the buyout stage across a variety of sectors. There is some rationale for supporting this segment through public funding, as it contributes to the overall development of EU capital markets.

**Nevertheless, the evaluation finds that the overall policy contribution of the EIF operations targeting the later-stage (buyout) firms is smaller relative to investments in less mature firms.** First, in this segment the financing gap appears to be less pronounced than for early-stage venture capital or for growth capital. Second, it appears that the financial value added of EIF support is also lesser: both the funds investing into buyout-stage firms and the final beneficiaries supported by such funds report easier access to alternative private funding. Third, when it comes to impact, the EIF supports promotes better growth and employment when targeting firms at earlier stages compared to beneficiaries at the buyout stage. Lastly, firms at the buyout stage appear to be less innovative than other beneficiaries within the portfolio.

## 3. Indirect equity/quasi-equity investments with a different stage focus contribute differently to the Group's financial sustainability.

**At the same time, investments into funds focusing chiefly on buyout-stage firms have added significantly to the Group's financial sustainability.** Looking into historical financial performance, the RCR mandate reached profitability as of end-2021, with an especially strong performance in recent years. This is mainly due to investment into funds focusing on later-stage buyout transactions. This part of the portfolio has provided a higher and more stable financial performance than earlier-stage transactions. The performance of investments into growth capital transactions stand in between buyout and early-stage venture capital.

**The performance of investments at the buyout stage is also more stable across funds relative to venture and growth capital.** When looking at individual funds, later-stage funds targeting buyout-stage firms have a higher likelihood to provide positive returns, and returns are more balanced across funds than funds with an early-stage focus, where in general a small number of outstanding performances drive portfolio performance. Lastly, investments into funds focusing on later-stage financing usually take less time to repay the initial investment.

**Being still young, the direct quasi-equity portfolio is not yet profitable as returns are still dragged down by costs and negative value adjustments.** Although both the venture debt and thematic finance portfolios have benefited from successful exits, these revenues do not yet cover the portfolios associated costs, which are frontloaded. However, when restricted to the sub-portfolios of exited operations the returns are promising.

**Both the RCR and the direct quasi-equity portfolios have a sizeable share not yet realised, with significant upside potential, but for which costs have already been incurred.** This results in a slow and gradual build-up of realised gains and losses impacting portfolio performance.

**The capital charge on indirect exposures is about half that of direct exposures.** This difference in capital charges is due to the regulatory treatment of single exposure compared to a diversified portfolio. Although the ex-post financial performance has shown that early-stage (venture capital) funds are riskier than later-stage funds, both have similar capital charges.

## 4. Some elements of the EIB Group's internal processes are not conducive to the efficient delivery of direct quasi-equity operations.

**In many aspects, quasi-equity differs from EIB core business transactions, and the EIB is still on the learning curve to accommodate these operations into its business model.** Venture debt financing targets young, innovative, high-growth companies, which are riskier-than-average clients facing high business uncertainty, rapidly changing business conditions and often negative and unpredictable cash flows. This is in contrast with traditional EIB banking clients which typically have a more predictable financial performance.

**While direct quasi-equity operations are typically approved via a fast-track procedure under global authorisation, the overall time needed to reach signature and disbursement takes much longer than the market standard, and has risen even more in recent years.** Typical venture debt operations from private sources take about eight weeks to sign. At the EIB, quasi-equity transactions take more than a year on average from initiation to signature, and the time to approval has been increasing consistently over the last few years. While the longer waiting time may be offset for some clients through better overall financing conditions, others find the EIB processes too slow to suit their rapidly changing business needs.

**Quasi-equity clients have special needs compared to other clients, and although the EIB has increased the resources allocated to handle its internal processes and in some cases lightened the burden on quasi-equity operations, there is still room to improve the integration of these transactions into the EIB's environment.** Standard EIB processes often present an excessive burden to potential and actual quasi-equity clients. The relatively substantial administrative procedures do not suit these clients that sometimes lack capacity (resources or expertise) to handle such heavy processes. Both venture debt and thematic products display a high attrition rate, increasing the costs recorded for operations that ultimately never materialised. The high attrition rate is partially due to the length of time it takes to reach approval and signature, as some potential clients find the EIB offer too slow to suit their needs. Operating and monitoring costs for quasi-equity — especially for venture debt — are higher than for other EIB operations. All in all, the administrative burden of EIB processes, which often appear to be rigid to such clients, can result in high attrition, adverse selection of clients and occasionally client dissatisfaction.

## 5. While the EIF is providing stable and predictable funding all along the economic cycle, the length of time it takes to commit equity investments and build up portfolios calls into question the suitability of indirect equity instruments to be used as part of initiatives designed to provide rapidly available funding to firms during economic shocks.

**The EIB Group provides valuable support to risk capital markets through stable and predictable funding, including in times of downturns and crises.** At times when other investors might be less inclined to support market players, the EIB Group remains a reliable financing source, contributing to the maintenance of the market infrastructure and the financing of innovative firms, even if other sources dry out.

**While the time to reach first disbursement of EIF indirect operations is quick by EIB Group standards, the EIF's indirect equity transactions are somewhat slower than the market's needs.** With an average of 310 days from appraisal authorisation to signature, the EIF's equity operations are among the fastest within the Group. However, many clients still perceive this as slow.

**Due to the way private equity funds operate, once committed to a fund, it takes several years for the EIF's indirect equity support to reach the final beneficiaries.** It takes, on average three years for a manager to build up a portfolio with a value of 75% of total commitments. For funds for which the investment period has finished, 80% to 85% of the total EIF commitment reaches the final beneficiaries. The remaining (un-invested) part is explained by 'dry powder' reserves that fund managers set aside for new investment opportunities and emergencies, and management fees that are paid to the fund managers.

**Overall, and for reasons that are not fully in the control of the EIB Group, the length of time it takes to commit equity investments and build up portfolios calls into question the suitability of indirect equity instruments in the EIB Group's rapidly available funding to firms during economic shocks.** Although the vast majority of equity and quasi-equity operations serve a structural objective, some initiatives in the past have been launched with an explicit or implicit countercyclical objective. Evidence shows that it can take years from initiation to deployment of operations, and the funding to reach final beneficiaries. Moreover, the EIB Group's countercyclical policies are frequently conducted via new external mandates which, for reasons beyond the EIB Group's remit, take additional time to be set up and operationalise. This additional delay needs to be added to the timeline. All in all, from the decision to launch a proactive countercyclical action as a reaction to an economic shock to the time the funding reaches the final beneficiaries via intermediaries takes several years. By that time, it is very likely that economic conditions would already have changed significantly.

## 6. The SME PPG does not fully capture the entirety of EIB Group support for small businesses.

**For the EIB, a large number of transactions allocated under other PPGs — innovation in particular — target SMEs and/or mid-caps**. In many cases, the underlying mandates, product definitions etc. explicitly require the beneficiaries to be SMEs. These generally do not feature as SME-related transactions in EIB Group statistics and reports. EIF transactions were automatically assigned to the SME PPG at Group level until 2021, when EIF introduced PPGs as part of the Group's alignment requirements.

**As a result, for the moment it is difficult to obtain a complete picture of the EIB Group's portfolio targeting small businesses.** The EIB's internal data do not have an 'SME flag' that includes SME-related transactions beyond the SME PPG — assembling the complete SME dataset requires expert data classification. The lack of clear insight into the scale of SME-related transactions of the EIB hampers the EIB Group's decision-making process to allocate resources optimally across policy objectives.

## Recommendations

**Recommendation 1:** The EIB Group should reflect in its analysis, decision-making and reporting processes the heterogeneity of the policy impact and financial performance when it comes to the allocation of the indirect equity portfolio across the various stages (venture capital, growth capital and buyout-stage transactions).

* * *

**Recommendation 2:** The EIB should review its current operational processes related to direct quasi-equity transactions and explore alternative operational and institutional set-ups for delivery of quasi-equity operations to better respond to the specific needs of young, innovative firms, aimed at narrowing the gap in terms of flexibility and time to market between the EIB and overall practice on the quasi-equity market.

* * *

**Recommendation 3:** The EIB Group should include in its reporting on small business activity the SME-focused transactions beyond the SME PPG.

# RECOMMENDATIONS AND MANAGEMENT RESPONSE

The Management Committee and the EIF Chief Executive welcome the valuable analysis, of the EIB Group equity and quasi-equity support for SMEs and Mid-Caps. SMEs and Mid-Caps play an important role in the European economy and are a key driver of growth and employment. Yet the lack of collateral and riskier business models hampers their access to bank debt and intermediated finance.

Therefore, EIB Group support for SMEs and Mid-Caps is a key Public Policy Goal (PPG) which aims to address these market failures. In pursuing its objectives as a policy driven bank, the availability of equity and quasi-equity support for SMEs and Mid-Caps plays an important role in addressing gaps.

As recognized by the Evaluation the EIB Group's equity and quasi-equity support for SMEs and Mid-Caps is addressing the relevant market gaps and makes a significant additional contribution to the market in terms of volumes, market developments and best practices.

The Evaluation also recognizes that the EIB Group has an important role in this market given the pro-cyclical nature of the risk-capital markets. The EIB Group's stable and predictable funding acts as an anchor especially in times of downturns and crisis, when traditional investors are less inclined to support market players. The EIB Group remains a reliable source of financing, thus contributing to the stability of the market, the maintenance of the market infrastructure, the fundraising for new generations of funds and the financing of innovative firms, particularly when other sources of finance dry out.

However, there are areas that could benefit from some improvement, namely: reporting and time to market. Thus, the Evaluation has 3 recommendations: two on reporting and one recommendation regarding time to market. Particularly, the long-time it takes to commit equity investments and build up portfolios, especially at the Bank.

Table 1: Recommendations and Management Response

## Recommendation 1

**The EIB Group should reflect in its analysis, decision-making and reporting processes the heterogeneity of policy impact and financial performance when it comes to the allocation of the indirect equity portfolio across stages (venture capital, growth capital and buyout-stage transactions).**

Overall, the EIB's and EIF's support to equity and quasi-equity markets is addressing relevant market gaps and makes a significant contribution to the market in terms of volumes, market development and best practices. The evaluation found that the EIF investments targeting the buyout stage provide less added value as compared to those falling under the venture and growth capital stages. This applies at both fund and final beneficiary levels. When it comes to impact, the EIF support was found to promote better growth and employment when targeting firms at earlier stages compared to beneficiaries of funds investing into buyout-stage firms. The firms in the buyout category also appear to be less innovative than other beneficiaries within the portfolio. At the same time, the profitability of the latter stage buyout funds tended to outperform the other stages in the past, thereby adding significantly to the group's financial sustainability.

In finding the right balance between the mixture of investments across the various stages, it is important that decision-making takes into account the existence of this trade-off. A first step towards this objective would be to use a classification of fund strategies in reporting and decision-support documents that are aligned with the market standards and reflect with sufficient granularity the focus of the underlying portfolio, enabling a differentiation between investments targeting early-stage venture capital, growth capital and buyout stage firms.

## Management Response: Agreed

The EIF notes the positive appreciation of the Report for its activities in support of equity and quasi-equity markets. Noting the specific findings of the Report relating to funds targeting the buyout stage, the EIF proposes that additional analysis based on qualitative and quantitative criteria be conducted in order to further underpin the specificities of that particular asset class and its benefits to the European private equity architecture as a whole.

In this context, the EIF observes that the beneficial effects of sustaining public investments to companies in the buyout stage extend well beyond the sole financial sustainability of the investment portfolio, which is already well highlighted in the report. Compelling and well-documented policy drivers mandate continuous efforts in this area, not least as regards the considerable company growth, job creation, management team professionalization and international expansion potential.

The Management Committee and the EIF Chief Executive recognize that, on the basis of the Report and any additional market and policy intelligence that may be conducted, an updated classification system of fund strategies in reporting and decision-support documents would be supportive of EIB Group action. Such initiative could assist relevant decision-making bodies to better understand the heterogeneity of the policy impact and the financial sustainability when it comes to the allocation of indirect equity portfolio across the different financing stages.

From EIB perspective it should be noted that any change to IT or reporting systems that impact the Bank would be time consuming and resource intensive and therefore could face implementation delays.

## Recommendation 2

**The EIB should conduct a review of its current operational processes related to direct quasi-equity transactions and explore alternative operational and institutional set-ups for delivery of quasi-equity operations to better respond to the specific needs of young, innovative firms, with the view to narrowing the gap in terms of flexibility and time to market between the EIB and the overall practice observed on the quasi-equity market.**

The evaluation found a number of shortcomings with respect to the EIB's quasi-equity operations: first, the time from initiation to signature of the quasi-equity operations is longer than the standard market practice and has been increasing over the last few years.

This longer waiting time was found by some clients to be too slow to suit their rapidly changing business needs. Second, the standard EIB processes were often found to present excessive burden to potential and actual quasi-equity clients. Finally, the quasi-equity clients appear to have special monitoring needs compared to other client and the EIB was not always perceived to be in a position to meet such needs.

## Management Response: Agreed

The Management Committee takes note of this recommendation and would like to highlight that the EIB as a policy driven bank has a more stringent due diligence process that can result in a lengthier process. Nevertheless, the EIB recognizes that the more stringent process only partially explains the length of the process and there is significant room for improvement in our time to market and efficiency gains could be explored.

The EIB Services are in the process of agreeing a number of improvements in venture debt product design reflecting recent market changes as well as direct feedback from clients and investors which - subject to MC approval - are expected to improve market fit and processing time to a certain extent. In addition, services will perform a review of the current operational process so as to assess the gap and explore options to narrow it in terms of flexibility and time to market, while ensuring that the thoroughness of the appraisal remains unaffected.

## Recommendation 3

**The EIB Group should include in its reporting on small business activity the SME-focused transactions outside the SME PPG.**

The EIB statistics and reports do not currently include a comprehensive overview of the EIB Group transactions implemented in support of small businesses. The evaluation found a large number of transactions which were not allocated to the SME PPG but are in fact targeting SMEs and mid-caps.

In addition, the EIB's business data and reporting do not have an 'SME flag' that includes SME-related transactions beyond the SME PPG. This lack of clear insight into the scale of SME-related transactions of the EIB hampers the EIB Group's ability to provide accurate input into decision-making and to allocate resources optimally across policy objectives.

## Management Response: Partially agreed

The Management Committee and the EIF Chief Executive understand the importance of reporting the full scale of the EIB Group support to SMEs and small Mid-Caps and acknowledge that the PPG framework does not allow for a comprehensive overview of the EIB Group transactions targeting SMEs. However, by adopting the PPG framework, EIB Group established long-term sustainable objectives with a clear link to EU policy so as to achieve a balanced mix of financings across different policy areas, including support to SMEs. The framework also sets the basis for appropriately reporting EIB Group's lending activities within the overall Group Operational Plan.

While the Group recognizes the merit of the proposal, it seems that it would not be limited to SMEs but could also apply to Digitalization and Innovation. Accounting for all operations in support of SMEs (as well as Digitalization and Innovation), regardless of the PPG to which the operation has been allocated, would risk blurring the (primary) PPG concept and consequently also introduce further complexities and confusion in the EIB Group reporting. Hence the Management Committee and the EIF Chief Executive do not recommend to implement the reporting of SME-focused transactions outside the SME PPG, as it would result in double counting of the volumes of lending that support more than one PPG. Instead, the EIB Group will present a note to the Management Committee, including, if possible, a one-off attempt to extract historical SME information for operations under the non-SME PPGs that were approved over a limited timeframe (to be defined), and a more detailed analysis of the proposal, taking into account the constraints around the implementation as well as its broader consequences, especially in relation to the existing PPG framework.

With regards to the proposed SME flag, it is not clear how a simple flag will provide sufficiently granular information. Also it should be noted that any change to IT or reporting systems would be time consuming and resource intensive and therefore could face implementation delays. In addition, our preliminary understanding is that there is no systematic collection of data on the number of company employees (way to identify SMEs & Mid-Caps) in case of projects contributing primarily to other than SME PPG. This would introduce a new reporting requirement towards the promoters, which is not recommended. In the current business environment. Also, in operations that do not exclusively target SMEs and Mid-caps, the exact breakdown of final beneficiary type is not known at the appraisal stage, which would require additional resources during the monitoring phase.

Given the above issues, it is not clear how beneficial the proposed SME flag would be compared to the existing PPG framework, in particular with respect to enhancing the EIB Group's ability to provide accurate input into decision-making and to allocate resources optimally across policy objectives.

# 1. INTRODUCTION

**This evaluation looks at the EIB Group's support to SMEs and mid-caps through equity and quasi-equity instruments in the European Union over the period 2010-2021. These operations usually target young, fast-growing and innovative firms. EIF equity operations intermediated through private funds amounted to €26 billion over that period, while EIB direct quasi-equity and indirect equity operations amounted to €4.4 billion and €1.7 billion, respectively. A large proportion of the operations are carried out through external mandates and resources.**

**The Evaluation Department's Work Programme 2021-2023, approved by the Bank's Board of Directors, plans to launch an "Evaluation of the EIB Group's support to SMEs and mid-caps through equity and quasi-equity" for 2021.** The Work Programme specifies the following: "SMEs are at the core of the EU economy, representing 99% of all businesses. They employ around 100 million people, account for more than half of Europe's GDP and contribute to every sector of the economy. For these companies, access to finance is still a concern despite a low interest rate and an ample liquidity environment, especially for younger, smaller innovative firms and firms active in countries more affected by economic downturns."

**The last IG/EV evaluation dedicated to SMEs in Europe dates back from 2013.** Since then, the approach and products that the EIB Group uses in support of SMEs have greatly diversified and the overall economic and market context has evolved.

**IG/EV has launched two evaluations of the different product lines offered by the EIB Group in support of SMEs and mid-caps.** The first of this series is an evaluation of support provided through equity and quasi-equity products. It is complemented by another evaluation focusing on loans (funded instruments) and guarantees (unfunded instruments).

**Box 1: Defining SMEs and mid-caps**

**Small and medium-sized enterprises**

Businesses that employ fewer than 250 persons and have an annual turnover not exceeding €50 million, and/or an annual balance sheet total not exceeding €43 million.

- Micro-enterprises are defined as enterprises that employ fewer than ten people and whose annual turnover or annual balance sheet total does not exceed €2 million.
- Small enterprises are defined as enterprises that employ fewer than 50 people and whose annual turnover or annual balance sheet total does not exceed €10 million.
- Medium-sized enterprises are defined as enterprises that employ fewer than 250 people and either have an annual turnover that does not exceed €50 million or an annual balance sheet not exceeding €43 million.

*Commission recommendation 2003/361/EC*

**Mid-cap enterprises**

Enterprises that employ between 250 and 3 000 people. They are not micro, small or medium-sized enterprises as defined in Commission Recommendation 2003/361/EC. Criteria relating to balance sheet total or turnover are not relevant in the context of this mid-cap definition.

**The evaluation focuses on the operations' relevance, additionality, impact and financial performance.** The evaluation addresses the following questions:

- To what extent do EIB Group operations appropriately address the heterogeneous SME/mid-cap equity and quasi-equity financing gap?
- To what extent is the EIB Group operating model fit for delivery of equity and quasi-equity support to SMEs?
- To what extent have the EIB Group's direct and indirect operations added value?
- To what extent is the Group's equity and quasi-equity financing contributing to enhanced growth and innovation?
- What are the implications of equity-type operations on the Group's long-term profitability and capital position?

**The intended users of this evaluation are primarily the following stakeholders:**

- The EIB and EIF Board of Directors for accountability and learning purposes.
- EIB Group management and services formulating EIB strategy and interacting with the European Commission and other EU and national bodies in relation to support for small businesses and innovative firms.
- Group services originating, structuring and implementing operations in support of small businesses and innovative firms.
- External stakeholders such as the European Commission, NPBIs, beneficiaries (small businesses and financial intermediaries) and the public at large.

## Financing young, fast-growing and innovative small businesses in Europe

**Equity and quasi-equity instruments typically target a special subset of SMEs and mid-caps, which are often young fast-growing innovative firms.** It is important to highlight that these instruments, in most cases, are not catering for the financing needs of the general SME and mid-cap population. They address the problem arising from the particular risk profile and business model related to innovation, which renders these firms often unable to obtain financing from the traditional system of financial intermediation. In exchange for the higher risk, these instruments also offer higher expected returns — usually beyond the profit-generating capabilities of traditional SMEs.

**Young, fast-growing, innovative SMEs play a crucial role as key drivers of growth, yet they are often unable to access funding to develop their business through the banking system.** Empirical evidence (Hallak and Harasztosi, 2019) shows that young, small firms are the largest contributors to net employment growth in the European Union. When it comes to productivity dynamics, recent United States data reveals that young firms — below five years of operating age — generate half of economic growth, roughly three times more than their share of employment might suggest (Klenow and Li, 2020). However, banks are generally unwilling to fund the investment needs of such firms. Innovative firms usually run more risky business models, which contribute to their growth potential, but they are also more difficult for banks to assess and monitor. Such firms also tend to rely heavily on intangible assets. Therefore, they usually do not possess sufficient physical capital that they could use as collateral.

**The lack of sufficient private funding for young, fast-growing or innovative firms gives rise to the 'equity gap', which can serve as a basis for public sector intervention.**[4] The equity gap is often linked to the following types of market failures in economic literature: [5]

- **Asymmetric information and transaction costs**: The often complex, novel and risky business models of such firms, sometimes based on undisclosed technology, create information asymmetries between investors and entrepreneurs. The availability and quality of available information for smaller and younger companies is even worse than for more mature firms. The costs associated with reducing the information gap may prevent investors from engaging in otherwise viable businesses.
- **Coordination failure**: The institutional building blocks of venture capital/private equity market infrastructure, and the networks necessary to operate this infrastructure, cannot develop without a pipeline of successful projects. These, however, cannot materialise without sufficient funding. Public intervention may overcome this chicken-and-egg problem by acting as a first mover to establish the equity markets for such firms.
- **Positive externalities**: Private investors cannot fully assess and/or appropriate the societal benefits of the innovation activities generated by the investee companies.
- **Limits to diversification**: Even when the equity gap is overcome for early-stage startups, for high-growth firms at the later stages of maturity the funding needs are getting bigger. Financing such large tickets does not allow enough diversification for typical investors. This can result in a 'scale-up gap', where financing — generally taking the form of later-stage venture capital or growth capital — can dry up for successful startups maturing into the growth phase.

[4] A detailed discussion of the economic rationale for public support for venture capital can be found in Kraemer-Eis, Prencipe and Signore (2016).
[5] The relevance of these arguments and the existence of the 'equity gap' in the EU context will be explored in more detail in Chapter 1.

**Box 2: EIB Group in support of the Pan-European Scale-up Initiative**

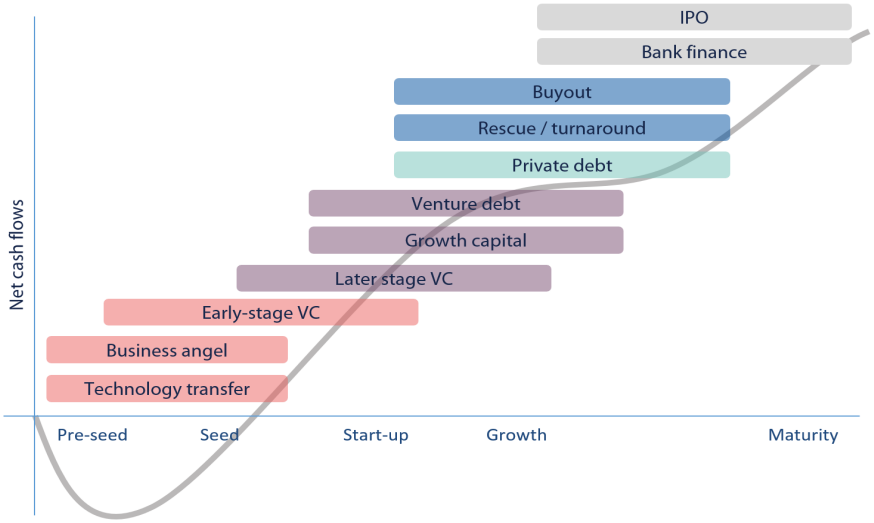
The financing of European companies that want to grow from startup status to a more developed venture is constrained. This is slowing down the growth of startups and the tech ecosystem across Europe.

The Pan-European Scale-Up Initiative, launched under the French Presidency of the Council of the European Union, aims to broaden access to funding for firms at the growth stage by unlocking capital resources for funds based in Europe. More European funds specialising in late-stage rounds are needed to facilitate the raising of over €100 million by investee companies on the private markets.

Under this initiative, the EIB Group will build on its strong experience and manage the European Tech Champions Initiative (ETCI), a multi-investor fund-of-funds structure that will help build a European ecosystem. The EIB Group will initially commit up to €500 million for the launch of the ETCI.

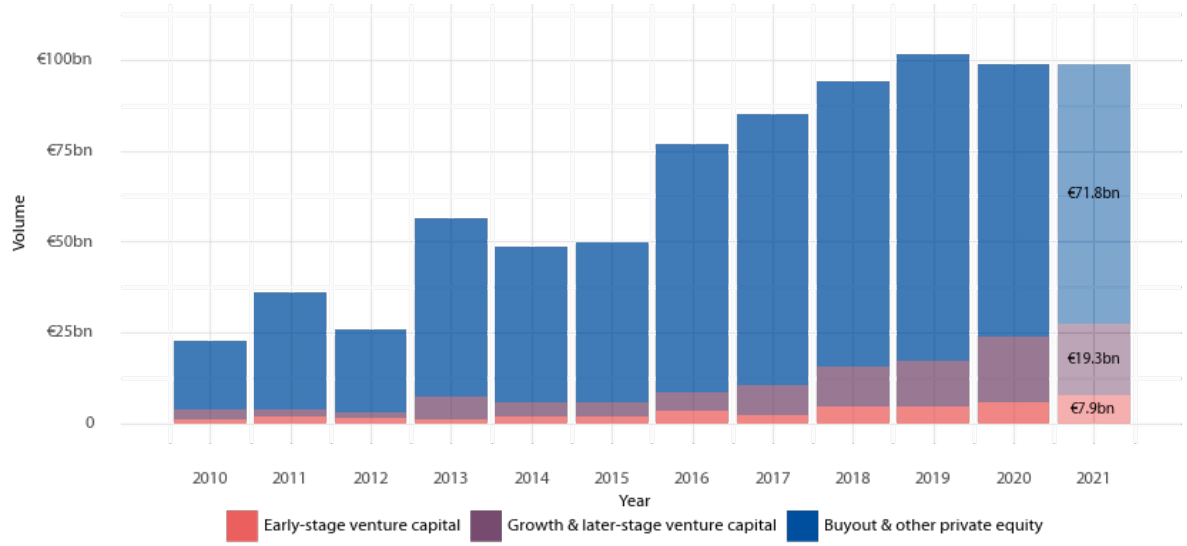
**Such SMEs require different types of financing at different stages of their development.** SMEs typically generate negative net cash flows during the earlier stages of their development. Having no reimbursement capacity, these small businesses cannot finance themselves through a regular bank loan. Without appropriate support, the net negative cash flows would then hamper their ability to growth in the long term. With maturity, the risk decreases and successful companies generate positive net cash flows, enabling these SMEs to finance themselves via traditional financing sources.

**Figure 1: The development and financing cycle of young, innovative or fast-growing companies, a.k.a. the J-Curve**



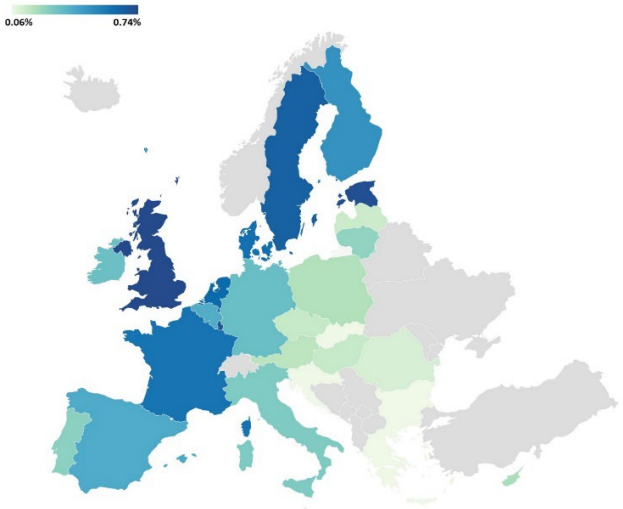

**For some more mature firms, private equity — generally taking the form of a buyout, rescue or replacement capital — can also play an important role in unlocking growth potential beyond innovation through reorganisation, mergers, acquisitions, transfer of ownership or simply through financing regional or international expansion.** For many such firms, equity financing is more suitable than loans. Yet, European private equity sources may not always be sufficiently available within the traditionally bank-based system of financial intermediation in the European Union. Public sector intervention in these cases is usually justified on the basis of strengthening non-bank financial intermediation in the European Union. Furthermore, strategic considerations such as the need to keep successful companies in European ownership can play a role.

**Figure 2: Investments in private equity/venture capital funds, EU 27 + United Kingdom**




Source: Invest Europe

**Figure 3: Venture capital and private equity investments by country, as a share of GDP**




Source: Invest Europe

**Since 2010, private equity and venture capital markets have grown rapidly in the European Union.** More than 70% of the funding consists of buyout and other private equity transactions, whereas the remainder is split between early- and later-stage venture capital, and growth capital (**Figure 2**). Venture capital and private equity markets are more mature, and develop more rapidly in certain Member States; thus, fundraising is heavily concentrated in a few countries, such as the United Kingdom, France and Sweden (**Figure 3**). Despite its small size, Luxembourg is by far the most active market relative to GDP, with funds raised reaching close to 3% of annual GDP. In Europe, the share of public intervention in private equity is growing, with volumes steadily increasing including an acceleration in 2016. The share of public funding is 12% of total funds raised over the period 2010-2020. Public intervention generally targets earlier stages — venture capital rather than private equity — and accounted for more than a quarter of venture capital funds raised over 2010-2020. However, public support at national level has fluctuated significantly over time (Kraemer-Eis et al., 2021).

**The total equity amount invested in European companies increased significantly during the period under review**, with a steep increase since 2019. Although relatively less concentrated than fundraising, the growth in investment is driven by the high volumes invested in France, Germany and the United Kingdom. While they remain relatively smaller, investments in Estonia, Lithuania, Greece, Malta and Cyprus were multiplied more than eight times over the period 2010-2021. Relative to GDP (Figure 3), Central and Eastern European countries lag behind and are still underserved, with the notable exception of Estonia where investments relative to GDP are at similar levels as in the United Kingdom.

**The venture debt market remains quite small but has gained in importance.** A few providers, such as Silicon Valley Bank, Kreos and the EIB dominate the venture debt market. Although not all providers report publicly on volume, the market size is estimated to account for more than €10 billion. In regional terms, the venture debt market follows a similar geographic distribution as the venture capital market.

# Evaluation scope

**This evaluation focuses on equity and quasi-equity operations concluded with clients located in EU Member States.** While the EIB Group is also active in venture capital and private equity markets outside the European Union, these operations were excluded from the scope, as (a) the bulk of EIB Group equity and quasi-equity operations are implemented in EU Member States; (b) the socioeconomic context in non-EU countries is very different compared to the European Union, especially in African, Caribbean and Pacific (ACP) countries where the lion's share of equity and quasi-equity operations outside the European Union take place. This would make it difficult to draw relevant conclusions for both of these regional groups.

**For the majority of the analysis, the evaluation examines operations approved in the period 2010–2021.** Such a long period enables the EIB Group portfolio of equity and quasi-equity operations and its evolving relevance to be examined given that the impact of the interventions takes time to materialise. While the overall scope of the evaluation is from 2010 to 2020, we allow some flexibility to use different time frames for the various evaluation issues. For the profitability analysis, which takes a lifetime perspective, the timeline is portfolio-dependent and is defined from inception up to end-2021. Other inputs into the analysis (such as surveys, interviews) required a focus on more recent operations for which there is adequate institutional memory and for which it is possible to identify and contact relevant stakeholders.

**The EIB Group offers a broad variety of equity and quasi-equity products.** This evaluation uses the term "equity-type operations" as a shortcut to refer to EIB Group equity and quasi-equity operations/products targeting SMEs and mid-caps at different stages of their life cycle. These include a range of equity products, such as technology transfer and business angel funding, early-stage and later-stage venture capital, growth capital targeting later-stage ventures and private equity in the form of buyouts,[6] replacement and rescue/turnaround capital targeting mature firms. The evaluation also includes hybrid debt products with equity-like elements, such as quasi-equity/venture debt in the definition. The definition includes both direct and indirect operations, and comprises operations undertaken at own risk and under third-party risk.

**As regards the EIF, the scope includes almost the entire equity/quasi-equity portfolio, with the exception of diversified loan funds.** All of these EIF equity transactions are considered in the scope of our evaluation since they aim to support SMEs and mid-caps, and have been included in the SME PPG at Group level by default.[7] The scope differentiates between the two types of funds that provide debt to final beneficiaries. Debt funds can either be "diversified", meaning that they target a granular portfolio, or "selective" when they target a non-granular portfolio and their managers adopt a private equity-like approach. The support provided via selective debt funds is included in the evaluation scope, as the way managers operate such funds is very close to equity funds, with a full due diligence process performed at beneficiary level. By contrast, diversified debt[8] funds are excluded from the evaluation scope.

**Table 2: EIB Group products in scope**

| | EIF | EIB |
|---|---|---|
| Direct operations | | Venture debt |
| | | Thematic finance |
| Indirect (intermediated) operations | Equity funds | Captive funds |
| | Co-investment schemes | |
| | Selective debt funds | |

[6] Funds investing in buyout-stage firms purchase controlling stakes in companies with the intention to improve their business and exit at a higher multiple. The EIF is selective in its financing to support funds investing in buyout-stage firms and focuses on funds that maximise the growth of their portfolio companies prior to selling them.

[7] While this was the case for most of the evaluation's scope, the restructuring of the EIF's PPGs in 2021 has changed that and some EIF operations since are contributing towards EIB Group PPGs other than the SME PPG.

[8] For the avoidance of doubt, diversified debt funds are excluded from the scope of the evaluation because they provide senior debt products rather than equity/quasi-equity products.

**As for the EIB, the evaluation will consider mainly direct quasi-equity operations.** Quasi-equity operations are conducted either fully or partially under own resources (for example, under EFSI) — in which case they are characterised as venture debt — or under mandates with 100% risk coverage from the European Commission targeting specific sub-sectors — in which case they are called thematic finance.

**While the EIB's intermediated equity operations — via captive funds — were also part of the original scope, the evaluation did not integrate these transactions into the full analytical framework due to the scarcity of available data.** The EIB provides intermediated equity support through "captive" investment funds and platforms promoted by the public sector. Firm-level data are currently available only for a small set of these operations, therefore it is difficult to develop a solid assessment of this portfolio. Leaving them out of the analysis would not significantly affect the overall conclusions, given the small size of the EIB's intermediated equity business line targeting SMEs. Nevertheless, the report highlights findings on these operations where data and information has enabled us to develop insights.

**Box 3: Quasi-equity, venture debt and thematic finance**

**Quasi-equity** is a category of "debt" which bears equity-type risks, but does not carry all the risks of pure equity. It ranks between equity and debt, having higher risk than senior debt and lower risk than common equity. Quasi-equity investments can be structured as debt, typically unsecured and subordinated and in most cases convertible into equity. It provides non-dilutive risk capital: the owner of the company does not lose ownership and control of their firm. At the same time, the investor is remunerated based on the company's performance, just as an equity investment is. It is considered to be an alternative to growth capital.

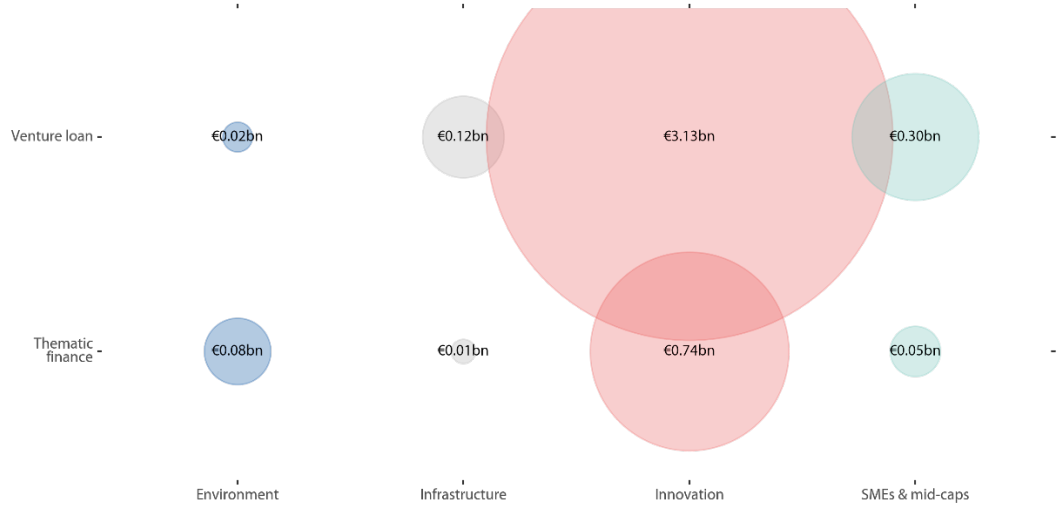
EIB's quasi-equity product is a strategic policy instrument that targets impact investing in companies with high R&D investments. Rather than focusing on short-term returns, it primarily targets companies that develop novel and strategic new technologies, even when it takes longer to market and acquire capital. This includes sectors such as biotech, robotics and clean energy.

**Venture debt** involves quasi-equity products that enable the EIB to directly support innovative small and medium-sized companies with tailored financial solutions to accelerate their development.

**Thematic products** are venture debt products that enable the EIB to specifically target market gaps with a higher risk profile. Benefiting from 100% risk coverage from the European Commission, they specifically focus on companies or projects with high development, technological or market risk beyond an acceptable level under EIB credit and equity risk guidelines. There are three quasi-equity thematic mandates:

- Infectious Diseases Finance Facility under InnovFin
- Energy Demonstration Projects Facility under InnovFin
- Future Mobility under the Connecting Europe Facility

**Figure 4: EIB quasi-equity operation volumes by contribution to vertical PPGs**




Source: EIB data

**The scope is not restricted to those transactions in the EIB's equity and quasi-equity portfolio that are reported under the SMEs and mid-caps PPG.** As presented in

Figure **4**, quasi-equity transactions are in most cases allocated to PPGs other than the SMEs/mid-caps one — to innovation, in particular. Only about 8% of quasi-equity transactions targeting innovative SMEs and mid-caps are reported under the SME PPG. In many cases the underlying mandates, product definitions etc. require the beneficiaries to be small and medium businesses. These operations are also very similar in their objectives and targeted beneficiaries to the operations of the EIF, which are allocated to the SMEs and mid-caps PPG by default. Thus, to obtain a complete picture of the EIB Group's equity and quasi-equity support to SMEs, the evaluation will selectively include other relevant product groups reported under other PPGs.

**Box 4: Difficulties in identifying operations targeting small businesses in the EIB's portfolio**

The EIB Group's Public Policy Goals (PPG) framework includes four mutually exclusive vertical PPGs, one of which is to support SMEs and mid-caps. The framework reflects the EIB Group's lending priorities and ensures an alignment between these objectives and the political priorities set by the European Union. PPGs are also used as indicators to report on financing provided across different policy areas.

From the EIB Group internal dataset, it is, however, difficult to identify EIB operations targeting small businesses. Depending on whether they are fronted by the EIB or the EIF, transactions of similar nature are classified under different PPGs. Some EIB operations, while they are in support of small businesses, are fully classified under other PPGs (such as innovation). Consequently, internal reports on SMEs and mid-caps activity do not provide a comprehensive picture on the support provided by the EIB Group since they are based on the PPGs allocation. During the period under review, EIF operations were de facto reported as contributing to the SMEs objective. However, recent developments on the alignment of EIF activity with PPGs reporting at Group level are likely to lead to similar issues of under-reporting for EIF operations.

While this evaluation addresses this issue for equity and quasi-equity operations, it is not specific to equity-type products; therefore the problem extends beyond the scope of this report.

## Methods and data

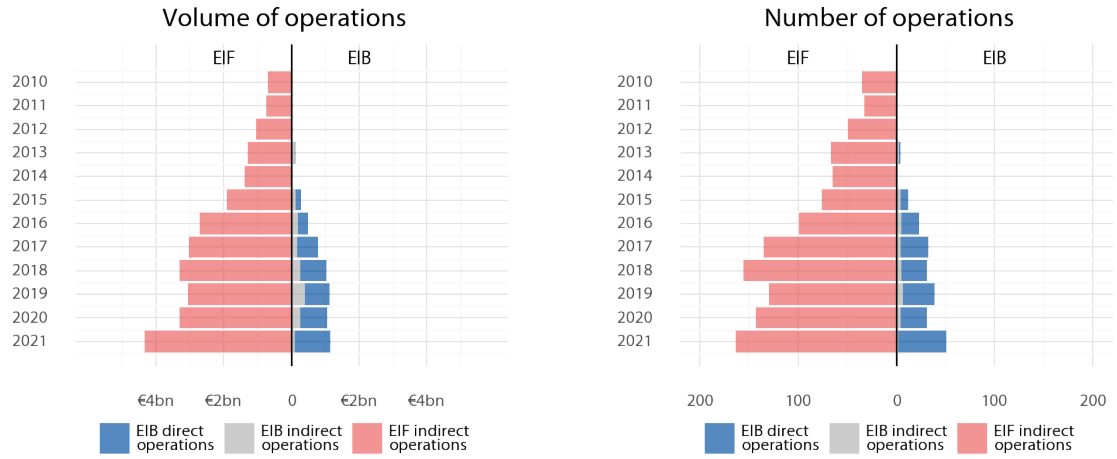
**The evaluation was based on various methods performed at portfolio and individual operation level, as well as on a broad variety of sources of information:**

- **Portfolio analysis:** The portfolio analysis looks at EIB Group equity and quasi-equity support using signature and disbursement data over the period 2010-2020. For intermediated transactions, the evaluation looks at data both at the intermediary and final beneficiary level.
- **Document review:** The evaluation examined the Group's internal documentation: strategies, procedures, agreements, reports, notes, approval and due diligence documents, minutes and any relevant documents describing products, mandates and programmes.
- **Literature review:** The evaluation reviewed the academic literature and relevant technical reports on the SMEs and mid-caps financing gap, and equity and quasi-equity support.
- **The evaluation assessed the equity financing gap for SMEs.** Based on a literature and data review, the evaluation assessed the equity funding gap in the European Union. It provided an analysis of the gap from a geographic perspective, by SME development stages and considered the gap's fluctuation with economic cycles.
- **Interviews:** The evaluation conducted interviews with EIB services and other relevant stakeholders, including industry experts and EIB Group clients — both intermediaries and SMEs and mid-caps benefiting from the Group's support.
- **Case studies:** The evaluation included an in-depth review of a selected group of operations, based on approval documents, agreements, follow-up reporting, individual interviews and any other relevant information.
- **Surveys:** The evaluation used survey data on Group clients benefiting from equity-type support, covering both final beneficiaries and financial intermediaries.
- **Financial sustainability analysis.** The evaluation also analysed internal Group data on costs and revenues and performed a profitability analysis at sub-portfolio level.
- **Counterfactual impact analysis.** Building on existing studies conducted by the EIF's Research and Market Analysis (RMA) team and the EIB's Economics Department, the evaluation performed a counterfactual analysis to assess the impact of the EIF's operations at final beneficiary and fund level.
- **Besides internal data on EIB and EIF operations, the evaluation also looks at external data sets.** These include data from Invest Europe on venture capital activity, the ECB SAFE survey, ORBIS and Zephyr.

# The Group's equity and quasi-equity portfolio

**Both the EIF and the EIB have been increasing the volume of equity/quasi-equity operations targeting SMEs and mid-caps over the last 10 years** (**Figure 5**)**.** On the EIF side, these are indirect operations via intermediaries, with net commitment volumes amounting to €26.8 billion over the period (Figure 6). Yearly commitments have increased more than threefold since 2010, and since 2016 they have exceeded €3 billion per year. The EIB's operations include direct operations — where the EIB is reaching out directly to the final beneficiary and providing quasi-equity — with a total signature value of €4.4 billion. Most of the operations have been signed since 2016.[9] EIB indirect operations amount to €1.7 billion.

**Figure 5: Volume (net commitments/signatures) and number of equity/quasi-equity operations over time**

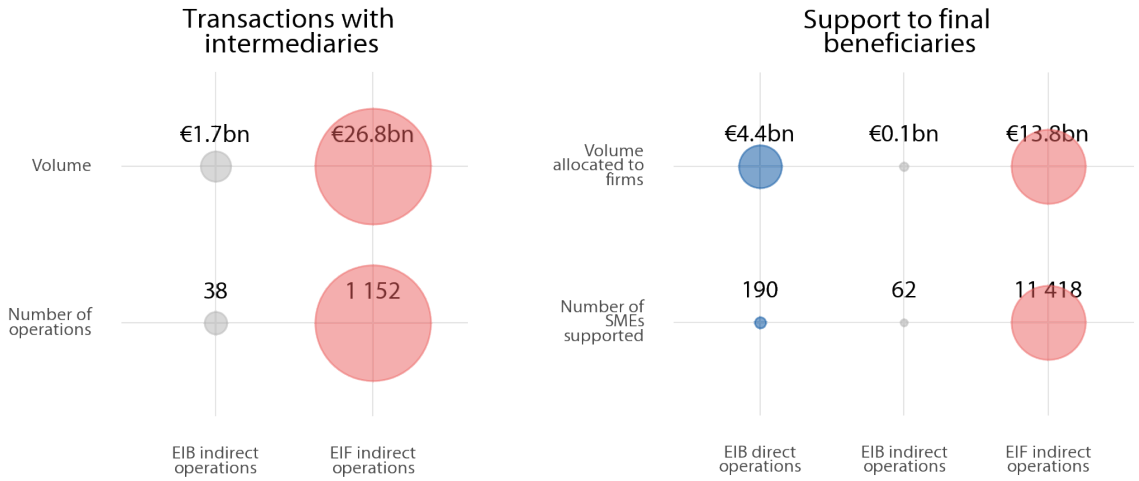



Source: EIB and EIF data

**About half of the EIF's net commitments to funds — €13.8 billion out of €26.6 billion — have been passed on to final beneficiary firms** (**Figure 6**)**.** The difference is due to a combination of factors: the time it takes for venture capital and private equity funds to build up the investment portfolio, the rapid increase of activity in the recent years, and the fact that funds operate usually with an undisbursed 'dry powder' buffer. These factors will be discussed in more detail in Chapter 3. For EIB-intermediated operations, the bulk of the data on final beneficiaries are not available (out of €1.7 billion invested in captive funds, firm-level data on final beneficiaries were available in-house only for €0.1 billion), hence creating a substantial apparent discrepancy between signatures and allocations.

[9] The portfolio definition in the case of the EIF is the following. We received data from the EIF on equity positions. We selected operations where the commitment took place between 1 January 2010 and 31 December 2020. We removed infrastructure funds from the data where the final beneficiaries are typically not SMEs and mid-caps. We also removed diversified debt funds from the data, as from the viewpoint of the final beneficiary these are loans as opposed to equity/quasi-equity products. The EIB's starting point was the signature dataset in BO/Serapis, where we selected all operations labelled "Equity/quasi-equity" over the time period defined above. Then we excluded all non-EU operations, except those that took place in the United Kingdom. We also excluded investments in, and co-investments with, climate and infrastructure funds.

**Figure 6: Scale of activity with intermediaries and final beneficiaries**



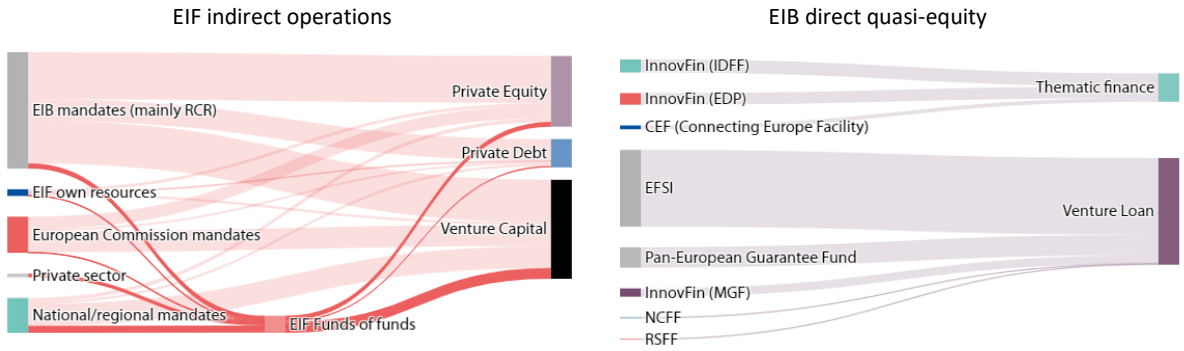

Source: EIB and EIF data

**A large share of equity and quasi-equity operations are supported via external mandates and resources. Figure 7** provides an overview of the mandates used to finance equity and quasi-equity activity as well as operations supported via external mandates and resources. The EIF's largest mandate is the EIB's RCR mandate, followed by European Commission mandates and national/regional sources that include structural funds. The EIF also combines national and regional sources with other relevant mandates into funds-of-funds with a specific — usually regional — investment objective. Mandates from the European Commission and from national sources also play an important role. In the case of the EIB, venture debt was mainly supported by EFSI and, to a smaller extent, by InnovFin, and more recently by the European Guarantee Fund (EGF). Thematic finance operations are carried out through specific mandates such as InnovFin.

**Box 5: EIF's mandate allocation policy**

The EIF manages a large number of mandates, each with different specific objectives and eligibilities. Based on agreements and for each mandate, the EIF defines a mandate profile that provides indicators of each preferred area of support to ensure that financing is channelled to the targeted final beneficiaries. The EIF then matches investment opportunities with the most suitable candidates in its mandate portfolio. This ensures fair and transparent treatment of all mandators.

**Figure 7: Use of resources and mandates supporting equity- and quasi-equity operations**




Source: EIB and EIF data

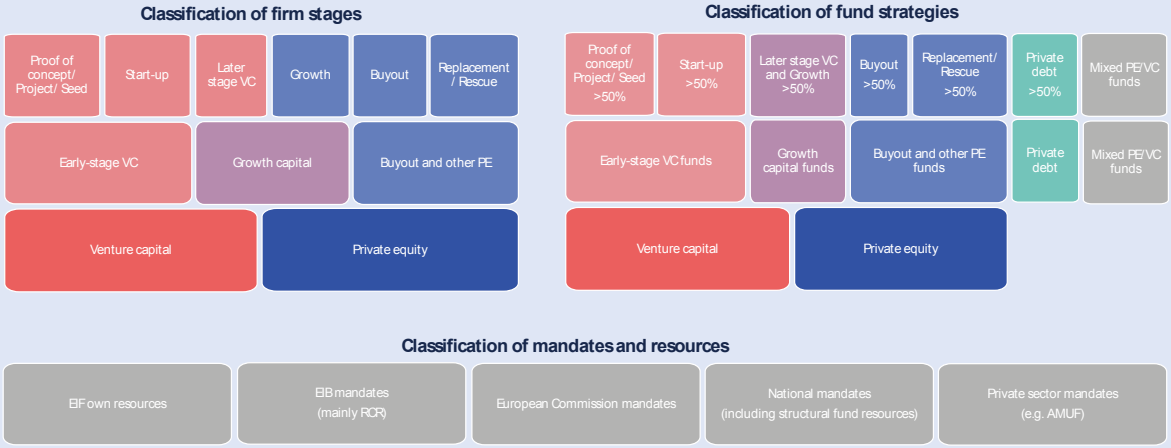
**Box 6: Grouping EIF operations by firm investment stages, fund strategies and mandates.**

**To be presented and analysed, operations data need to be grouped into meaningful categories.** This is particularly important for EIF data, as EIF operations span a wide range of investment stages, fund types and mandates. The aim was to create groupings that are (a) relevant for evaluation questions; (b) easily comparable with market data, in particular with data from Invest Europe; and (c) available and consistent over time.

**The starting point for categorising investments in final beneficiary firms is the EIF's own classification, which is based on the guidelines from Invest Europe.**[+] It uses six main categories, spanning from investments in early-stage to mature firms. In some parts of the analysis, we use three broader categories: early-stage venture capital, growth capital and buyout, and other private equity. In some cases, the data only enabled us to identify two categories: venture capital and private equity.

**In terms of group fund level data, the evaluation's starting point was the main focus of the fund's portfolio.** If a fund dedicated more than half of its volume into any particular firm investment stage, it was assigned to a group with the name of the investment stage. Separate categories were created for mixed funds that do not focus chiefly on one particular stage, and also for private debt funds. Similarly to firm-level data, higher-level categories were created as illustrated below. The resulting categorisation's advantage is that it corresponds well with the data reporting of Invest Europe.

**The evaluation also grouped the large number of mandates operated by the EIF based on the type of mandator.** The resulting five categories represent the EIF's own resources, EIB mandates, mandates originating from the European Commission, mandates with a national or regional focus (including ESIF mandates), and private sector mandates, such as the Asset Management Umbrella Fund (AMUF).




[+] *https://www.investeurope.eu/media/2784/invest-europe-research-methodology-and-definitions.xlsx in https://www.investeurope.eu/*

# 2. TO WHAT EXTENT DO EIB GROUP OPERATIONS ADEQUATELY ADDRESS THE HETEROGENEOUS SMALL BUSINESSES/MID-CAP EQUITY AND QUASI-EQUITY FINANCING GAP?

- **There is a strong rationale for public intervention on equity markets, particularly at the early stage. In Europe, there is a structural equity financing gap, especially in the areas of venture capital and growth equity.**
- **The Group's objectives for equity and quasi-equity operations are relevant to address these needs, while they also put emphasis on maintaining financial sustainability.**
- **Overall, EIBG operations are addressing a clear gap in the EU equity and quasi-equity markets, in which they play a key role.**
- **Nevertheless, a sizeable part of EIF operations, supported chiefly by the RCR mandate, are targeting firms at the buyout stage, where the financing gap appears to be less pronounced.**
- **Relative to the market, the Group's equity operations have a higher share in Member States with less developed risk capital markets.**
- **EIF venture capital and growth operations and EIB quasi-equity are targeting innovative sectors, while EIF support to funds investing in buyout-stage firms, and even more so, EIB indirect operations focus on less innovative industries.**
- **While there is growing demand for funding in green technologies, EIF operations in the past have had a low share in this segment.**
- **EIF operations are contributing to the development of EU equity markets by providing opportunities for less experienced fund management teams to enter the market.**

## Strong rationale for public intervention on the equity market

**Public sector intervention in private equity and especially venture capital has increased in many countries in recent years.** The main driver for this development is the link between venture capital, entrepreneurship, innovation and economic growth. If entrepreneurial activity is not met by a sufficient supply of equity investment due to market failures, the number of startups may decrease and innovative activity could diminish, which is seen as a necessary condition to master societal and economic challenges.

**Government intervention in venture capital and equity markets is traditionally legitimised by market failure rationale**. Proponents argue that due to market failures, the level of equity investments is suboptimal (too low) from a societal perspective. The key elements behind market failure are asymmetric information, transaction costs, coordination failure and positive externalities, which have been discussed already in more detail in the introduction to this report.

**In a European policy context, strategic sectoral policy and geopolitical objectives also present additional arguments for intervening on the private equity and venture capital markets.** Foreign venture capital is often thought to be a catalyst for the 'brain drain'[10] of European entrepreneurial talent. In addition, strategic autonomy in key innovative sectors becomes ever more important in times of heightened geopolitical risks.

**The rationale for public support is stronger in the venture capital and growth capital segment than for buyout private equity.** First, the market failure arguments are much more applicable to young, early-stage companies with negative net cash flows, which are typically found in the venture capital and growth segment, as opposed to the more mature companies that are often the target of buyout transactions. Second, firms benefiting from venture and growth capital are usually innovative, whereas buyout target firms are not necessarily so. As a consequence, arguments based on the positive spillover effects of innovation and the need for strategic autonomy are more relevant for earlier-stage segments. All in all, there is little academic evidence on the role of public intervention in the private equity segment targeting buyout-stage firms in general and possibly even less so for non-innovative firms. Yet, market inefficiencies still exist in the later-stage segment, and public intervention can still be useful generally in terms of strengthening non-bank financial intermediation in the European Union. However, due to the reasons mentioned above, overall public policy rationale appears to be more limited.

**Box 7: Strategic autonomy as a rationale for public support of venture capital**

In the period 2012-16, some 44% of European startups were acquired by US companies (Orizi, 2016). Empirical evidence also shows that US venture capital investment in Europe significantly increases the likelihood of a US-based exit or acquisition (Braun et al, 2019). With European companies being listed on foreign stock exchanges, concerns address the "impact on Europe's global standing, notably with respect to its competitiveness, employment, tax base and indeed the growth of its innovation ecosystem" (Bertelsmann, 2021). Moreover, as European technology "superstars" are increasingly US-governed, Europe has become increasingly dependent on the United States and China in key sectors (Lake Star, 2021; Bertelsmann, 2021). Public intervention is seen as critical to prevent the European Union from being marginalised in terms of its access to added value on the global markets in key sectors such as space, artificial intelligence, biotech, cybersecurity, 5G, quantum computing and fintech (Anghel et al., 2020).

The concept of "European strategic autonomy" has also become more prominent in the European Union's geopolitical objectives and industrial policy goals in response to the COVID crisis and, as such, in the European Union's roadmap for recovery. Building European strategic autonomy may reduce dependence on external players and may make the European Union less vulnerable to external threats, including in areas such as energy, disinformation and digital technology (Anghel et al., 2020).

The recent outbreak of war in Ukraine may further accelerate and strengthen these rationales. EU policy initiatives have responded to political concerns about technological dependence and resilience, including by launching the European Tech Champions Initiative (ETCI) (Reuters, 2022). The European Commission has also discussed a new "strategic investment window" for the InvestEU programme to promote strategic autonomy in key sectors.

**While the economic literature on whether public intervention is, on the whole, effective in the equity markets is inconclusive, there is a consensus that positive impact depends on the context and on how such intervention is implemented.** In particular, public intervention is more likely to be successful when a clearly established form of public

[10] Many factors, such as the lack of a harmonised market and regulations within the EU Member States and multiple EU stock exchanges with limited liquidity are driving this brain drain. Together, they make the single US market more appealing.

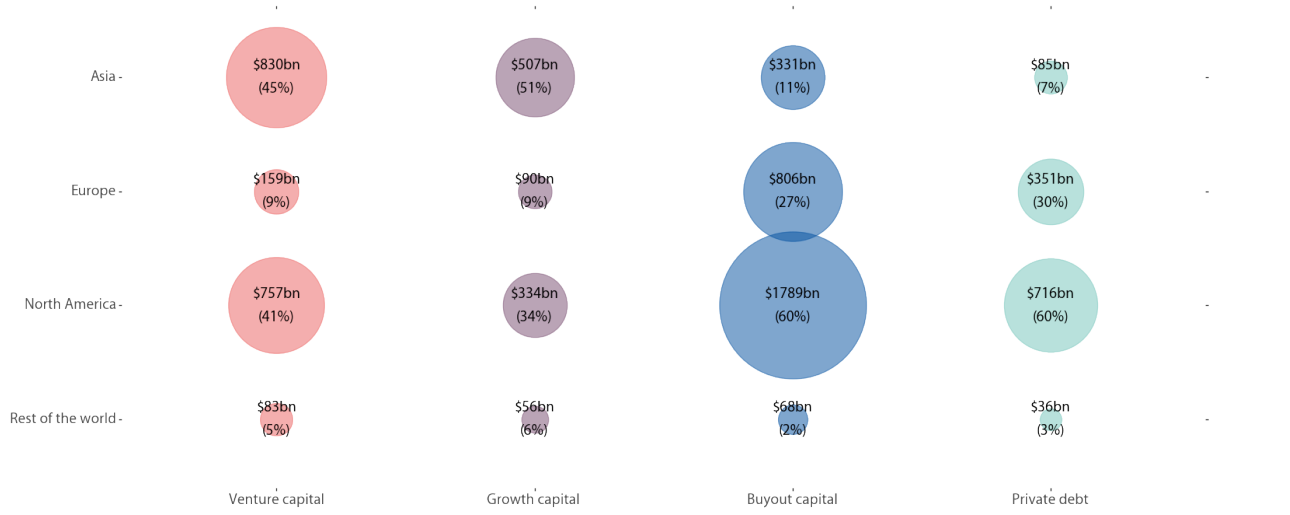
intervention can emulate private equity, for example in the form of co-investments, where there is balanced risk-sharing between private and public investors, and the institutional environment is sufficiently developed.

# There is a structural equity financing gap in the European Union

## The European Union relative to other developed countries

**There is a high structural gap in private equity in Europe in comparison to the United States, particularly for venture and growth capital.** In absolute terms, the gap is somewhat smaller for capital aimed at buyout-stage firms, where 27% of assets under management are targeting European firms. In venture and growth capital, Europe makes up less than 10% of the global volume, lagging well behind Asia and the United States (**Figure 8**). Regarding volume and GDP share, there is a large gap between Europe and the United States in terms of the equity type of funding for enterprises. According to OECD data, total US venture capital investments ranged between 0.2% of GDP in 2010 and 0.63% in 2019, far above the best performing countries in the European Union, Sweden and Estonia, which accounted for 0.07% of GDP in 2010 and 0.13% of GDP in 2019, respectively.

**Figure 8: Assets under management at global level in private market segments, split by regions (2021)**




Source: Preqin via McKinsey

Note: The size of the bubbles is proportional to the relative share of the geographical areas within the given market segment.

## Across firm stages

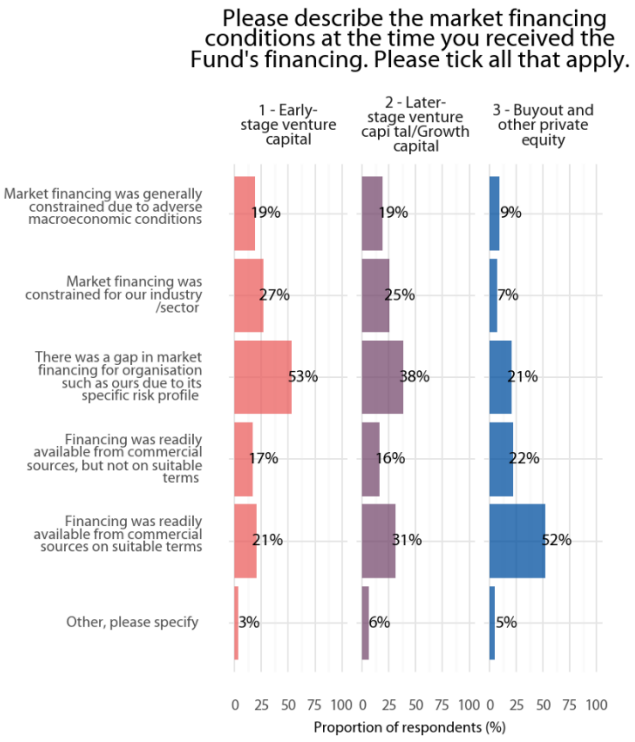
**The gap is clearly present in the venture capital segment, targeting young and innovative firms.** This is the segment where market failure arguments apply the most, and also where the gap is large relative to the rest of the world, despite significant public sector involvement from national programmes. For venture capital, public funding represents a minimum of 20% of total funds raised in most EU countries. While the public sources focus on the initial startup and seed capital, the literature also points to a lack of funding in later-stage segments, where high investment volumes are needed.

**There is compelling evidence of the increasing financing gap for growth capital, often referred to as the second valley of death**. High-growth firms — often innovative, but not always — frequently face financing problems which limits their expansion after reaching a certain size (Wilson et al., 2017). Due to the larger ticket sizes, larger fund volumes are needed to provide equity capital to these firms to achieve sufficient diversification. The large fund sizes often cannot be reached through private fundraising only. At the same time, there are only limited public interventions through equity instruments addressing the growth segment for SMEs and mid-caps. An active role of government in later-stage market segments — growth capital, but also including investments into buyout-stage firms — is specifically found in Nordic countries.

**For private equity excluding growth capital, such as investment into buyout-stage firms, the financing gap appears to be less pronounced.** This is by far the largest segment of the European market, and in many countries the market is well developed. In this market segment, Europe's lag compared to the rest of the world is relatively small, although there is strong heterogeneity across Member States. At this stage, firms often have alternative financing means, such as bank loans or public equity. In addition, firms supported by funds investing into the buyout stage are on average less innovative than in the venture capital segment. Nevertheless, general arguments for public support for equity market development, based on the general underdevelopment of non-bank financial intermediation in the European Union relative to the United States, apply in this segment too.

**The higher equity financing gap in the venture and growth capital segments relative to capital targeting buyout-stage firms is also confirmed by firm-level survey data.** Recipients of EIF-supported venture capital and growth equity often report financing constraints (**Figure 9**). In contrast, more than half of buyout clients indicate that market financing was readily available at the time of the investment, and only 20% reported the presence of financing gaps.

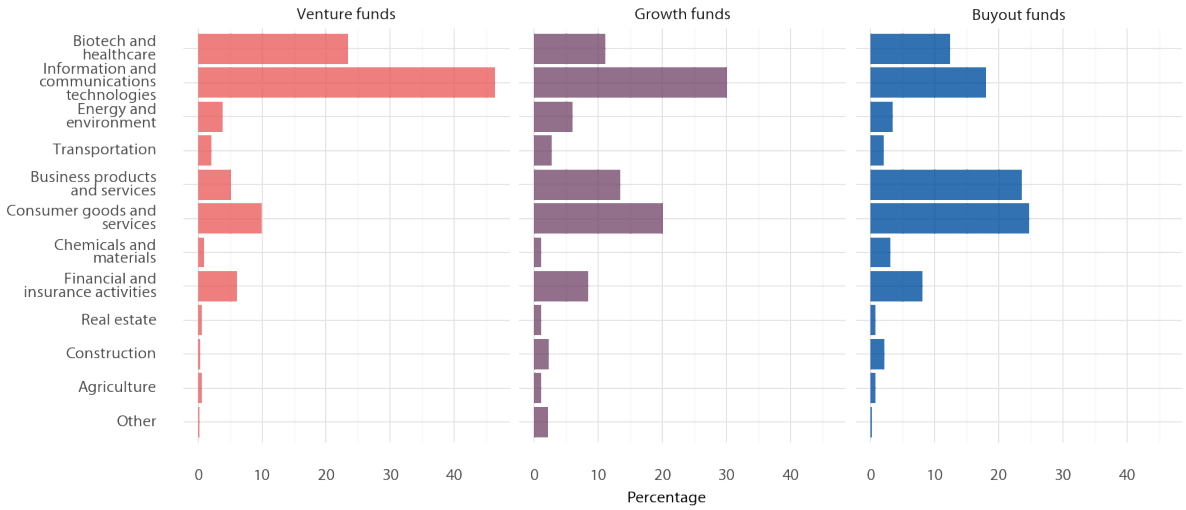
**Figure 9: Financing conditions reported by companies receiving EIB Group-supported equity**




Source: EV survey of EIB Group final beneficiaries

## Across sectors

**Figure 10: Sectoral shares of EU private equity and venture capital investments by fund strategy (2010-2021)**



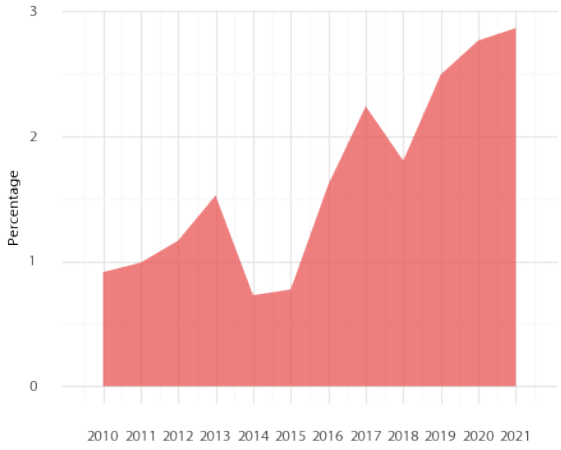

Source: Invest Europe

**The sectors that receive the most equity funding at the venture stage are ICT, biotech and healthcare, while later-stage funding shifts partially towards goods and services**. Almost half of total venture capital funding in the European Union targets the ICT sector, and about a quarter targets biotech and healthcare (**Figure 10**). These are the sectors where startup innovation activity is concentrated; therefore they are highly represented in venture capital investments.

While they also have a relatively large share in later-stage private equity investments, the role of goods and services targeting businesses and consumers starts to play an increasing role for growth capital, and especially for buyout-stage transactions.

**There is evidence of an increasing demand for venture capital targeting green technologies.** Investment into climate tech venture capital — mainly in transportation but also in energy and environment — increased by 210% between 2010 and 2021, and now represents 14% of the global venture capital market (PricewaterhouseCoopers, 2021). Data from Invest Europe also confirms this (**Figure 11**). As pointed out in a recent report by the European Commission, fund managers surveyed on market sentiment and views on public intervention indicated that 'Companies developing clean technologies also achieved important rankings in the EIF survey; currently on par with companies in the services sector and expected to grow significantly in importance going forward' (Naess-Schmidt et al., 2021). As investments into climate tech have longer-than-average investment horizons, and they carry high technology and regulatory risks, patient investors with high risk-absorbing capacity are warranted. In many cases, public funding is necessary to exploit the associated positive externalities linked to the contribution to a carbon-neutral economy, which are most likely not factored into private investment decisions.

**Figure 11: Share of the transportation sector in the EU venture capital market**




Source: Invest Europe

## Across geographies

**While the venture capital and private equity markets are more developed in certain EU Member States, it is difficult to pinpoint patterns explaining variations in the equity gap across geographies.**[11] Equity financing gap metrics based on the analysis of the supply side (equity market size, maturity and access across Member States) as well demand side factors (number of SMEs, culture of entrepreneurship and innovation etc.) often lead to seemingly counterintuitive results where the equity gap is the highest in the most developed Member States, and 'countries with very absent risk capital markets almost have no equity gap' (Naess-Schmidt et al., 2021).[12]

**Further factors need to be considered when considering equity financing gaps across EU countries.** These include country-specific differences in terms of access to debt as an alternative to equity, the nature of the given countries' "equity culture" with respect to SMEs' willingness to dilute their ownership, the development of innovation systems, as well as the impact of financial or economic crises and other idiosyncratic factors.

**In countries with more developed risk capital markets, demand for private equity and venture capital often increases together with supply.** In countries with a strong innovation culture and a developed market infrastructure — such as Germany, France, the Netherlands and Sweden, for instance — the pipeline of innovative firms seeking equity financing can also be substantial. As a large number of firms and entrepreneurs are already familiar with equity financing, the difference between supply and demand can be considerable, even in times of increasing supply. Even when the overall supply to the market is ample, significant gaps may be found for certain investment stages or sub-sectors.

[11] The EIF has developed the SME access to finance index (ESAF), a regularly updated composite indicator that summarises the state of the SME external financing market for each of the EU-27 countries. It includes an "equity" subindex which is currently led by Sweden (Torfs, 2021)

[12] One recent quantification of the equity gap by Member States (fi-compass, 2019) illustrates well the difficulties. It shows large gaps in some regions where the equity market is very well developed such as in the Nordic countries, and where it is less developed such as in Cyprus, Malta and Greece. At the same time, relatively low gaps are found in countries such as Poland, Bulgaria, Portugal and Hungary. Lower gaps are also to be found in countries such as Germany and Austria where the market for private investment is very well developed. The very high equity gap relative to GDP that is found in Greece also seems to be a special case where there was very limited access to equity financing, which may result in many Greek companies fearing rejection of support or not considering equity financing at all.

**While the financing gap in absolute terms could be smaller in countries with less developed equity markets, public support is nonetheless crucial for developing an innovation-friendly financing environment.** This is typically the case in countries in Southern Europe and in Central and Eastern Europe. The limited awareness of the possibility of equity finance in these countries can in itself be a sign of an insufficiently developed equity ecosystem. However, for the relatively small number of innovative startups insufficient supply can be a bottleneck. Public sector support is therefore crucial even if the measured equity gap in absolute size is small, and the lack of such support can delay the development of the infrastructure of innovation financing.

### Across financial and economic cycles

**There is evidence that the supply of venture capital and private equity is strongly pro-cyclical, and the impact of downturns is more prominent for financing gaps at earlier stages, for smaller firms as well as for more innovative startups.** This was also highlighted during the COVID-19 crisis, when early-stage venture capital deals declined sharply in the first months after March 2020, while later-stage venture capital remained much more stable. There is also evidence of venture-backed innovation being substantially more pro-cyclical than innovation in the broader economy. Empirical analyses have shown that innovation conducted by venture capital-backed firms in recessions is less highly cited, less original, less general and less closely related to fundamental science. These effects are more pronounced for startups financed by early-stage venture funds (Howell et al., 2020). Cyclical fluctuations in the financing gap are therefore translated into lost innovation opportunities. As a consequence, if the public sector can help stabilise venture capital funding during downturns, it not only stabilises the market itself but could also potentially limit the decline in innovation activity and its impact on productivity growth.

## The EIB Group's objectives for equity and quasi-equity operations are relevant to address the market's needs, while also emphasising financial sustainability.

**The EIB Group's equity and quasi-equity operations are implemented within a complex set of policy and financial objectives.** First, a large part of the portfolio is implemented using a variety of external mandates and resources, where mandators may be required to pursue different specific policy objectives, over which the EIB Group has only limited control. Second, objectives and priorities have been changing over time. To shed light on the key objectives, the evaluation focused mainly on the EIB Group's equity strategy. However, it is also crucial to look at the objectives behind individual mandates.

### EIB Group Equity Strategy

**The EIB Group Equity Strategy calls for a highly selective and targeted approach to equity investments to maximise impact.** The Group Equity Strategy provides the strategic framework for equity and quasi-equity-type operations at Group level. At the request of the EIB Board of Directors, a review of the EIB Group Equity Strategy was conducted in 2018 to provide an overview of the Group's equity financing activities. The final document was submitted and approved in 2020. To ensure that the EIB Group's limited resources are used in the most impactful manner possible, the Group Equity Strategy proposes a highly selective and targeted approach to equity investments:

- focusing on markets with the largest investment gap;
- where Group support has the greatest additionality and impact;
- while at the same time ensuring sustainability, adequate financial returns[13] and portfolio diversification.

[13] The EIF Statutes require that, when it pursues its activities, the level of remuneration of the EIF should reflect the risks incurred, cover the operating expenses, make it possible to establish reserves commensurate with the said risks and generate an appropriate return on resources.

**The Group deploys a broad set of equity instruments that differ in terms of features and contribution to strategic objectives.** For the Group, equity-type instruments are critical to enable support for the continuum of financing needs of companies/projects. The financing instruments toolbox would not be complete without them. According to the EIB Group Equity Strategy, while consuming high levels of capital, commensurate higher returns and higher catalytic effect can also be achieved at portfolio level.

**Figure 12: Group Equity Strategy — key objectives**


**The Group Equity Strategy emphasises the focus on intervention on sectors that are priorities for the European Union and are characterised by market failures:**

- Although the Bank's traditional loan activity has proven very successful, straight debt financing is inappropriate to support highly uncertain technological disruption, risky product developments, the early-growth phase of fast-growth companies, and unproven technologies in climate and infrastructure sector projects that carry significant technical risks and offer little visibility on revenues.
- In developing markets outside the European Union, but also in several EU markets, private equity markets are still in their infancy stage and fund managers have difficulties raising new funds without the support and associated signalling effect offered by IFIs like the EIB.
- Moreover, to create sustainable, long-term value for fund managers, investors and investee companies, the EIB Group ensures that environmental, social and governance (ESG) practices and standards are applied/integrated throughout the investment chain.

**The strategy also emphasises the need for prioritisation by product type.** To prioritise among products, the EIB and the EIF have assessed the Group's product offering across multiple criteria, including direct policy impact, the potential for ecosystem development, crowding-in of private investors, implementation efficiency and geographical distribution. Consistent with volumes currently deployed, investments in climate and infrastructure funds, venture debt, and investments in private equity and venture capital funds all score very well across these dimensions, contributing to strategic objectives in a significant and consistent manner.

**The strategy establishes a division of labour between the EIB and the EIF.** The revised Group organisational set-up (decided and implemented since January 2021) is that direct equity financing activity will be carried out by the EIB and indirect equity operations will be deployed by the EIF. Under certain mandates, the EIF invests directly into underlying companies (such as a co-investment facility), but it primarily focuses on indirect financing of small businesses and innovative firms. Activities outside the European Union[14] are mostly undertaken by the EIB.[15]

[14] Outside the European Union, Candidate Countries, potential candidate countries and other partnership countries.
[15] Some private equity funds supported by the EIF conduct operations both inside and outside the European Union.

## The RCR mandate

**The Risk Capital Resources (RCR) mandate — under which EIB resources are entrusted to the EIF — is a core pillar of the EIB Group Equity Strategy.** It is by far the largest of the EIF's equity mandates. It is also the one where the EIB Group has direct control over the mandate's objectives and implementation.

**While the RCR is a policy-driven mandate, the RCR's primary steering mechanism for portfolio allocation decisions is the financial objective.** Each individual investment must comply with the mandate's general and specific policy objectives (see Box 8). As from 2003, a financial objective was introduced to ensure the initiative's sustainability.[16] The RCR's predecessor[17] was launched in 1997 with a mandate from the EIB to the EIF to manage an EIB-supported venture capital portfolio. During these initial years, the EIF primarily supported early-stage independent fund management teams in the technology sector. The collapse of the dot-com bubble in 2001 resulted in a reorientation of the investment strategy in 2003 towards portfolio diversification by including a greater share of later-stage investments to partly balance the expected negative returns from a portfolio focused on early-stage venture capital investments.

**Box 8: Current specific policy objectives of the Risk Capital Resources (RCR) mandate**

**1. Address the equity gap faced by innovative companies in the European Union**:
- particularly in underserved sectors;
- in their early development and expansion stages;
- and support the establishment, growth and development of a well-functioning and liquid venture capital market.

**2. Broaden the access to finance for eligible beneficiaries in their growth phase:**
- to contribute to their further competitiveness and expansion potential (including cross-border); and
- to develop and stabilise the equity and hybrid debt/equity market for lower mid-market funds in the European Union.

**3. Support the commercialisation of research results and the transfer of intellectual property (IP) to the market in its various forms**
- including SMEs, projects, licensing and/or ownership of IP.

**4. Support delivery of the EIB Group's Climate Bank Roadmap.**
**Financial objective: Create a self-sustainable mandate**
- 2003: Portfolio rebalancing and target an internal rate of return (IRR) of 3%.
- Since 2011: Explicit 5% IRR objective.

All RCR investments shall comply with at least one specific policy objective. The primary steering mechanism for portfolio allocation decisions is the financial objective.

**Since its most recent revision in 2021, the mandate now includes a target for climate support to contribute to the delivery of the EIB Group's Climate Bank Roadmap.** The RCR is expected to further contribute to the EIB Group's climate and environmental sustainability objectives. A dedicated envelope — €1 billion for the period from 2022 to 2026 — has been created in support of clean tech and climate funds. This envelope allows for specific exceptions related to the mandate's maximum stake into a fund to further boost investments in these key areas. The most recent revision also introduced a climate target whereby a minimum percentage of the RCR portfolio must contribute to the Group's climate and environmental sustainability objectives. This target is set at 17% for its first year of application and rises to 25% for 2026.

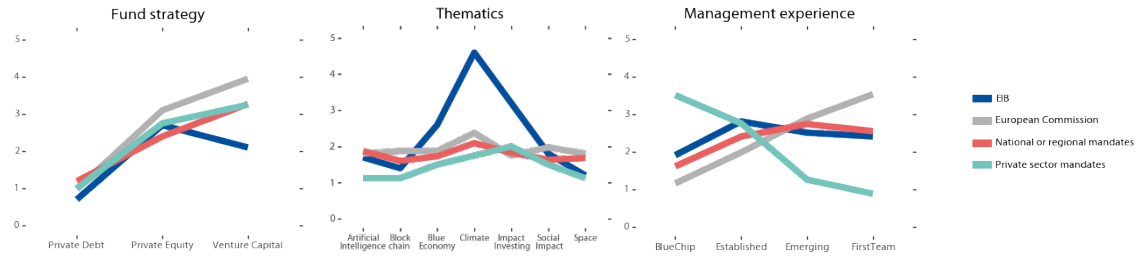
## Objectives expressed in third-party EIF mandates

**The EIF aggregates the preferences of the mandators into a scoring system, which can be useful to obtain a picture of the policy objectives specified by the different mandators.** Preferences over a range of policy dimensions are translated into a scoring system of one to five that can be used to generate a policy profile for each mandate. To illustrate this, **Figure 13** shows the scorings by mandator groups on preferences relating to fund strategies, policy thematics and fund management experience.

[16] A 3% gross annualised return target was set for investments approved since 2003. In 2013, the gross target return was increased to 5% for investments since 2013. In the most recent revision of the RCR mandate, the target was changed from a gross 5% target to a net 5% target.

[17] The EIB started venture capital investments in 1997 and also delegated to the EIF the management of two venture capital facilities. In 2000, under the EIF reform, the EIB acquired a majority stake in the fund. In that year the Risk Capital Mandate (RCM) was signed between the two institutions which transferred all venture capital operations to the EIF. In 2009, a further mandate under the Mezzanine Facility for Growth (MFG) was provided to the EIF. In 2012/2013, all these mandates were merged into one open-ended revolving mandate, the Risk Capital Resources mandate. A financial objective of a gross annualised return of 5% for investments signed since 2013 was introduced.

**Figure 13: Mandators' preferences over fund strategy, investment thematics and fund managers' experience**



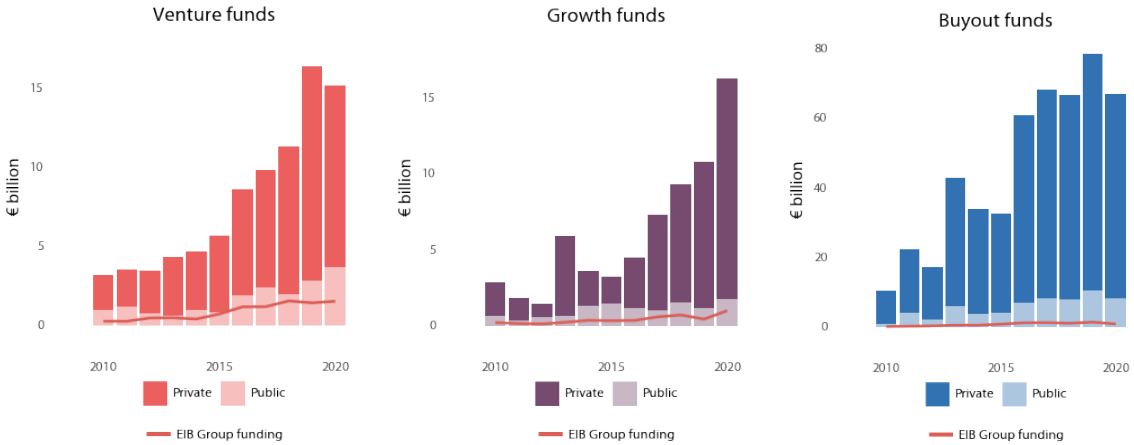

Source: EIF data

**Looking at the preferences of the different mandators, the following observations can be made:**

- Most mandators have a stronger preference for investing in venture capital funds than in private equity according to the EIF preference scores, with the exception of the EIB.
- Mandators are generally agnostic about the portfolio allocation across sectors.
- Climate is a preferred theme for EIB mandates, which is the consequence of the new climate objective that was added to the RCR during the 2021 mandate revision. Climate as a thematic target does not feature strongly for other mandators.
- The European Commission puts the strongest emphasis on providing opportunities for less experienced investment teams, whereas private mandators prefer fund managers with a well-established history.

# EIB Group operations in the light of market needs and policy objectives

**Figure 14: EIF net equity commitments in the light of total private and public funding to the EU venture, growth and buyout capital markets**



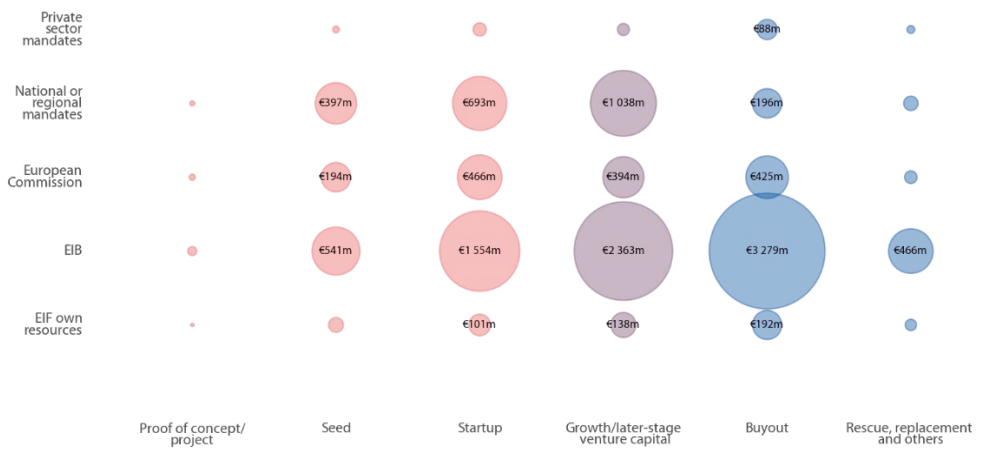

Source: Invest Europe and EIF data

**The EIB Group plays a key role in the funding of risk capital markets in the European Union.** Comparing EIF yearly net commitments to EU-level market data on risk capital funding, it appears that the EIF's support plays a decisive role in the venture and growth segments (**Figure 14**). The EIF provides a sizeable part of total funding, and in most years the majority of publicly-supported funding. In relative terms, the EIF plays a lesser role in the financing of buyout-stage transactions compared to the overall — much larger — total EU market size. While comparable data on venture debt at market level in Europe is scarce, it appears that the EIB Group is the largest venture debt supplier in the European Union.

**EIB Group investment covers all development stages.** Through its intermediated activity, the EIF provides support to small businesses at all stages of development (**Figure 15**). EIB venture debt operations chiefly target firms at the growth stage, whereas the scarce data available on EIB indirect operations suggest a heterogeneous portfolio across the full spectrum of investment stages.

**A large part of EIF operations — supported by the RCR mandate — are targeting firms at the buyout stage, where the financing gap appears to be less pronounced.** For EIF operations, in absolute terms, RCR is the highest-volume resource at all stages, including venture capital, growth capital and buyout capital (**Figure 15**). However, in absolute terms, funds investing into buyout-stage firms receive the largest share of RCR-supported volume.[18] In contrast, non-EIBG mandates are used mainly to finance firms at earlier stages (early venture capital, growth capital). As shown in the previous sections, the relevance of public sector intervention is weaker, and the equity financing gap is significantly smaller for buyout-stage financing than in the earlier stages. Furthermore, evidence presented later in Chapters 4 and 6 indicate that the financial value added and the impact on growth and innovation is weaker for firms at the buyout stage than for firms that are seeking venture and growth capital. This appears to be at odds with some of the key objectives specified in the Group Equity Strategy, namely to focus on markets with the highest financing gap and where the Group can achieve greatest additionality and impact. However, as shown in Chapter 6 funds investing into buyout-stage firms contribute significantly to the financial sustainability of the Group's equity portfolio.

**Figure 15: The EIF's portfolio of investments into final beneficiaries by stage and source of funding**

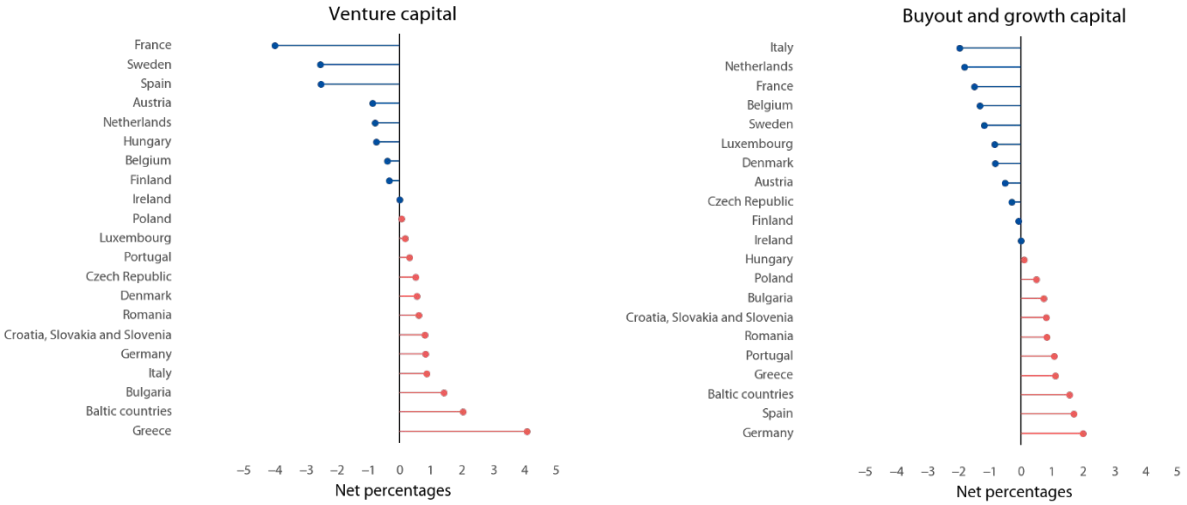



Source: EIF data

**In absolute terms, the EIB Group's equity and quasi-equity operations are concentrated in the EU countries with the most developed risk capital market. Relative to the market, the EIF overweights these Member States with less developed equity markets**. As presented earlier, the bulk of venture capital, private equity and venture debt markets in the European Union are concentrated in a few countries with the most developed equity markets. In absolute volume, EIF activity follows this distribution, with Germany and France being the largest beneficiaries of the EIB Group, both for equity and quasi-equity operations. Nevertheless, the analysis points towards some support to Member States with a less developed risk capital market: relative to the EU market, Member States with a strong equity market are underweighted in the EIF portfolio while others are overweighted (Figure 16). The only exception is Germany where the EIF's activity is overweighted compared to the market in the venture capital, buyout and growth segments. This is explained by the fact that the EIF is managing, on behalf of the German authorities, several regional mandates that are specifically targeting the German market.

[18] This is explained partly by the larger ticket sizes required to support more mature companies.

## Figure 16: Country shares of the EIF portfolio relative to the EU venture capital and private equity market

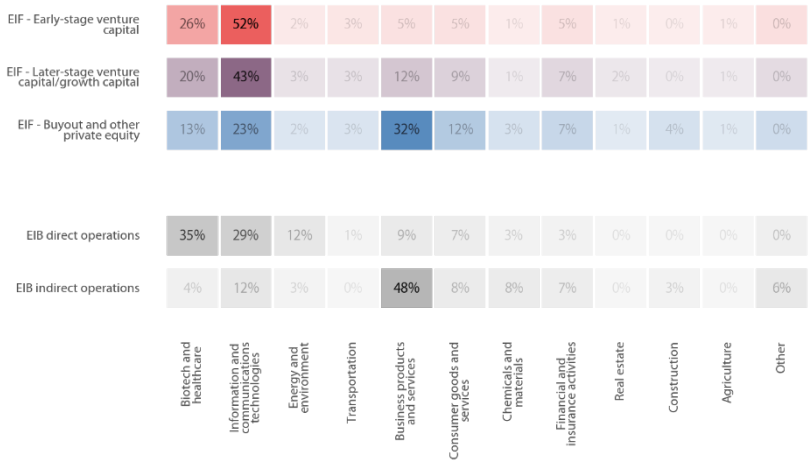



Net percentages are calculated as the difference between the percentage of investments allocated to a country by the EIF and the percentage of investments allocated to the same country by the market. Positive values (in red) indicate that the EIF overweights a country relative to the market, while negative (blue) values indicate the opposite.

Source: Invest Europe and EIF data

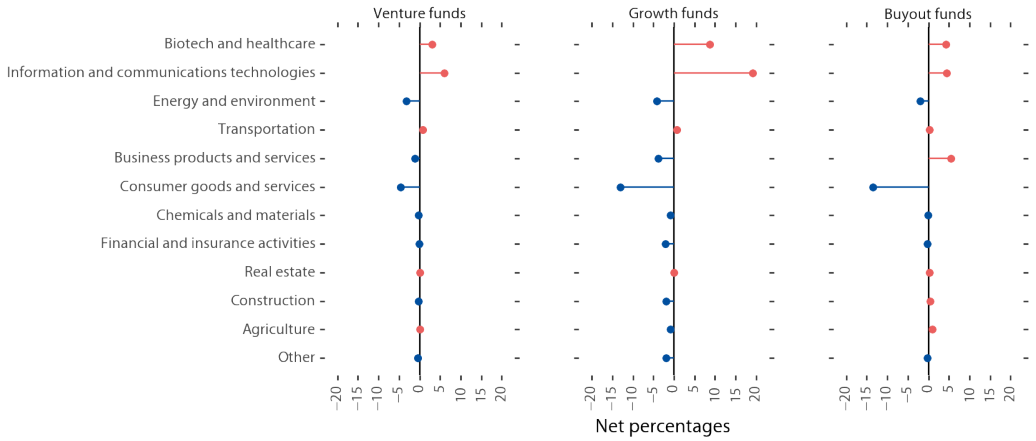
**EIF venture capital, growth and EIB direct venture debt operations are targeting more innovative sectors than either the EIF-supported investments into buyout-stage firms or EIB-intermediated transactions through captive funds**. The sectoral distribution of EIB Group activities shows a mixed picture when it comes to targeting innovative industries (**Figure 17**). Firms in the EIF's venture capital and growth portfolios, as well as EIB direct operations' beneficiaries are concentrated heavily in the innovative sectors, such as ICT and biotech. It is also shown that EIF-supported venture and growth funds are overweighting the innovative sectors relative to the market (**Figure 18**). In comparison, the firm composition of the buyout portfolio is geared towards more traditional sectors, such as business products and services, yet the EIF portfolio has a higher share of ICT and biotech firms in the buyout portfolio compared to the market. While data on EIB indirect operations is scarce and not representative, it suggests that the EIB-supported captive funds are focusing chiefly on business products and services, and have a relatively low share allocated to the innovative sectors.

## Figure 17: Sectoral shares of EIB Group financing volume by stage




Source: EIB and EIF data

## Figure 18: Sectoral composition of the EIB Group equity portfolio relative to the EU venture capital/private equity market



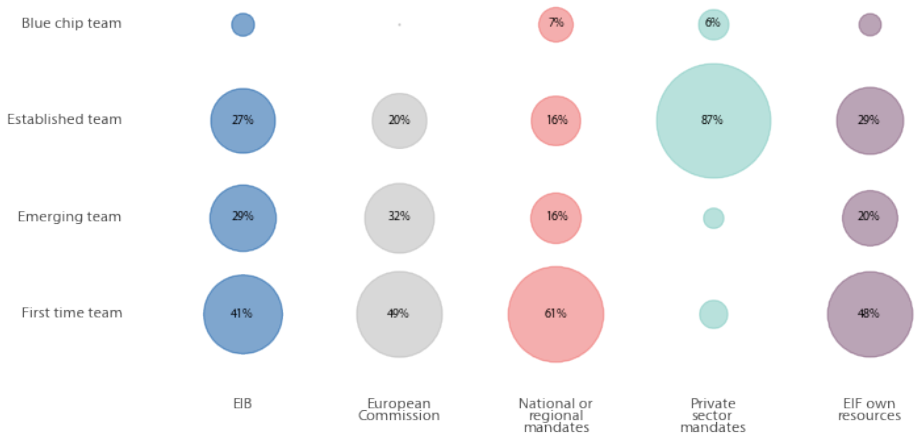

Net percentages are calculated as the difference between the percentage of investments allocated to a sector by the EIF and the percentage of investments allocated to the same sector by the market. Positive values (in red) indicate that the EIF overweights a sector relative to the market, while negative (blue) values indicate the opposite.

Source: Invest Europe and EIF data

**While there is a growing demand for funding in green technologies, EIF operations in the past had a low share in this segment, even relative to the market.** In light of the concerns about climate change, European venture capital and private equity markets have increasingly invested in green technology companies. Such firms are typically active in the energy and environment sector or transportation. Figure 18 shows the relative weight of each sector in the EIF's portfolio compared to the European markets. The EIF's investments in these sectors account for 2-3% (**Figure 17**). The energy and environment sector is also underweighted relative to the market in the EIF portfolio (**Figure 18**). With 12% of total investments, the EIB's direct quasi-equity operations show a stronger focus on the energy and environment sector.

**EIF operations are contributing to the development of EU equity markets by giving a chance to less experienced fund management teams.** Most mandates support the EIF in its role of market developer by encouraging support to first time teams (**Figure 19**). The portfolio of actual operations shows significant support towards such less experienced management teams. The only exceptions are the private sector mandates (AMUF), which are mainly supporting well-established teams.

## Figure 19: Share of committed volume in the EIF's portfolio by fund management teams' experience and source of funding




Source: EIF data

# 3. TO WHAT EXTENT IS THE EIB GROUP OPERATING MODEL FIT FOR DELIVERY OF EQUITY AND QUASI-EQUITY SUPPORT TO SMALL BUSINESSES?

- **Time to first disbursement of EIF indirect operations is quick by Group standards, but still slower than the market's needs. Due to the way equity funds operate, it takes several years to reach the final beneficiary.**
- **While the EIF is providing stable and predictable funding all along the economic cycle, the long time it takes to commit equity investments and build up portfolios calls into question the suitability of indirect equity instruments to be used as part of initiatives designed to provide rapidly available funding to firms during economic shocks.**
- **Approval of direct quasi-equity takes much longer relative to the market, and there are other elements of the EIB Group's internal processes that are not conducive to the efficient delivery of venture debt operations.**

**Financing needs are heterogeneous over time, both at market level along the economic cycles, and at the level of a single small business, depending on the firm's stage of development, business plan and economic context.** To be efficient, the EIB Group's intervention must deliver funding in a timely manner so that it matches with the existing needs of SMEs and mid-caps at a given period/time. This chapter assesses whether the time between the moment the funding needs arise and the moment the EIB Group's funding can be made available to the final beneficiaries is in line with the business needs of the beneficiary firms.

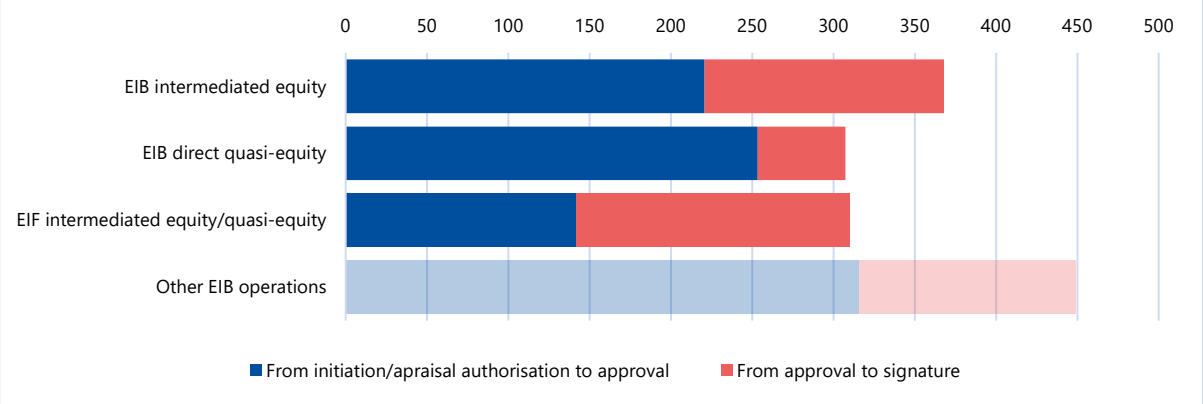
**Beyond the time needed to carry out operations, the evaluation also looked at other elements of the EIB Group internal processes and assesses their adequacy for efficient delivery of financial support.** The second part of this chapter focuses on the EIB's direct quasi-equity operations, in particular, and explores the extent to which the special nature of these transactions relative to typical EIB funding operations is taken into account.

## It takes a long time for EIB Group indirect equity operations to reach final beneficiaries

**The EIB Group provides valuable support to risk capital markets through stable and predictable funding in times of downturns and crises.** Private funding is pro-cyclical and fluctuates significantly with financial and economic cycles, showing strong downturns in times of turmoil. The EIB Group's funding — whether in quasi-equity or intermediated equity — is relatively stable over time. At times when other investors might be less inclined to support market players, the EIB Group remains a reliable financing source, contributing to the maintenance of the market infrastructure, and the financing of innovative firms even if other sources dry out.[19]

**Taking typically about ten months from first screening to signature, equity-type operations are quick by EIB Group standards.** Before an operation is formally signed by the EIB Group, it undergoes a series of steps where it is screened, analysed, discussed by the services involved, then formally approved by the Management Committee and/or the Board of Directors. Disbursements can start only after that, corresponding to the time when financing reaches actual beneficiaries.[20] Although they are different in nature, intermediated equity and direct quasi-equity operations take significantly less time to be signed compared to standard EIB operations (**Figure 20**).

**Figure 20: Average time to signature for equity and quasi-equity compared to other EIB operations[21]**

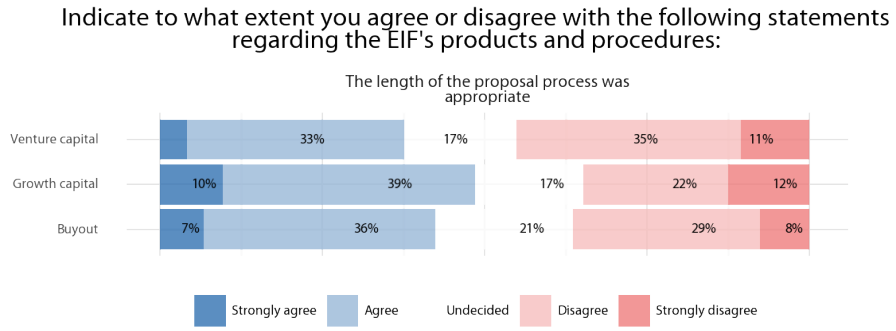



Source: EIB and EIF data

**Yet, EIF's indirect equity transactions are somewhat slower than the market's needs.** While the EIF's equity operations are among the fastest within the Group, some clients still perceive the process of signing a funding agreement with the EIF as slow. Results from the EIF's survey of fund managers indicate that more than a third of the respondents found the process to be lengthy (Figure 21).

[19] In some cases, the EIB Group could also increase its funding by topping up existing funds.
[20] Disbursements only occur when requested by the EIB's clients.
[21] While the time to approval is mostly in the control of the EIB or the EIF, time from approval to signature depends on legal negotiations with the clients. Consequently, this timing might be affected by factors outside of the EIB's control.

**Figure 21: Survey results on the length of the EIF approval process**




Source: EIF private equity and venture capital fund managers' survey

**Once committed to a fund, it takes several years for the EIF's indirect equity support to reach the final beneficiaries.** For intermediated operations, the capital committed is not immediately transferred to the fund at subscription. Fund managers only draw the committed capital from their investors to fund their investments, as opportunities arise. Consequently, the schedule of disbursement reflects how the fund managers build their portfolio over time. The active investment period typically takes five years.

**Due to these lags, at the time of the evaluation, only 51.5% of the EIF's total commitments (€26.8 billion) between 2010 and 2020 had actually been disbursed to final beneficiaries (€13.8 billion).** Analysis at portfolio level highlights that, on average, it takes three years for a manager to build up a portfolio with a value of 75% of total commitments (**Figure 22**). This trend can also be observed when disaggregating funds per vintage year. Investments into funds carried out in recent years show low disbursement levels, as these funds are still immature and their portfolio is not yet built (**Figure 23**). In line with market practices, funds do not disburse 100% of the commitments, as even for funds where the active investment period has expired, only 80-85% of the commitment actually reaches the final beneficiaries. The remaining (un-invested) part is explained by 'dry powder' reserves that fund managers set aside for new investment opportunities and emergencies, and management fees that are paid to the fund managers.

**Figure 22: Average time to build up the portfolio to 25%, 50% and 75% of commitment per fund strategy**

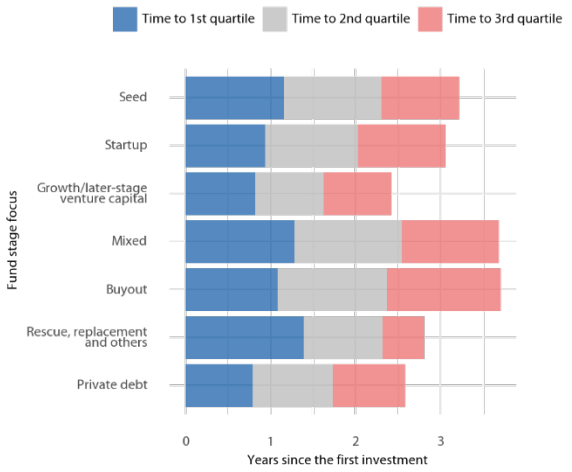
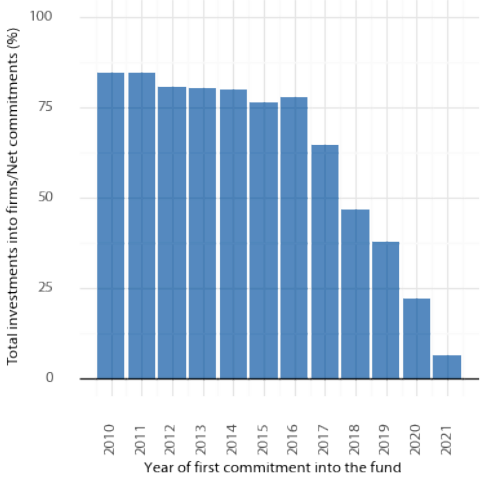



**Figure 23: Share of net commitments actually invested into SMEs by vintage year**




Source: EIF data

**The long time it takes to commit equity investments and build up portfolios calls into question the suitability of indirect equity investments to be used as part of initiatives designed to provide rapidly available funding to firms during economic shocks.** Although the vast majority of equity and quasi-equity operations serve a structural objective, some initiatives in the past have been launched with an — explicit or implicit — countercyclical objective. As shown above, it can take years from initiation to deployment of operations and for the funding to reach final beneficiaries,

which is the ultimate intended objective. Moreover, equity instruments are often supported by mandates, and the EIB Group's countercyclical policies are also frequently carried out through launching new external mandates (Box 9). New mandates take additional time to be set up and operationalise, and this additional delay needs to be added to the timeline. Adding up all the time delays, it appears that from the decision to launch a countercyclical action as a reaction to an economic shock to the time the funding reaches the final beneficiaries takes several years. By that time it is very likely that economic conditions would already have changed significantly.

**Box 9: The time to set up equity mandates with the aim of reacting to adverse economic shocks**

**Mandates provide additional resources and means for the EIB and/or the EIF to act beyond the activities they undertakes with own resources — whether in terms of volume of financing, or risk-taking.** This makes them, in theory, particularly relevant when reacting to adverse economic shocks where additional financing needs to be leveraged to provide timely and relevant support. A significant part of EIB Group equity and quasi-equity operations are carried out through mandates — including external ones — which makes their analysis relevant.

**For reasons beyond the EIB Group's remit, there is evidence that setting up external mandates may take too long to launch, which hampers their ability to react to changing market conditions.** This evaluation relies on existing evaluations conducted on mandates that had an — implicit or explicit — countercyclical objective. They include the 'Evaluation of the European Fund for Strategic Investments' (EIB 2021), and the 'Rapid assessment of the EIB Group's operational response to the COVID-19 crisis' (EIB, 2022). These evaluations highlighted the difficulty for these mandates to be fully countercyclical given the time needed to launch operations:

- **In the period following the Global Financial Crisis, financing conditions for small businesses had already improved by the time EFSI was launched.** The evaluation of EFSI analysed various aspects of the financing gap and their evolution over time to assess their relevance by the time EFSI was launched in mid-2015. Findings from the survey on the access to finance of enterprises (SAFE survey) indicated that by the time EFSI was launched, external financing was not the main bottleneck of SME growth. By 2015, risk perceptions played a lesser role in the evolution of banks' credit standards, real GDP growth was already stable, and the unemployment rate in the EU-28 had already long started to decrease.
- **Despite its formal establishment, the operational launch of the European Guarantee Fund (EGF) was delayed.** The EGF was formally established significantly faster than other EIB Group mandates but despite this, the EGF's operational launch was delayed. The delays were due to the time needed to reach consensus amongst contributors on key EGF design aspects, and to the process of obtaining EU state aid clearance. This delay hampered the ability of the EGF to act as an emergency support tool.

## Adapting the EIB Group's internal processes to fit direct quasi-equity transactions more efficiently

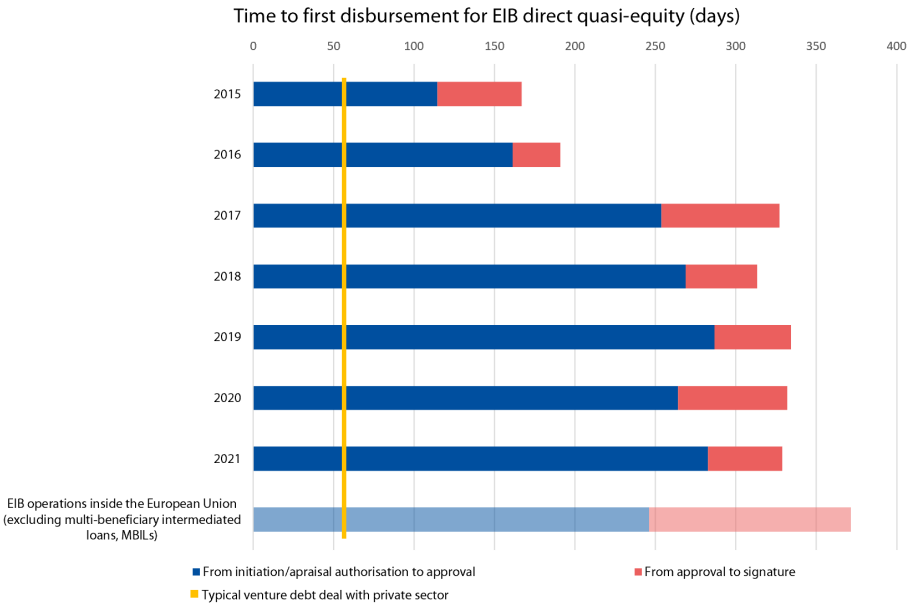
**Quasi-equity is dissimilar to EIB core business operations, and generally involves riskier clients with high business uncertainty facing rapidly changing conditions.** These are companies that are smaller and less mature than standard EIB clients, have less well-established business processes, and often lack a dedicated finance function and financial expertise. In addition, a large number of quasi-equity clients have negative, highly uncertain cash flows, and face rapidly changing business prospects and conditions. In most cases, business uncertainty stems from the risk related to the innovative nature of these firms.

**Standard EIB processes often present a significant burden to potential and actual quasi-equity clients.** The relatively substantial administrative procedures do not suit these clients that sometimes lack capacity (resources or expertise) to handle such heavy processes. Furthermore, EIB monitoring and risk assessment processes, in line with standard banking practices, are based on cash flow forecasts. However, for typical venture debt clients, with limited historical performance, these forecasts are subject to high uncertainty and variability over time.

**For EIB quasi-equity operations, the time from initiation to signature is longer than the standard market practice for venture debt, and moreover it has been increasing in recent years.** Direct quasi-equity operations typically benefit from a fast-track procedure under global authorisations, where approval is delegated from the Board of Directors to the Management Committee. While this allowed for a relatively quick process, on average the EIB takes more than 300 days to close a venture debt or thematic finance deal, to which one needs to add more than 100 days to disbursement. This is far above private financing sources which typically conclude a venture debt operation in about eight weeks as highlighted by our literature review. Moreover, the average number of days to signature has been increasing since 2017

(Figure 24). While the longer waiting time may be offset for some clients through better overall financing conditions, others find the EIB offer too slow to suit their rapidly changing business needs.

**Figure 24: Evolution of time to signature from 2015 to 2021 for direct quasi-equity operations**



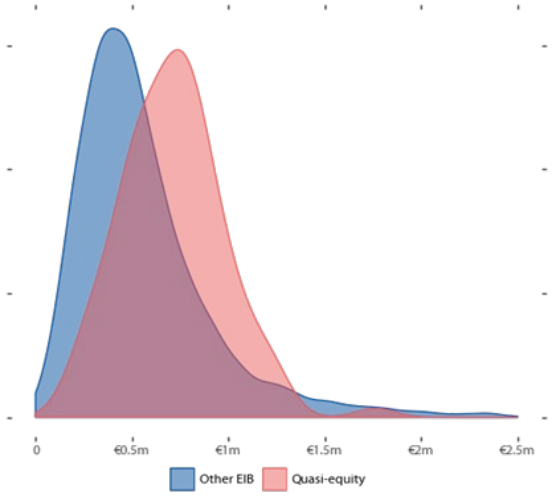

Source: EIB data

**Quasi-equity clients also have special monitoring needs compared to other clients, requiring increased post-disbursement follow-ups, detailed knowledge of the firm's characteristics, and flexibility towards their uncertain business environment.** Due to the high business uncertainty and rapidly changing conditions, quasi-equity operations are, on average, more subject to contractual waivers than other EIB operations (Table 3). This translates into a higher need for post-signature monitoring.

**Table 3: Share of post-signature waivers for different types of EIB operations**

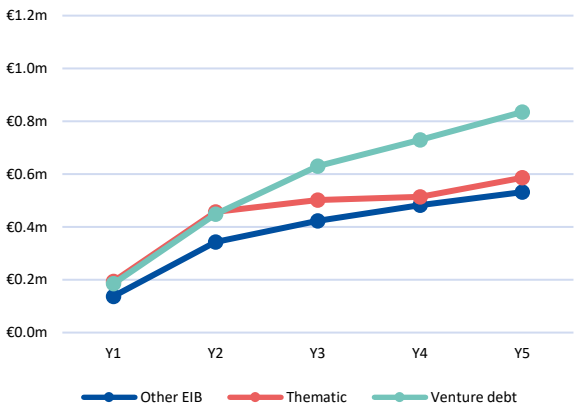
| Product type | % of operations requiring post-signature waivers |
|---|---|
| **Equity/quasi-equity** | 60% |
| **Framework loans** | 12% |
| **Guarantees** | 27% |
| **Investment loans** | 18% |
| **MBILs** | 12% |

**Figure 25: Distribution of costs per operation: quasi-equity vs. other EIB**




Note: Cumulative costs after four years
Source: EIB data

**Figure 26: Cumulative costs (in €) per operation per year**




Source: EIB data

**As a consequence, operating costs for quasi-equity — especially for venture debt — are higher than for other EIB operations.** The distribution of average cumulative costs per operation after four years clearly indicates significantly higher costs for quasi-equity operations compared to the rest of the EIB portfolio. Analysis of cumulative costs per year particularly highlights that venture debt transactions have the highest cumulative costs over their lifetime**.** Given the riskier nature of quasi-equity operations, due diligence, pre-approval and discussions between services is a more labour-intensive process than for standard operations, which translates into higher costs. Some of these processes are lighter for operations under the thematic finance window, which are 100% covered by the European Commission, and the mandator explicitly encourages higher risk-taking. Moreover, monitoring and post-disbursement events, such as the high proportion of contractual waivers, also lead to increasing costs.

**In addition, the EIB quasi-equity portfolio also bears high sunk costs linked to pre- and post-signature cancellations**. Both venture debt and thematic products display a high attrition rate — 37% for venture debt and 41% for thematic operations.[22] A significant part of the portfolio's costs — 16% for venture debt and 21% for thematic operations — corresponds to costs recorded for operations that ultimately never materialised. The high attrition is partially due to the long time it takes to reach approval and signature, as some potential clients find the EIB offer too slow to suit their needs. Anecdotal evidence suggests that the attrition due to timeliness leads in some cases to adverse selection as better clients choose alternative financing sources.

**Although the EIB has increased the resources allocated to handle the internal processes, and in some cases lightened the burden on quasi-equity operations, there is still room to improve the integration of these transactions into the EIB's environment.** For instance, while the Portfolio Management and Monitoring Directorate (PMM) increased the resources allocated to quasi-equity, transfers from OPS to PMM[23] can in some cases still lead to loss of institutional memory and loss of first-hand connection with the clients. In other cases, the conditions of the warrants[24] associated with the EIB financing — considered too strict by EIB clients compared to what is usually required by other quasi-equity providers — have discouraged other private investors from investing into the firms. All in all, the heavy administrative burden of EIB processes, which often appear to be rigid to such clients, can result in high attrition, adverse selection of clients and occasionally in client dissatisfaction.

[22] The attrition rate pre-signature is higher than the post-signature rate.
[23] For equity and quasi-equity operations, after the first disbursement, OPS (front office) transfers the operation and its monitoring to PMM (middle office).
[24] Warrants are derivatives issued by a company that give the right, but not the obligation, to buy equity at a certain price before expiration. They provide venture debt investors with an opportunity to participate in the company's growth and potential in returns.

# 4. TO WHAT EXTENT HAVE THE EIB GROUP'S DIRECT AND INDIRECT OPERATIONS ADDED VALUE?

- **There is significant financial added value at fund and final beneficiary levels for EIF activity under venture and growth capital, but more limited added value for capital targeting buyout-stage firms.**
- **EIB quasi-equity transactions demonstrate significant financial added value.**
- **There is also significant non-financial added value for EIF operations at both fund and final beneficiary levels, including for buyout-stage operations.**
- **The evaluation found that EIB quasi-equity transactions provide innovative financial structures to clients, although at the same time they provide limited advice and support.**

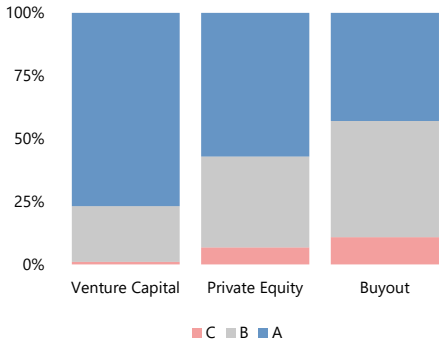
**This section provides an assessment of the financial and non-financial added value delivered by the EIB Group.** The evaluation assessed these operations at three levels:

1. **Financial intermediary (fund).** This includes an analysis of the contribution made by the EIF to the funds it supported. While the scope of the evaluation also includes the limited number of EIB equity investments in funds, the available evidence is insufficient to draw specific judgments on these operations.
2. **Final beneficiary.** This includes an analysis of the contribution the EIF-backed funds made to the companies in which they invested. It also includes an analysis of the contribution of the EIB's direct quasi-equity operations to the companies they supported.
3. **Market.** We specifically look at the mobilisation impact of EIB Group indirect support at regional level using counterfactual analysis.

# Added value at financial intermediary (fund) level

**The EIF provided strong financial added value to the funds in which it invested, particularly for venture and growth capital funds.** The systematic analysis of the advance self-assessments conducted for each EIF operation reveals differences between the types of funds when it comes to catalytic effects (**Figure 27**).[26] The earlier the stage of focus of an investment fund, the higher the assessed catalytic effect. While only 1% of venture capital funds have a rating of C, corresponding to the EIF having a lighter role of enhancing investors' base, 11% of funds investing into buyout-stage firms have such a rating.

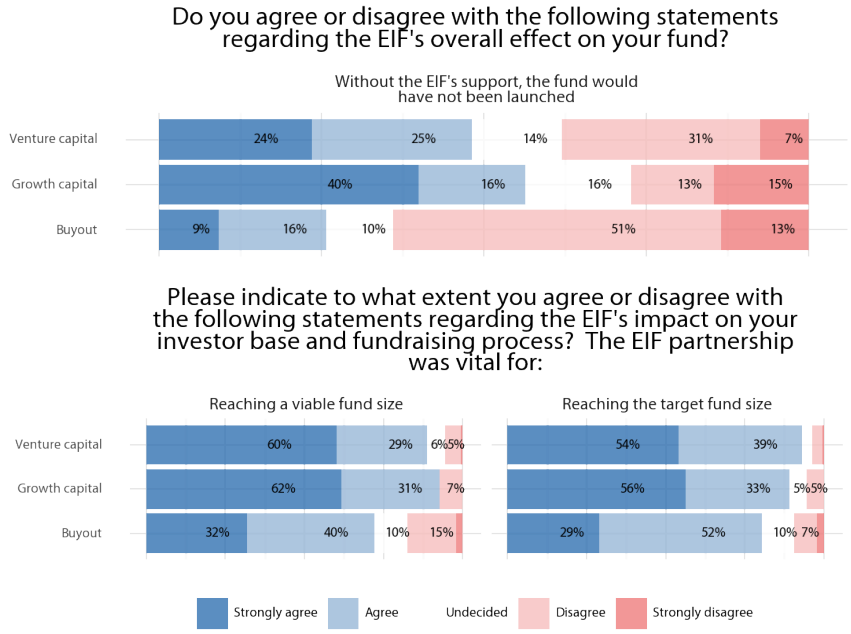
**Figure 27: EIF rating for catalytic effect (relative split per fund type)[25]**




Source: EIF data

**These results are also confirmed by the EIF's survey of fund managers**. When assessing potential effects in the EIF's absence, only 25% of managers of funds targeting buyout-stage firms report that the EIF was key in supporting the survival of the fund — compared to respectively 49% for venture capital and 56% for growth capital (**Figure 28**). The survey also confirms the strong financial added value of th e EIF with 89% of venture and 93% of growth capital fund managers reporting that, in the absence of EIF support, the fund would not have reached a viable fund size. This percentage decreases to 72% for funds investing into buyout-stage firms.

**Figure 28: Survey results on financial added value at fund level**



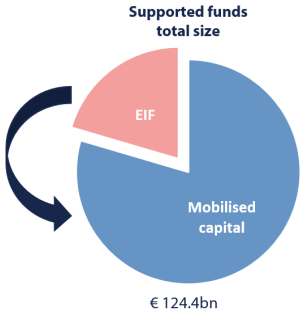

Source: EIF private equity and venture capital fund managers' survey

[25] Ratings range from A (where the EIF had the most impact for the fund existence) to C (where the EIF enhanced the investors' base).

[26] At the appraisal stage, every EIF Group operation is reviewed against set criteria to assess its added value. This advance assessment is conducted based on value added methodology. The methodology defines three pillars: (i) market-level value added, (ii) transactional-level structuring value added and (iii) transactional-level catalytic effect/leverage.

**The EIF's investments have in most cases helped to attract other investors into the supported funds.** Through its intervention, the EIF helps to mobilise external capital. One cannot assume direct causality between the EIF's support and private sector investments, as many other factors are also to be considered. Still, for every euro the EIF puts into a fund, on average €3.88 is committed by other investors alongside the EIF (**Figure 29**). Surveys and case studies also confirmed that, in the vast majority of cases, the participation of the EIB Group played a very important role in attracting other investors. This was due to several factors:

### Figure 29: EIF and third-party funding in EIF-supported funds

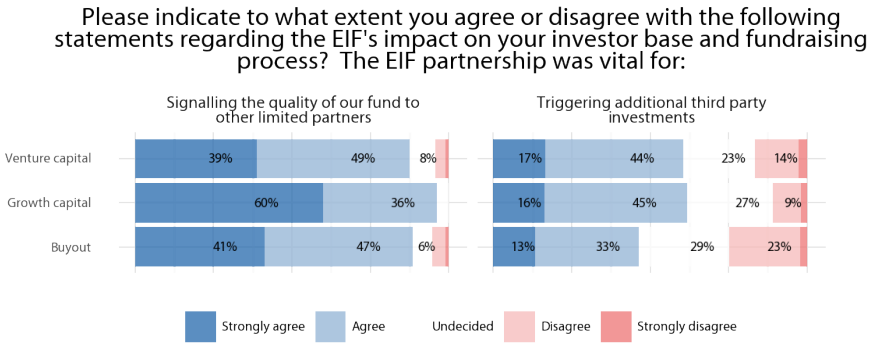



Source: EIF data

- **The large ticket size of the EIF helped the funds to reach a critical size, thereby facilitating the participation of other investors and reducing the risk they took.** While some individual mandates carry maximum exposure limits, the EIF can, if needed, blend different resources to take the required share into a fund. The size of the fund matters for other investors as they have maximum exposure limits along with the minimum ticket size. By committing early in the fundraising process, the EIF also helped to alleviate the concerns of some investors that a viable target size may not be reached.
- **The investment by the EIF signalled the quality of the fund to other investors.** The EIF's due diligence gives comfort to other investors, notably to those with a lower capacity to conduct a thorough process or not willing to invest too many resources for this purpose.

**Some mandates offer preferential conditions to attract private investors.** When investing alongside certain EIF mandates, other fund investors can benefit from an asymmetric distribution waterfall, with revenues being allocated in priorities to other investors. These specific conditions are set up with the objective of catalysing private capital towards specific market gaps.

### Figure 30: Survey results on the EIF participation's signalling effect




Source: EIF private equity and venture capital fund managers' survey

**The evaluation also found several cases in which the participation of the EIB Group was less important, but it still delivered benefits.** Some established fund managers with a solid track record or operating in more developed equity markets were able to attract sufficient private funding even without the EIF. Nevertheless, the EIF's participation helped to further increase fund size and implicitly the volume of investments in SMEs and mid-caps. For the EIF, the participation in these funds increased its exposure to, and facilitated learning from, some lead fund organisations. The EIF could then pass on such knowledge to less experienced fund managers.

**The EIF is wary of the potential risk of crowding out other investors and takes action to manage this risk.** There are 220 transactions in its portfolio in which the EIF reduced its commitment when the fund manager was able to reach its target fund size. While the reduction in the commitment may have also been influenced by other factors, such as the availability of the financial resources under specific mandates, the case studies show that, in most cases, the EIF did not look to maximise its commitments and the risk of crowding out was appropriately managed.

**The evaluation found some cases in which the supported funds appeared to be oversubscribed at the time of the investment.** The evaluation found funds financed under the Asset Management Umbrella Fund (AMUF) which were reported as oversubscribed at the time of the investment. With the objective of providing cost-efficient access to Europe's best performing private equity and venture capital managers, the AMUF typically targets well-established management teams.

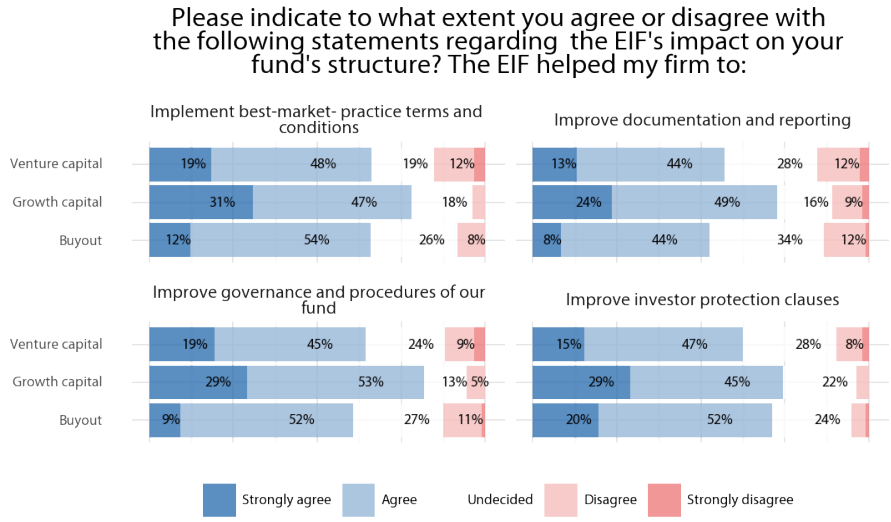
**Box 10: Best practices to mobilise private equity capital**

**The literature review identified a number of conditions that encourage private investors to co-invest with the public sector:**

- **Investing in "hybrid funds" which blend public and private resources rather than "fully public funds".** The literature suggests that crowding-in effects are more likely to materialise in the hybrid model, whose rationale is the use of public funds to leverage private investors' returns and, in parallel, develop equity markets locally. To attract private investors, the public sector has to create incentives that address the key structural factors and operational challenges that prevent private investors from investing.
- **Understanding the investment behaviour of the industry and sticking to market practices.** The literature argues that the public sector often views equity investments as a policy tool to pursue social and developmental goals. Accordingly, it may seek to introduce fairness, equity and balance criteria when designing equity instruments. However, this may in some cases contrast with the competitive and meritocratic nature of the equity industry, which relies on market forces and signalling mechanisms to allocate funds. There is therefore a need for the public sector to have a good understanding of the likely response of private investors to some of its requirements and limit deviations from market practice.
- **Respecting and promoting the alignment of interests and the independence of fund managers.** The literature suggests that the alignment of objectives and independent governance creates synergies between public and private actors, which explains the positive impact of hybrid venture capital models on the economic performance of investees compared to pure public sector models. Private investors are also more likely to co-invest in hybrid funds when these are managed by independent fund managers, whose decisions are not controlled by the public sector.

**The approach of the EIF is in line with the above conditions:** EIF investments apply the "hybrid model" in which public and private sources of financing are combined. The surveys and the case studies show that the EIF promoted the use of market best practices and its requirements did not deter private investors. Lastly, the alignment of interests between the fund manager and the investors and the independence of the fund manager have been among the key requirements of the EIB Group for the funds in which it has invested.

**Figure 31: Survey results on structuring input at fund level**




Source: EIF private equity and venture capital fund managers' survey

**The EIF has provided significant structuring input to the supported funds.** Such input included improvements in the governance arrangements, the legal documentation and reporting (Figure 31). The EIF helped the fund managers to align their approach to best market practices while securing the alignment of interests with the other investors. Through its support as a cornerstone investor, the EIF also assisted fund managers in getting independence from their historical sponsor. Through the overall pre-signature process — for example, when weaknesses are identified during the due diligence — the EIF triggered adjustments to strengthen the composition of the management team. Finally, the EIF also facilitates access to key market experts for its clients, notably through the organisation of recognised networking events.

## Added value at final beneficiary level

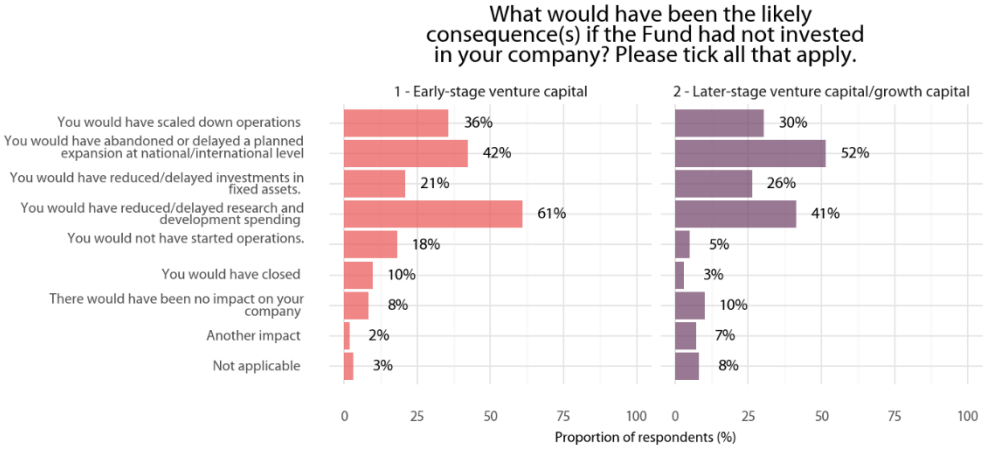
**EIF-intermediated operations provide strong financial added value to companies classified at the venture and growth capital stages and limited financial added value to companies at the buyout stage.** According to the responses of the survey EV conducted among EIB Group equity final beneficiaries, the majority of the clients in the venture and growth capital stages report constrained market financing conditions at the time they obtained financing from the EIF's backed funds. Particularly, their specific risk profile, the macroeconomic conditions and other sector-specific factors were key in constraining access to finance. The key beneficial features of the received EIF-supported financing were its amount and its timeliness. The cost of the financing (as compared to other financing sources) was not considered as an important consideration. Conversely, a majority of the final beneficiaries at the buyout stage report that alternative financing was readily available on suitable terms.

**The extent to which funds investing into buyout-stage firms increase access to finance for SMEs and mid-caps is not clear.** Since these funds target the acquisition of majority stakes in companies from other investors — and consequently create exit opportunities for the latter — their investments are only likely to increase access to finance for small and medium businesses to the extent that the investors who have exited reinvest into SMEs and mid-caps. The evaluation could not test to what extent this has happened in practice.

**The absence of financing from the EIF-supported funds would have had significant consequences for the companies at the venture capital and growth stages.**[27] Most surveyed respondents said they would have reduced or delayed spending on research and development, abandoned or delayed a planned expansion of their company or would have scaled down operations and investments, clearly pointing to high financial added value (**Figure 32**). Only 8-10% of the respondents said there would have been no impact on their company.

[27] Given their nature — they do not provide additional capital to the companies per se — this aspect is irrelevant for funds investing into buyout-stage firms.

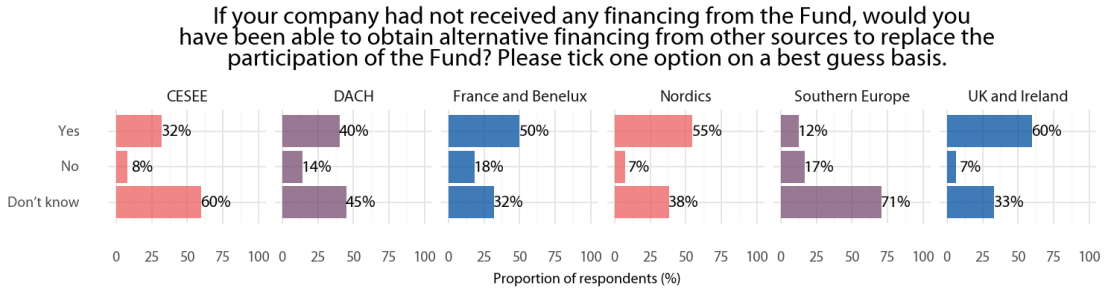
**Figure 32: Survey results on financial added value at final beneficiary level[28]**




Source: EV survey of EIB Group final beneficiaries

**Final beneficiaries from Southern Europe, Central and Eastern Europe as well as the DACH region[29] are significantly less confident they would have been able to secure alternative financing.** A large proportion of the companies supported in these regions either do not know or do not think they would have been able to obtain alternative financing. A similar picture emerges when splitting survey responses by regions: a significantly higher number of companies from these regions report the existence of constraints in the market financing conditions at the time they obtained financing (**Figure 33**).

**Figure 33: Survey results on financial added value at final beneficiary level, by country**



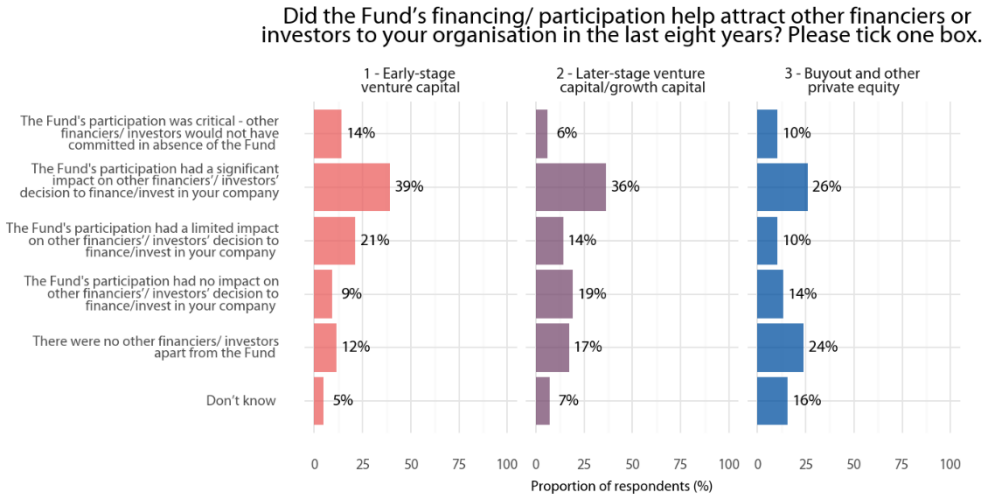

Source: EV survey of EIB Group final beneficiaries

**The final beneficiaries operating in the biotech and healthcare sector report they would have had more difficulties to secure alternative financing under the same timeframe.** As compared to the other sectors, a substantially higher number of companies in the biotech and healthcare sector which claim they had access to alternative sources of financing indicate that these sources would not have been available to them under the same timeframe. Similarly, a higher number of companies in this sector report the existence of a gap in market financing for companies such as theirs due to the specific risk profile.

**The funds supported by the EIF helped to attract other investors for their investees.** In addition to providing a valuable source of financing, the participation of the funds in these companies has in many cases helped to attract other financing sources (**Figure 34**). While the objective of the EIF's intervention is to attract additional financing at the fund level, the survey also suggests the existence of an indirect catalytic effect at the level of the final beneficiary. This effect appears stronger for the venture capital as compared to the growth and buyout stages.

[28] This question is not applicable to companies at the buyout stage since, as explained above, in most cases the change in ownership resulting from the participation of the buyout fund did not necessarily result in additional financing being made available to these companies.
[29] Germany (D), Austria (A), and Switzerland (CH).

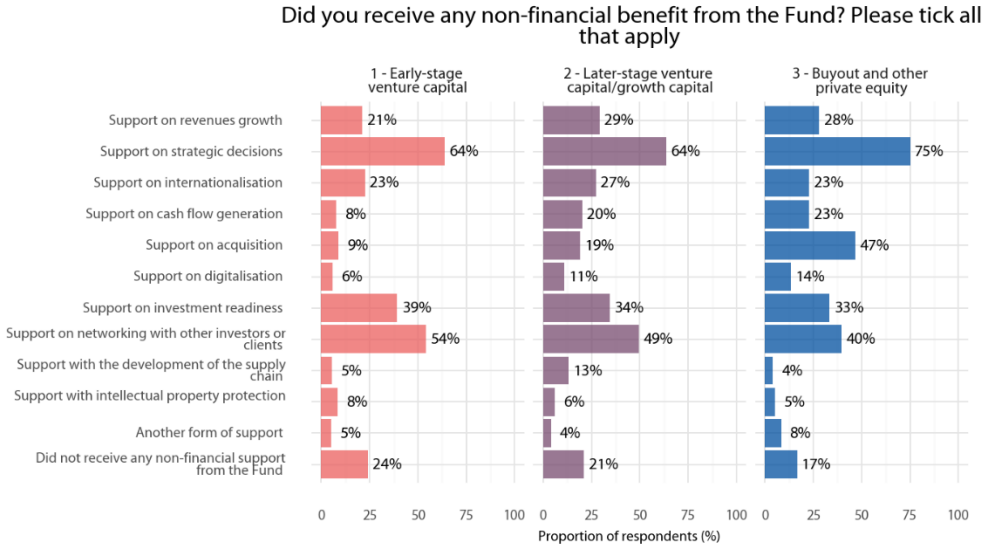
**Figure 34: Survey results on financial mobilisation at final beneficiary level**




Source: EV survey of EIB Group final beneficiaries

**The funds supported by the EIF, including those targeting buyout-stage firms, have provided strong non-financial added value to their investees.** Apart from providing financing, the funds have also delivered useful non-financial support to their investees (**Figure 35**). In particular, they supported the companies in strategic decisions, facilitated their access to other investors or clients and provided them with support on investment readiness. One of the characteristics of the funds targeting buyout-stage firms is that, unlike the other types of funds, they typically also provide their companies with support on acquisitions.

**Figure 35: Survey results on non-financial support at final beneficiary level**

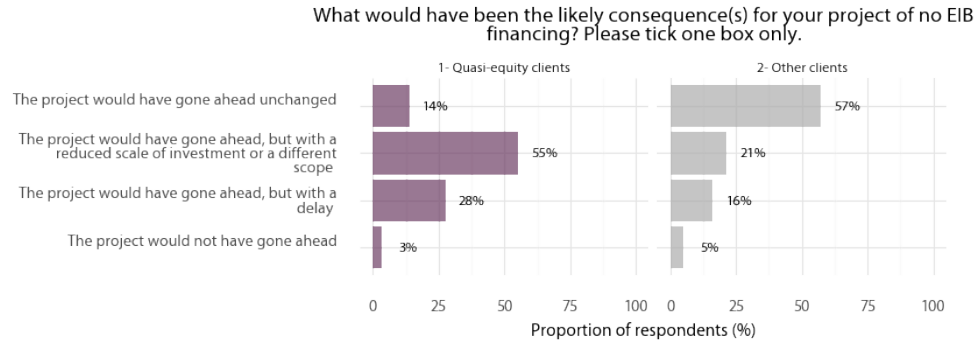



Source: EV survey of EIB Group final beneficiaries

**The EIB direct quasi-equity operations provided strong financial added value to the beneficiary companies.** The survey of quasi-equity clients confirms the existence of a strong financing gap, as only 10% of the clients indicated that financing was readily available from commercial sources on suitable terms. In addition, none of the 29 respondents would have been able to secure financing with the same features as those offered by the EIB. The features which would have been different include not just the cost, but a range of other things such as the type of product, the tenor, the collateral requirements and the flexibility of the drawdowns. In addition to the features, the size of the EIB financing also appears to be of significant importance for quasi-equity clients.

**The case studies show that, in most cases, the alternative for quasi-equity clients would have been to raise more equity, but on less favourable terms.** Most quasi-equity clients already had access to some equity financing prior to the operation with the EIB. In such cases, these companies indicated that they would have tried to raise more equity in the absence of the EIB. However, equity would not have always been available in an adequate size or within the same timeframe as the EIB Group financing.

### Figure 36: Survey results on financial added value at final beneficiary level

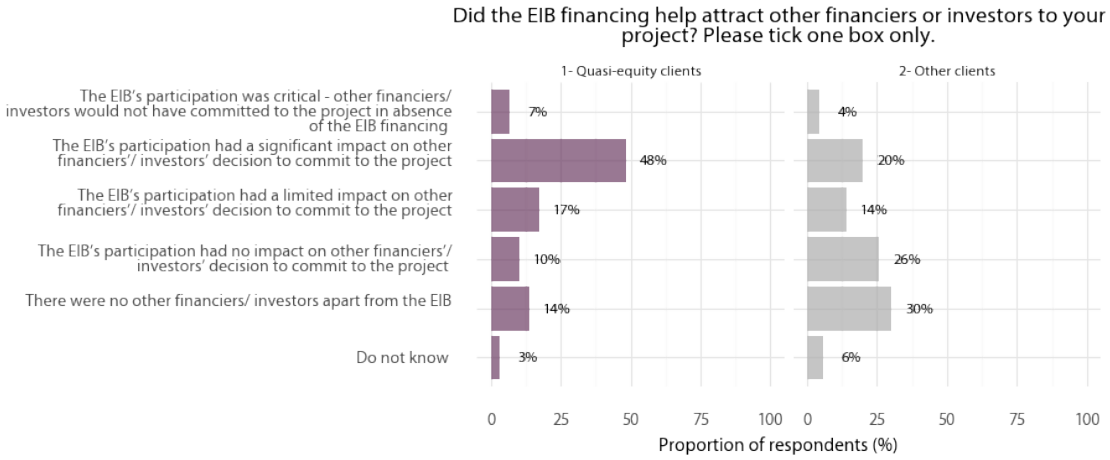



Source: EV survey conducted for the evaluation of Special Activities

**The survey data also shows that the absence of EIB quasi-equity financing would have had significant consequences on the supported projects.** In most cases the underlying projects would have either been reduced in scale or delayed (**Figure 36**). Such consequences appear to be more frequent for quasi-equity operations as compared to other operations financed by the EIB.

**The direct quasi-equity operations have also generally helped to attract other investors.** The majority of quasi-equity clients pointed to the significant or crucial role played by EIB's financing on other investors' decision to commit (**Figure 37**). The effect appears more significant for quasi-equity operations compared to other EIB operations. EIB financing signalled the quality of the company and decreased the risk for other investors.

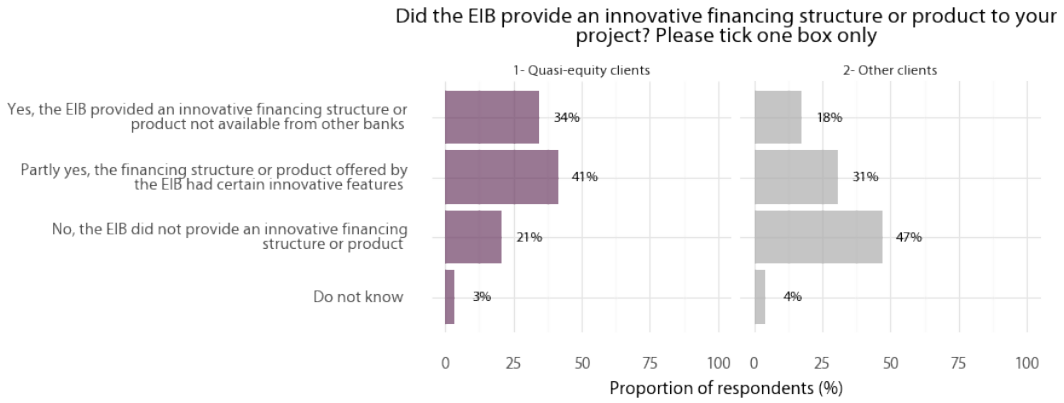
### Figure 37: Survey results on financial mobilisation at final beneficiary level




Source: EV survey conducted for the evaluation of Special Activities

**There are nevertheless a number of cases in which the EIB quasi-equity operations were perceived to have discouraged other potential investors.** 17% of quasi-equity clients reported this was the case for their operations. By contrast, only 3% of the other EIB clients believed the EIB financing had such an effect. There are two reasons behind this observation. First, some companies reported that the EIB financing replaced other equity financing which was already available within the same timeframe. Second, there are cases where the conditions of the warrants associated with the EIB financing discouraged other investors because of their potential of dilution. The evaluation also found cases where the EIB financing was not needed since the clients had access to a wide range of alternative financing sources.

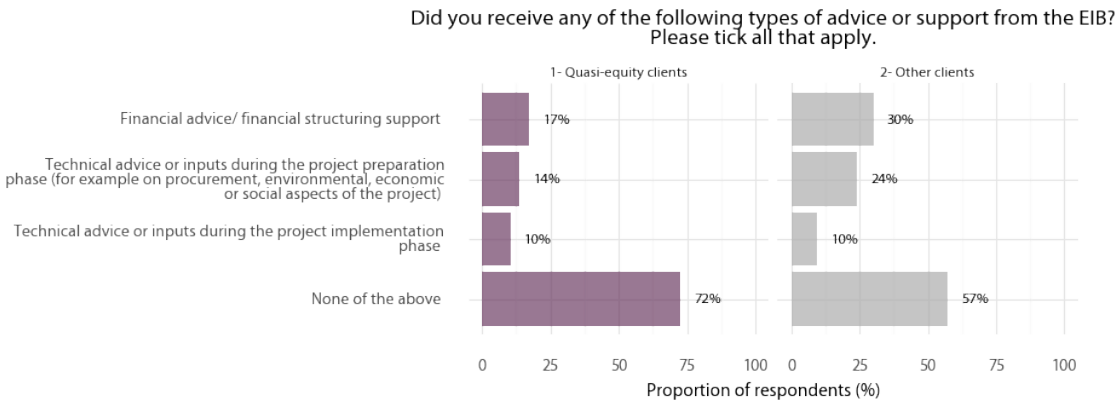
**Figure 38: Survey results on innovative financing structure at final beneficiary level**




Source: EV survey conducted for the evaluation of Special Activities

**EIB quasi-equity operations provide innovative financial solutions.** About 75% of quasi-equity clients state that the financial solutions provided by the EIB were fully or partly innovative relative to the offers available on the market (**Figure 38**). This is much higher than for other clients.

**Figure 39: Survey results on advice and support at final beneficiary level**




Source: EV survey conducted for the evaluation of Special Activities

**When it comes to advice and support, EIB quasi-equity operations provided limited added value to the clients compared to other EIB operations.** 72% of the surveyed quasi-equity clients did not receive any financial or technical advice from the EIB (Figure 39). The non-financial added value provided through quasi-equity needs to be assessed in the perspective of the nature of the product. The characteristics of quasi-equity — non-dilutive risk capital that does not offer shareholder rights to the issuer — can sometimes hamper the EIB's access to information and its ability to have full hands on the project. From the client side, the non-dilutive aspect also reflects their intention to remain in the driving seat. Case studies also did not reveal any specific case in which the client was deliberately looking for such advice and was not able to receive it from the EIB.

## Added value at market level

**The evaluation conducted a counterfactual analysis to look at the EIB Group's mobilisation effect at regional level.** The methodology used is similar to Kraemer-Eis et al. (2016), expanding the data coverage by adding several years of new transactions accumulated since the original study. The econometric model tests the existence and assesses the magnitude of crowding-in effects at the regional level triggered by the EIB Group, all other factors being equal.

**Regions with at least one investment backed by the EIB Group experience a volume of additional capital inflows in the subsequent three years.** The econometric analysis conducted by the evaluation shows that the EIB financing is typically followed by additional investments in the supported regions, everything else being equal. This investment is typically higher as compared to the regions in which the EIB Group is not present. The effect is pronounced in the second and the third year following the EIB Group's intervention. However, the econometric analysis does not find a statistically significant causal link between the EIB Group's presence and the additional inflow of capital. This suggests that, while the EIB Group-backed investments have a positive role in encouraging other investors to join, there are many other factors which play a role and influence such investment decisions.

**Box 11: Case studies support the EIF's key role as market developer**

Through its activity — especially through regional mandates — the EIF has successfully supported the development of emerging markets.

In Estonia, for example, the EIF acted through the Baltic Innovation Fund. The EIF's support to emerging fund management teams enabled such teams to grow from local to internationally established managers. The EIF's action, combined with a favourable context, contributed to the expansion of the Estonian market, which has now turned into one of the most dynamic European markets.

Similarly, the EIF's actions in Romania have been a trigger to the recent market birth. Positioning itself as a cornerstone investor with first time teams, it helped to attract private capital and supported the emergence of the Romanian market.

**There is no evidence of crowding out at the regional level.** The econometric analysis rules out any possible crowding-out effect. To confirm such a hypothesis the level of investment in the regions supported by the EIB Group would have had to either decrease or at least grow at a slower pace as compared to the region where the EIB Group is not present, which is not the case.

# 5. TO WHAT EXTENT IS THE GROUP'S EQUITY AND QUASI-EQUITY FINANCING CONTRIBUTING TO ENHANCED GROWTH AND INNOVATION?

- **EIB Group indirect equity investments help companies grow and develop in the same way as fully "private" equity investors.**
- **The positive impact on innovation performance is higher for early-stage venture capital and growth companies than for buyout firms.**
- **There is high impact on employment reported by early venture capital fund managers.**

## EIF equity support results in a similar impact on beneficiary firms as market funding

**Recent studies conclude that the EIB Group's venture capital and quasi-equity activity help companies to grow and develop.** The literature shows that firms backed by equity-type funding from the EIB Group outperform companies without venture capital/quasi-equity backing with respect to a number of key performance indicators and identifies a number of factors underlying this success:

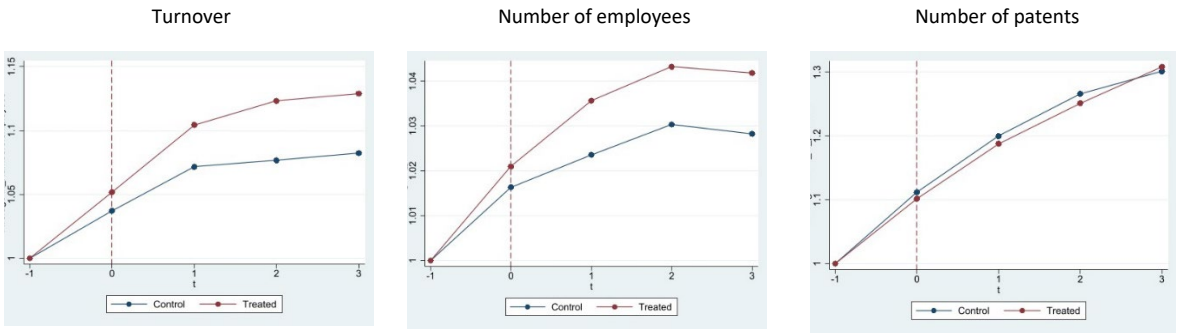
- A set of recent studies by the EIF document the positive effects of EIF-supported equity investments on investees' performance (such as assets, revenue, employment) and provides meaningful evidence towards the EIF's contribution to the financial growth and innovation of businesses in Europe. In particular, evidence suggests that EIF-supported venture capital investments result in improvements across various financial indicators (such as assets, revenue, employment) relative to non-venture funded peers (Pavlova and Signore, 2019), as well as in higher patent activity and better exit outcomes in the forms of mergers, acquisitions and initial public offerings (Pavlova and Signore, 2021).
- A recent internal study by the EIB's economics department provides evidence that EIB-supported direct quasi-equity has a positive impact on the performance of final beneficiaries compared to firms with no venture debt financing. Notably, venture debt-supported companies grow faster, are able to raise more long-term debt and become more productive relative to peers without quasi-equity funding.

**While these studies document the positive impact of the EIB Group's intervention, they do not establish how this impact compares to the effects of similar funding from private sources.** This is due to the choice of the control group against which the EIB Group intervention is benchmarked: they are firms without venture capital or venture debt support.

**This evaluation carried out a counterfactual analysis to test whether, and to what extent, EIF intervention through private intermediaries is able to address the agency problem generally associated with public support to private markets**. The hypothesis tested was the following: recipient firms of EIF-supported funds perform at least as well as the recipients of privately-funded risk capital.[30] This analysis built on a control group consisting of SMEs and mid-caps that received venture capital and private equity support from non-EIB Group-backed private equity funds. Their performance is then compared with treated peers receiving venture capital or private equity financing by the EIF. Given this design, similar economic performance of the EIF-backed investees (treated) and non-EIB Group-backed investees (controls) would suggest that EIF equity investments help companies grow and develop in the same way as fully "private" equity investors do.

**Overall, the analysis suggests that EIF indirect equity investments help companies to grow and develop in the same way as fully "private" equity investors do.** There is no statistically significant differential effect between the economic performance of the EIF-backed investees and the non-EIB Group-backed investees (**Figure 40**). The similar performance can be shown for a range of outcome variables, including turnover, cost of personnel, total assets, and capital. This holds true also when looking for disaggregated impacts at size, age, sector and geographical level.

**Figure 40: Impact of EIF vs. market-based equity funding on beneficiary performance**



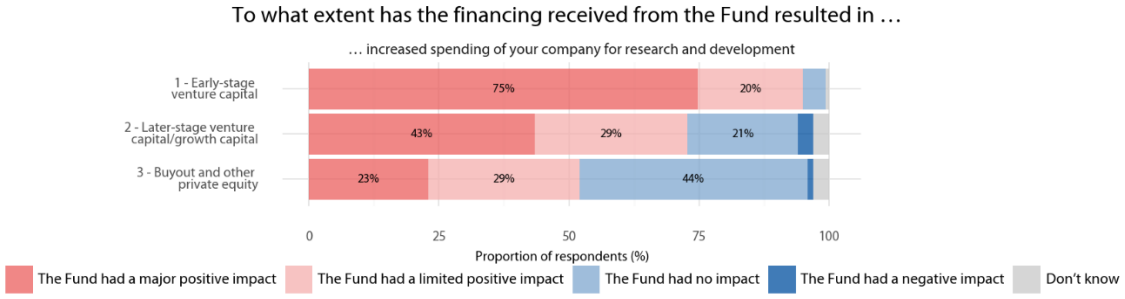

Note: The horizontal axis shows time in years relative to the "treatment year" — the year of equity investment into the firm. The vertical axis shows impact in proportional terms relative to t-1.

Source: EV counterfactual analysis based on EIF, Orbis and Zephyr data

## Stronger impact on employment and innovation at earlier stages

**The survey conducted at final beneficiary level highlights the positive impact of EIF activity on innovation performance**. Early-stage, and to some extent, growth firms benefiting from EIF-supported funding are more likely to carry out innovation spillovers and to file patents. Compared to firms receiving buyout investment, the funding received by firms in the early venture capital and growth stage is also more likely to be used to invest for innovation purposes (**Figure 41**).

**Figure 41: Survey results on the impact of investment on firm-level innovation by firm stage**

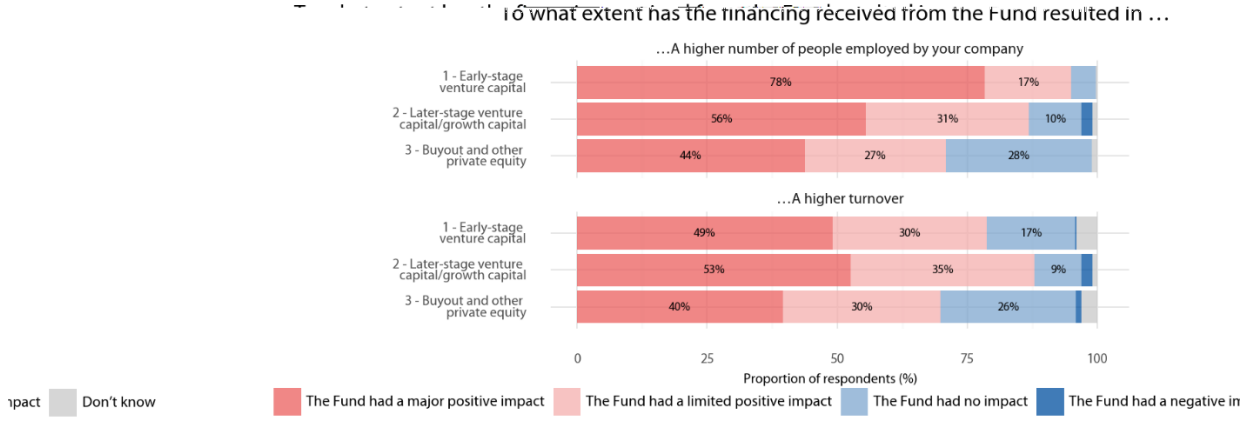



Source: EV survey of EIB Group final beneficiaries

[30] Box 10 discusses in detail the best practices for public intervention in venture capital markets to limit the agency problem.

**Beyond innovation, impact on employment is also more pronounced for early-stage beneficiaries.** More than three-quarters of early-stage venture capital recipients report a strong positive impact on headcount as a result of EIF-supported funding (**Figure 42**).

**Figure 42: Survey results on the impact of investment on firm-level employment by firm stage**




Source: EV survey of EIB Group final beneficiaries

# 6. WHAT ARE THE IMPLICATIONS OF EQUITY-TYPE OPERATIONS ON THE GROUP'S LONG-RUN PROFITABILITY AND CAPITAL POSITION?

- **Since inception, the RCR mandate has been profitable. Its performance has been improving over time, with an especially strong performance over recent years.**
- **The portfolio rebalancing towards private equity helped improve its overall performance. Compared to venture capital, private equity has a more stable performance across vintage years and economic cycles, more realised value and is quicker to distribute capital back.**
- **As the majority of private equity is targeting buyout-stage firms, while venture capital is mainly targeting early venture capital, the same conclusions hold when comparing buyout to early venture capital. Growth capital stands in between private equity and venture capital in terms of development stage and in terms of financial performances.**
- **Being still young, the direct quasi-equity portfolios are yet not profitable as they are still dragged down by costs and negative value adjustments. However, when restricting to the sub-portfolios of exited operations the returns are very good.**
- **Both the RCR and the direct quasi-equity portfolios have a sizeable share which is not yet realised, with significant upside potential, but for which costs have already been incurred. This results in a slow and gradual build-up of realised gains and losses impacting portfolio performance.**
- **Indirect equity exposures through funds have a capital charge around half that of direct quasi-equity exposure — stemming from different regulatory treatment.**

## Scope of the profitability analysis

**The objective of the profitability analysis is to assess the profitability of the portfolio/products and hence it focuses on the RCR portfolio for indirect operations and the quasi-equity portfolio for direct operations.**

- **Indirect operations**: As explained in Section 1, the EIF-fronted portfolio is mainly under mandates,[31] intra-Group and external ones, and as such the EIF mainly acts as an asset manager. The profitability of the EIF in such a role does not necessarily reflect the profitability of the product/portfolio per se and for that reason is not covered in the analysis. As the objective of this analysis is to assess the profitability of the portfolio/products, the evaluation concentrated on the **RCR mandate** which is on the EIB's balance sheet.
- **Direct operations:** These include the EIB-fronted quasi-equity operations.

**The temporal scope of the analysis covers the portfolios since inception up to 31 December 2021, hence it is portfolio-dependent**.

- **Indirect operations**: The evaluation covers the RCR portfolioand looks at its performance since inception in 1997, as well as the evolution over time. Firstly, a longer time span is necessary as investment into private equity (as opposed to public equity) funds is a long-term and illiquid investment. Typically, a fund life is ten years. In the first five years, fund managers call the capital and make investments into companies. In the subsequent five years, funds exit from these investments, and they distribute the proceeds to the fund's investors. Funds less than five years old are thus considered "immature" to assess their performance, as they are still in the investment period. In an analysis restricted to the years 2010-2020, these immature funds would represent half of the portfolio. Secondly, a longer time span will avoid the excessive influence of vintage years[32] and macro-financial conditions on the performance.
- **Direct operations**: This is a younger portfolio, with the first operation signed in 2014, the starting point for the analysis.

## Profitability of the RCR portfolio — intermediated operations

### Portfolio heterogeneity across strategies/stages and across time

**Given the heterogeneity of funds' performance across time and across strategies and stages (see Box 6 — Chapter 1), the analysis is split across time and the cross-section dimensions.**

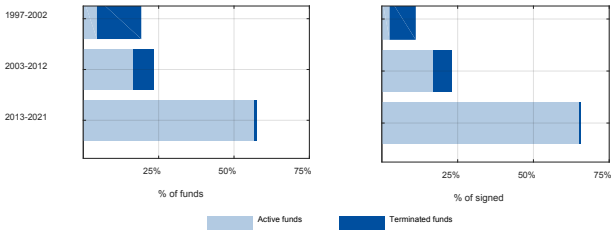
These aspects are particularly relevant in the case of the RCR portfolio as:

- it spans a 25-year period, which includes the collapse of the dot-com bubble in 2000, the global financial crisis, the subsequent long period of low interest rates and ample liquidity, and the COVID crisis;
- it includes funds with different performance targets (see Section 2.3.2);
- it includes funds invested in different strategies and stages.

[31] Each of these mandates have specific arrangements/structures in terms of objectives and fees.
[32] The vintage year is the first year in which a fund draws capital from its investors.

**The bulk of the portfolio was built post-2012 (Figure 43), only 22% of funds are in terminated status and 30% are still "immature".** The portfolio split by vintage years group shows that the bulk of the portfolio was built post-2012, around 58% of funds and 66% of signed volume. While 32% of funds are aged ten years or more, only 22% of funds are in terminated status. 30% of funds and signed volume are still "immature" — less than five years old — hence they are too young to assess their performance. Note that vintage years grouping splits the portfolio according to the annualised gross return target set in the mandate, in other words no return target pre-2002, a 3% gross[33] return target for investments approved since 2003, then an increase to 5% for investments since 2013.[34]

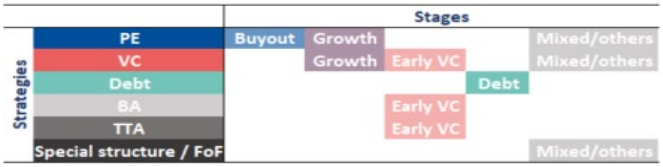
**Figure 43: RCR portfolio split by vintage years group**




Source: EV computations based on EIF funds level data

**Figure 44 illustrates the mapping of funds between strategies and stages which split the portfolio across the cross-section dimension**. In the analysis, both splits will be used. The strategy split follows the current EIF reporting. The stage split which better reflects the funds underlying investments according to the companies' stages, as highlighted in the evaluation, will also be reported. However, given that the time scope of the profitability analysis needs to take a since inception/lifetime view, it encounters some limitations with the stage decomposition as for the earlier years the stage classification is missing/not available.

**Figure 44: Strategies and stages**



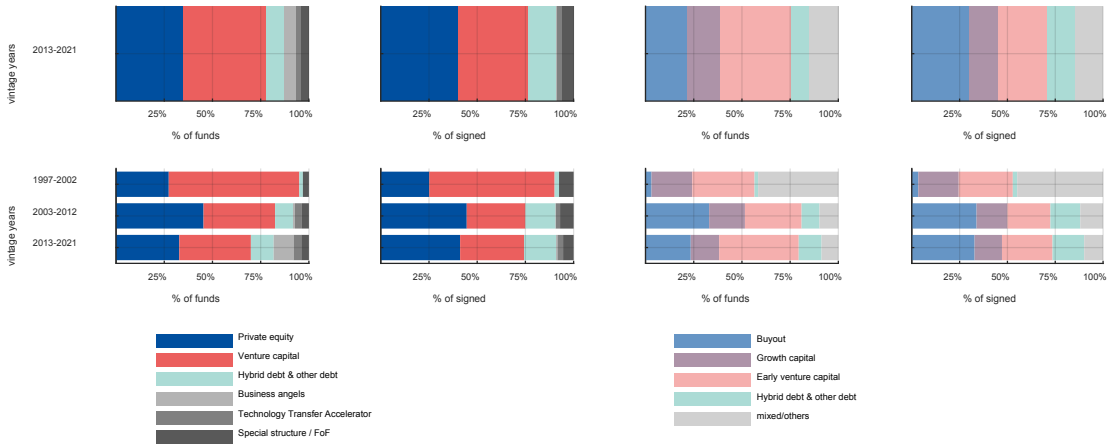

**The early vintage years (1997-2002) were concentrated on venture capital, representing 68% of funds and 65% of signed volume (Figure 45). While only 27% of the funds and 25% of signed volume went into the private equity segment.** For these early vintage years, the decomposition of funds across company stages is missing for around 50% of the funds and reported under the mixed/other[35] category.

**Since the portfolio rebalancing, which started in 2003, the share of private equity and venture capital is more evenly distributed and the portfolio is concentrated in private equity/buyout and venture capital /early venture capital.**

- In the earlier years, the EIF primarily supported early-stage independent fund management teams in the technology sector. The collapse of the dot-com bubble in 2001 resulted in a reorientation of the investment strategy in 2003 towards portfolio diversification by including a greater share of later-stage investments to partly balance the expected negative returns from a portfolio concentrated on early-stage venture capital investments.
- As a percentage of the total portfolio, the share of funds is the highest for venture capital and early venture capital (43% and 37%), while as a percentage of signed amounts the share is highest for private equity and buyout (40% and 30%). This is a reflection of the fact that private equity funds are bigger since they support more mature companies which require a larger ticket size, hence the EIBG absolute amount per fund is larger. The share of debt funds has been increasing over time and represents 9% of the funds and 16% of the signed amount.

[33] In other words, net of fees paid by the EIB to the EIF for managing the mandate.
[34] Hence, the vintage years grouping are 1997-2002, 2003-2012 and 2013-2021. It should be noted that since 2022, the 5% gross return target was transformed into a 5% net return target.
[35] This category includes funds for which the stage classification is missing and the few other stages, namely business angels, Technology Transfer Accelerator (TTA) and special structure/fund of funds (FoF).

**Figure 45: The RCR portfolio split by strategies and stages**




Source: EV computations based on EIF funds level data

## Portfolio financial performance — money multiples and internal rate of return

**The portfolio performance is first analysed through standard fund level performance metrics[36] that measure the performance from investments into funds with money multiples and the internal rate.**

### *Financial performance measures definition*

**The performance measures are computed on the basis of cash inflows into a fund, cash outflows from a fund and the unrealised/remaining value in the fund:**

- The **cash inflows into a fund** are the cumulative amount of cash called by a fund, that is **paid-in** into the fund by investors.
- The **cash outflows from a fund** are the cumulative proceeds that a fund has **distributed** back to its investors. This represents the realised value for the investors.
- The **residual value/net asset value** (NAV) **of the fund** is the fair value of the remaining stakes that a fund holds in its portfolio at the valuation date. This is the portion of a fund's value that is not yet realised.

**The performance measures[37] used are:**

- **Money multiples ratios which measure the amount of realised and/or unrealised value relative to the amount paid-in into a fund**:
    - The **distributed to paid-in (DPI)** is the cumulative amount distributed relative to the cumulative amount paid-in. **It measures the proportion of capital/cash returned to investors, in other words the realised value.** A DPI above one means that the fund has broken even as the amount of money paid-in has been recovered. Any number above one indicates that the fund has paid out more than has been paid in.
    - The **residual value to paid-in (RVPI)** is the residual value in the fund relative to the cumulative amount paid-in. **It measures the portion of a fund's value that is (still) unrealised/remaining.**

[36] All these measures fluctuate over the life of the fund and over time as they are also affected by macro-financial conditions which affect the remaining valuation of a fund and also the exit price of companies.
[37] These performance measures are computed replicating EIBG/market methodologies for estimated NAV at all cash flow dates. The metrics are always computed since the inception of the portfolio up to 31 December 2021. The data vintage used is as of April 2022.

- The **total value to paid-in (TVPI)** is the sum of the DPI and the RVPI, in other words **it is the sum of the actual realised value into a fund and the unrealised/remaining value of a fund.** Hence the TVPI accounts for potential/future returns, while the DPI accounts only for realised returns.

- **The internal rate of return (IRR)** is the discount rate that makes the net present value of all cash flows (inflows and outflows and treating the remaining unrealised NAV as a final positive cash flow) equal to zero at valuation date.

The money multiples ignore the time value of money and the duration of the investment. The internal rate of return is an annualised rate which takes into account the time value of money and the timing of the cash flows. As the calculation of the IRR is sensitive to the timing of cash flows, in the case of a very young portfolio it may provide a less representative performance measurement. It takes into account the realised and unrealised value, whereas the money multiples can be split into these two parts.

**These metrics are computed net of fund manager fees but gross of the fees the EIB paid to the EIF as the attribution of these fees by vintage year and or fund strategy/stage is not available.**

### *RCR portfolio historical financial performance*

**Figure 46 (upper panel)[38] shows that the portfolio performance has been improving over time. As of end 2021, the internal rate of return stood at around 9%, about 75% of the amount paid-in into funds has already been recovered and there still is significant unrealised value left in the portfolio.**

- Following the collapse of the dot-com bubble, the portfolio's IRR entered into negative territory. Only since end-2013 has it been consistently positive and it stood at around 9% as of end-2021.

- The distributed to paid-in (DPI) has been steadily increasing over time as more funds matured and returned capital. As of end-2021, 75% of the portfolio paid-in has been recovered and there is significant unrealised value. This residual value, which has been highly cyclical, has been steadily increasing over the past few years due to high equity market valuations, low interest rates and ample liquidity. Valuations are enduring some corrections in 2022 as equity markets have fallen amidst deteriorating macro-financial environment and monetary tightening. Private equity/venture capital are illiquid instruments with a significant time lag in reporting fund performances, so they typically lag public markets by many months.

**Further decomposing the portfolio performance by vintage years (Figure 46 — lower panel) shows that the early ones had a negative performance, 2003-2012 have already distributed more than the paid-in, hence a realised positive return, while the years 2013-2021, given their younger age, have only returned 50% of the paid-in but still have a lot of unrealised/remaining value.**

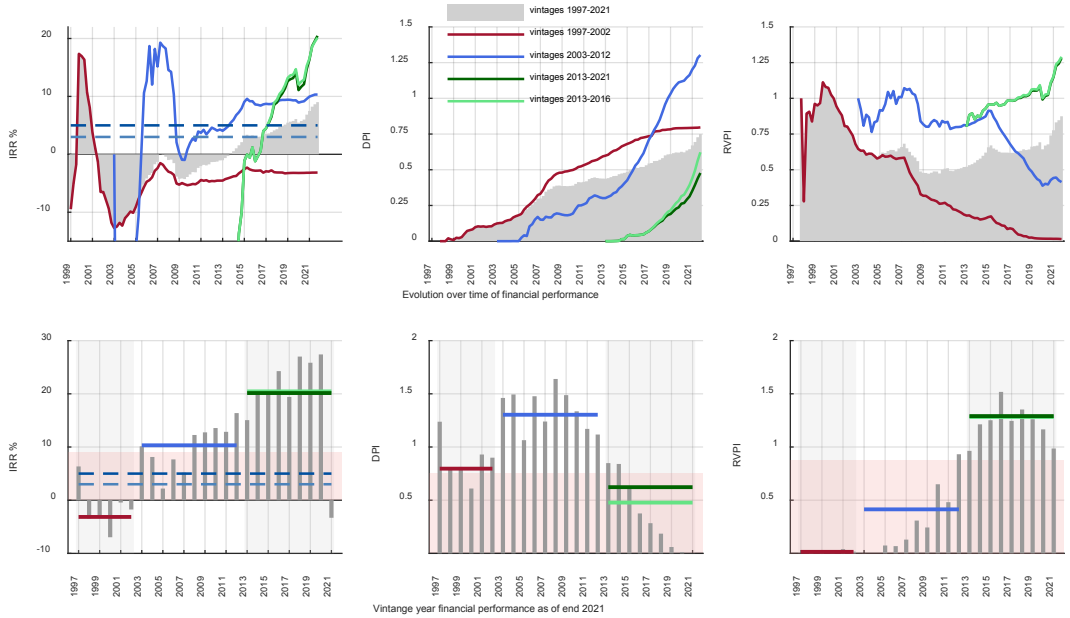
- The early vintage years (1997-2002) are close to all terminated and have had a negative performance. They have returned only circa 80% of the paid-in, have close to zero residual value left and a realised IRR of –3.2%: all years except 1997 have a negative performance. These are the funds covering the tech bubble bursts.

- Vintage years 2003-2012 have already distributed more than the paid-in — this holds true for all years — with a pooled across vintage years DPI of 130% and still have some residual value. The pooled IRR stands at 10.3%, well above the 3% target for these vintage year group as set in the mandate agreement.

- Vintage years 2013-2021, given their younger age with half of them still in the investment period have only returned 50% of the paid-in but still have a lot of residual value and a pooled IRR of 20.5% (above their 5% target) mainly driven by the still high unrealised value.

[38] It shows the recursive computation of the since inception metrics as of the end of each quarter from Q1-1997 to Q4-2021 (x-axis).

**Figure 46: Financial performance evolution over time — pooled vintage years (upper panel); financial performance as of end 2021 per vintage year and pooled vintage years (lower panel)**




Source: EV computations based on EIF funds level data

**Looking at sub-portfolios' performance for the two most important fund strategies further shows that the portfolio rebalancing towards later-stage private equity helped improve the overall performance. This is illustrated in Figure 47 and Figure 48 below.**

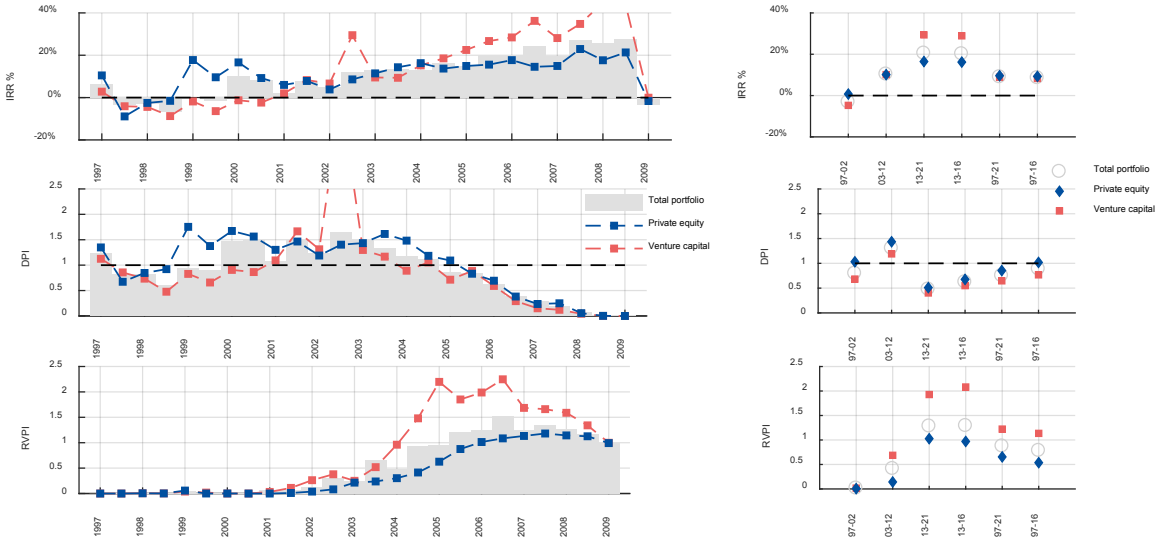
**Private equity has a more stable performance across vintage years and economic cycles than venture capital.** It was more resilient during the dot-com collapse and the global financial crisis.

- For vintage years 1997-2002, the private equity portfolio has been terminated just paying back the capital invested, while the venture capital portfolio has been terminated at a loss — only around 70% of the capital invested has been recovered.
- For vintage years 2003-2012, both private equity and venture capital have broken even (that is, have already returned more than the paid-in) but private equity has distributed more relative to paid-in than venture capital.
- Private equity IRR is less volatile and has recovered quicker after the dot-com collapse and stayed positive during the global financial crisis. Whereas venture capital IRR turned positive around 2015, and has since then converged to private equity IRR, mainly thanks to the steep increase in unrealised value over the last few years.

**Private equity has more realised value than venture capital (in other words a higher distributed to paid-in (DPI) ratio) and less unrealised/remaining value (therefore a lower residual value to paid-in (RVPI) ratio).** Since inception, already 85% of the paid-in has been returned for private equity, while only 65% for venture capital. Moreover, when excluding the last five immature vintages (namely, 2017-2021), the private equity portfolio has already broken even (in other words, distributed 102% of the paid-in), while venture capital has only yet returned three-quarters of the paid-in.

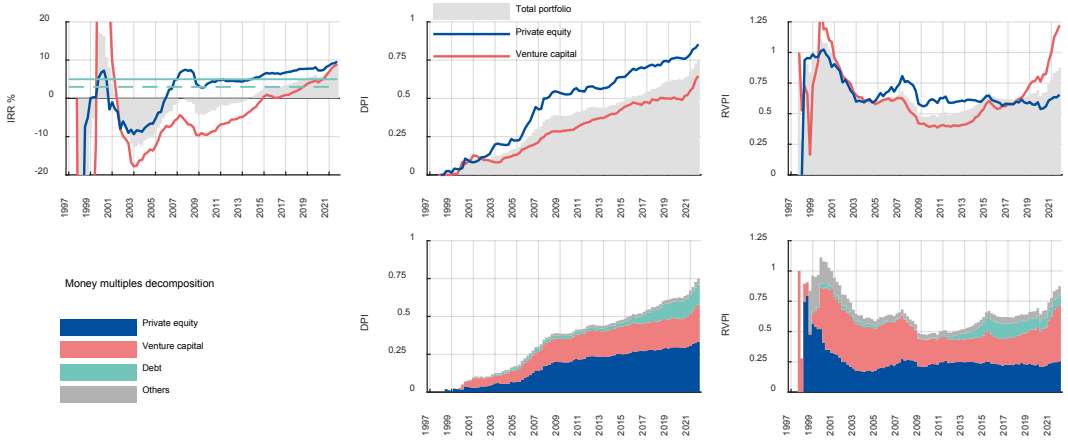
The money multiple decomposition by the contributions of the different strategies (**Figure 48** — lower panel) further shows that although the portfolio rebalancing started in 2003, it took some time to work its way through the portfolio metric as the weight of private equity in the paid-in increased in the total portfolio.

**Figure 47: Financial performance as of end-2021 — total portfolio vs. private equity and venture capital sub-portfolios' performance by vintage years (left-hand side panel) and by pooled vintage year groups (right-hand side panel)**




Source: EV computations based on EIF funds level data.

**Figure 48: Financial performance evolution over time — private equity vs. venture capital (pooled across all vintage years)**

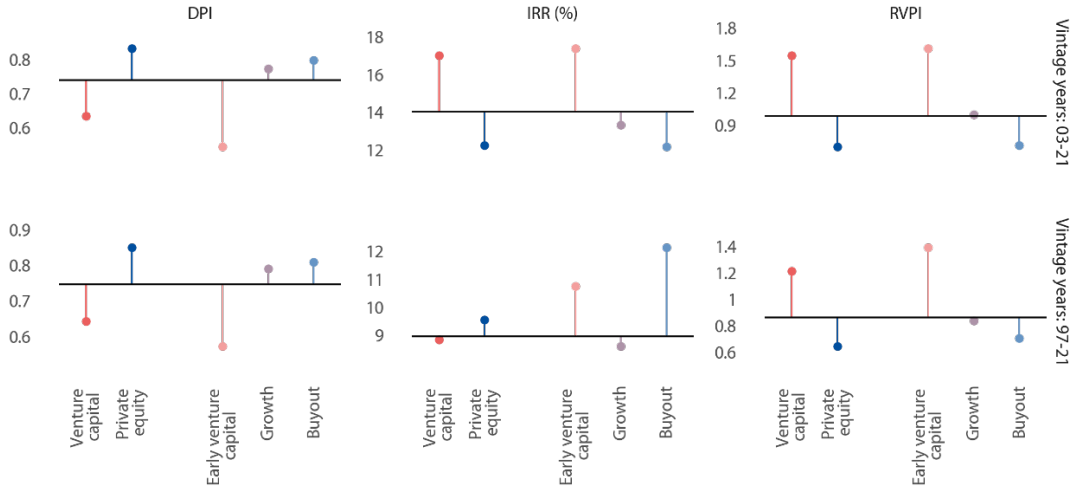



Source: EV computations based on EIF funds level data.

**As the majority of the private equity is targeting buyout-stage firms, while venture capital is mainly targeting early venture capital, the same general conclusions for private equity vs. venture capital hold for buyout vs. early venture capital. Figure 49** below compares the results along the funds grouping by the two main strategies, private equity and venture capital, and by the three stages spanning them, namely buyout, growth and early venture capital. Since in the early years, for a significant share of funds the stage classification is missing, the metrics are also computed by pooling across vintage years starting in 2003,[39] in addition to pooling across all years since 1997. Buyout has more realised value than early venture capital (higher DPI) and less unrealised value (lower RVPI). Growth capital stands in between private equity and venture capital in terms of development stage and in terms of financial performance.

[39] This means that the worst performing vintage years are excluded.

**Figure 49: Financial performance as of end 2021 — sub-portfolios' performance relative to the total portfolio**




Note: Horizontal line denotes the performance of the total portfolio
Source: EV computations based on EIF funds level data

## Portfolio performance — further zooming in on funds distribution

**The evaluation further assesses whether the performance of the different strategies and stages is a pervasive feature across funds by zooming in on the portfolio distribution.** The aim is to gain some insights into the drivers of the aggregate performance and uncover pervasive features across funds.

- To increase the sample size and its representativeness all funds fronted by the EIF are included.
- The emphasis is on the realised performance as measured by the distributed to paid-in (DPI) ratio — and not on the unrealised/remaining value — what might or might not happen, especially so given the current macro-financial and geopolitical environment as aforementioned;
- Only mature funds are included, that is funds at least five years old (namely, vintage years 1994 to 2016) and hence which are already in the phase of distributing money back to investors.

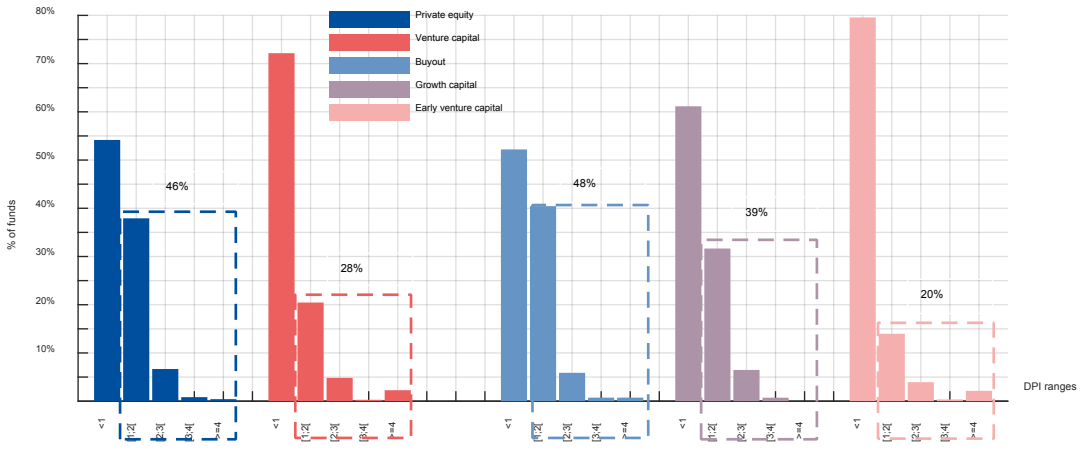
**The better portfolio performance of private equity (and buyout) is also pervasive across funds as they have lower distribution and selection risks and have shorter time to distribute cash.**

- **Private equity has lower distribution risks as measured by the higher proportion of funds returning the paid-in or more compared to venture capital (Figure 50).**
    - Private equity and funds investing into buyout-stage firms have a higher likelihood of returning the paid-in or more. Indeed, 46% and 48% of private equity and funds investing into buyout-stage firms respectively returned the paid-in or more, while only 29% and 20% of venture capital and early venture capital funds did so. Hence the DPI distribution of venture capital and early venture capital funds is more concentrated to the left of the threshold of one, that is higher likelihood of returning less than the paid-in. Growth capital has fewer distribution risks than venture capital/early venture capital but more than private equity/buyout.
    - Irrespective of the strategies and stages, the bulk of DPIs above one are concentrated in the ranges of DPI values between one and two — realised multiples of between 100% to 200% on the amount of cash paid-in.
    - The proportion of "top performers", in the far right tail of the distribution, is higher for venture capital and early venture capital, albeit representing a small percentage of outcomes.

- **Venture capital has higher selection risks as measured through the dispersion of quartile performances (Figure 51).** The "top performers", namely funds in the first quartile, across venture capital/early venture capital funds, perform better than the "top performers" across private equity/funds investing into buyout-stage firms. However the dispersion of quartile performances[40] for the venture capital/early venture capital is larger, hence displaying higher selection risks.

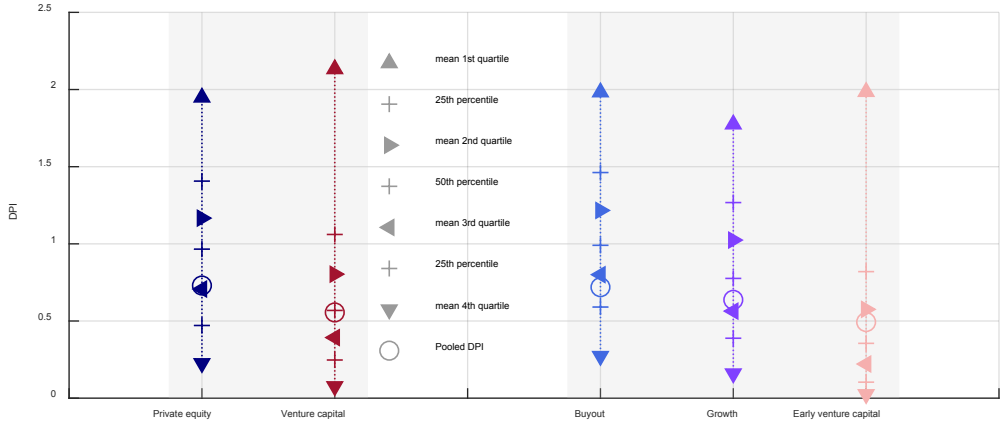
- **Private equity and buyout are quicker to distribute, that is they have shorter time to distribute/liquidity[41] which enables quicker capital redeployment (Figure 52).** The 50% quickest payers of buyout and private equity funds return the paid-in within around 7 1/2 to 8 years while for venture capital and early venture capital funds this is achieved in 9 to 9 1/2 years. Moreover, for each percentile level and each level of DPI, private equity and funds investing into buyout-stage firms distribute quicker than venture capital, growth and early venture capital funds. Growth funds are faster to distribute than early venture capital but slower than buyout.

**Figure 50: Distribution of risks: frequency distribution of funds by DPI ranges**




Source: EV computations based on EIF funds level data

**Figure 51: Selection risks: distribution spread and quartile analysis**



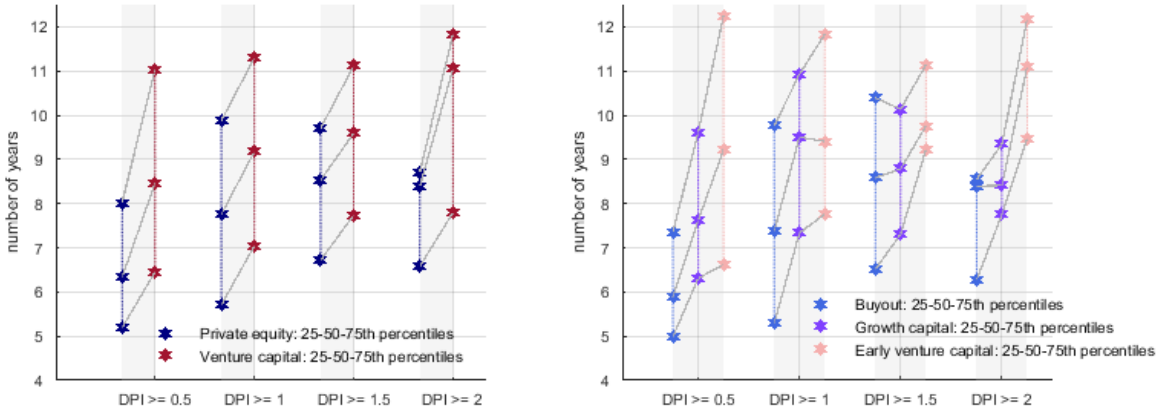

Source: EV computations based on EIF funds level data.

[40] Spread between top and bottom quartile funds.

[41] Time to distribute:

- For a given threshold level of DPI, we select all funds having reached that threshold and compute for each fund the time — in number of years (number of days divided by 365) — it has taken to reach that DPI level since the fund's first signature date. The chart shows the 25th, 50th and 75th percentiles of the time "to distribute" distribution.
- The computations are done over selected portfolios of funds, grouped according to the fund's strategy and firm stages.

**Figure 52: Time to distribute — Time to liquidity**




Source: EV computations based on EIF funds level data.

**These findings across strategies and stages at portfolio level and across funds show that the risk and returns are heterogeneous for early versus late-stage ventures. This is in line with empirical evidence on private equity and venture capital performance**.

- Early-stage firms have a much higher failure rate than later-stage firms which are less risky. Among other things, more mature firms are typically generating significant revenue (though they may still be unprofitable) and have moved beyond the market and product development stages. They are also seen as less risky because the odds of a successful exit are higher. In theory, these investments should have lower loss rates and shorter holding periods.
- Venture capital is a game of home runs, not averages. The vast majority of a fund's return will be generated by a very small number of companies in the portfolio. Returns on the best performing funds are mostly derived from a few select investments that end up producing outsized results.
- The percentage of "top performers" is higher for venture capital/early venture capital, and they perform better than private equity/buyout "top performers". However, the small proportion of these "wins" across the venture capital/early venture capital funds distribution has not been enough to counterbalance, at the portfolio level, the poorer performance of the rest of the funds distribution.
- Lastly, the more stable and better average/portfolio performance of private equity versus venture capital funds holds for the US and European markets. However, European venture capital funds' performance has been worse than their US counterparts, partly explained by their younger age. This has also been put forth as a reason for why the gap in venture and growth capital is higher in Europe than in the United States, as private investors have been disappointed by their financial performance.

## Portfolio performance — Cumulative and yearly (cash) profitability

**The evaluation further looks at the RCR profitability from a cash perspective. This metric includes:**

- The dividends income[42] represents the revenues above the amount paid-in/disbursed, as repayment of the amount paid-in into a fund does not generate a positive return/revenue per se.[43] Hence, compared to money multiples and the internal rate of return for which all proceeds/reflows to investors count as realised cash income, it leads to a delay in the observable positive performance of funds. To illustrate this, as of end-2021, 75% of the amount invested into funds has been recovered at the RCR portfolio level. However, only 26% of the funds for which the paid-in has been recovered have dividends/revenues recorded in the P&L.[44]

  On the cost side, it takes into account the fees paid by the EIB to the EIF,[45] the equity transfer price, and the capital losses on amounts invested into terminated funds. The EIF fees include all portfolio fronting and monitoring fees as well the profit share fees. The equity transfer price is the cost of funding of the portfolio. It is computed, on a yearly basis, as the average outstanding value of net paid-in[46] amount multiplied by the yearly average yield on the notional portfolio of own funds in other words the fund transfer price of equity.

**Figure 53 shows the evolution over time of the cumulative and yearly RCR cash profitability:**

- **As of end-2021, RCR cumulative realised total net revenues amounted to €0.3 billion (panel a), broken down as €2.1 billion of net revenues realised on the portfolio, €0.4 billion in fees paid to the EIF and €1.4 billion of funding cost.**

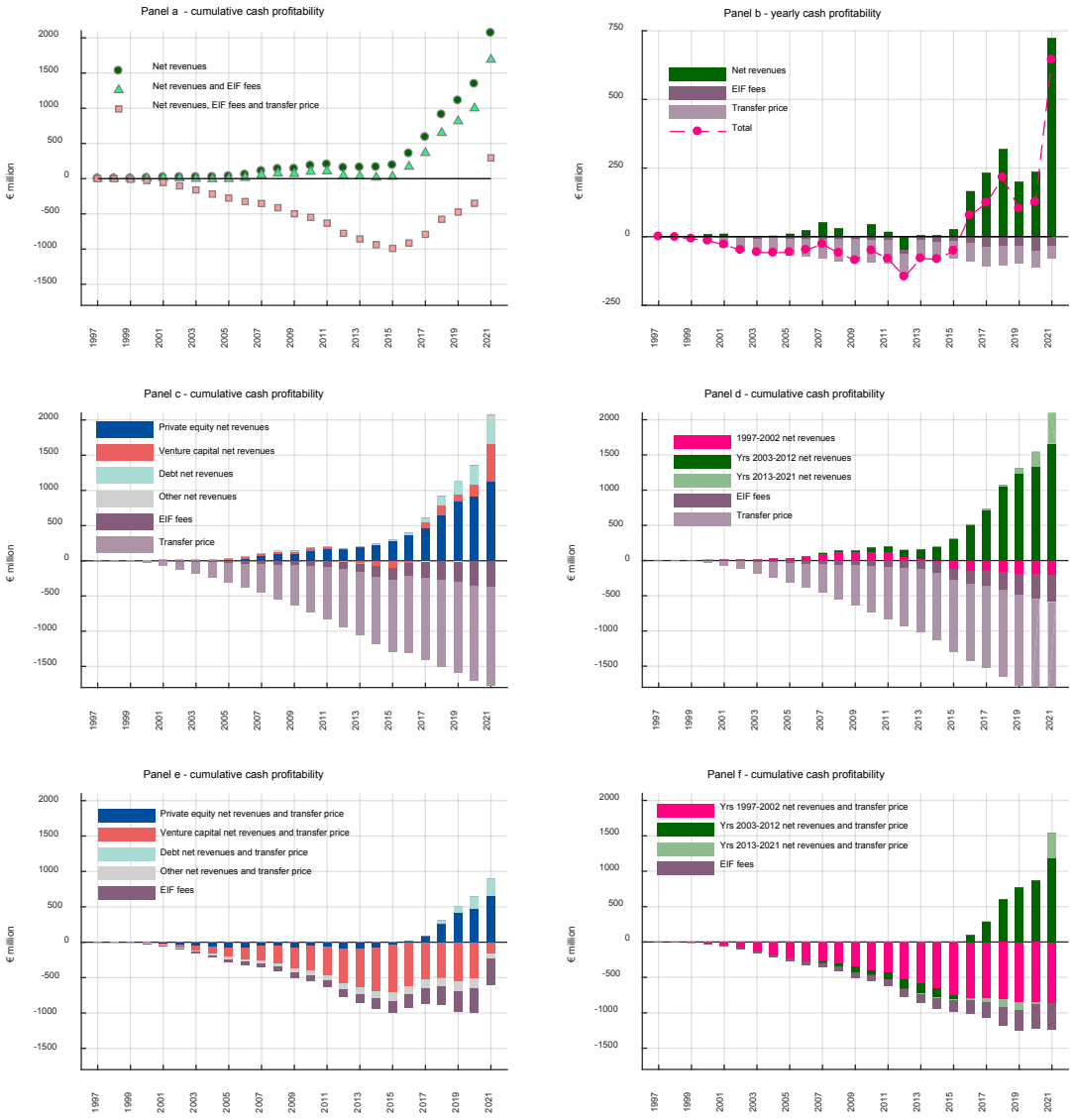
- The portfolio cumulative realised total net revenues have been increasing over time as the portfolio is maturing. **Figure 53** further illustrates the long time lag between the costs which are frontloaded — especially the funding cost which increases as the portfolio is being build up — and the revenues which are only generated with a lag as funds exit their portfolio companies.

- Since 2016, total portfolio net revenues have started improving as illustrated by the upward sloping curve of the cumulative performance (panel a) and the positive yearly performance (panel b). As of end 2021, on a cumulative basis, the portfolio since inception performance turned positive, supported by a very good year in 2021 in terms of net revenues and a low rates environment benefiting funding costs. Going forward, as more funds mature, more revenues should be generated but at the same time the macro-financial environment is deteriorating which could put downward pressure on exit performances. Risk-free rate increases could drive up the funding cost component if not compensated by a lower outstanding net paid-in stock.

- Panels c to f further disaggregate the results by strategies and vintage years group. It shows that the bulk of the net revenues — excluding EIF fees which cannot be attributed at the fund level — stem from the private equity investments (panel c) and vintage years 2003-2012 (panel d). Furthermore panel c illustrates that the private equity and debt sub-portfolios' revenues as well as those relating to vintage years since 2003 have compensated their respective funding costs. This has not been the case for venture capital and the early vintage years. These findings are similar to those of the money multiples analysis. Appendix 3 further shows disaggregated results across the cross-section, in terms of strategies, and time series, vintage years, dimensions.

[42] Note that the dividends income figure is net of the fees paid to fund managers.
[43] The accounting policies for funds only treat as dividends income reflows above the amount paid-in into the fund. That is any reflows on equity investment at fund level resulting from repayments are treated first as a return of capital until the paid-in/drawn is amortised. Any additional reflows are subsequently recorded as income.
[44] As of end-2021, the RCR DPI ratio stood at 75%. If only funds which have fully repaid the paid-in were included, the ratio would drop to 49%.
[45] These fees could not be included in the money multiples and IRR analysis as the attribution of these fees by vintage year and or fund strategy/stage is not available.
[46] The outstanding value of the net paid-in of a fund is the cumulative paid-in, since inception, minus the capital repayments.

## Figure 53: Evolution over time of cumulative and yearly RCR cash profitability



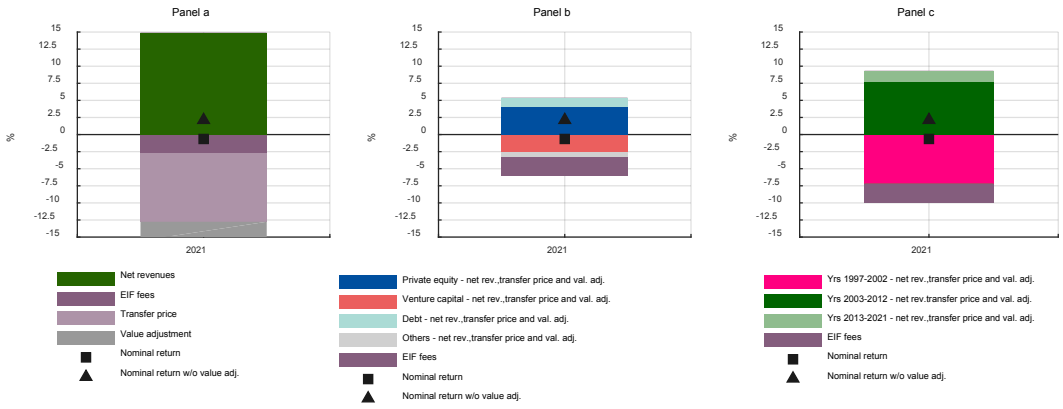

Source: EV computations based on EIF data and GR&C-RM/GFIN/ALM/AMU data

**Figure 54 shows the cumulative nominal return — total net euro revenues per euro disbursed/paid-in — of the RCR portfolio along with the contributions of the different components. As of end-2021, the cumulative realised return has been 2.1%** with 14.9%, -2.7% and -10.1% contributions from net revenues, EIF fees and portfolio funding costs respectively. Adding the negative value adjustment,[47] the return drops to -0.7%.

Lastly, as aforementioned in the previous section on money multiples and internal rate of return, the portfolio still has substantial unrealised upside value which is difficult to quantify with precision. All the more so that the end-2021 high valuations will most likely encounter some corrections given the deteriorating macro-financial environment and increasing policy rates.

[47] The negative value adjustment is computed, at fund level, as the minimum of the difference of the net asset value and net paid-in and zero.

**Figure 54: RCR nominal return as of end-2021**




Source: EV computations based on EIF data and GR&C-RM/GFIN/ALM/AMU data

# Profitability of the EIB direct quasi-equity portfolio

**The EIB-fronted quasi-equity operations are analysed in two distinct portfolios (as having different characteristics, see Box 3 — Section 1) namely venture debt (VD) and thematic finance (TF).**

**The metric used to assess the portfolios' performance is the cumulative nominal return — net euro revenues per euro disbursed. These net revenues include all revenues and costs (fronting, monitoring and funding cost),[48] including negative value adjustments, impacting the Bank P&L under EU-AD[49].**

**As of end-2021, for both portfolios the nominal returns are not yet positive (-9% and -11% respectively for the venture debt and thematic finance portfolio — Figure 55). Excluding the (unrealised) negative value adjustments, the returns are around 0%**.

- Although both portfolios have already benefited from successful exits, these revenues don't yet cover the portfolios' associated costs. These portfolios are still young, hence it is way too early to conclude. Indeed costs are incurred since origination of the operations while revenues are generated post-disbursements, with a large share of these at exits. Moreover, a further drag on the profitability of these portfolios is their high attrition rates, which adds a sunk cost component to their financial performance.[50]
- The return measure, being under EU-AD, does not account for unrealised gains — both portfolios still have significant unrealised value which is difficult to quantify with precision. All the more so that the end- 2021 high valuations will most likely encounter some corrections given the deteriorating macro-financial environment and increasing policy rates.

[48] For each portfolio the analysis includes the costs and revenues of all operations. Hence it also takes into account pre- and post-signature attrition cost (which is quite high as shown in Section 3), the cost of operations active not yet signed and the costs of the parent operation (namely, the global authorisation operation).
[49] EU Accounting Directive 2013/34/EU
[50] This sunk cost represents around 15% and 20% of the total children operation costs for the venture debt and thematic finance portfolios respectively.

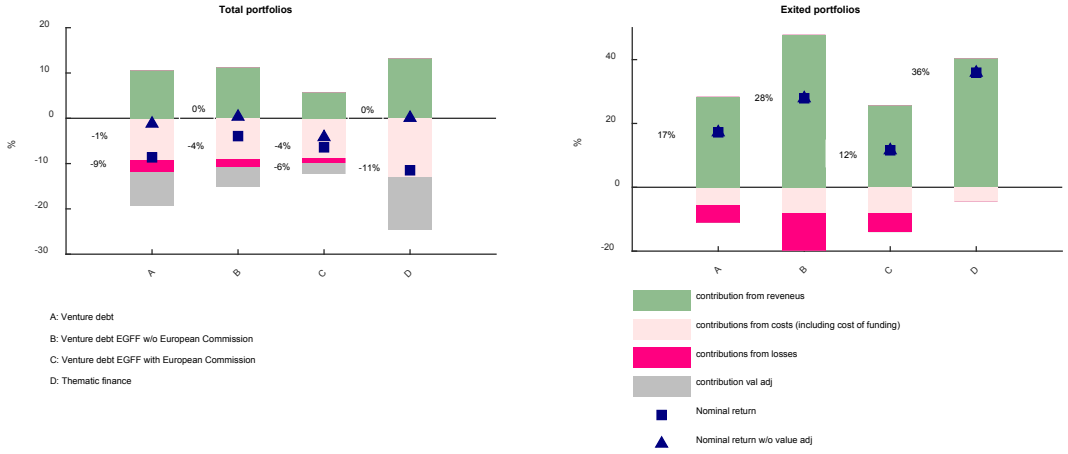
- Although both portfolios benefit from risk coverage from the European Commission, [51] of this first set of results are under the counterfactual of no risk coverage. That is, all losses and value adjustments are taken into account, no revenues are retroceded and no costs are reimbursed. This makes it possible to gauge the intrinsic portfolio profitability.

**When restricting to the sub-portfolios of exits (successful exits and losses), the nominal returns are very good reaching 17% and 36% respectively for the venture debt and thematic finance portfolios (Figure 55 — RHS panel).** The thematic finance portfolio has exhibited a higher return than the venture debt portfolio. Part of it is also due to good luck as this portfolio has not yet incurred a negative drag on its return from realised losses, while the venture debt portfolio did.

**The bulk of the venture debt portfolio is under EFSI EGFF. For this sub-portfolio a further analysis assesses the return with and without the European Commission's risk coverage**.[52]

- The return without the European Commission's coverage is similar to what is computed for the whole venture debt portfolio as explained above. While the return with the European Commission's coverage excludes the revenues retroceded/shared with the European Commission, the called (negative value adjustments) and losses covered by the European Commission and costs reimbursed by the European Commission.
- The results show that the EGFF sub-portfolio's return without the European Commission's coverage is higher. This is mainly explained by the fact that there has so far been more revenue sharing on the successful exits than loss sharing.

**Figure 55: Quasi-equity portfolios' nominal returns as of end-2021**




Sources: EV computations based on BO Serapis, SG/GS/PBA/MA, FC/FRA/FRD/LAU, PMM/TM/EUD and GR&C-RM/GFIN/ALM/AMU data.

[51] The thematic finance portfolio has a 100% first loss piece coverage while the venture debt portfolio is pari passu 50/50 with the European Commission.
[52] Data availability does not allow this to be done easily for the other portfolios and/or operations.

## Capital consumption

**Indirect equity exposures through funds have a median capital charge of €0.15 per euro exposure, which is half that for direct quasi-equity exposures.** This higher capital charge, as explained below, is due to different regulatory treatment of a single exposure relative to a diversified portfolio (look-through vs. fixed weight). The evaluation looks at capital charge from a regulatory capital viewpoint:

- For direct quasi-equity exposures[53] a risk weight of 370% is applied which translates into a €0.30 capital charge per euro exposure.
- For indirect equity exposures there is not a unique capital charge: (i) the look-through approach entered into force in June 2021's Capital Requirements Regulation II[54] and calculates risk weights as if the exposures were held directly by the Bank, namely, taking into account the risk parameters of the underlying portfolio companies and the financial structure of the fund; (ii) however, the (previous) Capital Requirements Regulation[55] risk weight of 190% is still allowed when the diversification of the portfolio is assessed; (iii) for funds whose balance sheet information is not available (such as newly established funds) a punitive capital charge of 1 250% is applied.[56]

To estimate a "representative" capital charge for indirect equity exposures, the evaluation exploits the cross-section dimension of all active funds'[57] capital charge using the vintage of December 2021.[58]

**The median capital charge for the full fund distribution is 15%**[59] (Box 12), which is similar to that resulting from a risk weight of 160%. Furthermore, the distribution is highly concentrated in the range of 10-30% (with 70% of the capital charges in the range of 10-20% and 15% in the range of 20-30%). Some 13% of funds have a punitive capital charge close to or equal to 100% and around 2% a very low capital charge of 8%.

Although the ex-post financial performance has shown that early-stage (venture capital) funds are riskier than later-stage funds, both have similar capital charges.

**Box 12: Funds capital charge distribution: percentiles**

| | 25% | **50%** | 75% |
|---|---|---|---|
| Full distribution | 15% | **15%** | 30% |
| Private equity distribution | 15% | **15%** | 18% |
| Venture capital distribution | 15% | **15%** | 19% |

Source: EV computations based on GR&C-RM/GREG/CM/CRU

[53] They are treated as "all other equity exposure" in the Capital Requirements Regulation.
[54] Regulation (EU) 2019/876
[55] Regulation (EU) No 575/2013
[56] These risk weights are not aligned with the real underlying risk.
[57] The distribution of active funds has 874 funds which have non-zero risk weight (in other words, are not fully under third-party risk).
[58] As a robustness check the analysis was re-run with the March 2022 vintage. Similar results were obtained.
[59] Private equity and venture capital also have a median capital charge of 15%, while debt type funds have a slightly lower median of 12%.

# 7. CONCLUSIONS

**The EIB Group offers a broad range of — direct and indirect — equity and quasi-equity instruments**, each targeting specific SMEs and mid-caps, which are often young, fast-growing innovative firms.

**Overall, the EIB Group's support to equity and quasi-equity markets is addressing relevant market gaps and makes a significant and additional contribution to the market in terms of volumes, market development and best practices.** Through its intermediated activity, the EIF is a key player in the underserved venture and growth capital segments of the EU risk capital markets, providing sizeable funding and mobilising private capital. With its venture debt and thematic operations, the EIB is the largest venture debt supplier in the European Union, serving a clear market need and crowding in additional investors. Overall, EIB Group operations have been contributing to the development of the EU venture capital and private equity market through structuring input in multiple ways: by supporting emerging players, promoting best market practice, or improving governance and reporting.

**Equity/quasi-equity investments are very heterogeneous: they show significant variations along the spectrum of firm stages in terms of relevance, additionality and policy impact, and contribute differently to the Group's financial sustainability.** There is a trade-off between policy impact and financial sustainability when it comes to allocating resources to the different stages (early-stage venture capital, growth capital and buyout). With an apparent lower financing gap — both at the level of their target beneficiaries but also for the fund managers — the overall policy contribution of the EIF's operations in funds targeting buyout-stage firms is smaller relative to investments in less mature firms. Still, the evaluation finds that these operations make a significant contribution to the Group's financial sustainability, with the RCR mandate having reached profitability as of end-2021. Being still young, the direct quasi-equity portfolios are yet not profitable as they are still dragged down by costs and negative value adjustments. However, when restricting to the sub-portfolios of exited operations the returns are promising. Both the RCR and the direct quasi-equity portfolios have a sizeable share which is not yet realised, with significant upside potential, but for which costs have already been incurred. This results in a slow and gradual build-up of realised gains and losses impacting portfolio performance.

**Capital charge on indirect exposures is about half that of direct exposures.** This difference in capital charges is due to the regulatory treatment of a single exposure compared to a diversified portfolio. Although the ex-post financial performance has shown that early-stage (venture capital) funds are riskier than later-stage funds, both have similar capital charges.

**Some elements of the EIB Group's internal processes are not fit for efficient delivery of quasi-equity operations**. In many aspects, quasi-equity differs from EIB core business transactions, and the EIB is still on the learning curve to accommodate these operations into its institutional infrastructure. While direct quasi-equity operations are approved under a global authorisation, the overall time needed to reach signature and disbursement takes much longer than the market standard and has increased further over the last few years. Quasi-equity clients have special monitoring needs compared to other clients, requiring increased post-disbursement follow-up and detailed knowledge of the firm's operations and business environment. There are also other elements in the EIB's institutional environment that are not always accommodating the special needs of quasi-equity clients.

**The EIB Group provides valuable support to risk capital markets through stable and predictable funding, also in times of downturns and crises.** At times when other investors might be less inclined to support market players, the EIB Group remains a reliable financing source, contributing to the maintenance of the market infrastructure, and the financing of innovative firms even if other sources dry out.

**Nevertheless, the long time it takes to commit equity investments and build up portfolios — which is driven by market practices — calls into question the suitability of indirect equity investments to be used as part of initiatives designed to provide rapidly available funding to firms during economic shocks.** While the time to approval of EIF indirect equity operations is quick by EIB Group standards, it lags well behind market practice. Due to the way private equity funds operate, it takes several years from the commitment date for the full funding to reach the final beneficiaries. Moreover, as the EIB's countercyclical policies are frequently carried out by launching new external mandates that take additional time to be set up and operationalise, this additional delay needs to be added to the timeline. All in all, for reasons beyond the EIB Group's control, from the decision to launch a countercyclical action in response to an economic shock to the time the funding reaches the final beneficiaries through intermediaries takes several years. By that time it is very likely that economic conditions would already have changed significantly.

**EIB public support channelled through private sector intermediaries helps companies grow and develop in the same way as fully "private" equity investors do.** The counterfactual analysis finds that the EIF's intermediated equity support delivery model — funding through private funds — appears to be successful in overcoming the agency problems generally associated with public interventions on financial markets. Firms receiving equity funding through EIF-supported funds show similar growth in employment and innovation activity as investees of other, non-EIF supported funds.

**The "SME PPG" does not fully capture the entirety of EIB Group support for small and medium businesses.** While, for the period under review, all EIF operations are captured under the SME PPG, in the case of the EIB a large number of transactions allocated to other PPGs — innovation in particular — are in fact targeting SMEs and/or mid-caps. As a result, for the moment it is difficult to obtain a complete picture of the EIB Group's portfolio targeting small and medium businesses.

# 8. RECOMMENDATIONS

## Recommendation 1

**The EIB Group should reflect in its analysis, decision-making and reporting processes the heterogeneity of policy impact and financial sustainability when it comes to the allocation of the indirect equity portfolio across stages (venture capital, growth capital and buyout-stage transactions).** Overall, the EIB's and EIF's support to equity and quasi-equity markets is addressing relevant market gaps and makes a significant contribution to the market in terms of volumes, market development and best practices. The evaluation found that the EIF investments targeting the buyout stage provide less added value as compared to those falling under the venture and growth capital stages. This applies at both fund and final beneficiary levels. When it comes to impact, the EIF support was found to promote better growth and employment when targeting firms at earlier stages compared to beneficiaries of funds investing into buyout-stage firms. The firms in the buyout category also appear to be less innovative than other beneficiaries within the portfolio. At the same time, the profitability of the later-stage buyout funds tended to outperform the other stages in the past, thereby adding significantly to the Group's financial sustainability. In finding the right balance between the mixture of investments across the various stages, it is important that decision-making takes into account the existence of this trade-off. A first step towards this objective would be to use a classification of fund strategies in reporting and decision-support documents that are aligned with the market standards and reflect with sufficient granularity the focus of the underlying portfolio, enabling a differentiation between investments targeting early-stage venture capital, growth capital and buyout-stage firms.

## Recommendation 2

**The EIB should conduct a review of its current operational processes related to direct quasi-equity transactions and explore alternative operational and institutional set-ups for delivery of quasi-equity operations to better respond to the specific needs of young, innovative firms, with the view to narrowing the gap in terms of flexibility and time to market between the EIB and the overall practice observed on the quasi-equity market.** The evaluation found a number of shortcomings with respect to the EIB's quasi-equity operations: first, the time from initiation to signature of the quasi-equity operations is longer than the standard market practice and has been increasing over the last few years. This longer waiting time was found by some clients to be too slow to suit their rapidly changing business needs. Second, the standard EIB processes were often found to present excessive burden to potential and actual quasi-equity clients. Finally, the quasi-equity clients appear to have special monitoring needs compared to other clients and the EIB was not always perceived to be in a position to meet such needs.

## Recommendation 3

**The EIB Group should include in its reporting on small business activity the SME-focused transactions outside the SME PPG.** The EIB statistics and reports do not currently include a comprehensive overview of the EIB Group transactions implemented in support of small businesses. The evaluation found a large number of transactions which were not allocated to the SME PPG but are in fact targeting SMEs and/or mid-caps. In addition, the EIB's business data and reporting do not have an 'SME flag' that includes SME-related transactions beyond the SME PPG. This lack of clear insight into the scale of SME-related transactions of the EIB hampers the EIB Group's ability to provide accurate input into decision-making and to allocate resources optimally across policy objectives.

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# APPENDICES

## Appendix 1: Firms stage and fund classification

The evaluation team decided to align fund classification with the Invest Europe classification. This also served to harmonise classification within the portfolio since some EIF classification was only introduced in the middle of the period under review — hence creating discontinuity in classification.

This allowed for further analysis and comparability with market data.

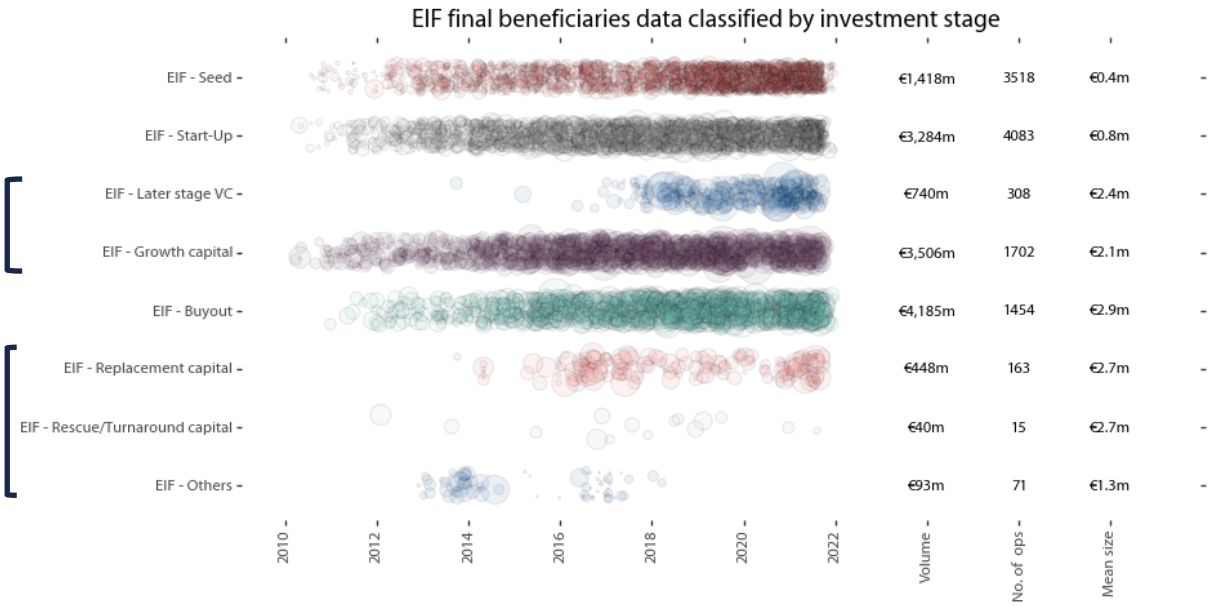
### Firm stage classification

Invest Europe firm stage classification

| | | | |
|---|---|---|---|
| **Stage of investment** | Venture Capital Transactions | Seed | Funding provided before the investee company has started mass production/distribution with the aim to complete research, product definition or product design, also including market tests and creating prototypes. This funding will not be used to start mass production/distribution. |
| | | Start-up | Funding provided to companies, once the product or service is fully developed, to start mass production/distribution and to cover initial marketing. Companies may be in the process of being set up or may have been in business for a shorter time, but have not sold their product commercially yet. The destination of the capital would be mostly to cover capital expenditures and initial working capital.<br><br>This stage contains also the investments reported as "Other early stage" which represents funding provided to companies that have initiated commercial manufacturing but require further funds to cover additional capital expenditures and working capital before they reach the break-even point. They will not be generating a profit yet. |
| | | Later stage venture | Financing provided for an operating company, which may or may not be profitable. Late stage venture tends to be financing into companies already backed by VCs. Typically in C or D rounds. |
| | Capital for mature companies Transactions | Growth capital | A type of private equity investment (often a minority investment) in relatively mature companies that are looking for primary capital to expand and improve operations or enter new markets to accelerate the growth of the business. |
| | | Rescue / Turnaround | Financing made available to an existing business, which has experienced financial distress, with a view to re-establishing prosperity. |
| | | Replacement capital | Minority stake purchase from another private equity investment organisation or from another shareholder or shareholders. |
| | | Buyout | Financing provided to acquire a company. It may use a significant amount of borrowed capital to meet the cost of acquisition. Typically by purchasing majority or controlling stakes. |

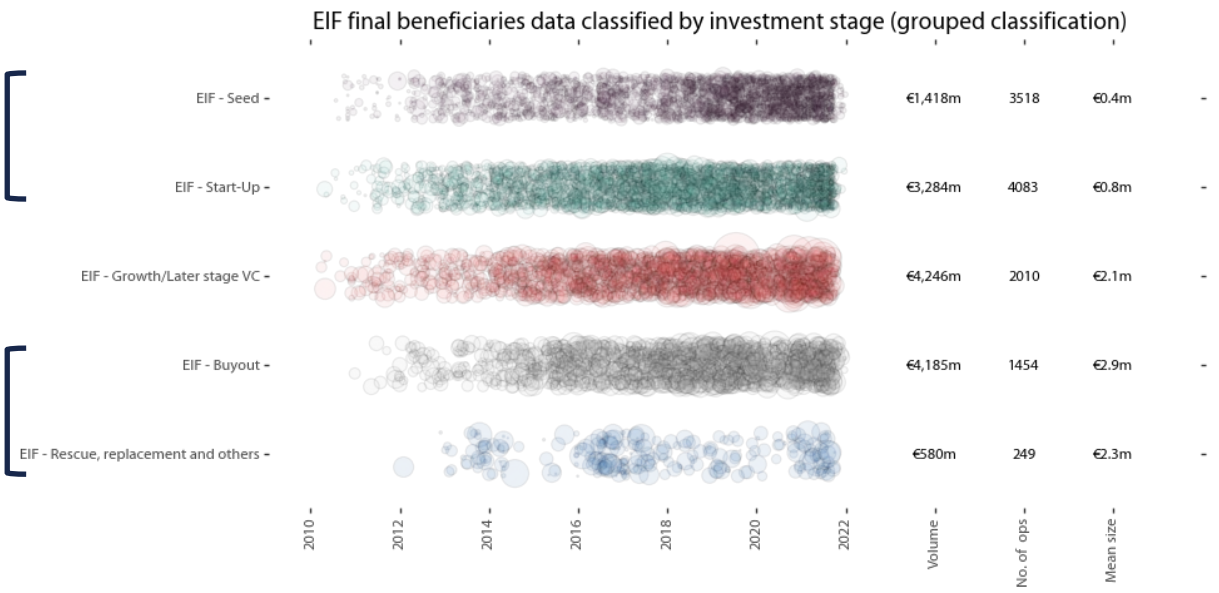
*Source : https://www.investeurope.eu/media/2784/invest-europe-research-methodology-and-definitions.xlsx*

The team obtained the stage classification (from the EIF) of each of the underlying investments/firms in portfolio.



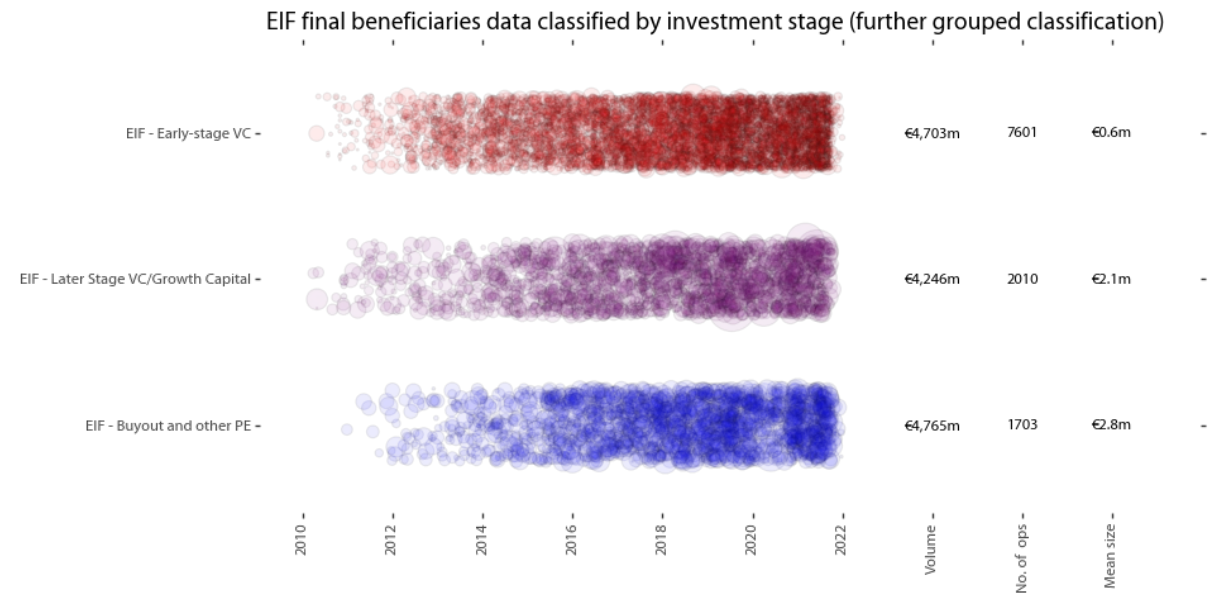
Stage classifications were grouped as follows:

- Later-stage venture capital and Growth under **Growth capital.**
- Replacement capital, Rescue/turnaround and others under **others.**




Larger aggregates were then created for overarching categories as follows:

- Seed and Startup under **Venture Capital.**
- Later-stage venture capital and Growth under **Growth capital.**
- Buyout, replacement capital, Rescue/turnaround and others under **Buyout.**



## Fund classification

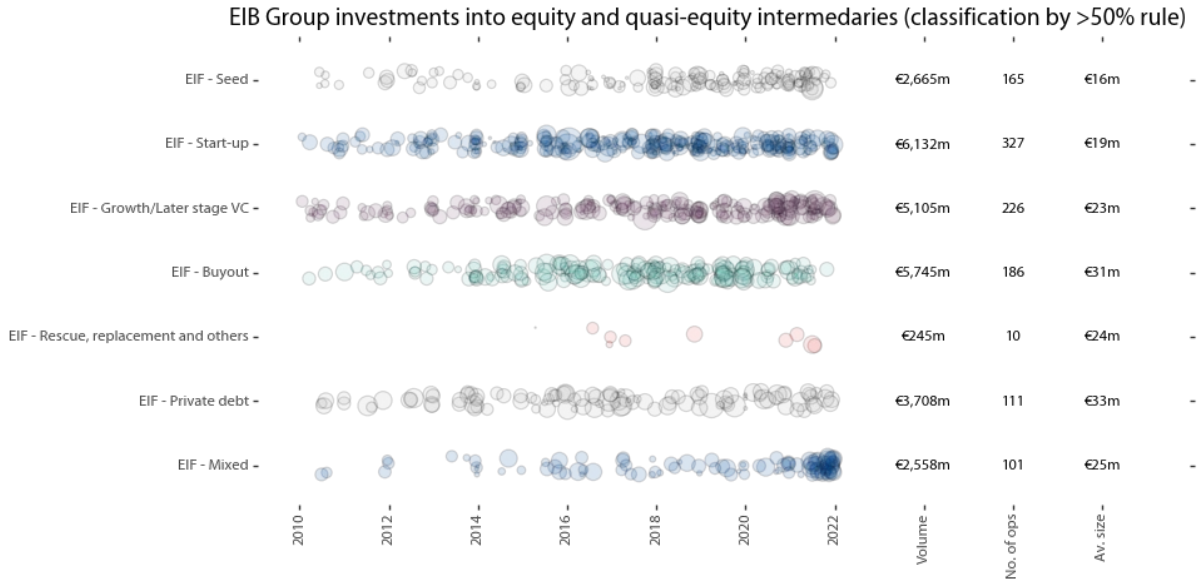
Invest Europe fund classification

| | | |
|---|---|---|
| Funds profile / Stage focus | Early Stage Fund | Venture capital funds focused on investing in companies in the early stages of their lives. |
| | Later Stage Venture Fund | Venture capital funds providing capital for an operating company which may or may not be profitable. Typically in C or D rounds. |
| | Venture Fund (all stages) | Venture capital funds focused on both early and later stage investments. |
| | Growth Fund | Funds that make private equity investments (often minority investments) in relatively mature companies that are looking for primary capital to expand and improve operations or enter new markets to accelerate the growth of the business. |
| | Buyout fund | Funds acquiring companies by purchasing majority or controlling stakes, financing the transaction through a mix of equity and debt. |
| | Generalist Fund | Funds investing in all stages of private equity. |
| | Mezzanine fund | Funds using a hybrid of debt and equity financing, comprising equity-based options (such as warrants) and lower-priority (subordinated) debt. |

*Source : https://www.investeurope.eu/media/2784/invest-europe-research-methodology-and-definitions.xlsx*

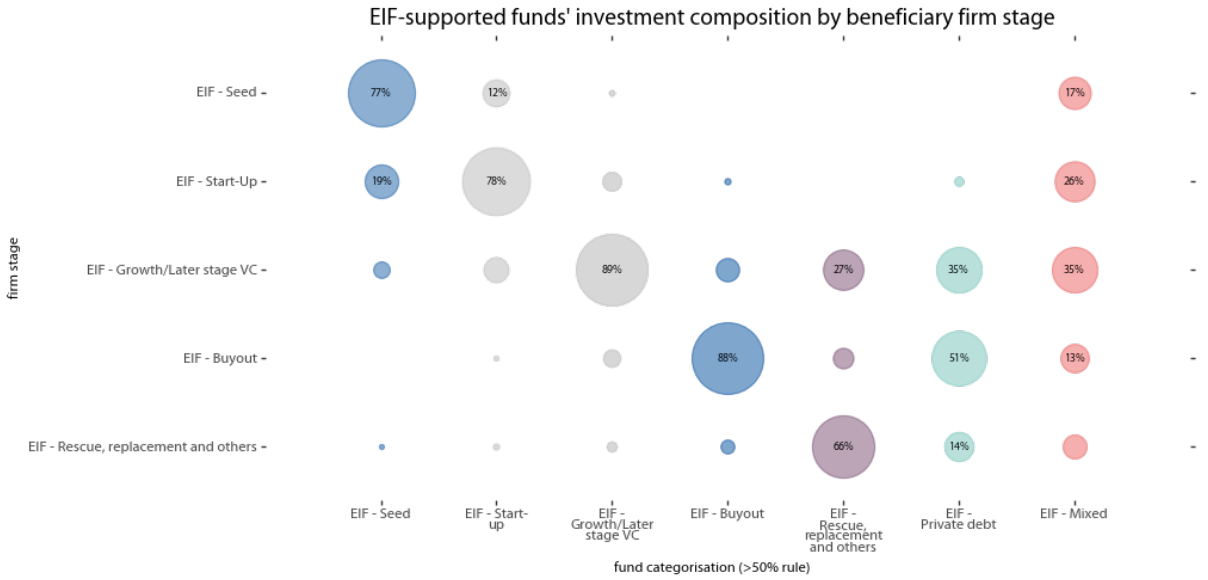
The team analysed each fund's portfolio and classified it according to the following rules:

- If a fund invests more than 50% in a specific firm stage, then the fund is labelled as this stage.
- If a fund does not have a specific firm stage representing more than 50% of its portfolio, then it is labelled as "mixed".



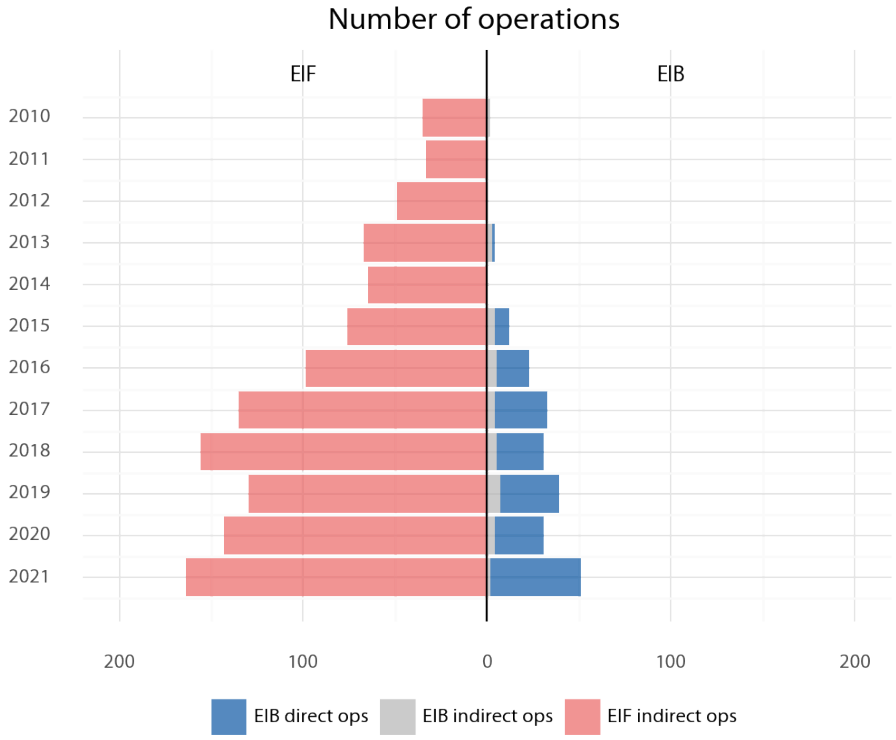
When comparing the newly obtained classification with the actual portfolio of investment, a strong correlation is confirmed:

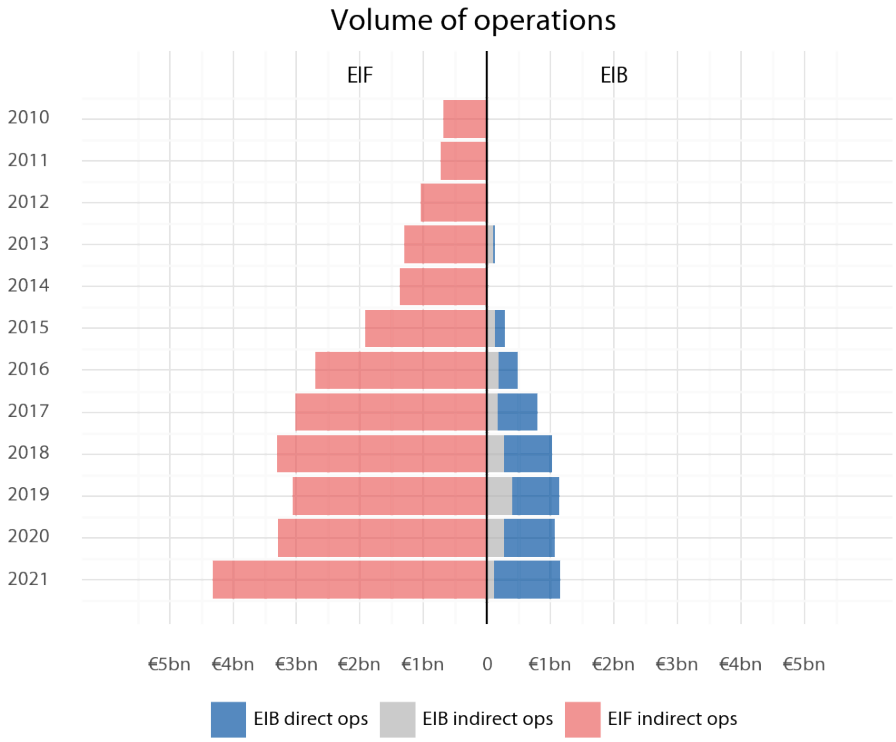
- Funds classified as “seed” have, on average, 77% of seed firms in portfolio
- Funds classified as “startup” have, on average, 78% of startups in portfolio
- Funds classified as “growth/later-stage venture capital” have, on average, 89% of growth/later-stage venture capital firms in portfolio
- Funds classified as “buyout” have, on average, 88% of buyout-stage firms in portfolio
- Funds classified as “rescue, replacement and other” have, on average, 66% of such firms in portfolio
- Funds classified as “mixed” are actually mixed with, on average, 17% of seeds, 26% of startups, 35% of growth/later-stage venture capital and 13% of buyout-stage firms in portfolio



# Appendix 2: portfolio review

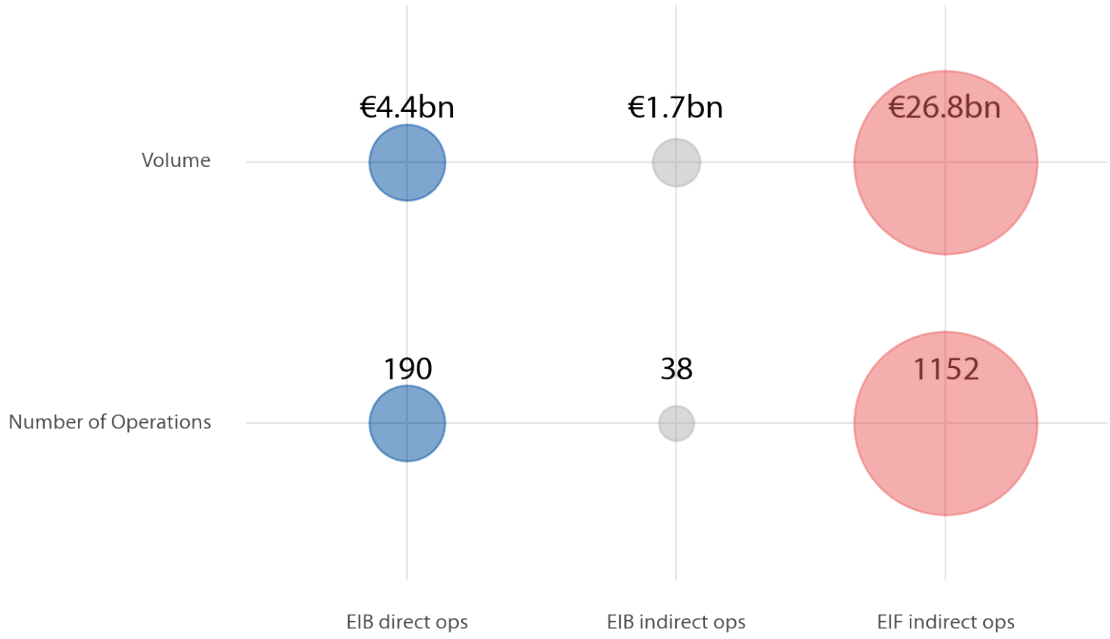
## Volumes at fund level have been increasing since 2016



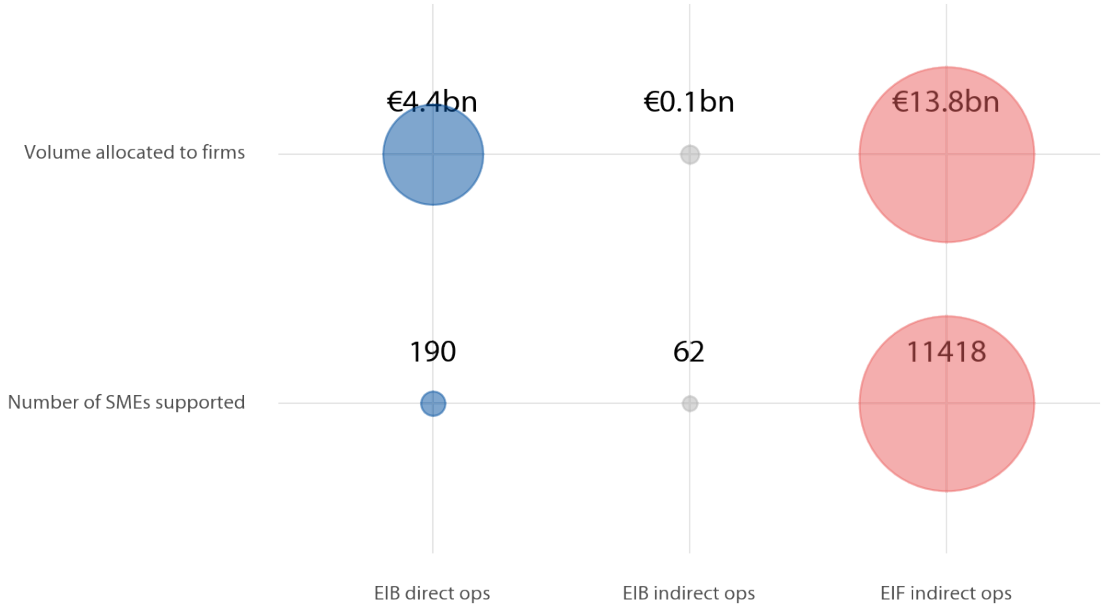



## Investments in funds vs. investments in final beneficiaries

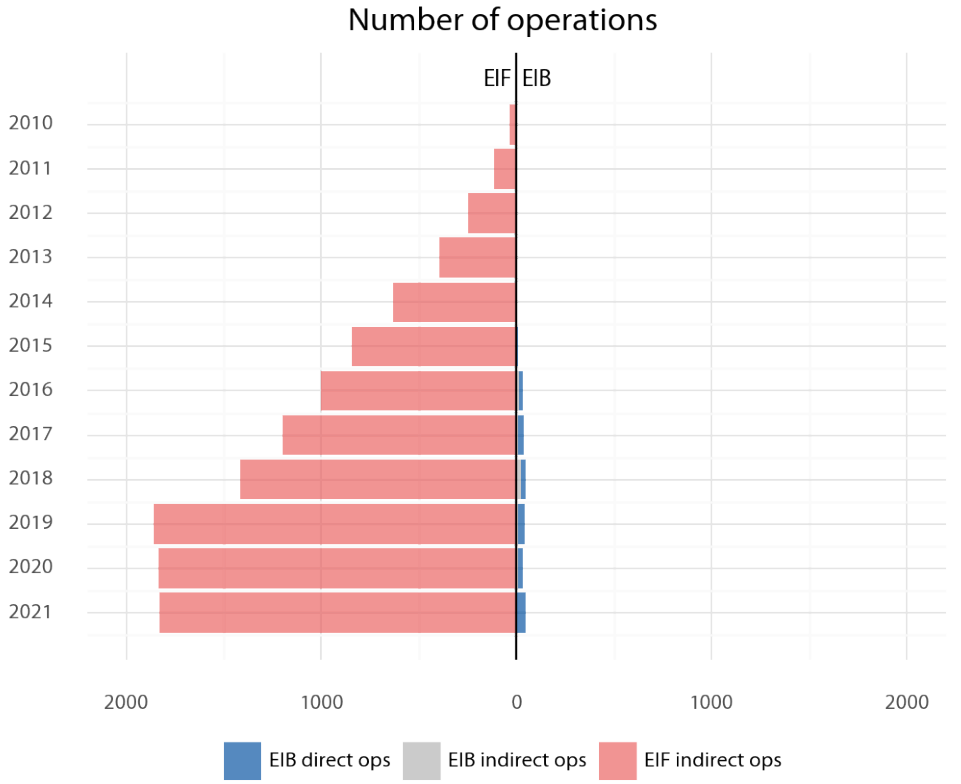
EIB Group equity and quasi-equity operations to EU SMEs: key statistics

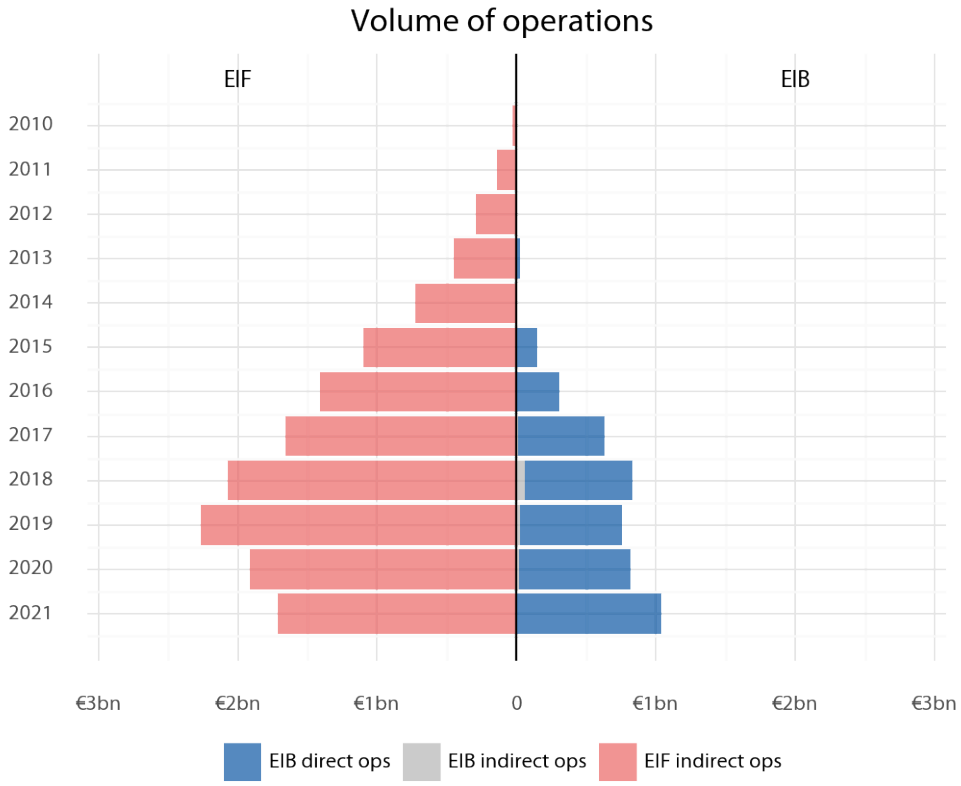



EIB Group equity and quasi-equity support to final beneficiaries: key statistics

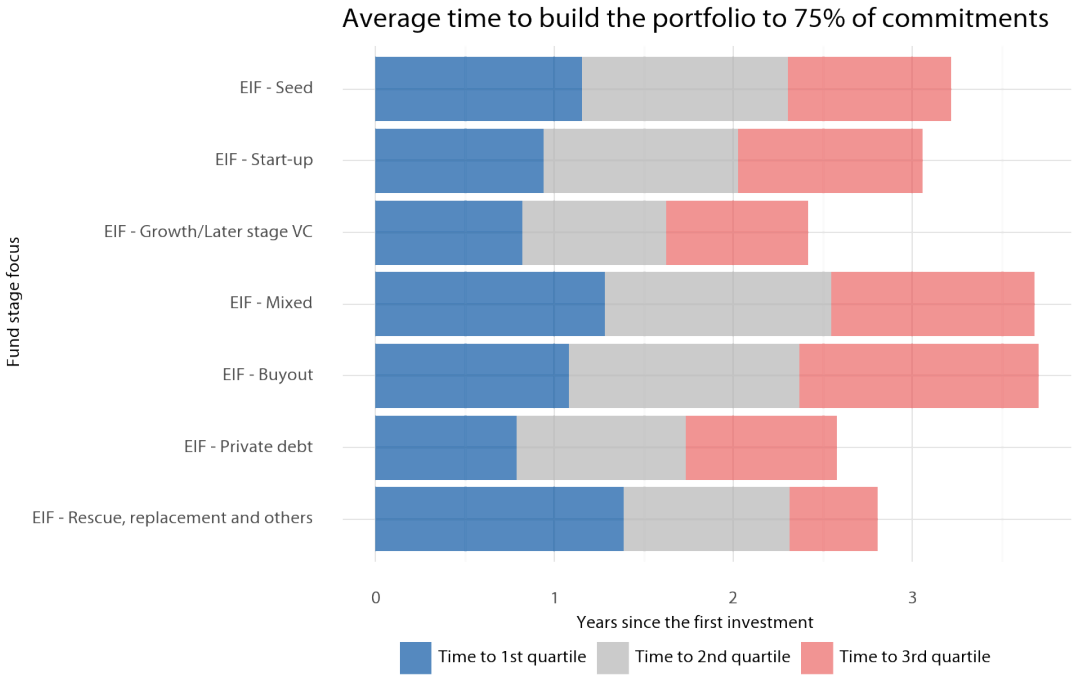


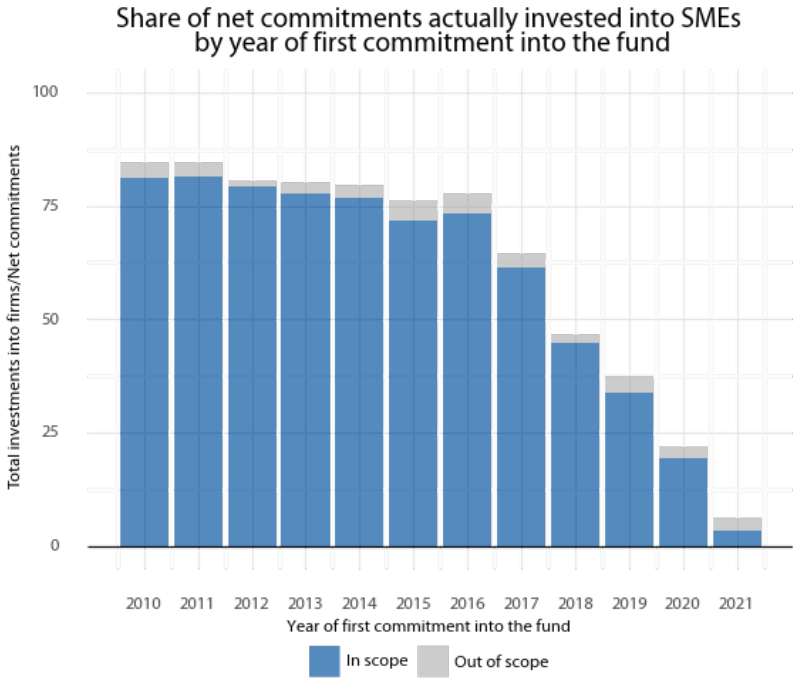
## Funding to final beneficiaries by year



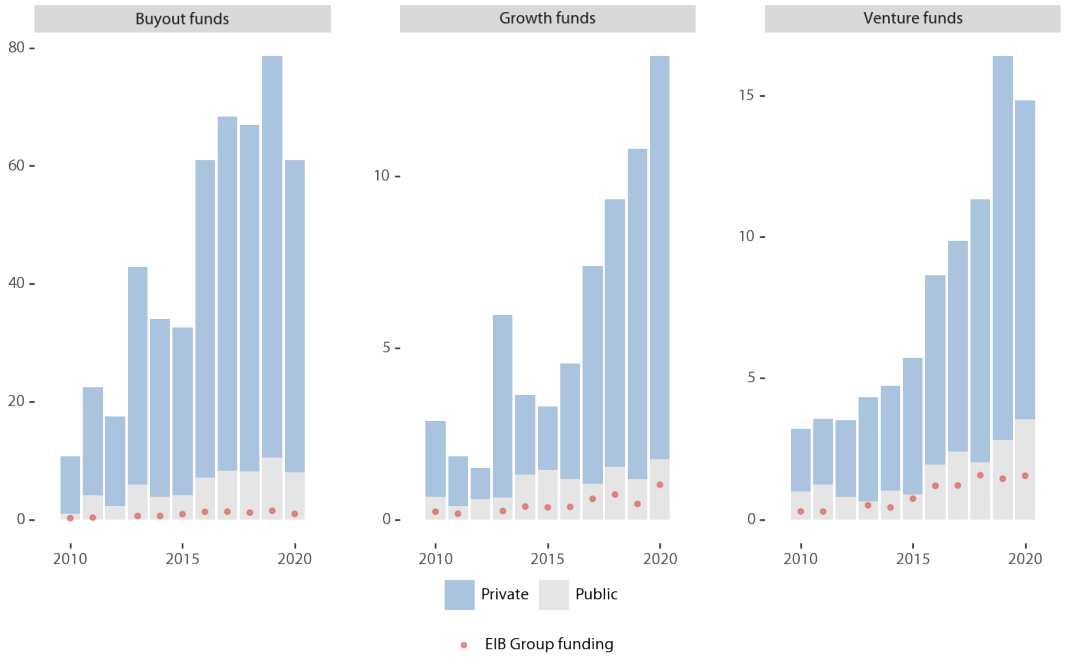
## Time for intermediaries to build up their portfolio



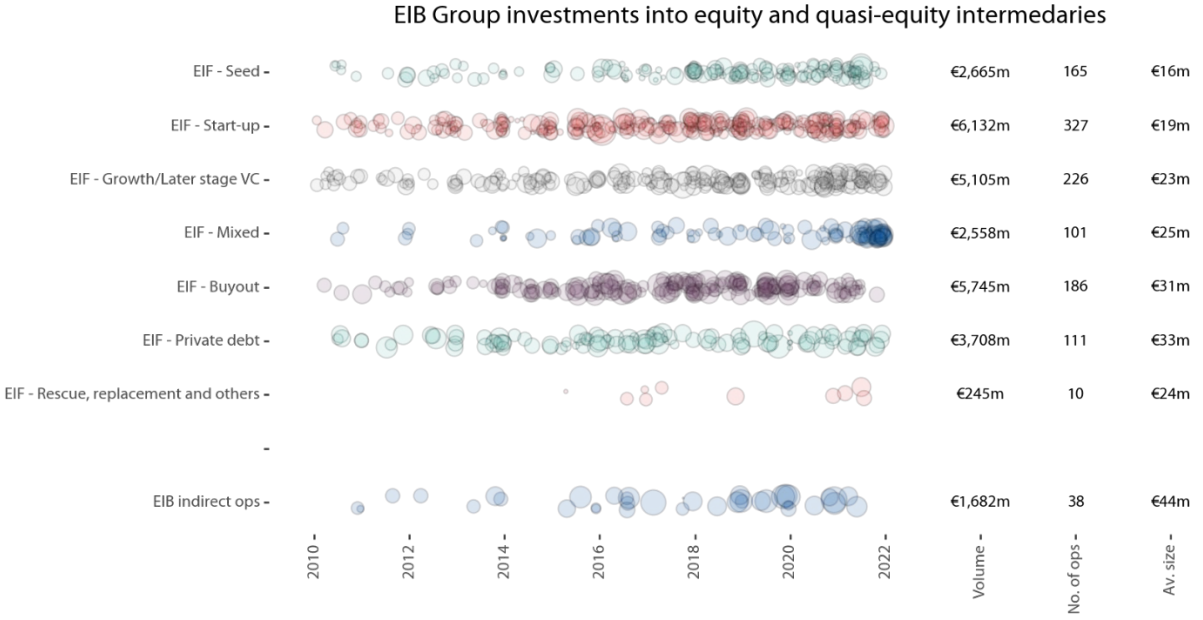
## EIB Group equity activity in light of the EU28 private equity market

EIB Group venture capital activity in the light of the total private and public funding to the EU venture capital market

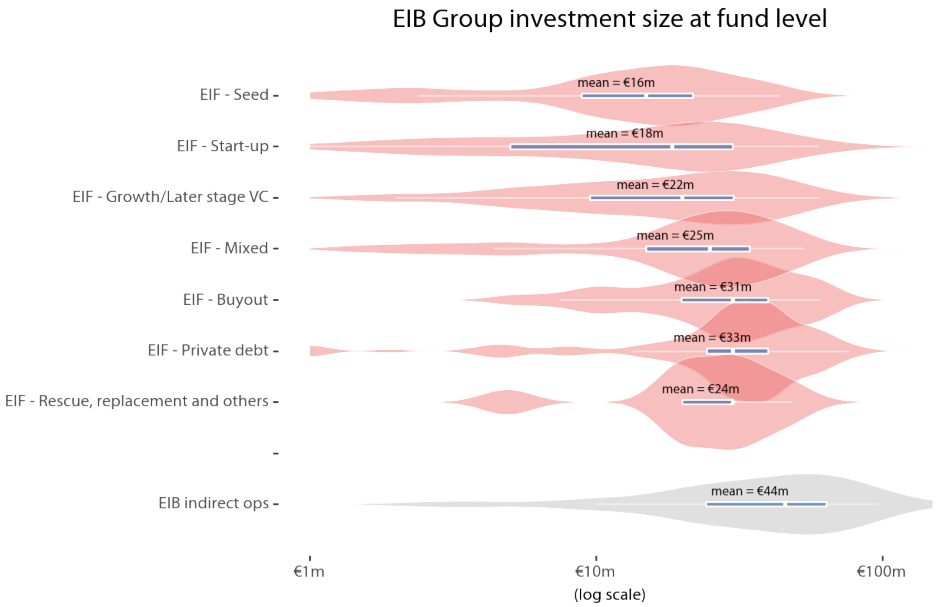



## Indirect operations by fund stage/type

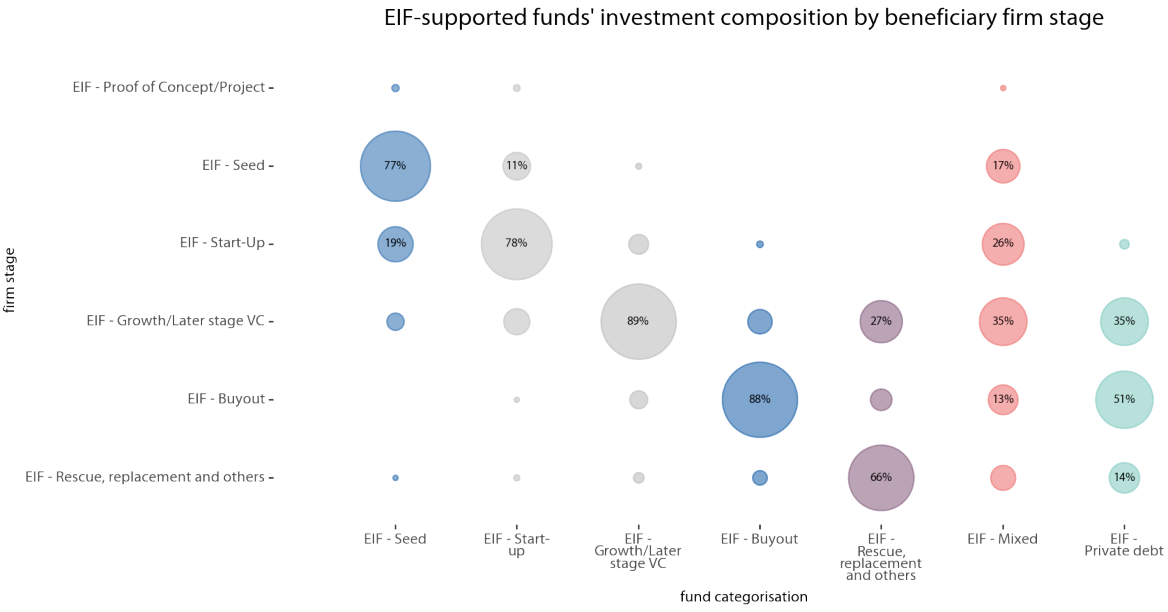
EIB Group investments into equity and quasi-equity intermedaries



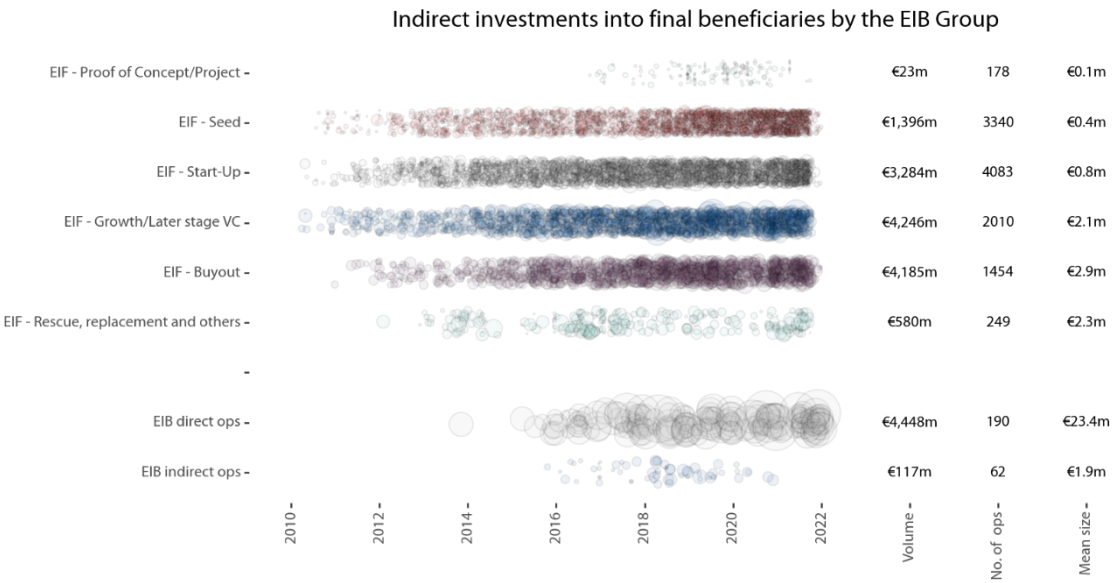
## Size of indirect operations



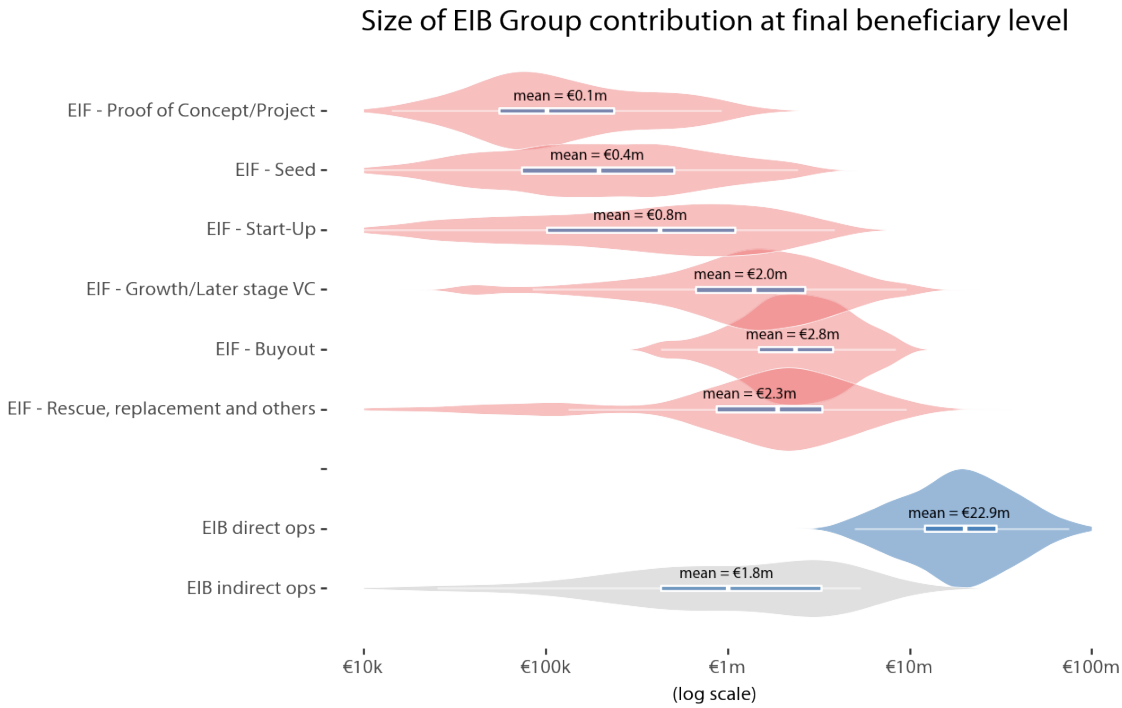

## How do the different funds invest?



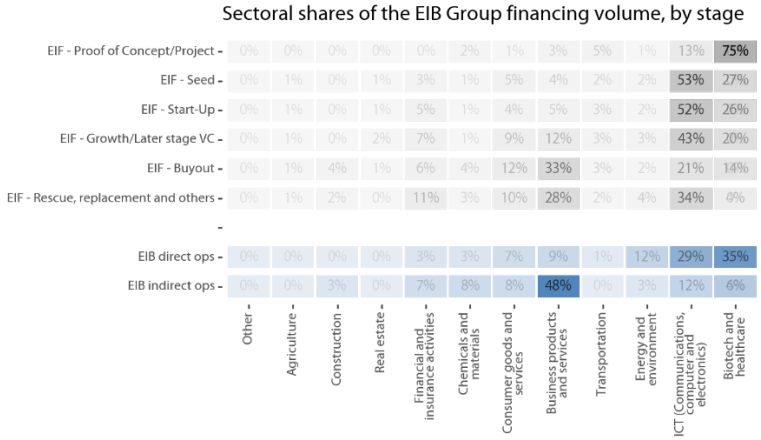
## Investment at final beneficiary level



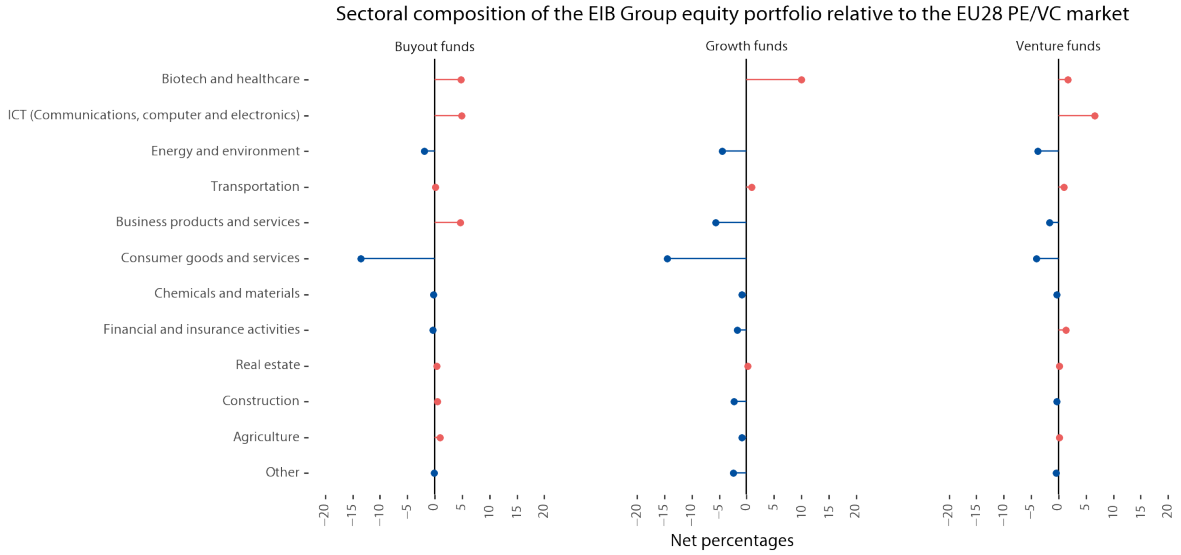

## Size of EIBG contribution by stage



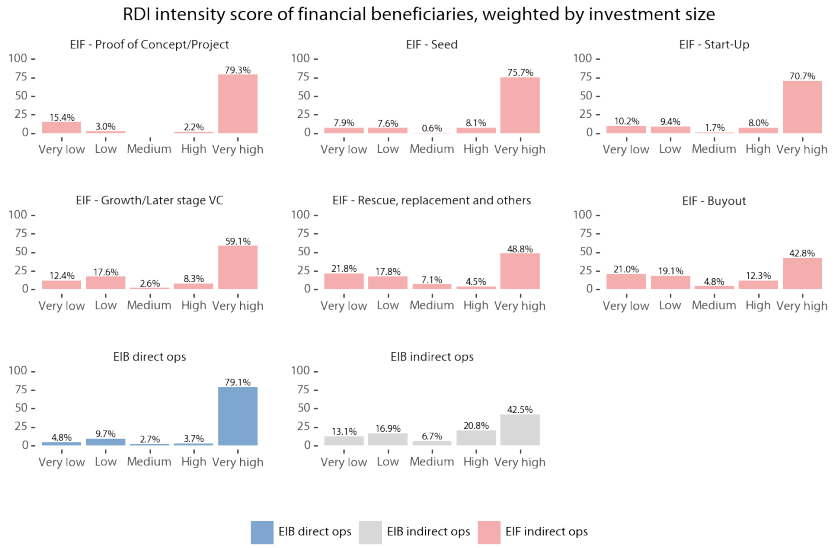
## EIBG support targets tech sectors, but more so at the early stage



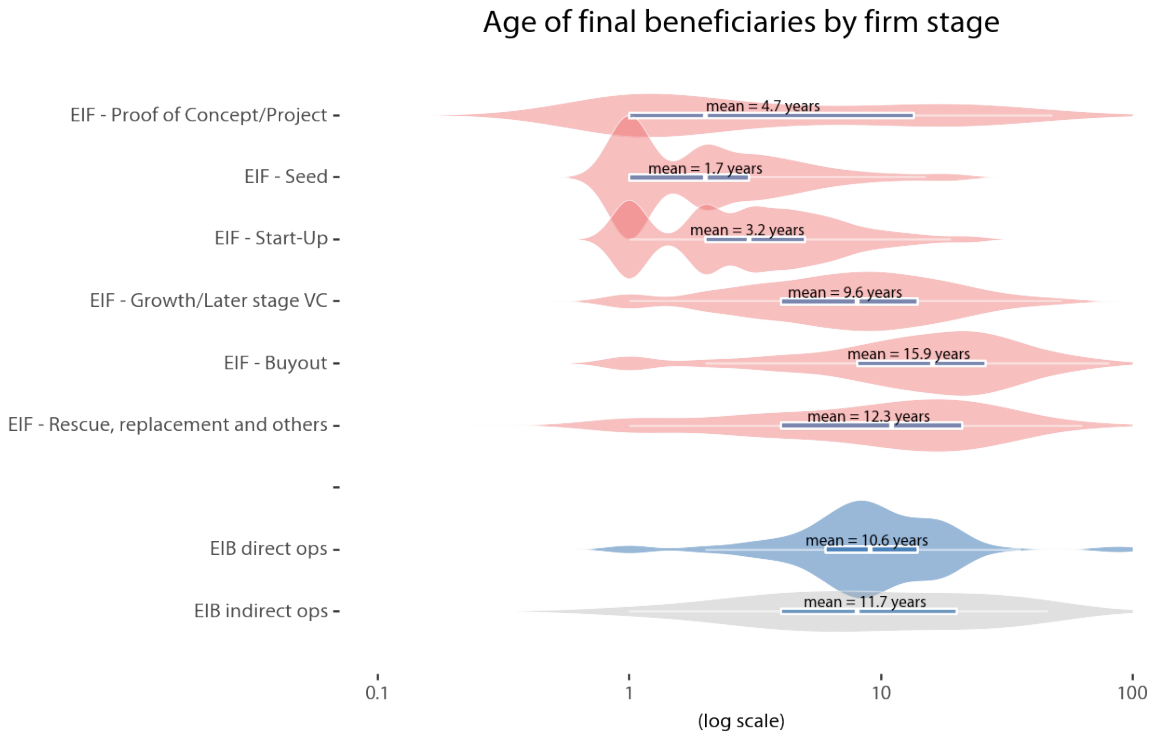

## EIF portfolio by sector and stage relative to the EU private equity/venture capital market

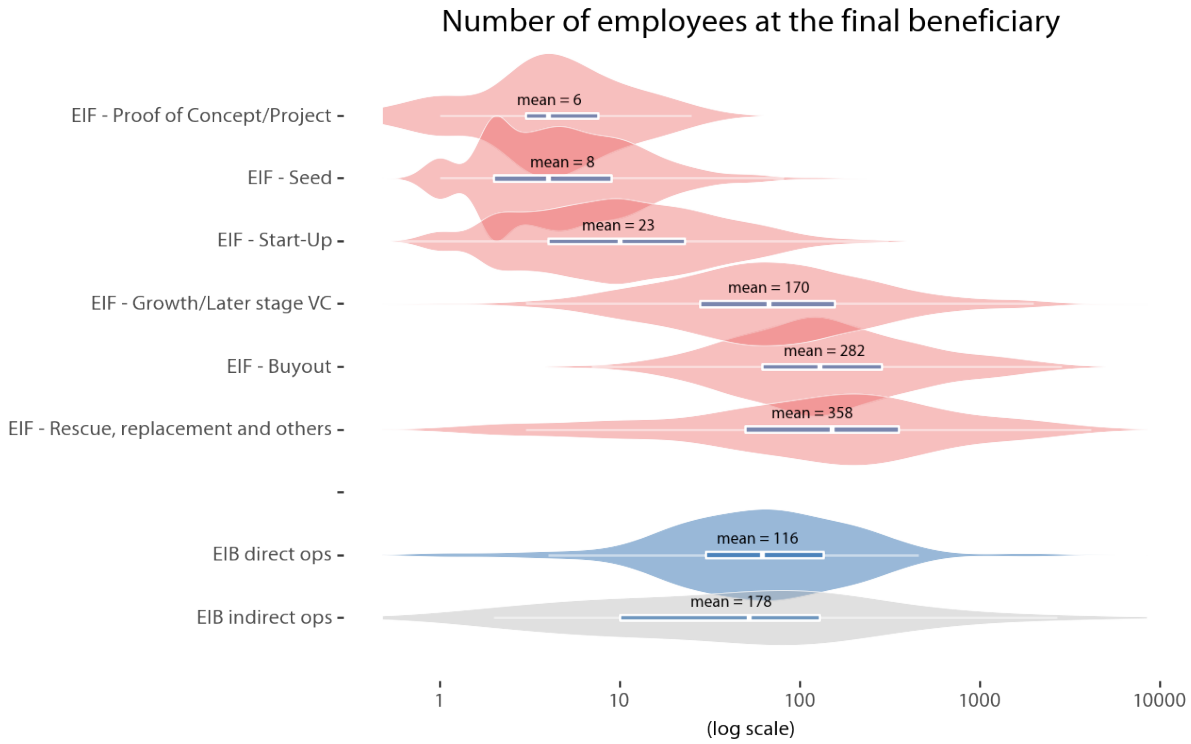



## RDI intensity score by stage

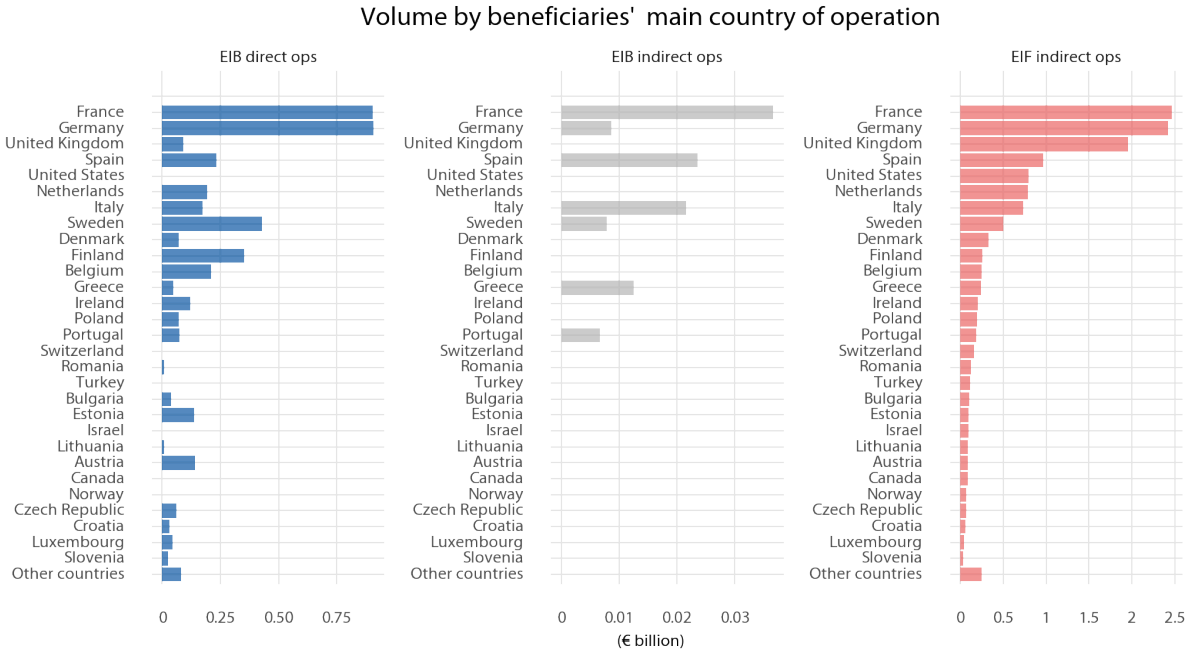


## Firm headcount and age increase with stage

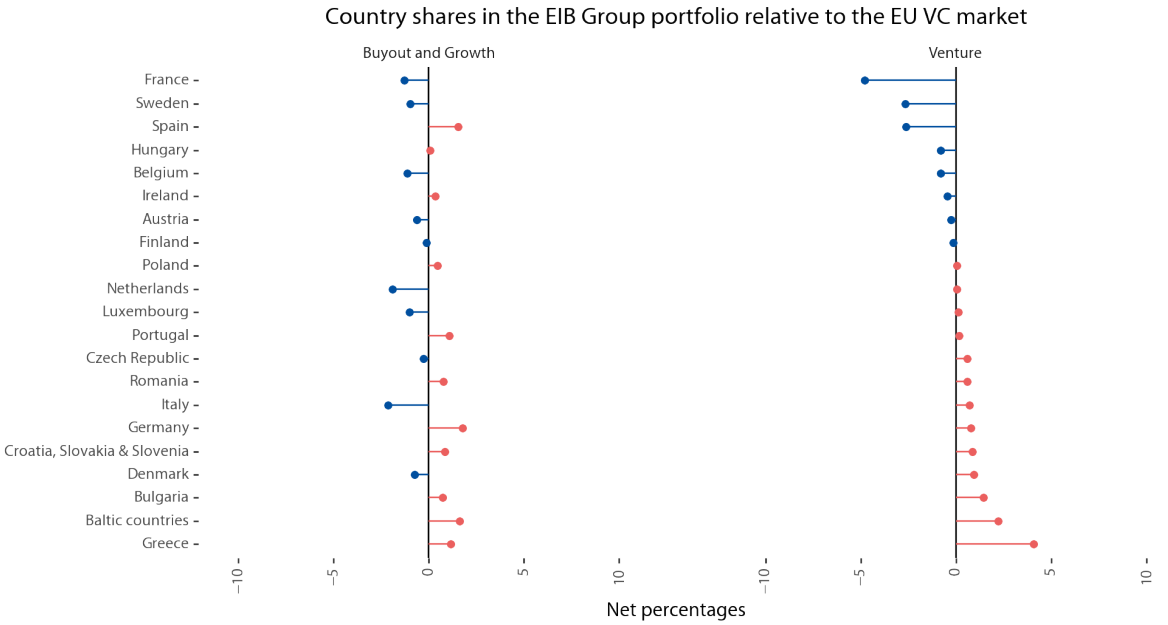


## Geo: heavy concentration in Western Europe in absolute terms

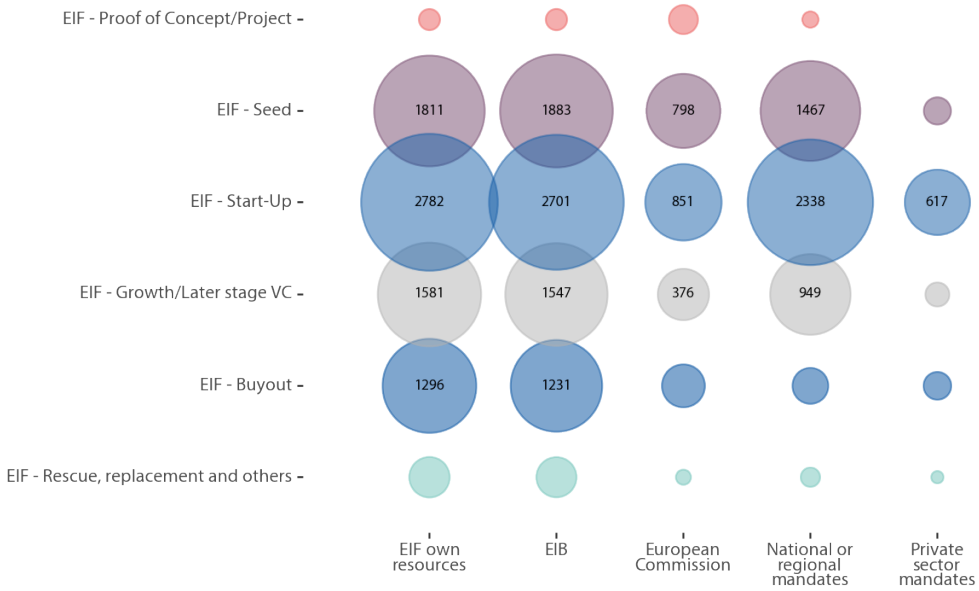



## Country shares relative to the market: signs of cohesion support

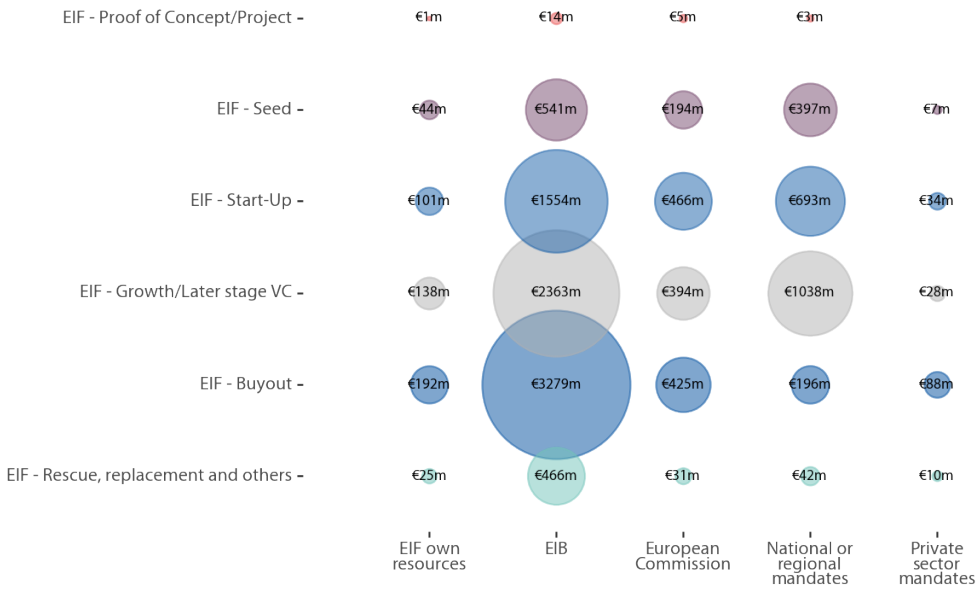


## EIF mandate use

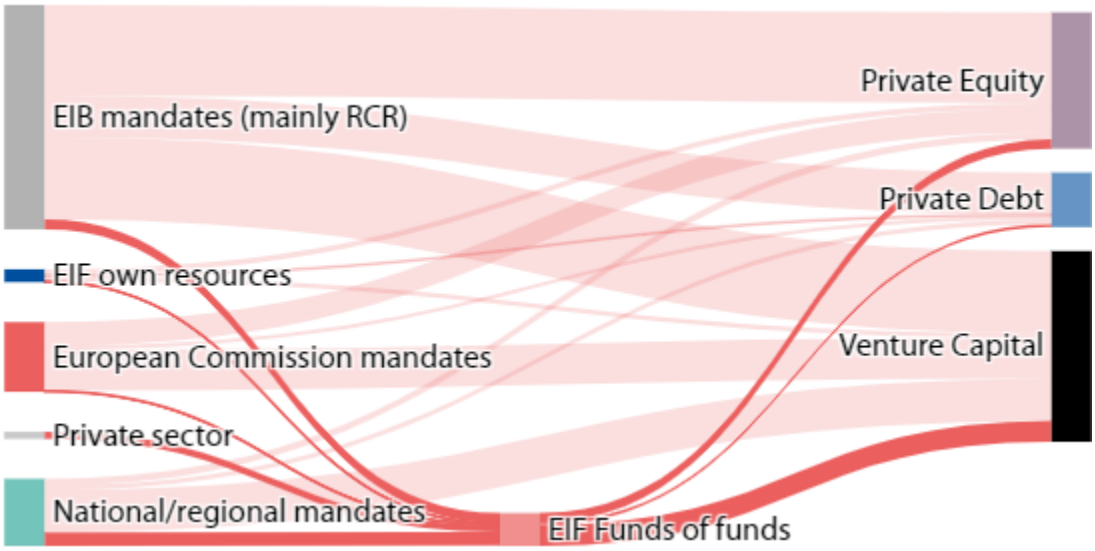
Number of firms supported by stage and mandate



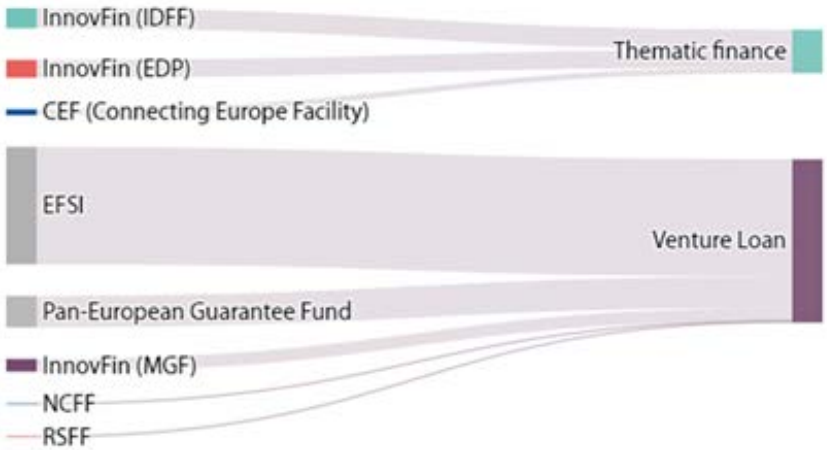

EIF investment into final beneficiaries by stage and mandate



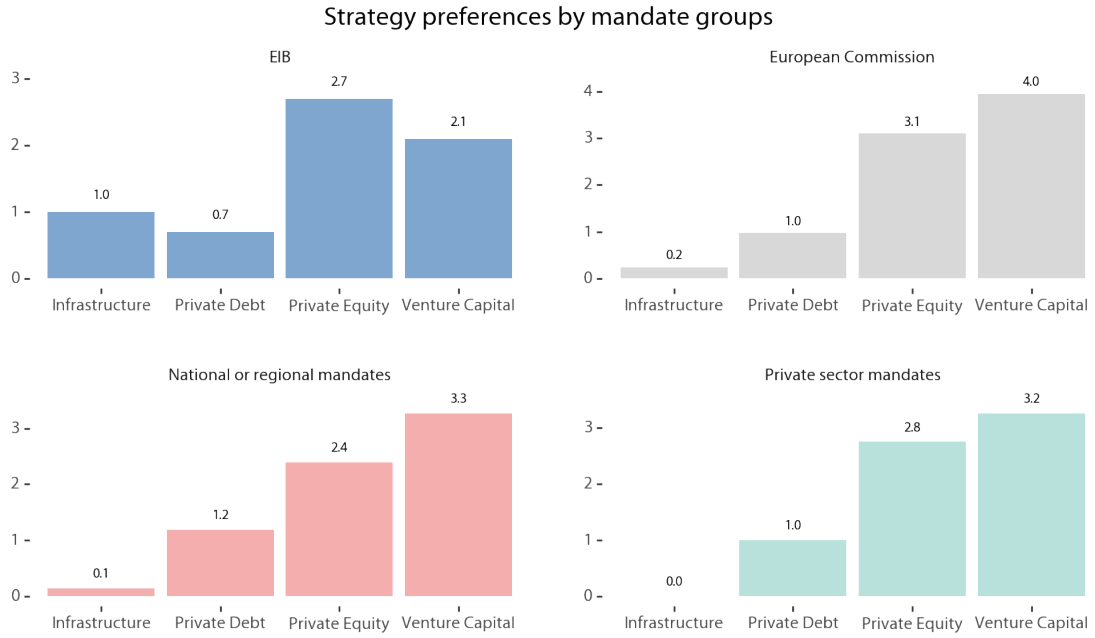
## EIF mandate use



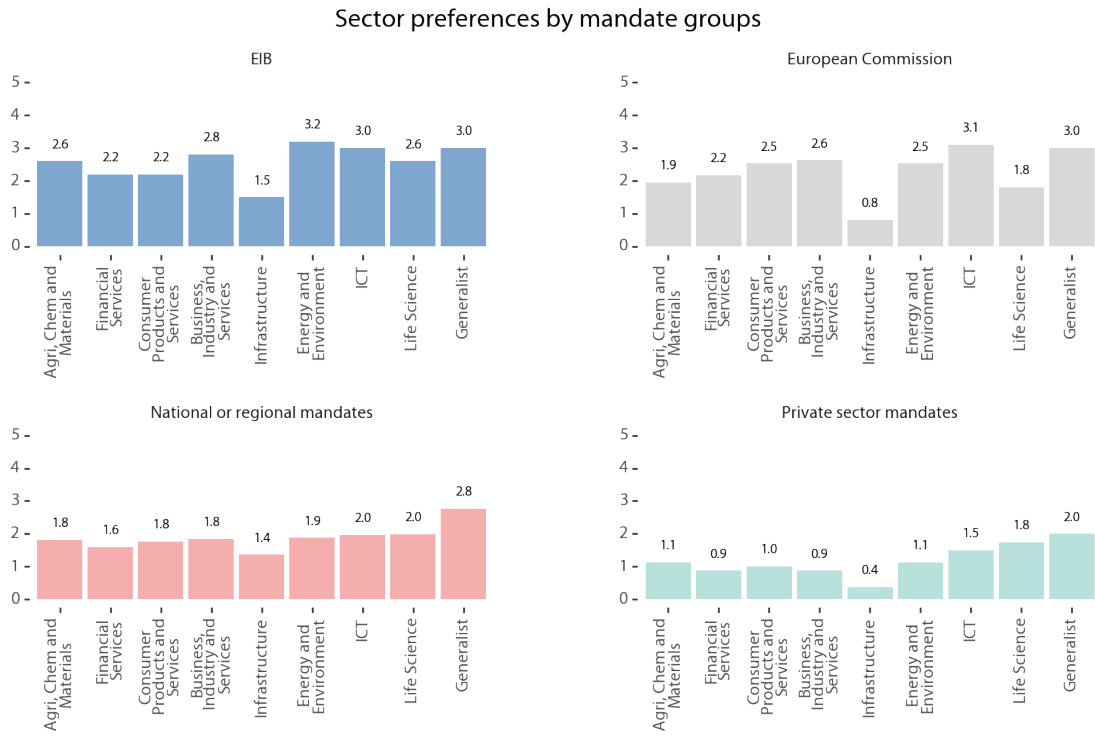

## EIB direct operations — mandate use



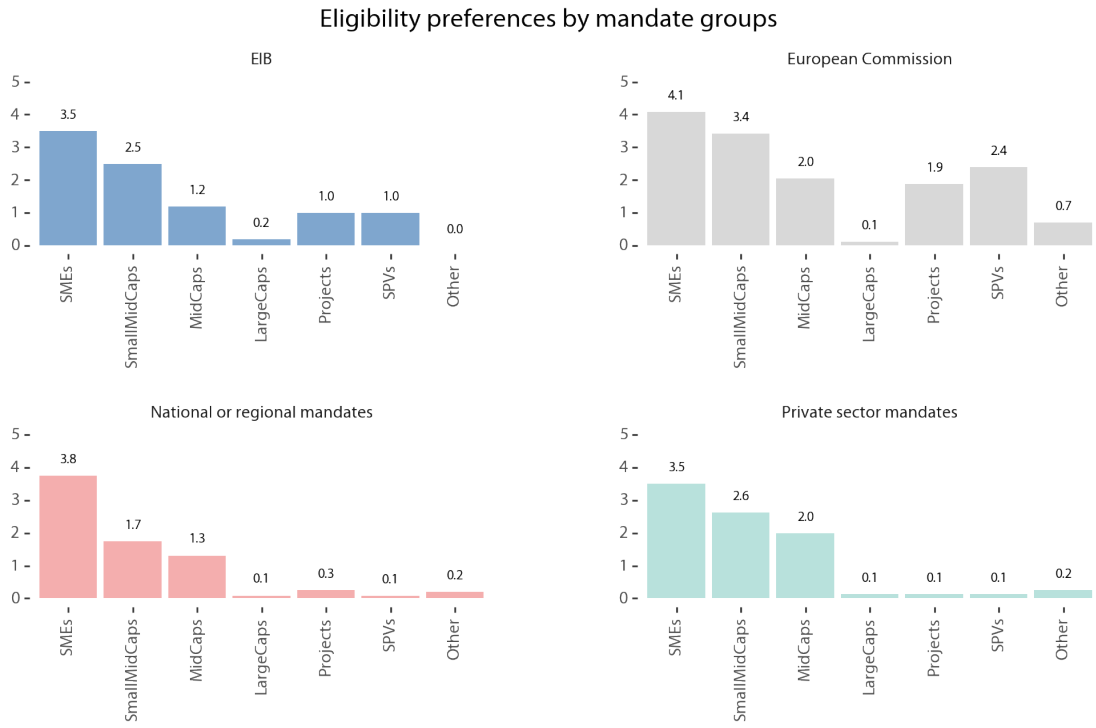
## Mandate preferences — strategy



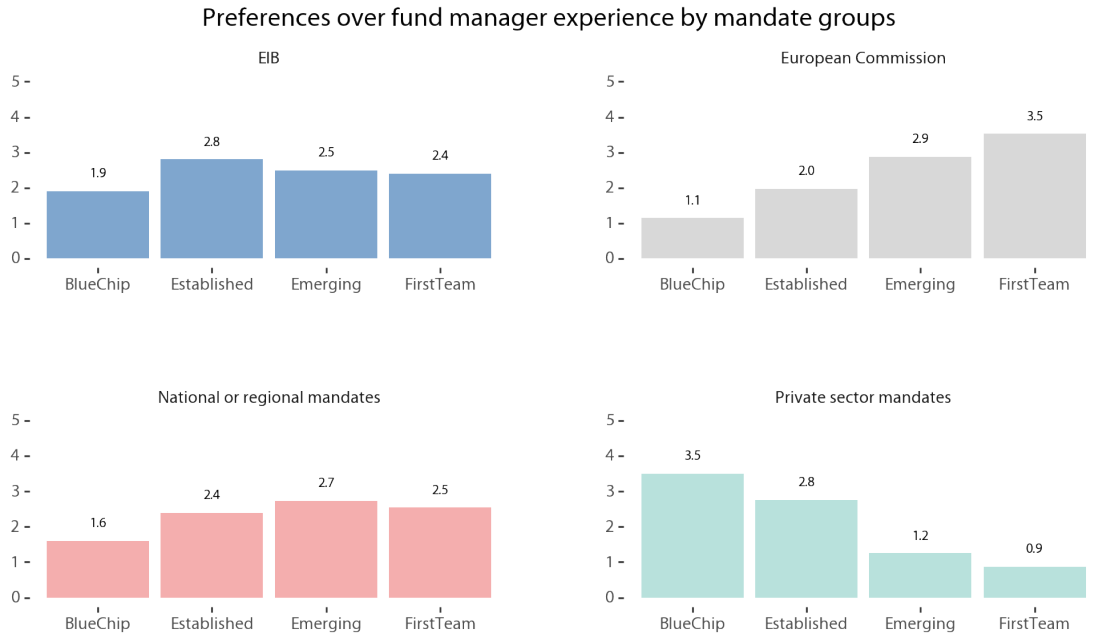

## Mandate preferences — sectors



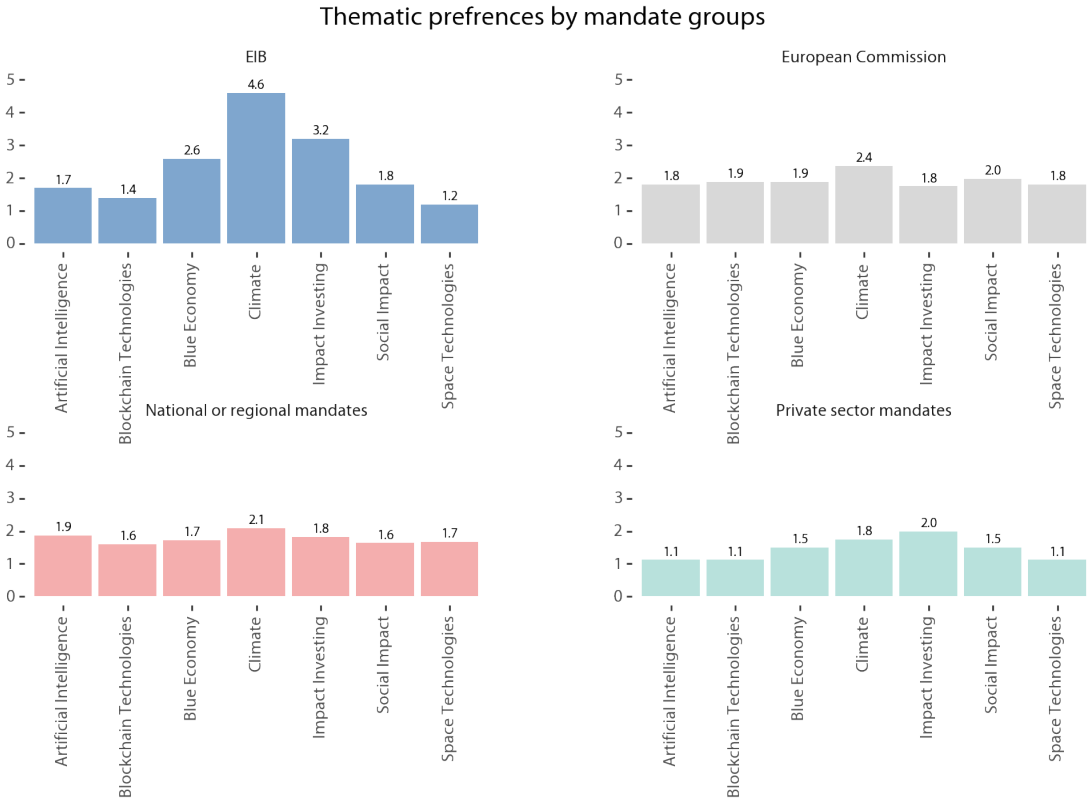
## Mandate preferences — size/client eligibility



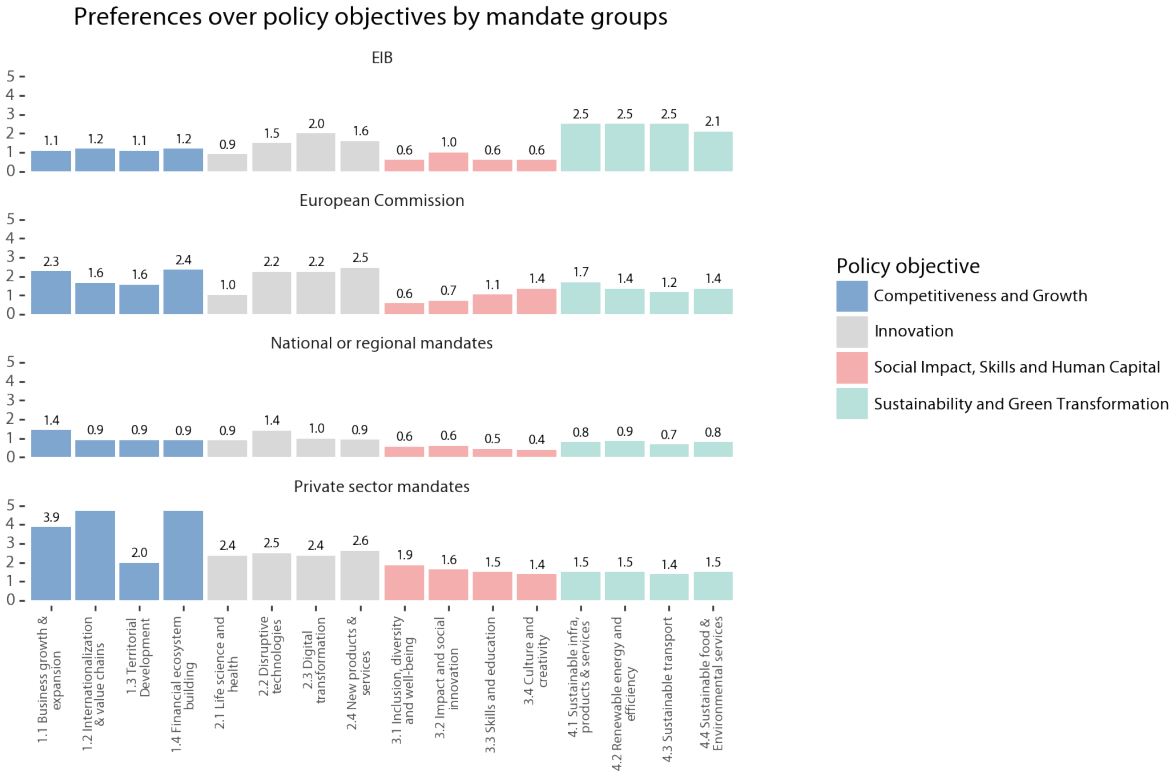

## Mandate preferences — fund manager experience



## Mandate preferences — thematic attributes




## Mandate preferences — policy objectives



# Appendix 3: Survey

## Description of survey data used in the evaluation

The evaluation uses a series of surveys to substantiate the findings presented in sections 2, 3, 4 and 6 of the report. This includes two surveys of fund managers conducted by the EIF's Research and Market Analysis division, a survey of EIB clients and a survey of final beneficiaries, the last two being conducted by the Evaluation Division of the EIB.

This appendix provides a description of the survey data used by the evaluation, including the number of responses received for each survey. It also includes a discussion on the strengths and limitations of the survey data.

**EIF surveys of fund managers**

The EIF's Research and Market Analysis division conducted two surveys of EIF-backed fund managers primarily headquartered in the EU27. These surveys were conducted on an anonymous basis and are focused on the added value of the EIF's participation. In particular, fund managers were asked to indicate the extent of their agreement or disagreement with a number of statements relating to the EIF's impact on the investor base and the fundraising process, the fund structure, the fund and the market as well as the overall effect of the EIF's value added**.** These two surveys are:

- **EIF survey of venture capital fund managers,** which was run between 7 November and 18 December 2017 and includes responses from 216 EIF-backed venture capital fund managers.
- **EIF survey of private equity fund managers,** which was run between 13 February and 26 March 2020 and includes responses from 158 EIF-backed private equity fund managers. Of these, 97 fund managers indicated that their first most important investment stage is "Buyout", 55 indicated "Growth Capital" and six fund managers indicated some other investment stage: pre-seed (1), early stage (1), later/growth stage (2), and rescue/turnaround (2).

Since the questions asked in these two surveys are identical, the evaluation team combined the data from these two surveys and classified the responses in three categories, as follows:

- **Venture capital:** this includes all 216 responses received as part of the survey of venture capital fund managers. NB: It was not possible to split the responses of this survey into early-stage venture capital and later-stage venture capital in order to include the later-stage venture capital in the Growth Capital category, as done in the other sections of the report.
- **Growth Capital:** this includes the 55 responses of the private equity fund managers who indicated "Growth capital" as the first most important stage of their investments.
- **Buyout:** this includes the 97 responses of the private equity fund managers who indicated "Buyout" as the first most important stage of their investments.

**Survey of EIB clients**

This survey was conducted in 2021 by the Evaluation Division of the EIB. It contains a range of questions on the financial and non-financial additionality provided by the EIB. The evaluation team extracted from this survey the 29 responses provided by the EIB quasi-equity clients and compared these with the responses provided by the rest of the EIB clients (136 responses in total), including both other riskier EIB special activities (44 responses) and less riskier EIB standard operations (92 responses).

**Survey of final beneficiaries**

This survey was conducted as part of this evaluation and targeted the final beneficiaries of the EIB Group's indirect equity operations. It was sent to a sample of 2 311 final beneficiaries of which 445 are classified in the buyout stage of development. The vast majority of the targeted population includes final beneficiaries of the EIF (2 266). Only 45 final beneficiaries of the EIB's indirect operations received this survey, which reflects the much more limited number of EIB indirect equity investments targeting SMEs and mid-caps.

In total, 479 responses have been received from final beneficiaries. The evaluation team has broken down these responses by stage of development, geography and sector of the respective beneficiary firms. These breakdowns and the corresponding numbers of responses received under each category are presented in the table below.

| Stage[60] | # of responses | Geography[61] | # of responses | Sector[62] | # of responses |
|---|---|---|---|---|---|
| Early-stage venture capital | 277 | DACH | 155 | ICT | 227 |
| Later-stage venture capital/growth capital | 99 | CESEE | 105 | Other | 116 |
| Buyout and other private equity | 96 | Nordics | 63 | Business products and services | 68 |
| | | France and Benelux | 50 | Biotech and healthcare | 64 |
| | | Southern Europe | 35 | | |
| | | UK and Ireland | 28 | | |

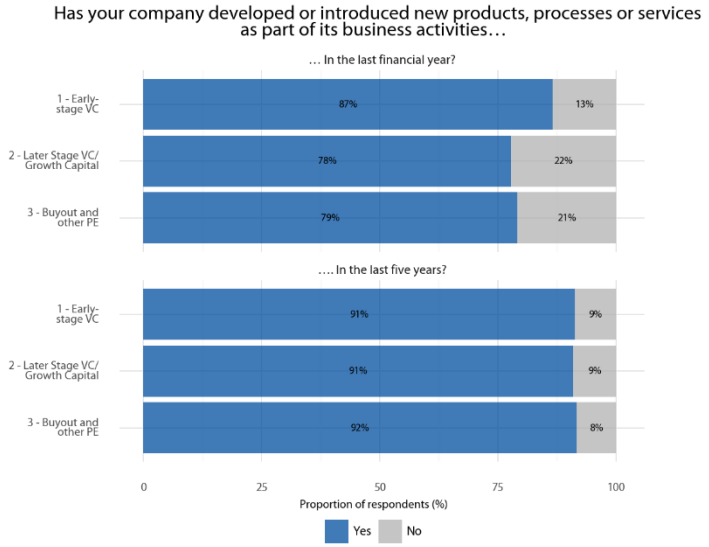
**Strengths and limitations of the survey data**

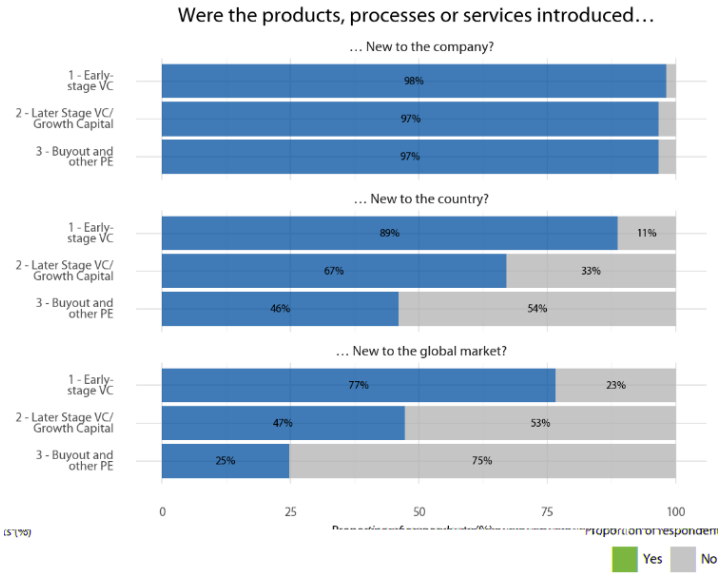
Both the EIF surveys of fund managers and the survey of EIB Group final beneficiaries are based on a significant number of responses, which makes them a reliable source of evidence. As a rule of thumb, at least 30 responses are required for each category of respondents in order to have meaningful results. As it can be seen above, this number is far exceeded for all categories of respondents, with the exception of the respondents from the UK and Ireland.

However, the survey of EIB clients only includes 29 responses relating to quasi-equity operations, which does limit somewhat its reliability. To address this issue, the evaluation team conducted eight additional case studies on quasi-equity operations, the findings of which broadly confirm the results of the survey. In addition, the 29 quasi-equity clients who responded tended in most cases to have broadly similar opinions, which further reduces the risk that an increase in the number of responses would have led to different results. Finally, the 29 responses account for some 22% of the total number of EIB quasi-equity operations included in the scope of the evaluation, which represents a significant share. Therefore, despite the lower number of responses available for this survey the evaluation team believes its results are also a reliable source of evidence.

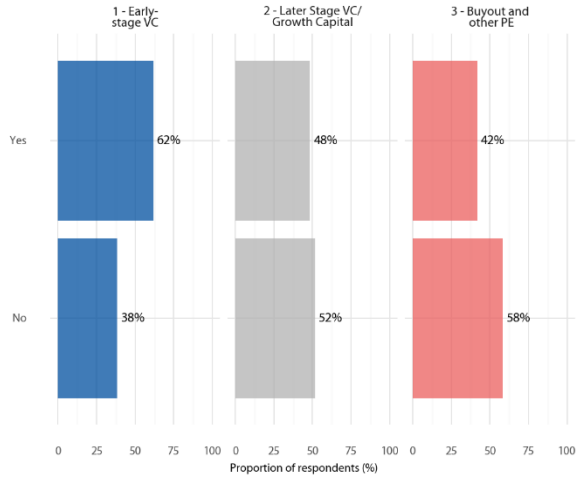
[60] Four of the responses received could not be linked to a specific final beneficiary and have therefore not been included in this breakdown.
[61] Forty-three responses received have not been included in this breakdown either because the respective companies were based in other regions or because the data on the country of operation was not available.
[62] Four of the responses received could not be linked to a specific final beneficiary and have therefore not been included in this breakdown.

## Survey results — EV survey of final beneficiaries

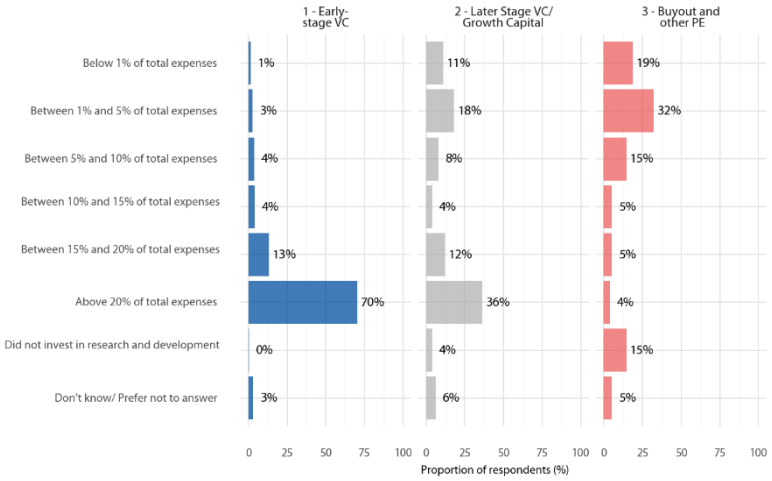


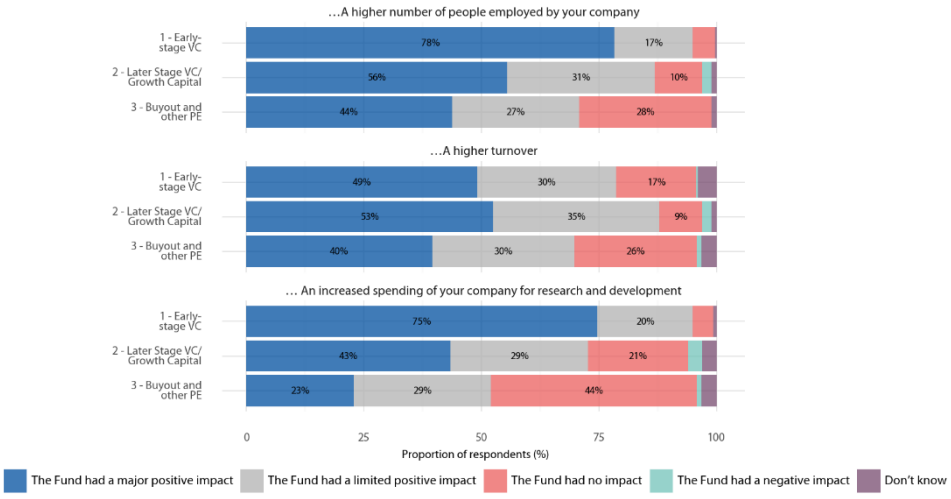
Did your company formally protect the newly introduced products, processes or services (via patent, design registration, trademark, copyright or trade secret)?

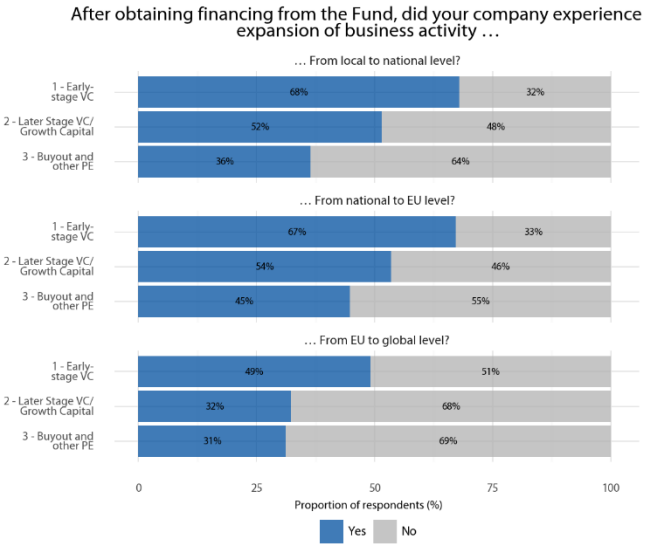


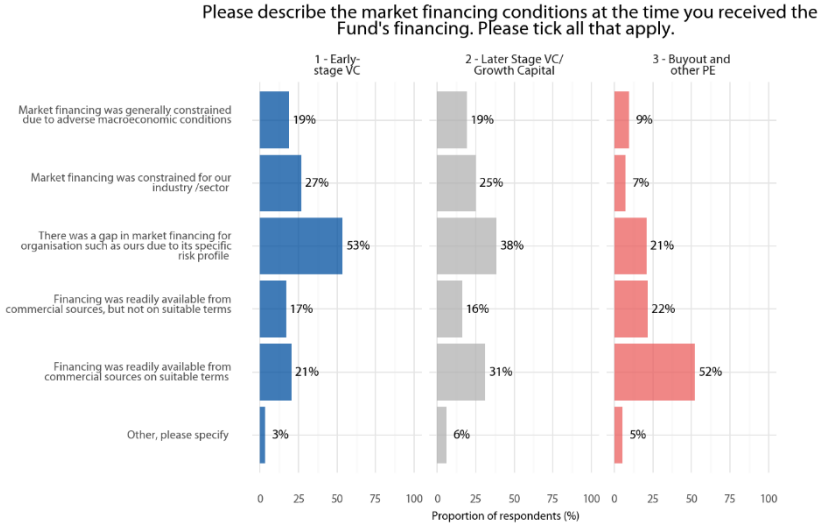

How much did your company invest on average per year in research and development (including the acquisition of intellectual property)?

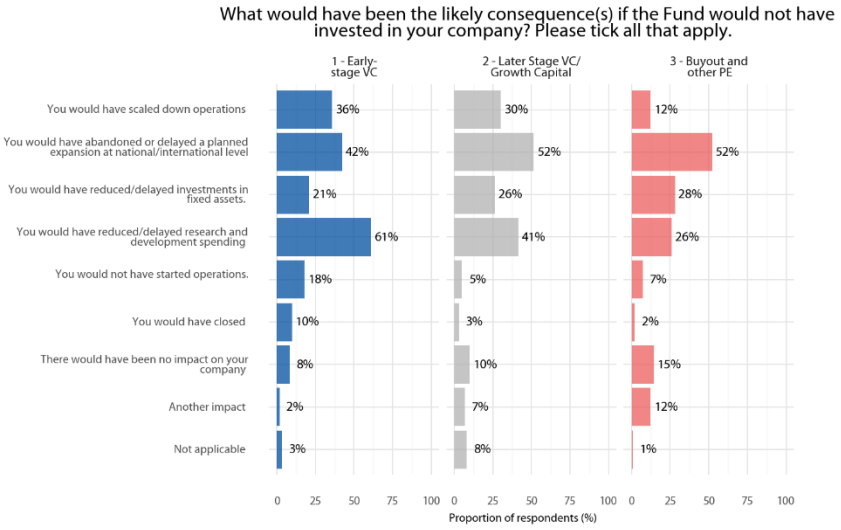


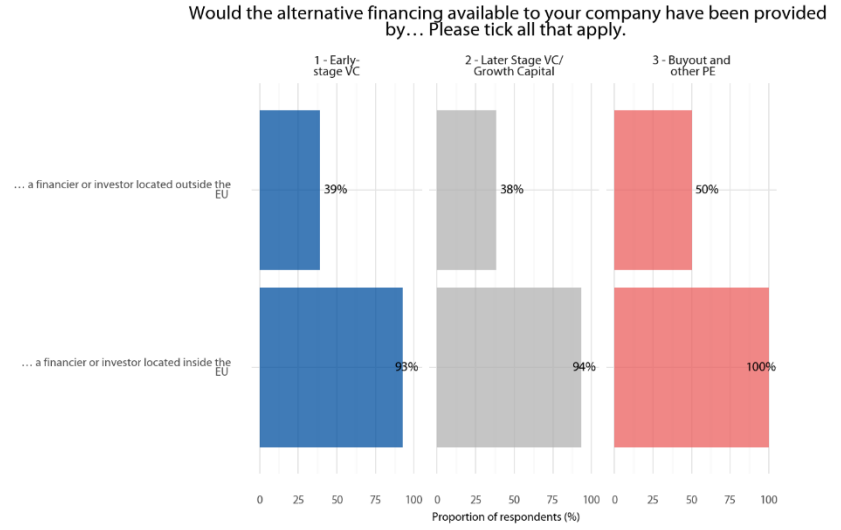

To what extent has the financing received from the Fund resulted in …

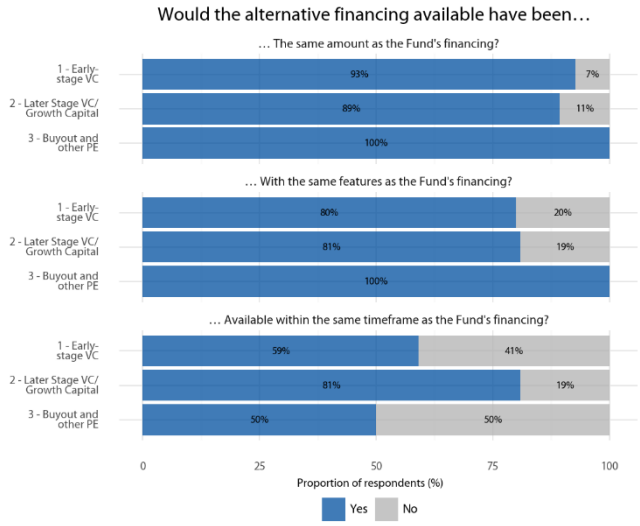



After obtaining financing from the Fund, did your company experience any expansion of business activity …
… From local to national level?
1 - Early-stage VC
2 - Later Stage VC/ Growth Capital
3 - Buyout and other PE
68%
32%
52%
48%
36%
64%
… From national to EU level?
67%
33%
54%
46%
45%
55%
… From EU to global level?
49%
51%
32%
68%
31%
69%
0
25
50
75
100
Proportion of respondents (%)
Yes
No

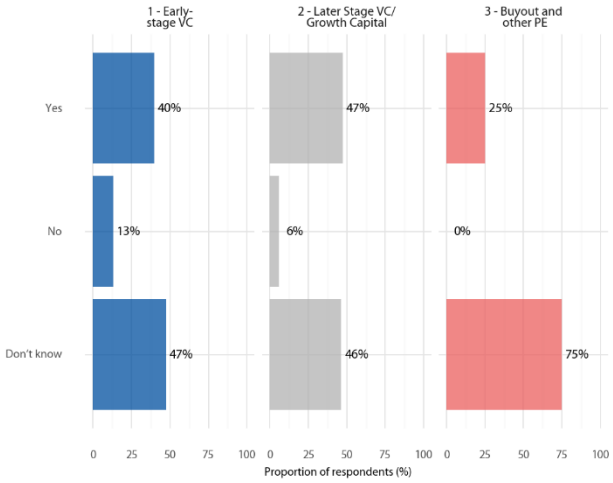

Please describe the market financing conditions at the time you received the Fund's financing. Please tick all that apply.
1 - Early-stage VC
2 - Later Stage VC/ Growth Capital
3 - Buyout and other PE
Market financing was generally constrained due to adverse macroeconomic conditions
Market financing was constrained for our industry /sector
There was a gap in market financing for organisation such as ours due to its specific risk profile
Financing was readily available from commercial sources, but not on suitable terms
Financing was readily available from commercial sources on suitable terms
Other, please specify
19%
19%
9%
27%
25%
7%
53%
38%
21%
17%
16%
22%
21%
31%
52%
3%
6%
5%
0
25
50
75
100
Proportion of respondents (%)


What would have been the likely consequence(s) if the Fund would not have invested in your company? Please tick all that apply.
1 - Early-stage VC
2 - Later Stage VC/ Growth Capital
3 - Buyout and other PE
You would have scaled down operations
You would have abandoned or delayed a planned expansion at national/international level
You would have reduced/delayed investments in fixed assets.
You would have reduced/delayed research and development spending
You would not have started operations.
You would have closed
There would have been no impact on your company
Another impact
Not applicable
36%
30%
12%
42%
52%
52%
21%
26%
28%
61%
41%
26%
18%
5%
7%
10%
3%
2%
8%
10%
15%
2%
7%
12%
3%
8%
1%
0 25 50 75 100
Proportion of respondents (%)

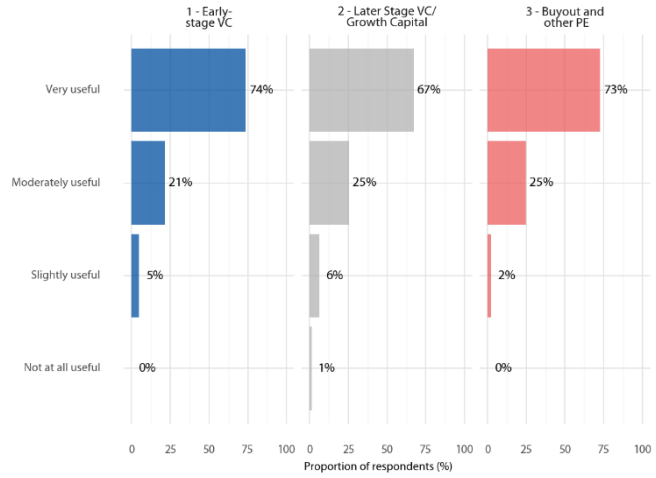

Would the alternative financing available to your company have been provided by… Please tick all that apply.
1 - Early-stage VC
2 - Later Stage VC/ Growth Capital
3 - Buyout and other PE
… a financier or investor located outside the EU
… a financier or investor located inside the EU
39%
38%
50%
93%
94%
100%
0 25 50 75 100
Proportion of respondents (%)


Would the alternative financing available have been…
… The same amount as the Fund's financing?
… With the same features as the Fund's financing?
… Available within the same timeframe as the Fund's financing?
1 - Early-stage VC
2 - Later Stage VC/ Growth Capital
3 - Buyout and other PE
93%
7%
89%
11%
100%
80%
20%
81%
19%
100%
59%
41%
81%
19%
50%
50%
0 25 50 75 100
Proportion of respondents (%)
Yes
No

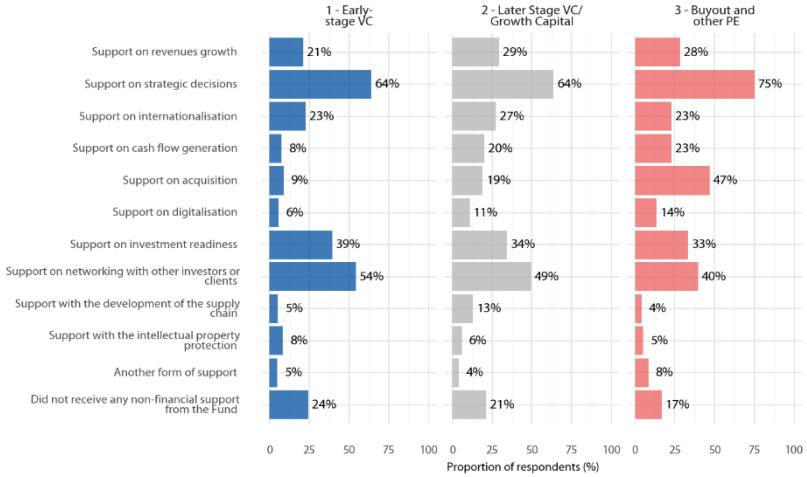
If your company had not received any financing from the Fund, would you have been able to obtain alternative financing from other sources to replace the participation of the Fund? Please tick one option on a best guess basis.

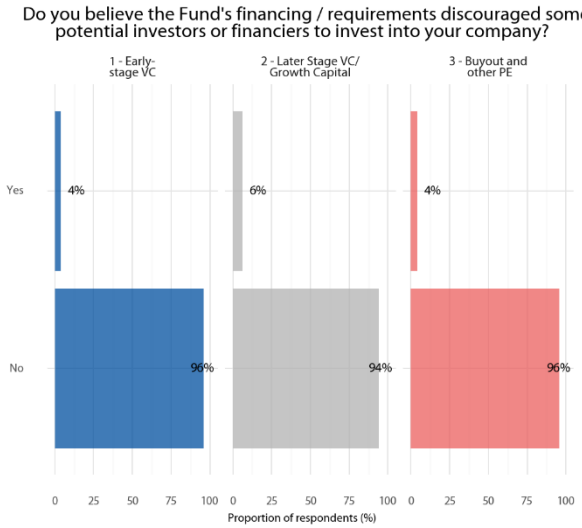


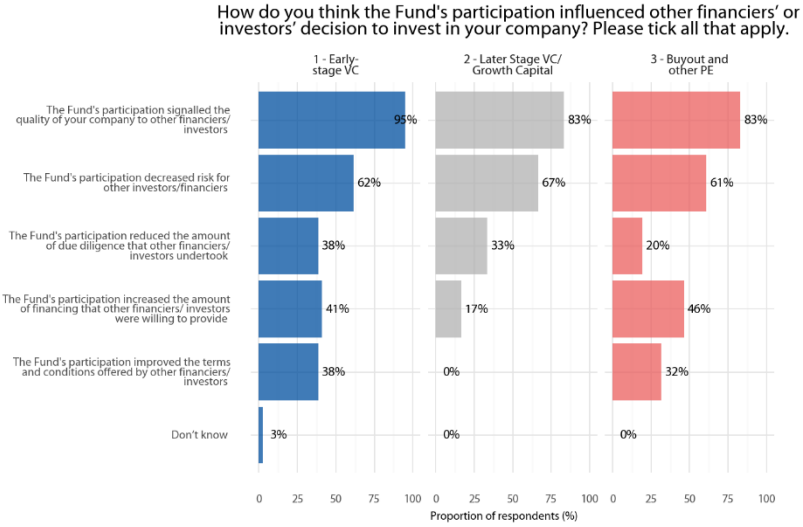

How useful did you find this support? Please tick one option.

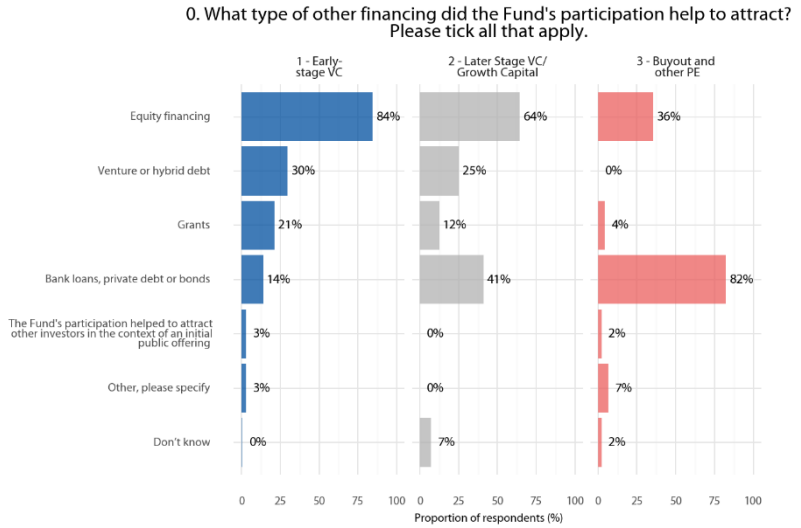


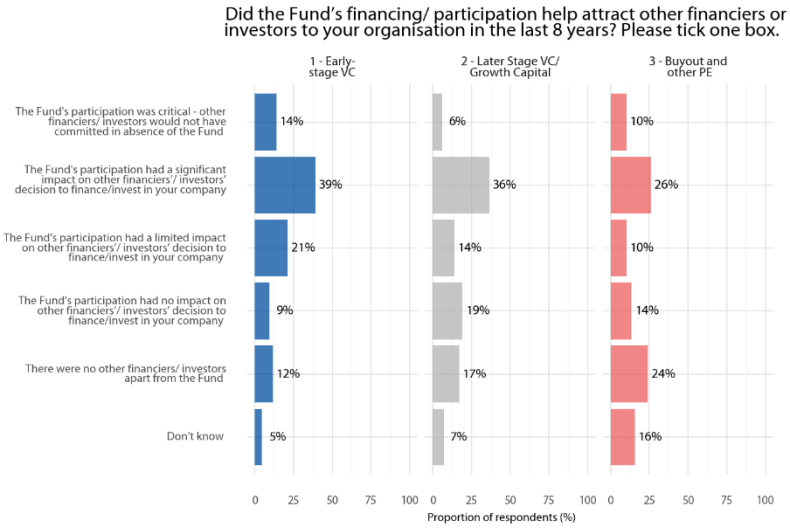

Did you receive any non-financial benefit from the Fund? Please tick all that apply

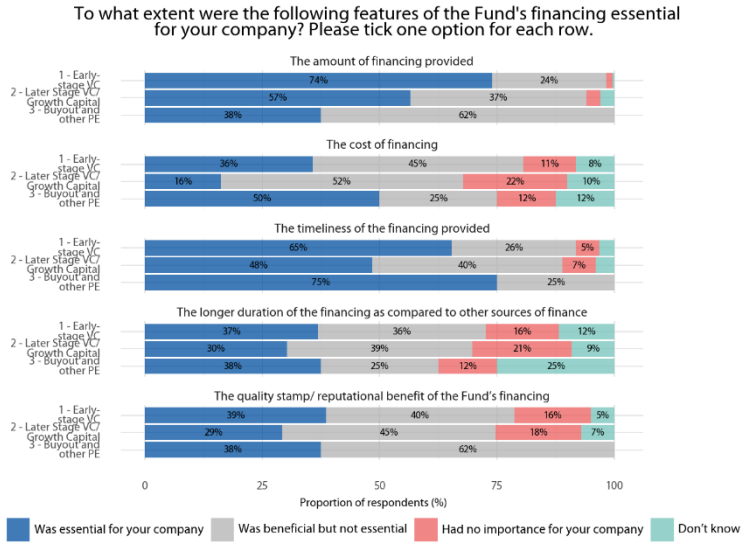



Do you believe the Fund's financing / requirements discouraged some potential investors or financiers to invest into your company?
1 - Early-stage VC
2 - Later Stage VC/ Growth Capital
3 - Buyout and other PE
Yes
No
4%
6%
4%
96%
94%
96%
0 25 50 75 100
Proportion of respondents (%)


How do you think the Fund's participation influenced other financiers' or investors' decision to invest in your company? Please tick all that apply.
1 - Early-stage VC
2 - Later Stage VC/ Growth Capital
3 - Buyout and other PE
The Fund's participation signalled the quality of your company to other financiers/ investors
95%
83%
83%
The Fund's participation decreased risk for other investors/financiers
62%
67%
61%
The Fund's participation reduced the amount of due diligence that other financiers/ investors undertook
38%
33%
20%
The Fund's participation increased the amount of financing that other financiers/ investors were willing to provide
41%
17%
46%
The Fund's participation improved the terms and conditions offered by other financiers/ investors
38%
0%
32%
Don't know
3%
0%
0%
0 25 50 75 100
Proportion of respondents (%)

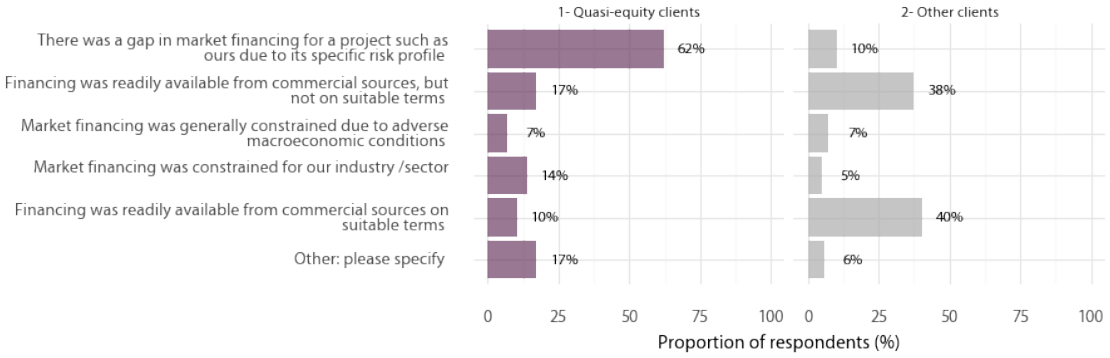

0. What type of other financing did the Fund's participation help to attract? Please tick all that apply.
1 - Early-stage VC
2 - Later Stage VC/ Growth Capital
3 - Buyout and other PE
Equity financing
84%
64%
36%
Venture or hybrid debt
30%
25%
0%
Grants
21%
12%
4%
Bank loans, private debt or bonds
14%
41%
82%
The Fund's participation helped to attract other investors in the context of an initial public offering
3%
0%
2%
Other, please specify
3%
0%
7%
Don't know
0%
7%
2%
0 25 50 75 100
Proportion of respondents (%)


Did the Fund's financing/ participation help attract other financiers or investors to your organisation in the last 8 years? Please tick one box.
1 - Early-stage VC
2 - Later Stage VC/ Growth Capital
3 - Buyout and other PE
The Fund's participation was critical - other financiers/ investors would not have committed in absence of the Fund
14%
6%
10%
The Fund's participation had a significant impact on other financiers'/ investors' decision to finance/invest in your company
39%
36%
26%
The Fund's participation had a limited impact on other financiers'/ investors' decision to finance/invest in your company
21%
14%
10%
The Fund's participation had no impact on other financiers'/ investors' decision to finance/invest in your company
9%
19%
14%
There were no other financiers/ investors apart from the Fund
12%
17%
24%
Don't know
5%
7%
16%
0 25 50 75 100
Proportion of respondents (%)

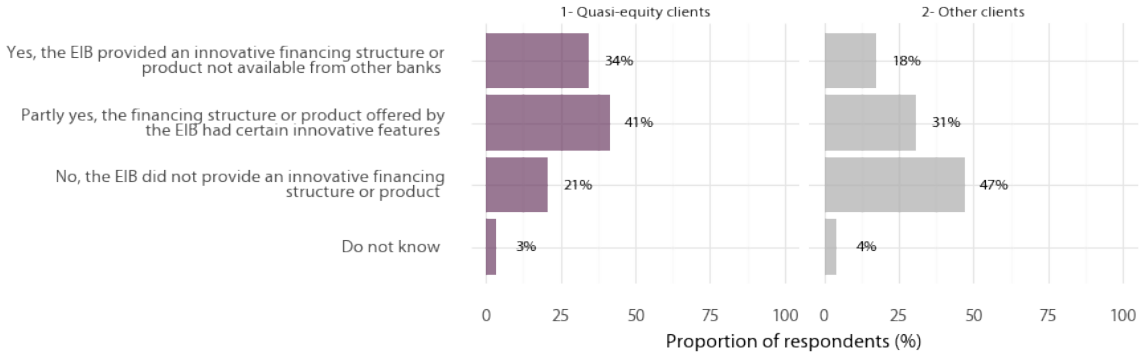

To what extent were the following features of the Fund's financing essential for your company? Please tick one option for each row.
The amount of financing provided
1 - Early-stage VC
74%
24%
2 - Later Stage VC/ Growth Capital
57%
37%
3 - Buyout and other PE
38%
62%
The cost of financing
1 - Early-stage VC
36%
45%
11%
8%
2 - Later Stage VC/ Growth Capital
16%
52%
22%
10%
3 - Buyout and other PE
50%
25%
12%
12%
The timeliness of the financing provided
1 - Early-stage VC
65%
26%
5%
2 - Later Stage VC/ Growth Capital
48%
40%
7%
3 - Buyout and other PE
75%
25%
The longer duration of the financing as compared to other sources of finance
1 - Early-stage VC
37%
36%
16%
12%
2 - Later Stage VC/ Growth Capital
30%
39%
21%
9%
3 - Buyout and other PE
38%
25%
12%
25%
The quality stamp/ reputational benefit of the Fund's financing
1 - Early-stage VC
39%
40%
16%
5%
2 - Later Stage VC/ Growth Capital
29%
45%
18%
7%
3 - Buyout and other PE
38%
62%
0 25 50 75 100
Proportion of respondents (%)
Was essential for your company
Was beneficial but not essential
Had no importance for your company
Don't know

## Survey results — EV special activities survey

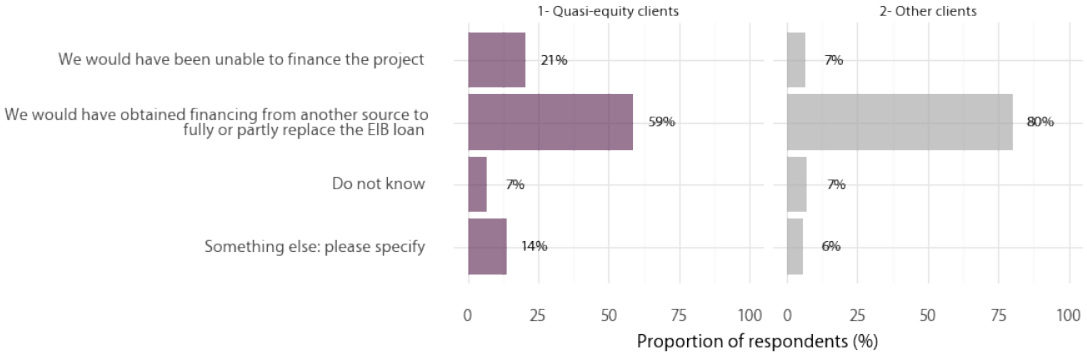
Please describe the market financing conditions at the time you applied for EIB financing for the above project. Please tick all that apply



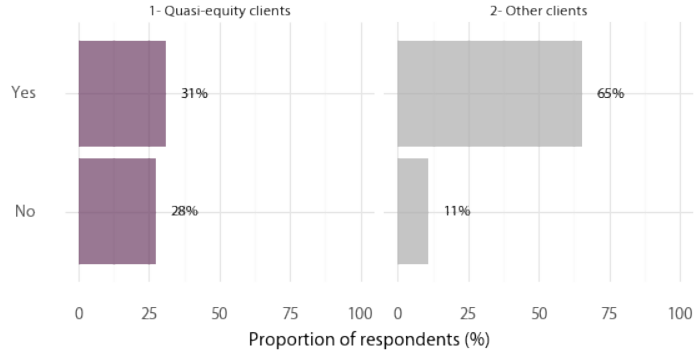

Did the EIB provide an innovative financing structure or product to your project? Please tick one box only



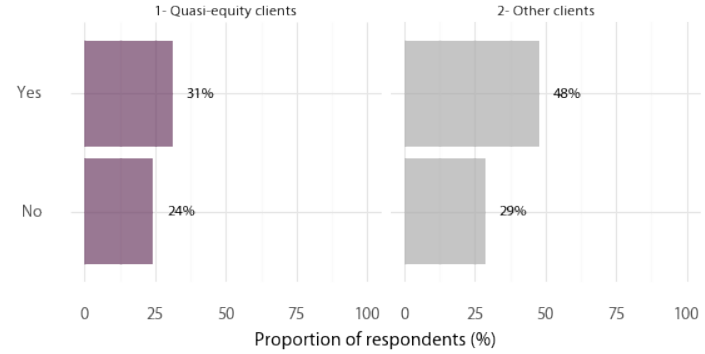

What would have happened if your project had not received any financing from the EIB? Please answer this question on a best guess basis



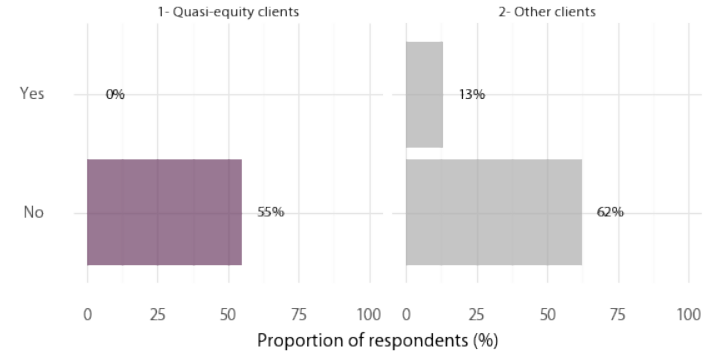

Would the financing available from the above sources have been…: … The same amount as the EIB loan?



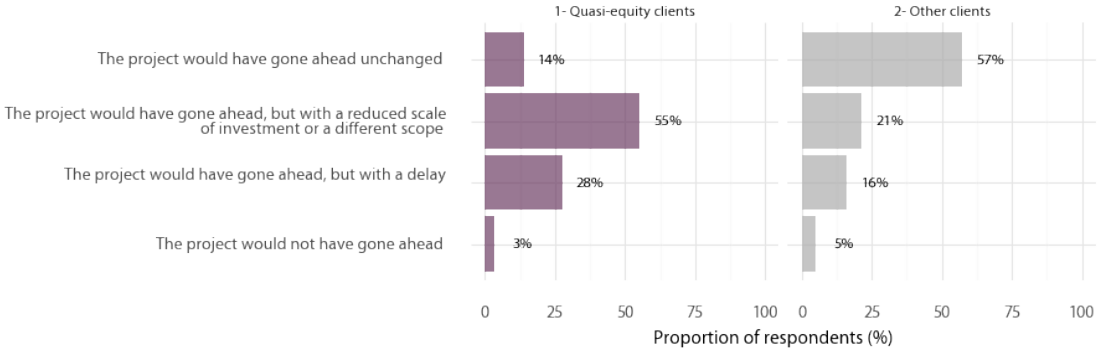
Would the financing available from the above sources have been…: … Available within the same timeframe as the EIB financing?



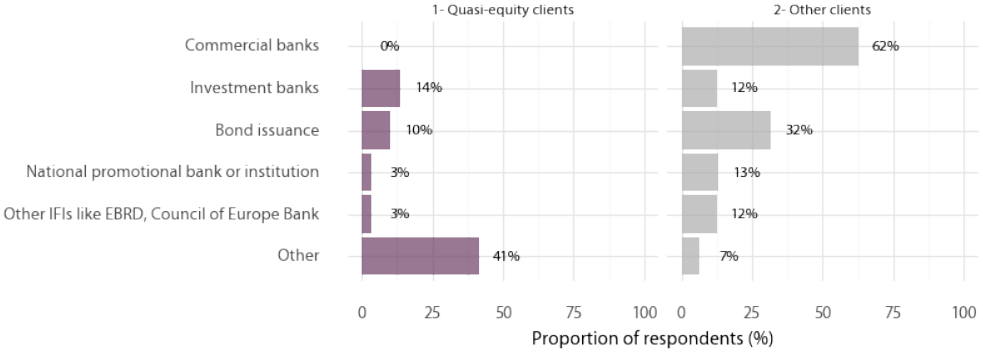

Would the financing available from the above sources have been…: …. With the same features as the EIB financing?



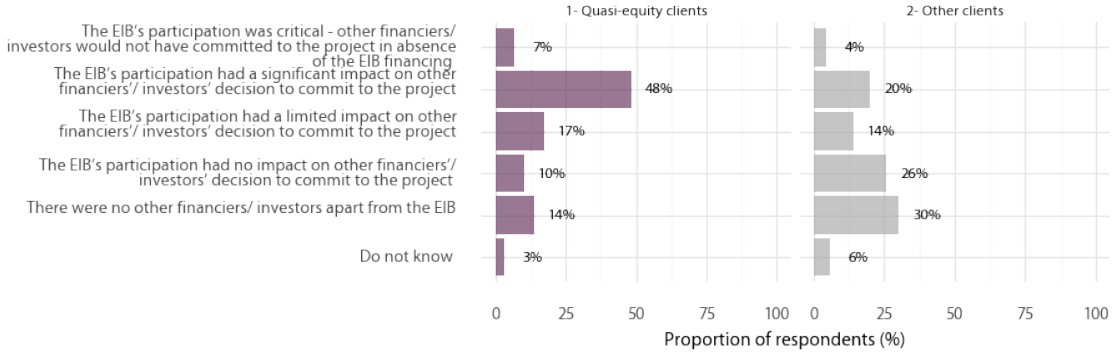

What would have been the likely consequence(s) for your project of no EIB financing? Please tick one box only.



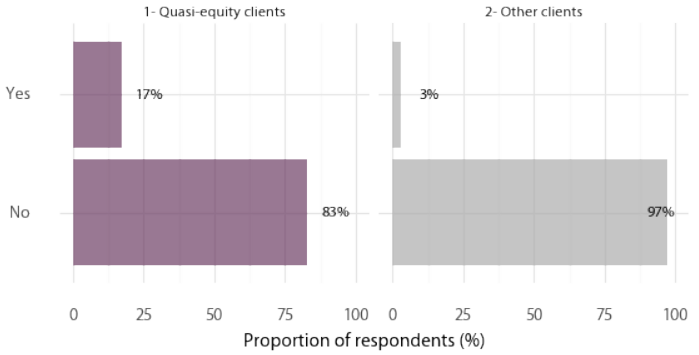

Which of the following alternative sources of financing would you have accessed to replace EIB financing? Please tick all that apply



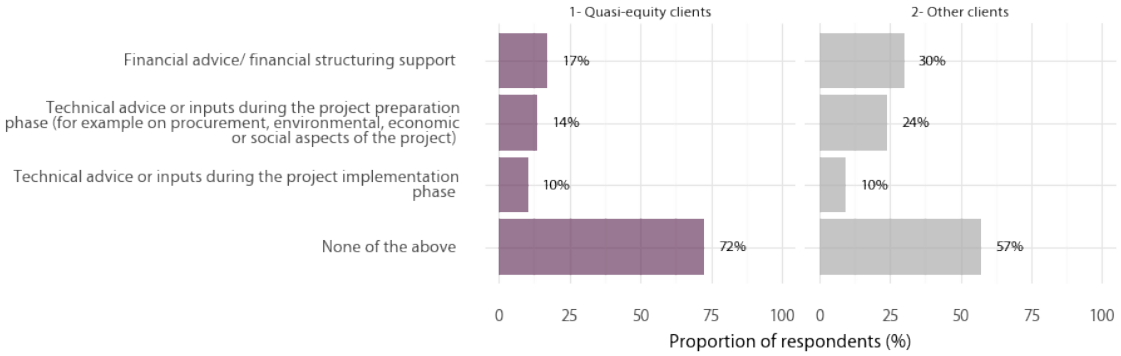
Did the EIB financing help attract other financiers or investors to your project? Please tick one box only.




Did the EIB financing crowd-out or discourage any potential investors or financiers?

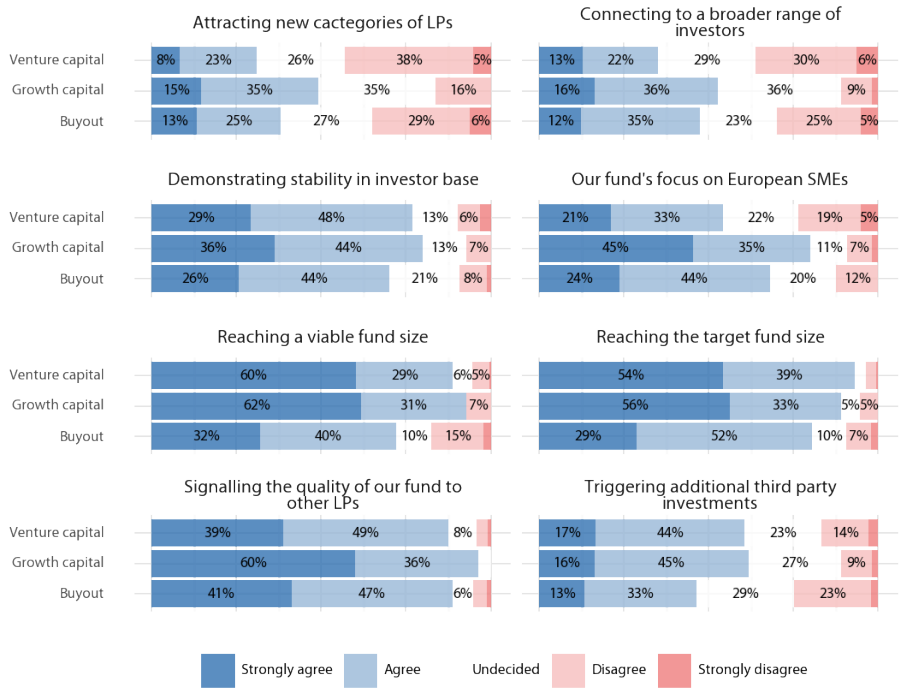



Did you receive any of the following types of advice or support from the EIB? Please tick all that apply.

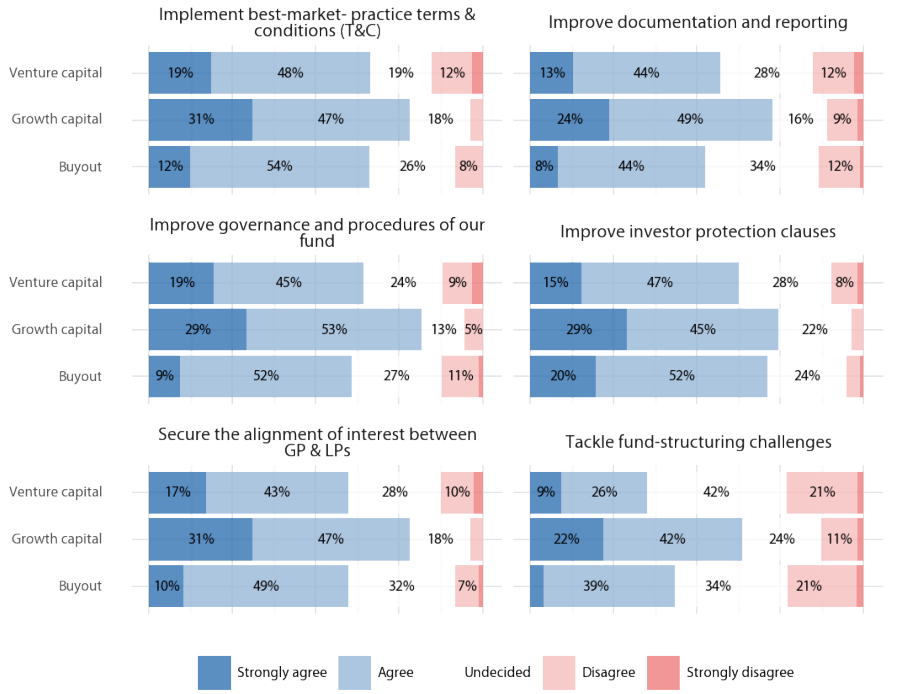


## Survey results — EIF surveys of fund managers

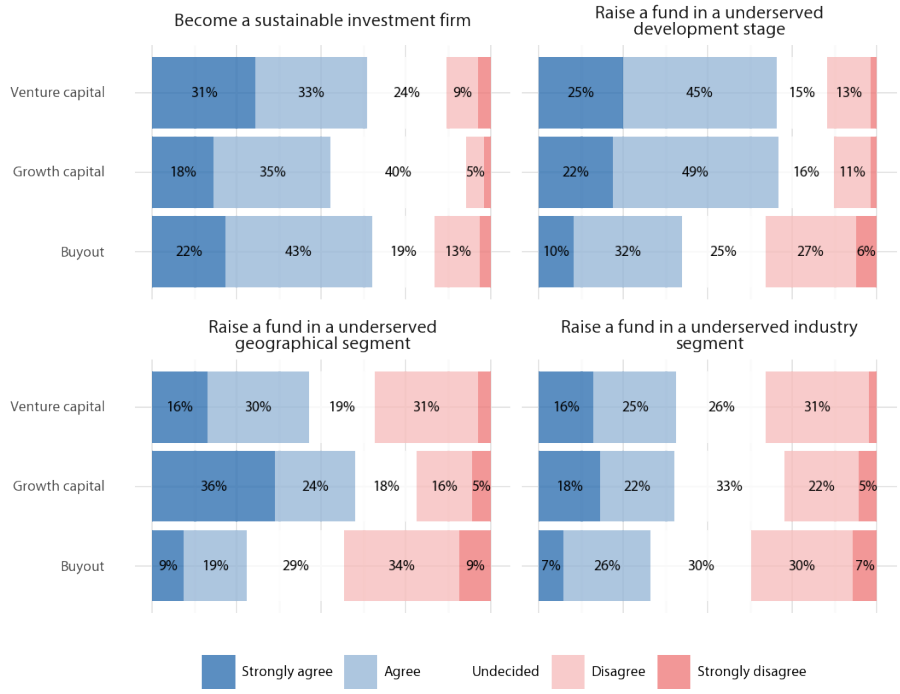
Please indicate to what extent you agree or disagree with the following statements regarding the EIF's impact on your investor base and fundraising process? The EIF partnership was vital for:



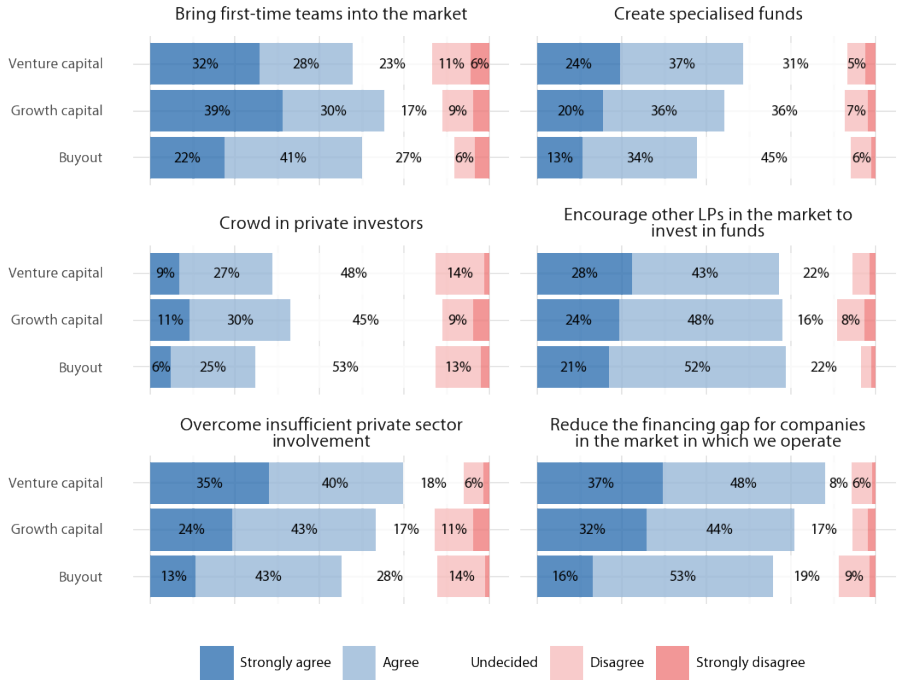

Please indicate to what extent you agree or disagree with the following statements regarding the EIF's impact on your fund's structure? The EIF helped my firm to:



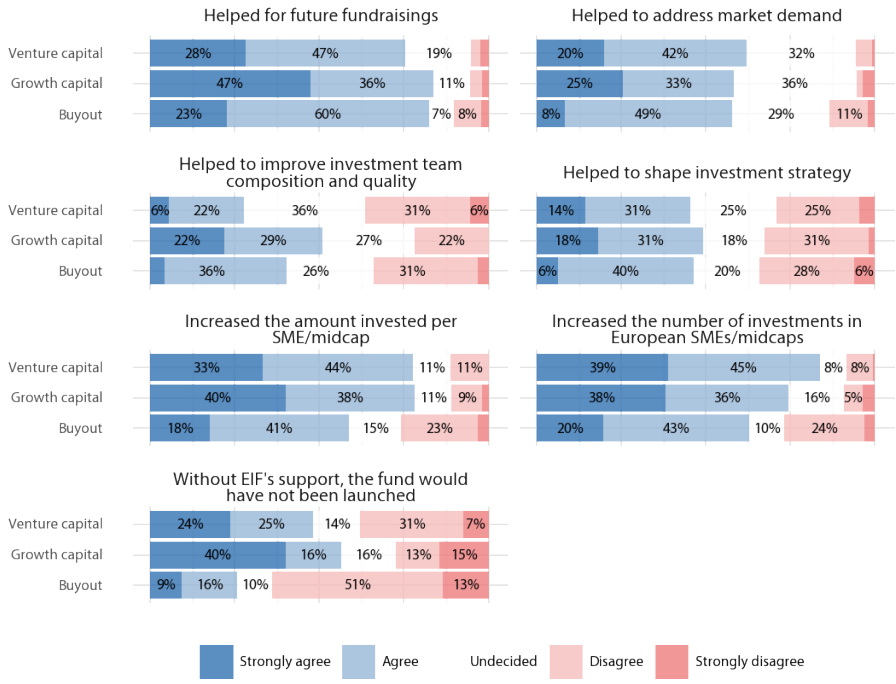
Do you agree or disagree with the following statements regarding the EIF's effect on your fund and the market in which you are operating? Due to the EIF's commitment, we were able to:



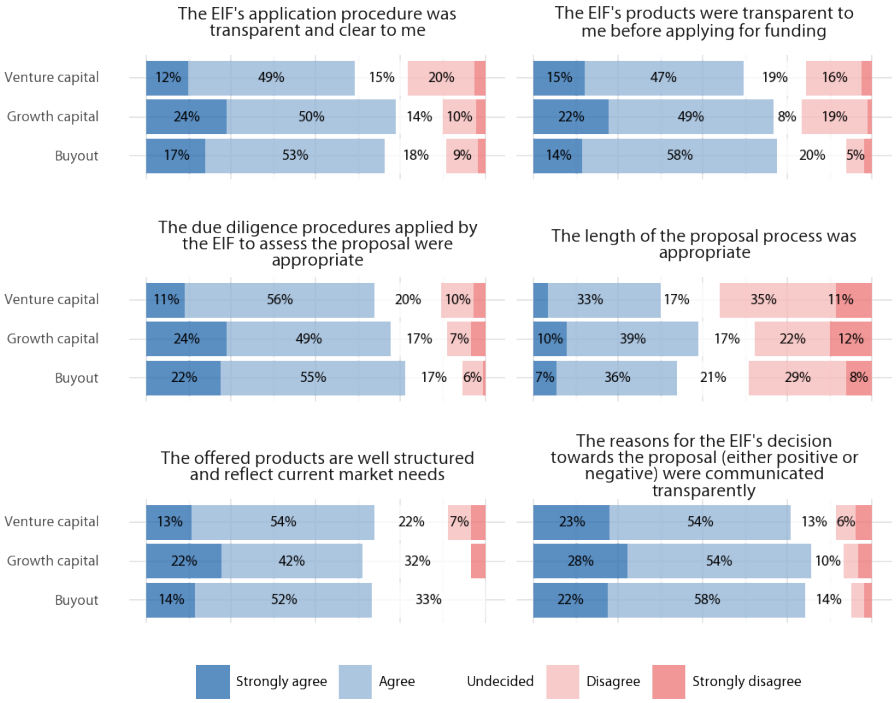

Do you agree or disagree with the following statements regarding the EIF's effect on the market in which you are operating? The EIF's presence in our market helps to:



## Do you agree or disagree with the following statements regarding the EIF's overall effect on your fund?




## Indicate to what extent you agree or disagree with the following statements regarding the EIF's products and procedures:



# Appendix 4: Counterfactual and crowding-in analyses — Technical annex

## Content

# Introduction

This technical note discusses the empirical approach employed to investigate the net causal impact of EIBG equity and quasi-equity operations on the economic performance of final beneficiaries, including innovation activity and investment attractiveness (crowding-in effect on private investment). This main objective has been translated into two specific evaluation questions (EQs):

- **EQ4**: To what extent did the EIBG equity and quasi-equity funding mobilise private capital (crowding-in effect) in the final beneficiaries?
- **EQ6**: To what extent did the EIBG equity and quasi-equity funding contribute to enhanced growth (turnover, employment, profits, assets) and innovation (intellectual property rights — IPR — profile) of the final beneficiaries?

EQ6 is analysed through a counterfactual analysis (Section 2), while EQ4 is assessed through an econometric model (Section 3).

Both the analyses build and expand on a literature review of similar studies carried out by the EIBG and other public programmes supporting small and medium businesses' access to finance through equity-like instruments. When considered pertinent, differences (or similarities) with previous EIBG studies are highlighted and results compared.

The appendix focuses on the description of methods, including data and results, to answer EQ4 and EQ6.

# The counterfactual analysis at the firm level

## 2.1 Methodology design and differences with existing studies

Most recent contributions conclude that private equity investments, including venture capital, help companies grow and develop. The literature shows that backed firms outperform non-backed companies with respect to a number of key performance indicators and identifies a number of factors underlying this success (see the literature review for details). Specifically, a set of recent studies by the EIF documents the positive effects of EIF-supported equity investments on investees' performance (such as assets, revenue, employment) and provides meaningful evidence towards the EIF's contribution to the financial growth and innovation of businesses in Europe.[63] Indeed, the EIF has a predominant role as a public risk capital provider in Europe covering 60% of the public intervention in the private equity market (see below).

While capitalising on existing EIF studies, **our analysis expands previous research as follows**:

- This analysis tested whether, and to what extent, the EIBG intervention via the intermediated channel (funds-of-funds) tackles the market failures in the private equity market, including the agency problem.[64] To achieve that goal, **the control group consists of SMEs and mid-caps that received private equity support from non-EIBG backed private investors** (in other words, non-public supported). **Their performance is then compared with treated peers receiving private equity financing from the EIBG**.[65] The theoretical assumption behind this choice is that the private equity market is affected by an agency problem failure when evaluating investees, and this failure cannot be tackled by fully private funds. In that case, public risk capital providers such as the EIBG can enter the market and contribute to address that failure both indirectly (via funds-of-funds) or via direct operations. From the empirical perspective, our control group exhibits demand for equity financing as the treated companies do, minimising the self-selection bias stemming from equity investment accessibility or firms' willingness to be invested in by external investors. This strategy allows the better isolation of the differential effect (if any)

[63] See Pavlova and Signore, (2019; 2021) among others.

[64] The public intervention, included public supported funds, in private equity markets is traditionally legitimised by market failure associated with: (i) a high degree of imperfect information in the context of SME financing (such as absence of a track record for startups); (ii) disproportionality with respect to the screening cost of assessing the quality of small companies relative to the potential financial return on investment; (iii) spillover effects (return to society) from private equity investments are not considered in private investment decisions, which are based on the expected private return. This makes the level of private equity investments suboptimal from a societal perspective (see the literature for details).

[65] To our knowledge, existing studies do not compare the performance of private equity/venture capital-backed companies with non-private equity/venture capital-backed companies at all.

attributable to the presence of the EIBG in a given equity investment as compared to other investors. [66] **Given this design, the absence of a positive effect between the economic performance of the EIBG-backed investees (treated) and non-EIBG-backed investees (controls) would suggest that EIBG private equity investments help companies grow and develop in the same way as fully "private" equity investors do.[67]**

- EIF studies exclusively focus on early-stage investments, whereas this assessment expands the scope of the previous studies by including both early-stage and later-stage interventions.
- **This analysis looks at an extended period using more recent data.** With respect to the analysis of Pavlova and Signore (2019; 2021) which focuses on the investment period 2007-2014, this analysis covers the 2010-2020 time span. The time shift is valuable because it adds more recent data and enlarges the open window on a period that has not been investigated by previous studies, which focused narrowly on cyclical downturns following the global financial crises.
- **Unlike the EIF studies, this analysis is based on M-DID estimates.** The use of this technique brings in relevant advantages, such as reducing possible bias from time-invariant unobservable firms' characteristics both in the matching and in the estimation phase.[68]
- **M-DID estimates draw on a recent estimation procedure for panel data** implemented in the *flexpaneldid* command for STATA developed by Dettmann et al. (2020).[69] It has the advantage of **properly accounting for time-related information on treatment and outcome variables** in the database and further minimising the potential bias in the estimated causal impact from other factors (see Section 2.4.2 for details).[70]

## 2.2 Identification strategy

The identification strategy stems from the standard theoretical framework used in programme evaluation based on the counterfactual approach.[71] It is described in detail in the Box below.

**Box 13: Identification strategy**

Let $Y_i$ be the observed outcome variable of company $i$ and $T_i \in \{0,1\}$ the treatment variable, with $T_i = 1$ if the company $i$ has received the treatment and $0$ otherwise. In our setting the treatment corresponds to the status of having been invested in by the EIBG, that is, being listed in the EIBG indirect equity investments portfolio. Let $Y_i^1$ denote the potential outcome of a treated company, and $Y_i^0$ the potential outcome of the control unit. In terms of potential outcomes, the causal effect of the treatment could be measured by the difference $Y_i^1 - Y_i^0$.

The difference between the potential outcomes cannot be measured empirically because the potential outcome ($Y_i^0$) (what the performance of treated companies would have been if they had not received the treatment) cannot be observed. However, under certain conditions, it is possible to link observed outcomes to their potential values. The first condition is the Stable Unit Treatment Value Assumption (SUTVA)[72]. It requires that the potential outcome of each company is independent of the treatment assignment of other firms; put differently, potential outcomes for any company do not vary with the treatments assigned to other companies:

$$Y_i = Y_i^1 T_i + Y_i^0 (1 - T_i) \quad (1)$$

In principle, we would be interested in measuring the average treatment effect on the treated ($ATT = E[Y^1 - Y^0 | T = 1]$) that corresponds to the average difference in the potential outcome variables for treated firms. However,

[66] The empirical strategy by Pavlova and Signore (2019) compares the economic performance of EIF venture capital-backed startups with a control group of non-venture capital-backed peers, therefore leaving in the analysis potential sources of (self-) selection bias. The authors are aware that their identification strategy can only identify the cumulated effect of a venture capital investment, without isolating the differential effect (if any) attributable to the presence of the EIF in a given venture capital investment (Pavlova and Signore, 2019; p. 25)

[67] In other words, the goal of this analysis is to shed light on the extent to which the EIBG's delivery model of intermediated intervention through private funds can overcome the agency problem generally associated with public interventions on private equity markets and can replicate the benefits often attributed to private risk capital providers. Under the assumption that EIBG-backed companies would have received a full private equity investment anyway, the performance and innovativeness of EIBG-supported companies are evaluated against recipients of other privately-funded risk capital. It should be said that the EIBG intervention in the private equity market is mainly driven by public goals and is not motivated by competition reasons with fully private funds.

[68] For instance, in the paper by Pavlova and Signore (2019) when the matching difference-in-differences (M-DID) estimate was performed as a robustness check, the sample size of treated firms entering the econometric analysis collapsed up to 16 firms.

[69] The estimator developed by Dettmann et al. (2020) builds on the assumptions by Callaway and Sant'Anna (2019) and Imai et al. (2019) approaches.

[70] Issues include: the economic cycle influences on the estimated causal impact (such as after/before crises) (Heckman et al., 1999); the heterogeneity of the treatment over time (which can also depend on the economic situation) (Bergemann et al., 2009); applicants' behavioural changes that anticipate the treatment (Ashenfelter's dip or Fallacy of alignment) (Ashenfelter, 1978; Heckman et al., 1999). Moreover, the influence of multiple treatments is duly considered.

[71] Angrist and Pischke (2009).

[72] Rubin (1980).

since the potential outcome ($Y_i^0$) is unobservable, it is common practice to estimate the $ATT$ in relation to the average treatment effect (ATE) given by (from now on the sub-script $i$ is omitted for simplicity):

$$ATE = E[Y|T = 1] - E[Y|T = 0] \quad (2)$$

The ATE is measurable since it is based on observed outcomes, but poses an identification challenge because the $ATT$ and $ATE$ do not necessarily coincide. In the case that the assignment of the treatment depends on potential outcomes, the true causal impact can be over(under)estimated depending on the relationship between the treatment and the potential outcome. In such cases, the $ATE$ can be rewritten as:

$$ATE = ATET + E[Y^0|T = 1] - E[Y^0|T = 0] \quad (3)$$

In the context of our analysis, this would happen, for instance, if EIBG-supported funds tend to select only specific types of firms ( such as high-growth enterprises), while non-EIBG backed funds do not. In that case, it is likely that the estimated causal impact on the economic performance indicators (such as the number of employees) attributable to the presence of the EIBG is overestimated because treated companies would have had better performance than controls even in the absence of the treatment $E[Y^0|T = 1] > E[Y^0|T = 0]$.This is not the case of the EIBG intervention, so this concern is minimised. Moreover, the companies in our control group have received equity investment from non-EIBG-backed funds, therefore self-selection bias stemming from equity investment accessibility or firms' willingness to be invested in by external investors is minimised too (see Pavlova and Signore, 2021; 2019).

Despite our effort to minimise the (self-) selection bias, it is still possible that the bias is non-zero because equity investments are not provided randomly. Accordingly, our identification strategy was designed to mimic a randomised controlled trial on observables firms' characteristics. Let $X_i$ be a vector of a set of observable features of firm $i$ such that $X_i^1 = X_i^0$ for each $i$, under the conditional independence assumption (CIA), potential outcomes are independent on the treatment conditional on such observables, in other words, $(Y^1, Y^0) \perp T|X$. Formally, we have:

$$E[Y^1 - Y^0|X] = E[Y|X, T = 1] - E[Y|X, T = 0] \quad (4)$$

Moreover, if the probability of receiving the treatment conditional on observables strictly falls between 0 and 1 (common support), $0 < P(T = 1|X) < 1$, it follows that the $ATT$ can be written as:

$$ATT = \int (E[Y|X, T = 1] - E[Y|X, T = 0])dP(X|T = 1) \quad (5)$$

Under the conditional independence assumption and common support assumptions, the $ATT$ is estimated by comparing the performance of treated companies against the performance of control companies with similar characteristics in $X_i$. The selection of the sub-sample of companies entering our control group is run by applying exact matching with propensity score matching (PSM).[73]

The combination of exact matching with the PSM serves to minimise the (self-) selection bias from observables (the validity of the matching procedure is tested by looking at the balancing properties). However, treated and controls may still differ on unobservable characteristics that we cannot control for. To address this issue, we exploit the longitudinal structure of our dataset to control for time-invariant unobserved characteristics and for each performance indicator used to test the ATT, we always test the common trend assumption:

$$\begin{aligned} ATT = &\Big[E\big[Y(1)\big|p\big(X(0)\big), T = 1\big] - E\big[Y(1)\big|p\big(X(0)\big), T = 0\big]\Big] + \\ &- \Big[\big[E|Y(0)|p\big(X(0)\big), T = 1\big] - \big[E|Y(0)|p\big(X(0)\big), T = 0\big]\Big] \end{aligned} \quad (6)$$

Overall, the causal impact (ATT) is estimated in a two-step procedure. In the first step, the matching procedure is performed to identify a proper control group within the full sample of potential controls. In the second step, and under the validity of the matching, the DID estimation is run on the matched sample of treated and controls. The resulting estimator is the ATT, namely the differential effect attributable to the presence of the EIBG in a given private equity investment.

[73] Rosenbaum and Rubin (1983)

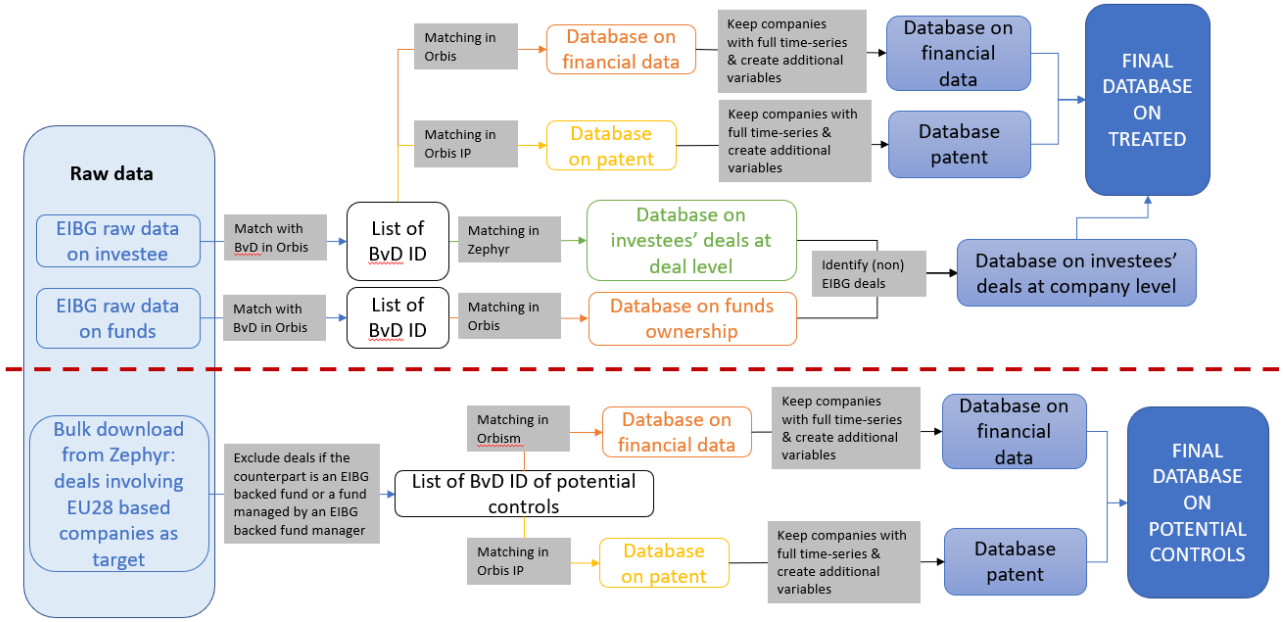
## 2.3 Data for the counterfactual analysis

Different data sources have been combined to perform the counterfactual analysis (**Figure 56**). The data sources include:

- The EIBG monitoring database for companies in the treated group;
- Bureau van Dijk's (BvD) Zephyr for the identification of the equity investments and funds, which are not supported by the EIBG.[74] The large pool of potential control companies was identified by combining Zephyr data and Orbis data (see below) after having excluded all equity deals and the related funds backed by the EIBG. By doing so, the identified potential control group only includes companies invested in by fully private investors (funds). Bureau van Dijk's Orbis, for firm financial data and performance indicators.
- Bureau van Dijk's Orbis IP (intellectual property) for patent data, used as proxy for innovation in our analysis.

All the data were collected according across EU28 and between 2010 and 2021.

**Figure 56 — Database structure**




Source: CSIL (Centre for Industrial Studies) own elaborations

### 2.3.1 EIBG monitoring database

The EIBG monitoring database on equity operations included three different types of operations:[75]

1. EIF indirect equity operations;
2. EIB indirect equity operations;
3. EIB direct equity operations.

For the purpose of the counterfactual analysis, EIB direct operations were excluded from the analysis, and the scope was restricted to EIF and EIB indirect operations.

[74] Bureau van Dijk's Zephyr is an international and comprehensive deal information database. It includes over two million rumoured, announced, and completed merger and acquisitions (M&A) transactions, initial public offerings (IPOs), secondary equity offerings (SEOs), and private equity and venture capital deals, with integrated financial and ownership information. The database includes deals on which information is published in a wide range of media, such as the popular business press as well as specialised publications in the area of corporate finance. It does not impose a minimum deal value to be included in the database, which guarantees that the information is not limited to large deals only. For each deal a large amount of information is published, such as firm-specific characteristics of targets and acquirers, including geographic and industry information, deal value as well as the announcement and closure dates. The Zephyr database might fail in including the most exhaustive list of private equity deals (Bollaert and Delanghe, 2015). However, it has the advantage of providing for each deal the full list of entities involved and their role.

[75] Indirect operations refer to investments delivered via third-party investors (funds-of-funds), while direct operations are equity investments in final beneficiaries directly managed by the EIBG. EIF indirect equity operations date back to 1987 and started reaching out to an increasing number of final investees from 2012 onwards. EIB indirect operations are more recent and date back to 2010. Since then, they have targeted a limited number of companies. EIB direct equity operations date back to 1998, but the number (and the invested amount) has reached a critical mass only in very recent years, from 2016 onwards.

As regards EIBG indirect equity operations, we only considered investments that took place between 2010 and 2018 to observe a congruous period after the investment and measure impacts.[76] Investees that received support before 2010 were excluded as well because out of scope. The database was also cleaned by removing corporates, and investees based outside EU28, investees with EIBG's equity investment share equal to zero, and investees associated with other operations different from equity. No restrictions were applied as regards the sector of activity of the investees, the location of the fund, the development stage of the company, or the fund strategy.

Table 4 reports aggregate statistics by country of the EIBG's indirect equity investments. The dataset includes 11 945 individual equity investments to 5 400 investees.[77] Total EIBG equity investment to European SMEs and mid-caps through these operations amounted to €7.1 billion between 2010 and 2018. Significant heterogeneity is observed across countries. The largest recipients both in terms of the number of investments and the total amount received were France, the United Kingdom and Germany. However, it is interesting to note that the average invested amounts vary substantially across countries, ranging from €1.2 billion in Portugal to €184 million in Slovakia. When data by year is analysed, the invested amount steadily increased over time reaching about €3 billion in 2018.

**Table 4: EIBG equity investment data by country and by year**

| | By country | | | | |
|---|---|---|---|---|---|
| | Equity investments (in #) | Share (in %) | Amount (in EUR m) | Share (in %) | Average size (in EUR k) |
| Austria | 161 | 1.35% | 59 | 0.83% | 367 |
| Belgium | 264 | 2.21% | 155 | 2.18% | 588 |
| Bulgaria | 291 | 2.44% | 94 | 1.32% | 321 |
| Croatia | 40 | 0.33% | 18 | 0.25% | 445 |
| Cyprus | 5 | 0.04% | 4 | 0.06% | 898 |
| Czech Republic | 37 | 0.31% | 17 | 0.23% | 450 |
| Denmark | 215 | 1.80% | 155 | 2.19% | 723 |
| Estonia | 81 | 0.68% | 46 | 0.65% | 570 |
| Finland | 294 | 2.46% | 153 | 2.15% | 520 |
| France | 1 978 | 16.56% | 1 430 | 20.11% | 723 |
| Germany | 2 829 | 23.68% | 1 254 | 17.63% | 443 |
| Greece | 378 | 3.16% | 129 | 1.82% | 342 |
| Hungary | 24 | 0.20% | 24 | 0.34% | 999 |
| Ireland | 308 | 2.58% | 128 | 1.81% | 417 |
| Italy | 502 | 4.20% | 431 | 6.07% | 859 |
| Latvia | 36 | 0.30% | 30 | 0.42% | 836 |
| Lithuania | 112 | 0.94% | 51 | 0.72% | 457 |
| Luxembourg | 88 | 0.74% | 32 | 0.44% | 359 |

[76] Data are readily available until 2022. However, in line with the literature and for practical purposes, we consider only those operations that can be monitored for a sufficiently long period after the equity investment has occurred. To guarantee at least three years of follow-up, we cut the investee sample in 2018 to track the financial performance of the beneficiaries up to 2021, namely the last available year for the financial data in Orbis at the time of the data extraction (February 2022).

[77] It is possible that a company received multiple EIBG-backed equity investments in the same year, or across a number of years. For the purpose of the analysis, we treat only the first occasion as treatment.

| | | | | | |
|---|---|---|---|---|---|
| Netherlands | 649 | 5.43% | 443 | 6.23% | 683 |
| Poland | 106 | 0.89% | 87 | 1.23% | 823 |
| Portugal | 108 | 0.90% | 132 | 1.85% | 1 220 |
| Romania | 75 | 0.63% | 47 | 0.66% | 622 |
| Slovakia | 68 | 0.57% | 13 | 0.18% | 184 |
| Slovenia | 15 | 0.13% | 4 | 0.06% | 265 |
| Spain | 737 | 6.17% | 543 | 7.64% | 737 |
| Sweden | 375 | 3.14% | 243 | 3.41% | 647 |
| United Kingdom | 2 169 | 18.16% | 1 388 | 19.52% | 640 |
| Total | 11 945 | 100.00% | 7 110 | 100.00% | 595 |

| By year | | | | | |
|---|---|---|---|---|---|
| | Equity investments (in #) | Share (in %) | Amount (in EUR m) | Share (in %) | Mean size (in EUR k) |
| 2010 | 64 | 0.54% | 29 | 0.41% | 454 |
| 2011 | 200 | 1.67% | 112 | 1.57% | 558 |
| 2012 | 483 | 4.04% | 263 | 3.70% | 544 |
| 2013 | 786 | 6.58% | 407 | 5.72% | 517 |
| 2014 | 1 294 | 10.83% | 672 | 9.46% | 520 |
| 2015 | 1 727 | 14.46% | 969 | 13.63% | 561 |
| 2016 | 2 080 | 17.41% | 1 254 | 17.64% | 603 |
| 2017 | 2 321 | 19.43% | 1 463 | 20.58% | 631 |
| 2018 | 2 990 | 25.03% | 1 941 | 27.30% | 649 |
| Total | 11 945 | 100.00% | 7 110 | 100.00% | 595 |

Source: CSIL own elaborations based on raw data provided by EIB/EV

Note: The numbers correspond to the raw data and therefore include multiple investments to the same investee.

### 2.3.2 Matching EIBG investment data with Orbis data (the treated group).

**The final database obtained after combining the EIBG monitoring database with Orbis consisted of 4 199 EIBG-backed investees over a starting sample of 5 400 unique investees (77.6%).** The matching procedure is explained in detail below.

We used the Orbis dataset to retrieve information on the financial and economic performance of EIBG indirect equity operations' beneficiaries. Orbis is a commercial dataset and it contains firm-level financial statements and ownership data. The main advantage is that data are standardised and comparable across countries. The database is widely used in economic research as a source of firm-level data for micro-econometric analysis and has been widely used in existing studies on the impact of private equity and venture capital investments on investees, including studies by the EIF.

Out of our 5 400 unique investees, we found a match in Orbis for 4 423 of them (81.9%). To match investees' data with Orbis data we employed a mixed strategy. Firms in Orbis have a unique identifier, the Bureau van Dijk ID (BvD ID), which serves to easily retrieve the respective financial data from the database for the identified firm. However, the BvD ID in the EIBG monitoring database was only available for a subset of firms. Therefore, to retrieve investees' financial data we had to:

- **For companies with the BvD ID available**, the list of BvD IDs was uploaded on Orbis and financial data were downloaded. In some cases, the available BvD IDs were removed by Bureau van Dijk either because historical records were missing or because they had only been temporarily created, while some others were not correct and therefore the search algorithm did not find the respective BvD ID. In the latter case, the companies were added to the list of companies without the BvD ID.
- **For companies without the BvD ID available,** the Orbis Batch Search algorithm was exploited. It is a built-in function in the Orbis platform and enables BvD IDs to be identified based on a set of information at the company level: the name, the city, the country, and the identifier (EU VAT or national identifier). The output is the corresponding BvD ID and a score denoting the quality of matching, which ranges from A (best quality) to D (poorest quality). To ensure the reliability of the analysis and prevent erroneous pairs from entering the final dataset, only investees with high-quality matching were retrieved, in other words, matching scores equal to A.

Figure 57 and Figure 58 show the success of the matching procedure. We successfully paired 82% of the EIBG beneficiaries with a record in Orbis. On average, 94% of beneficiaries were matched in each country. Belgium and Greece show the poorest matching with coverage of 61% and 73%, respectively. Looking at the matching by year, on average 92% of beneficiaries that received equity were matched each year. In 2010, the matching share is 74%. The matching quality indicates that, at this stage, data availability attrition is not an issue.

**Figure 57: Matching output by country**

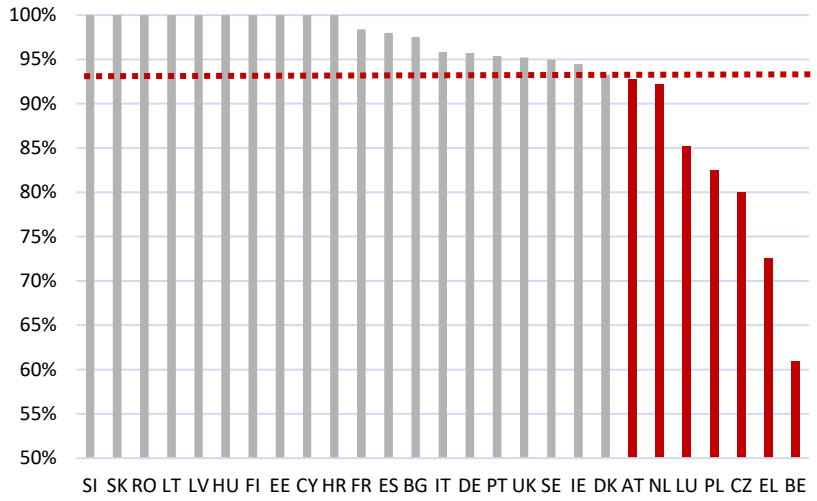
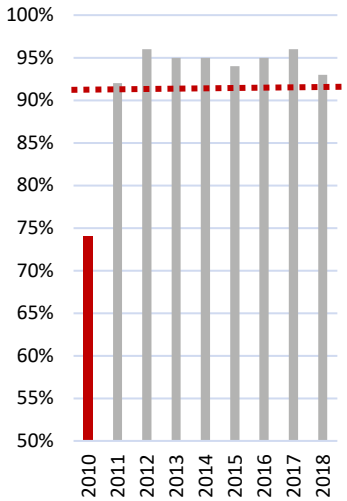



**Figure 58: Matching output by year**




Source: CSIL own elaborations

Several firms that were successfully matched in Orbis had an incomplete time series of their financial data and had to be removed.[78] All financial data were already converted into EUR by Orbis.[79] We undertook a data cleaning procedure by excluding observations with odd or inconsistent values following the approach by Amamou et al. (2020). We drop firm-year observations in which data from the balance sheet (such as total assets, fixed assets, intangible fixed assets, total shareholder funds, liabilities, etc.) had negative values. We check the consistency of the data and drop the firm-year financial statements when the basic balance-sheet equivalences are violated by more than 10%. We verified if total

[78] For the counterfactual analysis, we need to observe the outcome variables of interest for at least one year before and three years after the equity investment.

[79] In the case of companies located outside the euro area, conversions were provided by Orbis.

assets correspond to total liabilities and whether total assets correspond to the sum of fixed assets and current assets. Lastly, we also deflated variables using the country-specific Harmonised Index of Consumer Prices (HICP) deflators.

As for patent data, we assumed that the firm had not filed any patents in that year if the data were missing. This is likely the case as Bureau van Dijk's IP uses nearly all available patent sources in the world.

Lastly, we kept only industrial companies and removed from the database other typologies of beneficiaries including financial companies, banks, insurance companies, research institutes, mutual and pension funds, private equity firms and venture capitalists. These typologies represented 5% of the total number of investees in our database. As mentioned above, the final database consisted of 4 199 EIBG-backed investees.

### 2.3.3 The identification of potential controls

In principle, all SMEs and mid-caps based in EU28 that received an equity investment from a non-EIBG backed investor between 2010 and 2018 were eligible candidates to enter the control group. The steps that we followed to design the control group included:

1. Collecting from Orbis information on the full ownership of the funds, fund managers, and business angels[80] that acted as intermediaries for the EIBG indirect operations. This step was necessary to identify which funds had public investors and exclude them.[81]
2. Collecting data on all deals included in Zephyr.

From Zephyr, we downloaded an initial database of 608 375 deals. We performed a data cleaning procedure (Table 2) to identify eligible companies and identified a sample of potential controls totalling 15 621 companies.

**Table 5: Actions to identify potential controls**

| # | Action | N. of deals |
|---|---|---|
| 1 | Download from Zephyr of all completed deals whose target company is in EU28 | 608 375 |
| 2 | Identification of deals where EIBG final beneficiaries are targets or acquirors | 11 536 |
| 3 | Exclusion of deals where EIBG-backed funds are involved (excluding EIBG beneficiaries) | 30 364 |
| 4 | Exclusion of deals involving target companies found at step 3 | 107 003 |
| 5 | Exclusion of deals when the BvD ID of the target company is missing | 70 968 |
| 6 | Exclusion of deals where the acquiror BvD ID is missing | 133 927 |
| 7 | Exclusion of deals involving target companies found at step 6 | 66 469 |
| 8 | Exclusion of deals where EIBG-backed funds are the target | 43 |
| 9 | Exclusion of deals where the target has never been involved in a private equity deal[82] | 154 695 |
| 10 | Exclusion if the first private equity deal took place in 2022 | 140 |
| 11 | Exclusion if the latest private equity deal took place before 2010 | 10 700 |
| 12 | Exclusion if a single deal is recorded per target and it is an "exit" | 1 772 |

Source: CSIL own elaborations

**Table 6** shows the distribution of treated and potential controls by country and by year of investment. The ratio between potential controls and treated investees is shown in the last column. Treated and controls are heterogeneously distributed across countries, but the two distributions are pretty homogeneous. The ratio of potential controls over treated varies across countries, ranging from 0.37 in Greece to 69.00 in Cyprus.

[80] The full list of business angels was collected from the EIB website.

[81] A batch search based on the name and the country of the fund (manager) or business angel was performed in Orbis to collect information on the BvD ID of the fund or fund manager. Based on the resulting list of BvD IDs, information on BvD IDs of the full lists of funds managed by fund managers, their global ultimate owner (GUO), their domestic ultimate owner (DUO), and their immediate shareholder (ISH) were retrieved from Orbis. The global ultimate owner exercises the greatest degree of control over the firm and is not itself controlled by any other company. The domestic ultimate owner is the highest company in the ownership pyramid located in the same country as the fund (manager). The immediate shareholder is the largest direct shareholder of the firm and may or may not be located in the same country.

[82] We consider a deal an equity investment if it is classified in Zephyr as "Angel investment", "Capital increase", "Corporate venturing", "Development capital", "Mezzanine", "PIPE", "Private equity", "Recapitalisation" or "Venture capital".

**Table 6: Distribution of treated and potential controls by country and by year**

| By country | | | | | |
|---|---|---|---|---|---|
| | No. of treated companies (in #) | Share (in %) | No. of potential controls (in #) | Share (in %) | Potential controls over treated |
| Austria | 89 | 2.0% | 151 | 1.0% | 1.70 |
| Belgium | 84 | 1.9% | 332 | 2.1% | 3.95 |
| Bulgaria | 198 | 4.5% | 727 | 4.7% | 3.67 |
| Croatia | 16 | 0.4% | 27 | 0.2% | 1.69 |
| Cyprus | 1 | 0.0% | 69 | 0.4% | 69.00 |
| Czech Republic | 8 | 0.2% | 163 | 1.0% | 20.38 |
| Denmark | 83 | 1.9% | 318 | 2.0% | 3.83 |
| Estonia | 33 | 0.7% | 70 | 0.5% | 2.12 |
| Finland | 104 | 2.4% | 563 | 3.6% | 5.41 |
| France | 861 | 19.5% | 1 599 | 10.2% | 1.86 |
| Germany | 695 | 15.7% | 1 482 | 9.5% | 2.13 |
| Greece | 87 | 2.0% | 32 | 0.2% | 0.37 |
| Hungary | 9 | 0.2% | 334 | 2.1% | 37.11 |
| Ireland | 103 | 2.3% | 305 | 2.0% | 2.96 |
| Italy | 206 | 4.7% | 767 | 4.9% | 3.72 |
| Latvia | 22 | 0.5% | 55 | 0.4% | 2.50 |
| Lithuania | 94 | 2.1% | 50 | 0.3% | 0.53 |
| Luxembourg | 23 | 0.5% | 66 | 0.4% | 2.87 |
| Malta | 0 | 0.0% | 29 | 0.2% | 0.00 |
| Netherlands | 225 | 5.1% | 952 | 6.1% | 4.23 |
| Poland | 33 | 0.7% | 859 | 5.5% | 26.03 |
| Portugal | 62 | 1.4% | 147 | 0.9% | 2.37 |
| Romania | 44 | 1.0% | 100 | 0.6% | 2.27 |
| Slovakia | 29 | 0.7% | 37 | 0.2% | 1.28 |
| Slovenia | 7 | 0.2% | 41 | 0.3% | 5.86 |
| Spain | 342 | 7.7% | 1 398 | 9.0% | 4.09 |
| Sweden | 132 | 3.0% | 955 | 6.1% | 7.23 |
| United Kingdom | 833 | 18.8% | 3 993 | 25.6% | 4.79 |
| Total | 4 423 | 100% | 15 621 | 100% | 3.53 |

| By year | | | | | |
|---|---|---|---|---|---|
| | No. of treated companies (in #) | Share (in %) | No. of potential controls (in #) | Share (in %) | Potential controls over treated |
| 2010 | 25 | 0.6% | 1 407 | 9.0% | 56.28 |
| 2011 | 88 | 2.0% | 1 357 | 8.7% | 15.42 |
| 2012 | 218 | 4.9% | 1 415 | 9.1% | 6.49 |
| 2013 | 339 | 7.7% | 1 700 | 10.9% | 5.01 |
| 2014 | 532 | 12.0% | 2 245 | 14.4% | 4.22 |
| 2015 | 658 | 14.9% | 1 955 | 12.5% | 2.97 |
| 2016 | 753 | 17.0% | 1 778 | 11.4% | 2.36 |
| 2017 | 829 | 18.7% | 1 864 | 11.9% | 2.25 |
| 2018 | 981 | 22.2% | 1 900 | 12.2% | 1.94 |
| Total | 4 423 | 100.0% | 15 621 | 100.0% | 3.53 |

Source: CSIL own elaborations

Note: Treated units include only companies that were successfully matched in Orbis.

When creating the dataset for the control group we followed the same procedures applied to the treated companies.

## 2.4 Empirical approach

In what follows, we describe the method to select the counterfactual control sample by combining the exact matching with the propensity score matching (PSM) and difference-in-differences (DID) methodology to estimate the impact of the EIBG's indirect equity support on final beneficiaries.

### 2.4.1 Matching phase

The goal of the matching phase is to match beneficiary firms (treated group) with identical firms that received equity from non-EIBG-backed funds (control group). We implement the estimator of Abadie and Imbens (2006) via a combination of exact and propensity score matching. Propensity score matching (Rosenbaum and Rubin, 1983) is a non-parametric estimator of causal effects widely used in the evaluation literature. It addresses the limits of least square analysis in the presence of observational data, while it also avoids the so-called curse of dimensionality, significantly restricting the feasibility of matching estimators. The propensity score matching is improved by the exact matching strategy. Exact matching stratifies the sample according to relevant dimensions and identifies the control twin for each treated company based on selected variables (Costalli and Negri, 2021). Since the exact matching may lead to situations where many treated are unmatched because no controls are identical on all selected matching variables, the combination of the two methods allows for a minor loss of treated to still ensure a good match.

Although treated and potential controls have both received equity investments, the two groups are not balanced on the outcome variables (performance indicators) nor on most of the variables that are likely to influence either the treatment or the outcome itself. Table **7** shows the descriptive statistics of the variables entering the analysis before the matching. They include the investment year, the firm's structural features, management features, and outcome variables.

**Table 7: Descriptive statistics on treated and potential controls before the matching phase**

| | Observation | | Mean | | Standard deviation | | Min | | Max | |
|---|---|---|---|---|---|---|---|---|---|---|
| | T | C | T | C | T | C | T | C | T | C |
| **Investment year** | | | | | | | | | | |
| 2010 | 4 199 | 14 617 | 0.01 | 0.09 | 0.07 | 0.29 | 0 | 0 | 1 | 1 |
| 2011 | 4 199 | 14 617 | 0.02 | 0.09 | 0.14 | 0.28 | 0 | 0 | 1 | 1 |
| 2012 | 4 199 | 14 617 | 0.05 | 0.09 | 0.22 | 0.29 | 0 | 0 | 1 | 1 |
| 2013 | 4 199 | 14 617 | 0.08 | 0.11 | 0.27 | 0.31 | 0 | 0 | 1 | 1 |
| 2014 | 4 199 | 14 617 | 0.12 | 0.14 | 0.33 | 0.35 | 0 | 0 | 1 | 1 |
| 2015 | 4 199 | 14 617 | 0.15 | 0.13 | 0.36 | 0.33 | 0 | 0 | 1 | 1 |
| 2016 | 4 199 | 14 617 | 0.17 | 0.11 | 0.38 | 0.32 | 0 | 0 | 1 | 1 |
| 2017 | 4 199 | 14 617 | 0.19 | 0.12 | 0.39 | 0.33 | 0 | 0 | 1 | 1 |
| 2018 | 4 199 | 14 617 | 0.22 | 0.12 | 0.41 | 0.33 | 0 | 0 | 1 | 1 |
| **Firm's structural features** | | | | | | | | | | |
| **Macro-region** | | | | | | | | | | |
| BRITISH ISLES | 4 196 | 14 600 | 0.23 | 0.27 | 0.42 | 0.44 | 0 | 0 | 1 | 1 |
| CESEE | 4 196 | 14 600 | 0.11 | 0.16 | 0.31 | 0.37 | 0 | 0 | 1 | 1 |
| DACH | 4 196 | 14 600 | 0.17 | 0.11 | 0.38 | 0.31 | 0 | 0 | 1 | 1 |
| FR & BENELUX | 4 196 | 14 600 | 0.27 | 0.19 | 0.44 | 0.39 | 0 | 0 | 1 | 1 |
| NORDICS | 4 196 | 14 600 | 0.07 | 0.12 | 0.26 | 0.32 | 0 | 0 | 1 | 1 |
| SOUTH | 4 196 | 14 600 | 0.15 | 0.15 | 0.35 | 0.36 | 0 | 0 | 1 | 1 |
| **Size (based on the number of employees)** | | | | | | | | | | |
| MICRO | 2 172 | 7 616 | 0.43 | 0.39 | 0.49 | 0.49 | 0 | 0 | 1 | 1 |
| SMALL | 2 172 | 7 616 | 0.3 | 0.3 | 0.46 | 0.46 | 0 | 0 | 1 | 1 |
| MEDIUM | 2 172 | 7 616 | 0.2 | 0.22 | 0.4 | 0.41 | 0 | 0 | 1 | 1 |
| MID-CAPS | 2 172 | 7 616 | 0.07 | 0.09 | 0.25 | 0.29 | 0 | 0 | 1 | 1 |
| **Firm's structural features** | | | | | | | | | | |
| **Sector (as from EIF based on Invest Europe)** | | | | | | | | | | |
| ICT | 4 071 | 14 164 | 0.42 | 0.29 | 0.49 | 0.45 | 0 | 0 | 1 | 1 |
| LIFE SCIENCE | 4 071 | 14 164 | 0.1 | 0.07 | 0.3 | 0.26 | 0 | 0 | 1 | 1 |
| SERVICE | 4 071 | 14 164 | 0.29 | 0.34 | 0.46 | 0.47 | 0 | 0 | 1 | 1 |
| OTHER | 4 071 | 14 164 | 0.18 | 0.3 | 0.38 | 0.46 | 0 | 0 | 1 | 1 |
| **Age category** | | | | | | | | | | |
| 0 years | 4 189 | 14 600 | 0.25 | 0.08 | 0.43 | 0.27 | 0 | 0 | 1 | 1 |
| 1-3 years | 4 189 | 14 600 | 0.33 | 0.28 | 0.47 | 0.45 | 0 | 0 | 1 | 1 |
| 4-9 years | 4 189 | 14 600 | 0.2 | 0.28 | 0.4 | 0.45 | 0 | 0 | 1 | 1 |
| 10-20 years | 4 189 | 14 600 | 0.13 | 0.21 | 0.34 | 0.41 | 0 | 0 | 1 | 1 |
| > 20 years | 4 189 | 14 600 | 0.08 | 0.15 | 0.28 | 0.36 | 0 | 0 | 1 | 1 |
| **Age** | | | | | | | | | | |
| Age (ln) | 4 139 | 14 550 | 1.16 | 1.75 | 1.17 | 1.18 | 0 | 0 | 4.76 | 5.51 |
| **Firm's management features** | | | | | | | | | | |
| **Independence indicator** | | | | | | | | | | |
| A | 4 196 | 14 600 | 0.3 | 0.35 | 0.46 | 0.48 | 0 | 0 | 1 | 1 |
| B | 4 196 | 14 600 | 0.18 | 0.09 | 0.38 | 0.29 | 0 | 0 | 1 | 1 |
| C | 4 196 | 14 600 | 0.01 | 0.02 | 0.1 | 0.12 | 0 | 0 | 1 | 1 |
| D | 4 196 | 14 600 | 0.38 | 0.47 | 0.49 | 0.5 | 0 | 0 | 1 | 1 |
| Unknown | 4 196 | 14 600 | 0.13 | 0.07 | 0.34 | 0.26 | 0 | 0 | 1 | 1 |

| Outcome variables | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Firm's innovation activity** | | | | | | | | | | |
| No. of patents | 1 207 | 3 207 | 6.4 | 12.4 | 25.6 | 72.5 | 0 | 0 | 635 | 2 878.00 |
| **Profitability** | | | | | | | | | | |
| P/L before taxes (ln) | 641 | 3 531 | 13.6 | 13.2 | 2.5 | 2.6 | -0.1 | 0 | 17.8 | 20.7 |
| Turnover (ln) | 1 769 | 7 172 | 13.03 | 14.17 | 4.83 | 3.67 | 0 | 0 | 21.49 | 22.92 |
| No. of employees (ln) | 2 172 | 7 616 | 2.8 | 3 | 1.7 | 1.9 | 0 | 0 | 8 | 8 |
| Return on assets (ROA) | 1 690 | 7 288 | -11.1 | -5 | 29.6 | 28.2 | -100 | -100 | 96 | 100 |
| Return on equity (ROE) | 1 631 | 6 655 | -31.7 | -18.1 | 113 | 126.1 | -924.5 | -977.1 | 490.3 | 992.2 |
| **Size outcome indicators** | | | | | | | | | | |
| Capital (ln) | 2 645 | 10 341 | 9.8 | 10.5 | 3.7 | 4 | 0 | 0 | 18.9 | 22.8 |
| Total assets (ln) | 2 706 | 10 480 | 14.5 | 14.7 | 2.4 | 2.5 | 0 | 0 | 22.9 | 23.8 |
| Fixed assets (ln) | 2 706 | 10 465 | 11.9 | 12.5 | 4.4 | 4.3 | 0 | 0 | 21 | 23.7 |
| (Growth rate) No. of employees | 1 272 | 5 400 | 0.8 | 0.5 | 4.1 | 3.7 | -1 | -1 | 109 | 172 |
| Cost of personnel (ln) | 1 525 | 6 415 | 13.5 | 13.4 | 2.3 | 2.4 | 2.7 | 0 | 19 | 20.9 |
| **Asset allocation** | | | | | | | | | | |
| Cash over total assets | 2 561 | 9 794 | 0.4 | 0.2 | 0.3 | 0.3 | 0 | 0 | 1 | 1 |
| Tangible assets over total assets | 2 550 | 9 901 | 0.1 | 0.2 | 0.2 | 0.2 | 0 | 0 | 1 | 1 |
| Intangible assets over total assets | 2 549 | 9 867 | 0.1 | 0.1 | 0.2 | 0.2 | 0 | 0 | 1 | 1 |
| Liquidity ratio | 2 466 | 9 547 | 6.4 | 3.7 | 12.3 | 8.5 | 0 | 0 | 98.8 | 100 |

Source: CSIL own elaborations

The matching procedure is carried out on the full sample of potential controls identified in Section 2.3.3. Firstly, the treated units are paired with potential controls via exact matching, meaning that treated and controls are stratified by a set of variables, namely the investment year, the macro-region where the firm is located, the sector of activity, the size, and the age class. This generates 3 840 unique strata. As briefly mentioned in the previous section, to optimise the identification of controls, we narrow the analysis only to firms with available financial data in the year before and for the three years following the first equity investment.

The second step of the matching entails the construction of the PSM to estimate the conditional probability of being treated. We run a probit regression where the probability of receiving equity from an EIBG-backed fund is explained with a set of variables that are likely to influence the treatment and the outcome variable of interest. We augmented the probit regression with a set of firms' structural and management features, as well as with financial and innovativeness characteristics. The full list of variables used for the matching is included in Table 8. The selection of the variables used for the matching relied on common practice in the literature on equity investments, especially on the experience of the EIF's Research and Market Analysis division.

Following the literature[83], we also included in the PSM higher-level effects of variables, namely squared and cubic orders. The one-to-one nearest-neighbour matching algorithm with replacement was employed to match each treated company with its peer in the controls pool. Accordingly, each treated company is matched with the potential control firm that has the closest propensity score. The replacement option allows the same control company to be potentially

[83] See Pavlova and Signore (2019; 2021) among others.

paired with multiple treated firms, leading to higher-quality matches but being used less efficiently than the information provided by controls. (Caliendo and Kopeinig, 2005). To mitigate data loss, we run the matching separately for each outcome variable which implies that final matched samples could slightly differ across outcome variables. In any case, treated and controls were matched by considering the time t-1 as a pre-treatment period. As a robustness check the analysis was repeated by considering the three-year period from t-1 to t-3 as a pre-treatment period and the main results remained robust across different matching strategies.

**Table 8: Variables used in the matching phase**

| Variable | Type of matching | Main references |
|---|---|---|
| Investment year[84] | Exact | |
| **Firm's structural features** | | |
| Macro-region[85] | Exact | Pavlova and Signore (2019, 2021); Brown and Earle (2017) |
| Sector (Invest Europe)[86] | Exact | Pavlova and Signore (2019, 2021); Brown and Earle (2017) |
| Size category[87] | Exact | Amamou et al. (2020); Brown and Earle (2017) |
| Age category[88] | Exact | Pavlova and Signore (2019, 2021); Brown and Earle (2017) |
| Age (squared, cubic) (ln) | PSM | Brown and Earle (2017) |
| No. of employees (squared, cubic) (ln) | PSM | Amamou et al. (2020); Brown and Earle (2017) |
| **Firm's management features** | | |
| Independence indicator[89] | PSM | Pavlova and Signore (2021) |
| **Firm's financial history[90]** | | |
| Outcome variable (squared, cubic) (ln) | PSM | |
| Outcome variable (growth rate) | PSM | |
| **Firm's innovation activity** | | |
| Having at least one patent[91] | PSM | Pavlova and Signore (2019, 2021); Amamou et al. (2020) |

Source: CSIL own elaborations

**Table 9**, **Table 10** and **Table 11** show the balancing properties after the matching procedure for three selected outcome variables: fixed assets, turnover, and innovation (patents).[92] Results show that the matching enabled a significant reduction of the bias. All differences between the two samples are not statistically significant. The matched control group shows sufficient similarity to the treated group and is suitable for comparison.

[84] Categorical variable: 2010-2018
[85] Categorical: BRITISH ISLES, CESEE, DACH, FR & BENELUX, NORDICS, SOUTH
[86] Categorical: ICT, Life science, Service, Other
[87] Categorical: Micro, Small, Medium, Mid-cap
[88] Categorical: 0 years; 1-3 years; 4-10 years; 11-20 years; more than 20 years
[89] Categorical: A (no shareholders with >= 25% ownership), B (no shareholders with >= 50% ownership, but at least one with >= 25%), C (a shareholder with >= 50% ownership and/or an ultimate owner exists), D (a shareholder with a direct >= 50% ownership) , Unknown
[90] The set of matching variables included in the firm's financial history varies according to the outcome variable
[91] Categorical: (0/1)
[92] The set of tables with the balancing properties for all the other outcome variables is available upon request. Results do not substantially differ from those reported here. For each variable we calculate the standardised percentage bias, before and after the matching, defined as a percentage difference of the sample means in the treated and the matched control groups as a percentage of the square root of the average of the corresponding sample variances (Rosenbaum and Rubin, 1985).

**Table 9: Balancing properties for fixed assets**

| Variable | Mean | | | t-test | |
|---|---|---|---|---|---|
| | Treated | Control | % bias | t | p>\|t\| |
| Investment year | | | | | |
| 2010 | 0 | 0 | | | 1 |
| 2011 | 0.02 | 0.03 | | | 1 |
| 2012 | 0.03 | 0.03 | | | 1 |
| 2013 | 0.08 | 0.09 | | | 1 |
| 2014 | 0.15 | 0.16 | | | 1 |
| 2015 | 0.16 | 0.17 | | | 1 |
| 2016 | 0.25 | 0.23 | | | 1 |
| 2017 | 0.30 | 0.28 | | | 1 |
| 2018 | 0.01 | 0.01 | | | 1 |
| Macro-region | | | | | |
| BRITISH ISLES | 0.20 | 0.21 | | | 1 |
| CESEE | 0.09 | 0.09 | | | 1 |
| DACH | 0.04 | 0.05 | | | 1 |
| FR & BENELUX | 0.24 | 0.23 | | | 1 |
| NORDICS | 0.11 | 0.13 | | | 1 |
| SOUTH | 0.31 | 0.28 | | | 1 |
| Size (based on the no. of employees) | | | | | |
| MICRO | 0.19 | 0.22 | | | 1 |
| SMALL | 0.37 | 0.35 | | | 1 |
| MEDIUM | 0.35 | 0.35 | | | 1 |
| MID-CAP | 0.08 | 0.09 | | | 1 |
| Sector (as from EIF based on Invest Europe) | | | | | |
| ICT | 0.29 | 0.29 | | | 1 |
| LIFE SCIENCE | 0.08 | 0.08 | | | 1 |
| SERVICE | 0.26 | 0.27 | | | 1 |
| OTHER | 0.37 | 0.36 | | | 1 |
| Age category | | | | | |
| 0 years | 0 | 0 | | | 1 |
| 1-3 years | 0.11 | 0.10 | | | 1 |
| 4-9 years | 0.30 | 0.31 | | | 1 |
| 10-20 years | 0.35 | 0.36 | | | 1 |
| > 20 years | 0.23 | 0.23 | | | 1 |
| Age (ln) | 2.3775 | 2.3808 | -0.4 | -0.06 | 0.954 |
| $Age^2$ (ln) | 6.3861 | 6.3631 | 0.6 | 0.08 | 0.933 |
| $Age^3$ (ln) | 18.63 | 18.463 | 1 | 0.15 | 0.882 |
| Number of employees (ln) | 3.4194 | 3.4093 | 0.6 | 0.09 | 0.924 |
| Number of $employees^2$ (ln) | 14.173 | 14.154 | 0.2 | 0.02 | 0.980 |
| Number of $employees^3$ (ln) | 65.139 | 65.352 | -0.3 | -0.04 | 0.966 |
| Fixed $assets^2$ (ln) | 193.6 | 198.01 | -6.6 | -0.98 | 0.327 |
| Fixed $assets^3$ (ln) | 2 812.1 | 2 909.7 | -6.9 | -1.02 | 0.307 |
| Fixed assets growth rate | 1.676 | 1.2236 | 5.8 | 0.87 | 0.387 |
| Having at least one patent | 1.9528 | 1.964 | -5.6 | -0.84 | 0.402 |
| BvD independence indicator | 3.3438 | 3.4966 | -13 | -1.94 | 0.053 |
| Fixed assets (ln) | 13.664 | 13.857 | -7.6 | -1.13 | 0.258 |

Source: CSIL own elaborations

**Table 10: Balancing properties for turnover**

| Variable | Mean | | | t-test | |
|---|---|---|---|---|---|
| | Treated | Control | % bias | t | p>\|t\| |
| Investment year | | | | | |
| 2010 | 0 | 0 | | | 1 |
| 2011 | 0.04 | 0.05 | | | 1 |
| 2012 | 0.03 | 0.03 | | | 1 |
| 2013 | 0.08 | 0.10 | | | 1 |
| 2014 | 0.18 | 0.20 | | | 1 |
| 2015 | 0.16 | 0.16 | | | 1 |
| 2016 | 0.26 | 0.24 | | | 1 |
| 2017 | 0.25 | 0.21 | | | 1 |
| 2018 | 0 | 0 | | | 1 |
| Macro-region | | | | | |
| BRITISH ISLES | 0.11 | 0.12 | | | 1 |
| CESEE | 0.14 | 0.15 | | | 1 |
| DACH | 0.003 | 0.004 | | | 1 |
| FR & BENELUX | 0.17 | 0.17 | | | 1 |
| NORDICS | 0.16 | 0.18 | | | 1 |
| SOUTH | 0.41 | 0.37 | | | 1 |
| Size (based on the no. of employees) | | | | | |
| MICRO | 0.14 | 0.19 | | | 1 |
| SMALL | 0.38 | 0.32 | | | 1 |
| MEDIUM | 0.37 | 0.36 | | | 1 |
| MID-CAP | 0.11 | 0.13 | | | 1 |
| Sector (as from EIF based on Invest Europe) | | | | | |
| ICT | 0.28 | 0.27 | | | 1 |
| LIFE SCIENCE | 0.05 | 0.05 | | | 1 |
| SERVICE | 0.22 | 0.24 | | | 1 |
| OTHER | 0.44 | 0.44 | | | 1 |
| Age category | | | | | |
| 0 years | 0 | 0 | | | 1 |
| 1-3 years | 0.09 | 0.08 | | | 1 |
| 4-9 years | 0.29 | 0.30 | | | 1 |
| 10-20 years | 0.35 | 0.35 | | | 1 |
| > 20 years | 0.28 | 0.27 | | | 1 |
| Age (ln) | 2.4641 | 2.48 | -1.9 | -0.24 | 0.81 |
| Age2 (ln) | 6.8086 | 6.8423 | -0.8 | -0.1 | 0.918 |
| Age3 (ln) | 20.371 | 20.312 | 0.3 | 0.04 | 0.966 |
| Number of employees (ln) | 3.6661 | 3.6523 | 0.9 | 0.11 | 0.912 |
| Number of employees$^2$ (ln) | 15.858 | 15.91 | -0.4 | -0.06 | 0.955 |
| Number of employees$^3$ (ln) | 75.495 | 76.646 | -1.4 | -0.18 | 0.857 |
| Turnover$^2$ (ln) | 247.44 | 246.62 | 1.3 | 0.16 | 0.872 |
| Turnover$^3$ (ln) | 3 996.4 | 3 976.7 | 1.3 | 0.17 | 0.867 |
| Turnover growth rate | 20.939 | 10.087 | 4.9 | 0.63 | 0.528 |
| Having at least one patent | 1.954 | 1.9571 | -1.5 | -0.19 | 0.85 |
| BvD independence indicator | 3.5276 | 3.5982 | -6.5 | -0.83 | 0.407 |
| Turnover (ln) | 15.577 | 15.54 | 1.7 | 0.21 | 0.832 |

Source: CSIL own elaborations

**Table 11: Balancing properties for patenting activity**

| Variable | Mean | | | t-test | |
|---|---|---|---|---|---|
| | Treated | Control | % bias | t | p>\|t\| |
| Investment year | | | | | |
| 2010 | 0 | 0 | | | 1 |
| 2011 | 0.02 | 0.02 | | | 1 |
| 2012 | 0.02 | 0.02 | | | 1 |
| 2013 | 0.03 | 0.03 | | | 1 |
| 2014 | 0.07 | 0.08 | | | 1 |
| 2015 | 0.09 | 0.10 | | | 1 |
| 2016 | 0.11 | 0.10 | | | 1 |
| 2017 | 0.19 | 0.19 | | | 1 |
| 2018 | 0.24 | 0.24 | | | 1 |
| Macro-region | | | | | |
| BRITISH ISLES | 0.19 | 0.20 | | | 1 |
| CESEE | 0.02 | 0.03 | | | 1 |
| DACH | 0.16 | 0.16 | | | 1 |
| FR & BENELUX | 0.25 | 0.24 | | | 1 |
| NORDICS | 0.12 | 0.11 | | | 1 |
| SOUTH | 0.27 | 0.25 | | | 1 |
| Size (based on the no. of employees) | | | | | |
| MICRO | 0.28 | 0.28 | | | 1 |
| SMALL | 0.34 | 0.34 | | | 1 |
| MEDIUM | 0.30 | 0.31 | | | 1 |
| MID-CAP | 0.08 | 0.08 | | | 1 |
| Sector (as from EIF based on Invest Europe) | | | | | |
| ICT | 0.29 | 0.28 | | | 1 |
| LIFE SCIENCE | 0.22 | 0.22 | | | 1 |
| SERVICE | 0.12 | 0.13 | | | 1 |
| OTHER | 0.36 | 0.37 | | | 1 |
| Age category | | | | | |
| 0 years | 0 | 0 | | | 1 |
| 1-3 years | 0.23 | 0.19 | | | 1 |
| 4-9 years | 0.33 | 0.34 | | | 1 |
| 10-20 years | 0.21 | 0.22 | | | 1 |
| > 20 years | 0.23 | 0.24 | | | 1 |
| Age (ln) | 2.0884 | 2.16 | -6.6 | -0.86 | 0.392 |
| Age2 (ln) | 5.6287 | 5.7119 | -1.7 | -0.22 | 0.823 |
| Age3 (ln) | 17.014 | 17 | 0.1 | 0.01 | 0.993 |
| Number of employees (ln) | 3.0705 | 3.0018 | 3.9 | 0.5 | 0.614 |
| Number of employees$^2$ (ln) | 12.546 | 12.057 | 4.2 | 0.54 | 0.588 |
| Number of employees$^3$ (ln) | 58.59 | 55.113 | 4.7 | 0.61 | 0.545 |
| No. of patent families$^2$ | 317.52 | 410.25 | -3.7 | -0.48 | 0.634 |
| No. of patent families $^3$ | 24 994 | 56 642 | -6.6 | -0.86 | 0.393 |
| Having at least one patent | 1.8348 | 1.8498 | -4.1 | -0.53 | 0.596 |
| BvD independence indicator | 2.952 | 2.9459 | 0.4 | 0.06 | 0.956 |
| No. of patent families | 7.7988 | 7.3093 | 2.8 | 0.36 | 0.719 |

Source: CSIL own elaborations

### 2.4.2 Estimation phase

Under the validity of the matching procedure and the assumption of parallel trends (see Section 2.5.2) the causal impact attributable to the presence of the EIBG in a given private equity investment as compared to non-EIBG backed investments is estimated by looking at the difference in the outcome variable $Y_i$ between matched treated and control investees (Eq. 6). We measured impacts for the full set of outcome indicators reported in Table 12. They are classified in four groups: (i) firm's innovation activity; (ii) profitability outcome indicators, (iii) assets and employment outcome indicators; (iv) financing mix. For each outcome indicator, the matching and the estimation phase were implemented separately.

We run the flexible conditional difference-in-differences approach recently developed by Dettmann et al. (2020) to obtain the DID estimator (in other words, the ATT in Eq. 6)[93], which has the advantage of properly accounting for time-related information on treatment and outcome variables in our database. Specifically:

- considering our treatment variable (EIBG equity investment), this command enables us to deal with varying dates (years) of applications;[94]
- the information on the outcome development is fully considered. The estimation procedure estimates the casual impact comparing the individual differences in the outcome development between treated and respective controls during both the matching and the estimation phase. For instance, if an EIBG investee received the equity investment in 2014, the command assigns a control firm which has similar characteristics in 2014;[95]
- it integrates the possibility to combine the exact matching and the PSM in a flexible way and incorporates efficient and different distance functions in the matching phase by distinguishing continuous and categorical variables (see for details Dettmann et al., 2020).

**Table 12: Outcome variables**

| Variable | Time of observation (relative to treatment) | Main reference |
|---|---|---|
| **Innovation activity** | | |
| No. of patents | From t to t+3 | Pavlova and Signore (2021) |
| **Profitability outcome indicators** | | |
| Turnover (ln)[96] | From t to t+3 | Pavlova and Signore (2019) |
| Profit/loss before taxes (ln)[97] | From t to t+3 | Pavlova and Signore (2019) |
| Return on assets (ROA)[98] | From t to t+3 | Pavlova and Signore (2019) |
| Return on equity (ROE)[99] | From t to t+3 | Pavlova and Signore (2019) |
| **Assets and employment outcome indicators** | | |
| Capital (ln)[100] | From t to t+3 | Pavlova and Signore (2019) |
| Total assets (ln)[101] | From t to t+3 | Pavlova and Signore (2019) |
| Fixed assets (ln)[102] | From t to t+3 | Pavlova and Signore (2019) |

[93] We use the command "flexpaneldid" in STATA 17.
[94] The command is also designed to deal with different individual treatment durations, and waiting phases, in other words, the time from application to the start of the treatment. Our data have no information on these issues, so they are less relevant in our setting.
[95] This is a step forward with respect to the standard "xtreg" command that compares the mean outcome in the treated and the control group, regardless of the observed periods of the outcome variables for each individual unit.
[96] Total operating revenues (including net sales, other operating revenues and stock variations); values do not include VAT.
[97] All operating revenues minus all operating expenses plus results from financial activities of the company.
[98] Share of net income over total equity. It is an indicator of how profitable a company is with respect to its total equity.
[99] Share of net income over total assets. It is an indicator of how profitable a company is with respect to its total assets.
[100] Issued share capital (authorised capital).
[101] Total amount (after depreciation) of non-current assets plus total amount of current assets.
[102] Total amount (after depreciation) of non-current assets.

| | | |
|---|---|---|
| No. of employees (ln) | From t to t+3 | Pavlova and Signore (2019) |
| Cost of personnel (ln)[103] | From t to t+3 | Pavlova and Signore (2019) |
| **Financing mix** | | |
| Cash over total assets[104] | From t to t+3 | Pavlova and Signore (2019) |
| Tangible assets over total assets[105] | From t to t+3 | Pavlova and Signore (2019) |
| Intangible assets over total assets[106] | From t to t+3 | Pavlova and Signore (2019) |
| Liquidity ratio[107] | From t to t+3 | Pavlova and Signore (2019) |

Source: CSIL own elaborations

## 2.5 Results of the counterfactual analysis

**Overall, the analysis suggests that there is no statistically significant differential effect between the economic performance of the EIBG-backed investees and the non-EIBG-backed investees**. The unconditional ATT coefficient is positive and statistically significant only in a limited number of cases, including turnover, cost of personnel, total assets, and capital, which would imply a positive differential impact in favour of EIBG-backed investees as compared to their controls (Table 13). This positive impact is not robust across different specifications (see Section 2.5.2) and disappears when it is disaggregated by moderating factors such as year, sector, age, and geographical area (see Table 14, Table 15, Table 16).

**The result of this analysis would indicate that EIB Group equity investments help companies grow and develop in the same way as fully "private" equity investors do**.

**Table 13: Estimated ATTs on financial performance and innovation activity (average and by post-treatment period)**

| | Innovation activity | | | |
|---|---|---|---|---|
| | **No. of patents** | | | |
| ATT | 0.0134 | | | |
| ATT (t +1) | -0.0565 | | | |
| ATT (t +2) | -0.1404 | | | |
| ATT (t +3) | 0.0034 | | | |
| No. of treated firms | 333 | | | |
| No. of control firms | 333 | | | |
| | **Profitability** | | | |
| | **Turnover (ln)** | **P/L before taxes (ln)** | **ROA** | **ROE** |
| ATT | 0.2365** | 0.0831 | -2.5014 | 5.6378 |
| ATT (t +1) | 0.1216 | 0.3939* | -1.5253 | -19.9190 |
| ATT (t +2) | 0.2191* | 0.2146 | -2.9669 | -17.0121 |
| ATT (t +3) | 0.2462* | 0.0798 | -1.2484 | 5.0914 |
| No. of treated firms | 326 | 102 | 388 | 299 |
| No. of control firms | 326 | 102 | 388 | 299 |

[103] Detail of all the staff costs of the company (including pension costs).
[104] Amount of cash at bank and in hand of the company over total assets.
[105] All tangible assets such as buildings, machinery, etc. over total assets.
[106] All intangible assets such as formation expenses, research expenses, goodwill, development expenses and all other expenses with long-term effects over total assets
[107] A measure of how well the startup can meet its short-term financial liabilities.

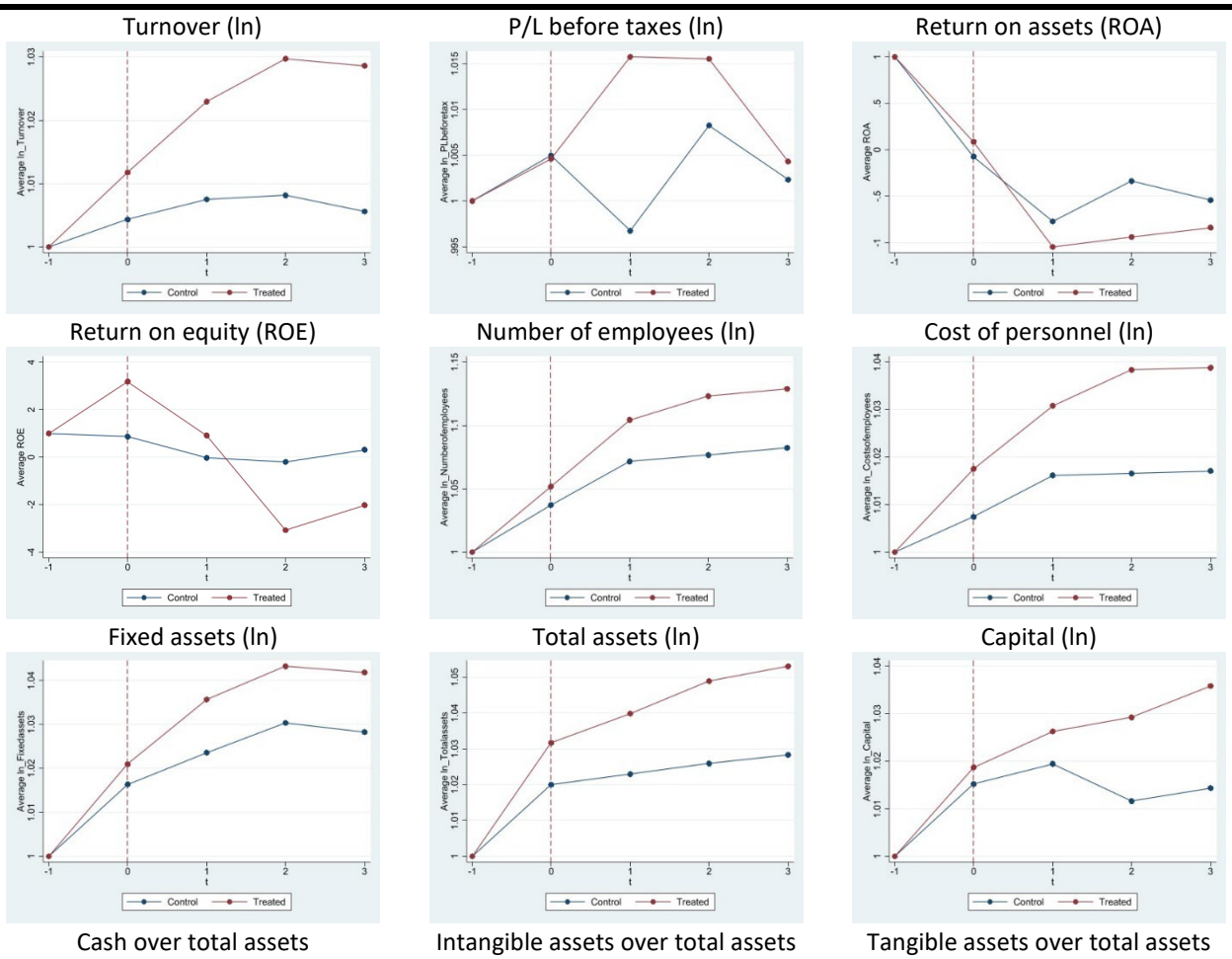
| Size outcome | | | | | |
|---|---|---|---|---|---|
| | **No. of employees (ln)** | **Cost of personnel (ln)** | **Fixed assets (ln)** | **Total assets (ln)** | **Capital (ln)** |
| ATT | 0.0889 | 0.1823** | 0.1326 | 0.2286*** | 0.1444** |
| ATT (t +1) | 0.0685 | 0.0687 | 0.0919 | 0.0624 | 0.3641 |
| ATT (t +2) | 0.1157* | 0.1820** | 0.0784 | 0.1795*** | 30.6703 |
| ATT (t +3) | 0.1228 | 0.1875** | 0.0912 | 0.1235 | 28.9057 |
| No. of treated firms | 345 | 309 | 445 | 474 | 452 |
| No. of control firms | 345 | 309 | 445 | 474 | 452 |
| **Asset allocation** | | | | | |
| | **Cash over total assets** | **Intangible assets over total assets** | **Tangible assets over total assets** | **Liquidity ratio** | |
| ATT | -0.0101 | 0.0170* | -0.0157* | -0.3795 | |
| ATT (t +1) | -0.0047 | 0.0031 | 0.0031 | 0.3130 | |
| ATT (t +2) | -0.0044 | 0.0146 | -0.0063 | -0.1675 | |
| ATT (t +3) | -0.0266* | 0.0212* | -0.0131 | -0.2580 | |
| No. of treated firms | 533 | 550 | 548 | 523 | |
| No. of control firms | 533 | 550 | 548 | 523 | |

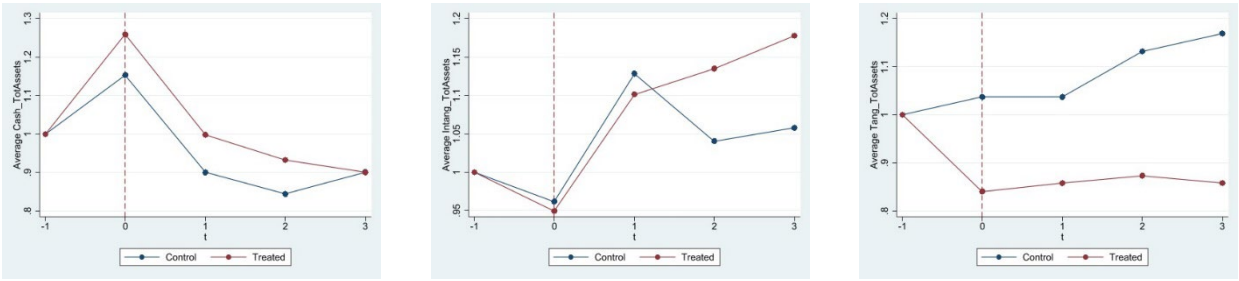
Source: CSIL own elaborations

Note: *,**, *** denote statistical significance at 5%, 1%, and 0.1% level respectively.

**Figure 59** plots the pre- and post-investment dynamics of each outcome variable for treated and control firms.

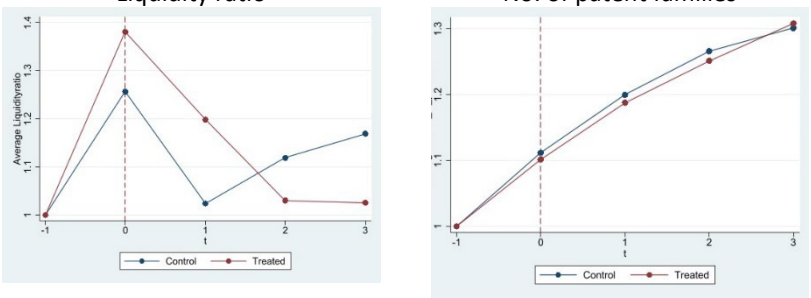
**Figure 59: Impact of the EIBG's indirect equity support to SMEs and mid-caps**






Liquidity ratio

No. of patent families




Source: CSIL own elaborations

Note: Performance of EIBG indirect equity beneficiaries ('Treated — Red line') against the comparison group ('Control — Blue line') between one year before and three years after the first equity investment. The treatment year at t = 0 with standardised scale $t - 1 \equiv 1$

### 2.5.1 Heterogeneity of impact

This section discusses whether firms' characteristics shape the estimated ATTs, because it is possible that the effects estimated above vary by different data cuts. Given the uneven distribution of EIBG indirect equity investments across countries, sector, and age of the firms, we test whether specific sub-segments drive the results.

Table 14, Table 15 and Table 16 report the estimation of the ATT when it is interacted with variables that can influence the materialisation (or the magnitude) of the impact of equity investments on the target companies. For instance, it is possible that the impact could be larger for startups as compared to later-stage companies. We use different age cuts to investigate this aspect.[108]

Overall, the results confirm the fact that even by looking at disaggregated impacts by specific sub-groups of firms there is **no differential effect on the performance of companies that can be attributed to the presence of the EIBG in a given equity investment as compared to equity investments carried out by other (non-EIBG backed) private investors.**

**Table 14: Estimated ATTs on profitability and innovation outcome variables, by moderating variable**

| | Turnover (ln) | P/L before taxes (ln) | ROA | ROE | No. of patents |
|---|---|---|---|---|---|
| **Sector** | | | | | |
| ATT*ICT | 0.4056 | -0.0156 | 5.2471 | 5.2945 | -0.8519 |
| ATT*Life science | 0.2373 | -0.4373 | 6.3253 | 19.1050 | -0.8827 |
| ATT*Other | 0.3931 | -0.0483 | 4.4412 | 2.7376 | -0.2888 |
| **Macro-region** | | | | | |
| ATT*CESEE | 0.0402 | -0.6116 | -12.1811* | 8.5688 | -0.5413 |
| ATT*DACH | 0.0289 | -2.2454*** | -7.8030 | 63.8018 | 0.1828 |
| ATT*FR_BENELUX | -0.0425 | -0.2228 | 1.0854 | 14.9057 | -0.0485 |
| ATT*NORDICS | 0.1139 | 0.1765 | -1.1093 | 22.8027 | -1.1869 |
| ATT*SOUTH | 0.0483 | -0.6529 | -3.3669 | 12.9324 | 0.1786 |
| **Age** | | | | | |

[108] Ideally, to properly investigate the heterogeneity of the impact according to the development stage of the company, the classification provided by the EIF (proof of concept, project, seed, later-stage venture capital, growth, buyout, replacement/rescue) would be preferable. However, while this classification was available for EIF beneficiaries, it was not available for either EIB beneficiaries or the control companies. Therefore, even if not fully equivalent, we use the age of the company as a proxy of its development stage.

| | | | | | |
|---|---|---|---|---|---|
| ATT*AGE_1_3 | 0.4992 | --- | -1.1759 | 24.5971 | 0.4409 |
| ATT*AGE_4_9 | 0.2070 | 0.0209 | -4.8186 | 19.6282 | 0.3522 |
| ATT*AGE_10_20 | 0.2619* | -0.1852 | -1.2076 | 0.9797 | 1.4402* |
| No. of treated | 326 | 102 | 388 | 299 | 333 |
| No. of controls | 326 | 102 | 388 | 299 | 333 |

Source: CSIL own elaborations

Note: *,**, *** denote statistical significance at 5%, 1%, and 0.1% level respectively.

**Table 15: Estimated ATTs on economic size, by moderating variable**

| | No. of employees (ln) | Cost of personnel (ln) | Fixed assets (ln) | Total assets (ln) | Capital (ln) |
|---|---|---|---|---|---|
| **Sector** | | | | | |
| ATT*ICT | 0.1946 | -0.0214 | 0.6827* | 0.1281 | 0.1716 |
| ATT*Life_science | -0.3291 | -0.0380 | 0.2785 | -0.1047 | 0.0159 |
| ATT*Other | 0.1011 | 0.0280 | 0.4542 | -0.0436 | -0.0797 |
| **Macro-region** | | | | | |
| ATT*CESEE | -0.2647 | 0.3616 | -0.1999 | -0.1707 | -0.0674 |
| ATT*DACH | -0.2470 | -0.1573 | -0.9727 | -0.3657 | -0.1873 |
| ATT*FR_BENELUX | -0.2540 | 0.0117 | -0.3040 | -0.3443* | -0.1273 |
| ATT*NORDICS | 0.0390 | 0.0013 | -0.5540 | -0.1705 | -0.0797 |
| ATT*SOUTH | -0.0917 | 0.0513 | -0.1447 | -0.1811 | -0.0816 |
| **Age** | | | | | |
| ATT*AGE_1_3 | -0.0520 | 0.3691 | 0.6090 | 0.3486 | 0.4482* |
| ATT*AGE_4_9 | -0.1530 | 0.1225 | -0.5010* | 0.1562 | 0.2597 |
| ATT*AGE_10_20 | -0.0597 | 0.1442 | -0.1717 | 0.0635 | 0.1786 |
| No. of treated | 345 | 309 | 445 | 474 | 452 |
| No. of controls | 345 | 309 | 445 | 474 | 452 |

Source: CSIL own elaborations

Note: *,**, *** denote statistical significance at 5%, 1%, and 0.1% level respectively.

**Table 16: Estimated ATTs on asset allocation outcome variables, by moderating variable**

| | Cash over total assets | Intangible assets over total assets | Tangible assets over total assets | Liquidity ratio |
|---|---|---|---|---|
| **Sector** | | | | |
| ATT*ICT | -0.0484 | 0.0144 | 0.0095 | -0.3754 |
| ATT*Life_science | 0.0554 | 0.0088 | 0.0451 | 0.5787 |
| ATT*Other | -0.0356 | 0.0068 | 0.0055 | -0.4198 |
| **Macro-region** | | | | |
| ATT*CESEE | -0.0295 | 0.0592* | -0.0379 | -0.9737 |
| ATT*DACH | 0.0366 | -0.0230 | -0.0086 | 3.1824 |
| ATT*FR_BENELUX | 0.0125 | 0.0346 | -0.0167 | 0.9040 |
| ATT*NORDICS | -0.0277 | 0.0062 | 0.0021 | -1.0229 |
| ATT*SOUTH | -0.0351 | 0.0185 | 0.0094 | -1.5103 |
| **Age** | | | | |
| ATT*AGE_1_3 | -0.0219 | 0.0157 | -0.0024 | 0.6589 |
| ATT*AGE_4_9 | 0.0191 | -0.0142 | -0.0031 | 0.0865 |
| ATT*AGE_10_20 | 0.0126 | 0.0025 | 0.0012 | -0.1647 |
| No. of treated | 533 | 550 | 548 | 523 |
| No. of controls | 533 | 550 | 548 | 523 |

Source: CSIL own elaborations

Note: *,**, *** denote statistical significance at 5%, 1%, and 0.1% level respectively.

### 2.5.2 Robustness checks

We now outline some technical aspects in support of the results described above.

Firstly, we test the parallel trends assumption underlying the DID estimation of the ATTs. It requires that both treated and control firms share the same trend of the outcome variables in the pre-treatment period in the absence of the treatment. For each outcome variable, we keep the matched sample of treated and control companies for which data are available in the three years before the treatment and estimate the following ordinary least squares (OLS) model:

$$Y_{i,t} = \beta_0 + \beta_1 t + \beta_2 (t * T_i) + \varepsilon_{i,t} \quad (7)$$

where $t$ (the trend) ranges from t-3 to t-1, indicating whether the firm-year observation is at three, two, or one year before the treatment (in other words, investment year). In Eq. 7, the coefficient of interest is $\beta_2$ associated to the term $(t * T_i)$, where $(T_i)$ indicates the treatment. If the assumption of parallel trend holds true, $\beta_2$ is expected to be statistically not different from zero.

The results are summarised in Table 17. As expected, the coefficient of interest is not always statistically significant but is in two cases, namely the number of employees and tangible assets over total assets where it is significant at 5% level. Apart from these two cases, overall the evidence suggests that the trends between treated and control firms are parallel in the pre-treatment phase validating our main results.

**Table 17: Assessment of common trends assumption**

| | **Innovativeness** | | | | |
|---|---|---|---|---|---|
| | **No. of patents** | | | | |
| Time trend (t) | 0.7467*** | | | | |
| Time trend*Treated ($t * T_i$) | -0.1062 | | | | |
| No. of observations | 1 788 | | | | |
| No. of groups | 596 | | | | |
| | **Profitability** | | | | |
| | **Turnover (ln)** | **P/L before taxes (ln)** | **ROA** | **ROE** | |
| Time trend (t) | 0.2456*** | 0.1147 | 0.3132 | 4.3800 | |
| Time trend*Treated ($t * T_i$) | 0.1184 | 0.1572 | 0.3818 | -4.2414 | |
| No. of observations | 1 703 | 503 | 1 857 | 1 439 | |
| No. of groups | 589 | 180 | 713 | 550 | |
| | **Size outcome** | | | | |
| | **No. of employees (ln)** | **Cost of personnel (ln)** | **Fixed assets (ln)** | **Total assets (ln)** | **Capital (ln)** |
| Time trend (t) | 0.1422*** | 0.2233*** | 0.4700*** | 0.2684*** | 0.0690* |
| Time trend*Treated ($t * T_i$) | 0.0546* | -0.0143 | -0.0276 | 0.0354 | 0.0164 |
| No. of observations | 1 759 | 1 618 | 2 344 | 2 493 | 2 387 |
| No. of groups | 628 | 562 | 812 | 869 | 830 |
| | **Asset allocation** | | | | |
| | **Cash over total assets** | **Intangible assets over total assets** | **Tangible assets over total assets** | **Liquidity ratio** | |
| Time trend (t) | -0.0239* | 0.0108 | -0.0071* | -0.1442 | |
| Time trend*Treated ($t * T_i$) | -0.0037 | 0.0028 | 0.0079* | -0.0306 | |
| No. of observations | 2 523 | 2 536 | 2 504 | 2 487 | |
| No. of groups | 971 | 996 | 984 | 957 | |

Source: CSIL own elaborations

Note: *,**, *** denote statistical significance at 5%, 1%, and 0.1% level respectively. The test was performed on the sub-sample of investees with the complete time series from t-3 to t-1.

Secondly, we replicated the analysis by exploiting the full length of the time series by considering as a pre-treatment period in the matching phase the three-year time span from t-1 to t-3. To reduce the loss of observations, the matching phase in the main analysis relied on firms' characteristics observed only one year before the treatment (t-1), and therefore it did not take on board the full information available in our data, generating a potential imbalance on (un)observable characteristics between the group of treated and control firms. Table 18 reports the results for selected outcome variables. They are consistent with the main results, corroborating the robustness of our conclusion.

**Table 18: Estimated ATTs on selected variables (average and by post-treatment period) using three years of pre-treatment**

| | Innovation activity | Profitability | Size outcome |
|---|---|---|---|
| | No. of patents | Turnover | Fixed assets |
| ATT | -0.1516 | 0.4505*** | 0.2112 |
| ATT (t +1) | 0.0058 | 0.0955 | 0.1469 |
| ATT (t +2) | -0.0931 | 0.2539* | 0.0430 |
| ATT (t +3) | 0.8191 | 0.2220 | 0.0379 |
| No. of treated firms | 328 | 306 | 407 |
| No. of control firms | 328 | 306 | 407 |

***Source:*** *CSIL own elaborations*
***Note:*** **,**, *** denote statistical significance at 5%, 1%, and 0.1% level respectively. The test was performed* on the sub-sample of investees with the complete time series from t-3 to t-1.

## 2.6 Limitations and future research avenues

In this section, we describe the main limitations of the analysis together with potential future research avenues to improve it.

One of the main limitations concerns the data loss that we had to deal with when extracting company data from Orbis. It is a well-known problem, but, despite its limitations, Orbis is the most used database in this type of analysis with a large geographical scope.[109]

A second limitation may concern the control group. To select only companies that received equity investments from non-EIBG backed funds we excluded all the deals that involved both funds directly supported from the EIBG, and funds managed by funds managers supported by the EIBG between 2010 and 2020. However, it could still be the case that we included deals made by EIBG-backed funds that we failed to identify and remove. We believe that the probability of this scenario is extremely low given the extensive work done to compile the list of the EIBG-backed funds. Additionally, we checked that the acquirors of the deals identified as non-EIBG backed were not classified as public entities, but we cannot ensure that they have never been supported by a public body. To do so, we would have to investigate the full ownership history of each non-EIBG-backed fund.

[109] Data loss may cause a potential sample selection. We started with an initial sample of 5 400 unique investees; 4 423 of them (81.9%) were matched in Orbis, and 4 199 (77.6%) were kept after the preliminary cleaning procedures, and we ended up implementing the analysis on a subset ranging between 102 (1.9%) and 550 (10.2%) investees. The reason why the size of the treated sample was reduced so much is twofold: companies were excluded either because they had limited availability of relevant variables (especially financial data) or because no adequate controls were found throughout the matching procedures. Although we carried out robustness checks and ascertained the validity of the main results across different specifications, we cannot exclude that data loss affected somehow our results. However, similar counterfactual studies using Orbis ended up with a very similar scenario (Pavlova and Signore, 2019; 2021 among others.)

A third issue relates to the use of Zephyr as data source to create the control group. Indeed, this database was originally meant to collect information on mergers and acquisitions instead of private equity deals. This means, especially for the first years of the analysis, that we might have extracted only a subset of the companies that could have actually entered the pool of potential controls and missed a relevant part of non-EIBG-backed investees. However, the comparison of the number of deals included in Zephyr and in other databases such as Crunchbase suggests that this is not an issue anymore.

Lastly, as mentioned in Section 2.5.1, we used the age of the investee as a proxy for its development stage. The information on the development stage of the company at the moment of the equity investment was only available for the treated group; in contrast, that information was missing for the investees in the controls.

To further deepen the analysis, future research avenues would be:

- To replicate the analysis by using as treatment variable the amount of the EIBG investment instead of the binary treatment. The amount of the investment could also be used as a matching variable to ensure that matched treated and control investees have received the same magnitude of support.
- To perform a triple difference-in-differences analysis where the economic performance of EIBG-backed beneficiaries is compared to both their peers that received equity from non-EIBG supported funds and to companies that have never received private equity investments at all.

# The crowding-in analysis at the regional level

## 3.1 Methodology design

According to the existing literature,[110] the intervention of multilateral development banks in the equity market could be either a substitute or a complement to private financing, leading to crowding out or in of private capital inflows, respectively. The model that we have used to assess the existence and magnitude of crowding-in effects at the regional level triggered by the EIBG is described in Box 14. The model has been estimated separately for:[111]

- the total equity market, including both private equity and venture capital investments;
- the private equity market;
- the venture capital market.

For the sake of comparability of results, we followed the same approach by Kraemer-Eis et al. (2016).[112]

[110] Broccolini et al. (2019); Fei (2018), Kraemer-Eis et al. (2016). See also the literature review.

[111] The split between private equity and venture capital is discussed in the main text.

[112] There are four differences between the model estimated in Box 2 and the model by Kraemer-Eis et al. (2016). The first one is that our dependent variable is scaled by GDP, while in Kraemer-Eis et al. (2016) it is measured by level, in other words, the log of total size of the equity market in the region. The second concerns the EIBG's investments (treatment variable). Our model uses a binary variable (1/0) capturing the presence of the EIBG in a given region-year; in contrast, Kraemer-Eis et al. (2016) uses the (log) amount of the EIBG's investments in the region. However, we also estimated our models by using the same variable as in Kraemer-Eis et al. (2016) and the results remain robust. Thirdly, Kraemer-Eis et al. (2016) only focuses on the venture capital market, while in this evaluation the private equity segment is also examined. Fourthly, we examine the period 2010-2020; in contrast, Kraemer-Eis et al. (2016) analyses the period 2007-2014, in the aftermath of the financial crisis.

**Box 14: The model to assess the crowding-in effect**

$$
\begin{aligned}
Equity\ inv_{i,t} = \quad & \alpha Equity\ inv_{i,t-1} + \sum_{k=1}^{3} \beta_k EIBG\ inv_{i,t-k} \\
& + \beta_5 educ_{i,t-1} + \beta_6 unemp_{i,t-1} + \beta_7 empdens_{i,t-1} \\
& + \beta_8 EIBG\ inv_{i,t-1} * educ_{i,t-1} + \beta_9 EIBG\ inv_{i,t-1} * unemp_{i,t-1} + \beta_{10} empldens_{i,t-1} * unemp_{i,t-1} \\
& + \gamma EIBG\ inv_{i,t-1} * MacroReg_{i,t-1} + \delta_t + \eta_i + \varepsilon_{i,t}
\end{aligned}
\tag{8}
$$

where:

- $i$ indicates the $i-th$ European NUTS2 region, with $i = 1, \dots, 215$;
- $t$ denotes time, $t$ region, with $t = 2010, \dots, 2020$;
- $Equity\ inv_{i,t}$ is the total size of the equity market in region $i$ at time $t$ net of the amount of the EIBG investments. EQ4 asks to test the presence of a crowding-in of external non-EIBG capital, therefore the EIBG share of investments was subtracted from the size of the private equity market as reported by Invest Europe aggregates to avoid double counting.[113]The variable is measured as a share of GDP to prevent large regions from biasing the results (see below for details). For the private equity and venture capital estimations, only the private equity and venture capital components of the market are considered;
- $Equity\ inv_{i,t-1}$ is the same variable as above lagged by one year to take on board the dynamic of the equity market (Bond, 2002). Equity investments today are likely to be a function of previous investment levels;
- $EIBG\ inv_{i,t}$ is a binary variable equal to 1 if in the region $i$ there is at least one equity investment supported by the EIBG at the time $t$ and 0 otherwise. In an alternative specification, it is a continuous variable measuring the amount of the EIBG investment in the $i-th$ region at time $t$. For the private equity and venture capital estimations, only the share of private equity and venture capital investments by the EIBG are considered, respectively;
- $Educ_{i,t-1}, unemp_{i,t-1}$, and $empdens_{i,t-1}$ are respectively the share of the regional population that has attained tertiary education (namely a bachelor's, master's or PhD degree, or any certificate with ISCED 2011 level above 5), the unemployment rate and employment density (that is, workers/square km), all from Eurostat. All these variables enter the model with one temporal lag to address endogeneity issues. The employment density is expressed in natural logarithm. According to Kraemer-Eis et al. (2016) all these variables are useful to predict the size of the regional private equity capital investment.
- The model is saturated with a large set of fixed effects:
    - $MacroReg_i$ is a set of five dummy variables out of the six EU macro-regions[114] capturing effects related to common area-specific shocks, as well as unobserved factors which could drive bank lending, such as changes in credit demand and local economic conditions.
    - Region fixed effects ($\eta_i$) further reduce the threat of omitted variable bias by controlling for all time-invariant differences in observables and unobservables that could influence the development of the regional private equity market. They can include, for instance, social, cultural and institutional factors characterising the regions, fixed in the short term.
    - Year fixed effects ($\delta_t$) are a set of time dummies used to control for all the possible year-specific effects related to the economic cycle that can affect the dependent variable.[115]
- $\varepsilon_{i,t}$ is the potentially heteroskedastic and serially correlated idiosyncratic shock, that is assumed to be uncorrelated across regions. Accordingly, standard errors are clustered at the regional level, under the assumption that the EIBG's support is assigned at the regional level and that mobilisation effects vary by region.

[113] Invest Europe data also include the EIBG's equity investment data.

[114] The baseline level for this variable is the British Isles macro-region. The composition of regions is described in the main text.

[115] To control for macroeconomic effects, we also employed the real GDP per capita and the real gross fixed capital formation (in other words, investment) in the model specification. Notwithstanding, the associated coefficients always turn out to be highly insignificant, after controlling for time and region effects)

## 3.2 Data for the crowding-in analysis

We took data from the following sources:

- Equity investments at the regional level (the dependent variable) are from Invest Europe. The database covers 215 European regions over the years 2007 to 2020.[116] Data are reported in current EUR and distinguish the entire market (in other words, including early-stage venture capital and later-stage private equity investments) from the early-stage (venture capital) market. As far as we are aware, Invest Europe data represent the most reliable quantitative representation of the equity ecosystem in Europe, as most of the collected information is sourced directly from final investees. The nominal GDP in EUR from Eurostat was used as the scaling factor for the total value of the market. Scaling by GDP gives a better understanding of the relative magnitude on the equity market with respect to the region's economy.[117]
- EIBG equity investment data are from the EIBG's internal database of equity transactions as described in Section 2.3.1. The location of the companies supported by an EIBG investment was identified through Bureau van Dijk's Orbis database and attributed to their respective NUTS2 region (the investee's headquarters).[118] Company level micro-data were firstly aggregated at region-year level and afterwards combined with the Invest Europe data so as to obtain a balanced panel of EIBG-backed investments for 215 NUTS2 EU regions observed from 2010 to 2020.
- Region-specific socioeconomic variables are from Eurostat and they were used as controls in the econometric model. All monetary values used in this analysis were converted at constant prices (basis year 2015 = 100) by using Producer Price Index (PPI) country-specific deflators from Eurostat and the OECD.

[116] We received data from the EIBG in March 2022.

[117] For data cleaning purposes we winsorize the top and bottom 1% of the total amount scaled by GDP of private equity market volume. Moreover, we checked for inconsistencies and removed region-year observations with negative values of the private equity market once the EIBG investments were subtracted.

[118] As mentioned in Section 2.3.2, 92% of EIBG investees were matched in Orbis.

## 3.3 Results of the crowding-in analysis

Table 22: Descriptive statistics of the variables entering the econometric model report the summary statistics of variables entering the model in Eq. 8, while estimation results are reported in Table 19 (total market), Table 20 (venture capital market), and Table 21 (private equity market)

**Table 22: Descriptive statistics of the variables entering the econometric model**

| Variable | Observation | Mean | Standard deviation | Min | Max |
|---|---|---|---|---|---|
| Total equity market size (GDP %)* | 1 930 | 0.28% | 0.39% | 0.00 | 4.34% |
| Private equity market size (GDP %)* | 1 781 | 0.27% | 0.37% | 0.00 | 4.37% |
| Venture capital market size (GDP %)* | 1 779 | 0.03% | 0.04% | 0.00 | 0.62% |
| EIBG total equity investments (ln) | 1 930 | 6.95 | 7.59 | 0 | 19.37 |
| EIBG private equity investments (ln) | 1 781 | 5.97 | 7.47 | 0 | 19.04 |
| EIBG venture capital investments (ln) | 1 779 | 4.77 | 6.75 | 0 | 18.80 |
| EIBG total equity investments (yes/no) | 1 930 | 0.46 | 0.50 | 0 | 1 |
| EIBG private equity investments (yes/no) | 1 781 | 0.40 | 0.49 | 0 | 1 |
| EIBG venture capital investments (yes/no) | 1 779 | 0.34 | 0.47 | 0 | 1 |
| Tertiary educational level (population share) | 1 924 | 0.26 | 0.08 | 0.09% | 0.54 |
| Unemployment rate | 1 801 | 0.09 | 0.06 | 0.013 | 0.36 |
| Employment density (ln) | 1 653 | 4.02 | 1.34 | -0.46 | 8.39 |
| **Macro-region** | | | | | |
| BRITISH ISLES | 1 983 | 0.078 | 0.269 | 0 | 1 |
| CESEE | 1 983 | 0.164 | 0.370 | 0 | 1 |
| DACH | 1 983 | 0.133 | 0.340 | 0 | 1 |
| FR & BENELUX | 1 983 | 0.221 | 0.415 | 0 | 1 |
| NORDICS | 1 983 | 0.098 | 0.297 | 0 | 1 |
| SOUTH | 1 983 | 0.231 | 0.421 | 0 | 1 |
| ***Source**: CSIL elaborations. *Net of EIBG equity investments. Negative values were excluded from the analysis.* | | | | | |

Empirically, the estimation strategy follows the approach by Kraemer-Eis at al. (2016), which enables us to compare the results of this new evaluation with existing EIF studies on the same topic. The model is estimated with four different estimation techniques, namely: (i) the pooled OLS (POLS), which does not consider the panel structure of the data (in other words, the time dimension of our database) and treats each row in the database as an independent observation; (ii) the fixed-effect (FE) estimator, which in contrast, recognises that regions are "repeated observations" over time; and an instrumental variable approach labelled (iii) GMM-dif, and (iv) GMM-sys respectively (see below for details).

For each approach, three specifications of the Eq. 8 are used: the first only includes our variables of interest, in other words the EIBG intervention; the second specification adds the remaining control variables. In any specification, the model is saturated with the full set of available fixed effects as described in Section 3.1. Indeed, the third specification differs from the second only because of the presence of country-year fixed effects to depurate the impact of the EIBG on the equity market from time-varying shocks at the country level (changes in financial legislation as well as political and cultural issues).

### 3.3.1 Results of the crowding-in analysis for the total market

Column (1) of Table 23 gives evidence of a positive relationship between the presence of the EIBG in the regional equity market and the amount of equity investments (as a share of GDP) on the following years. The dependent variable excludes the amount invested by the EIBG, therefore **the results indicate that regions with at least one investment by the EIBG experience a volume of additional capital inflows in the subsequent three years higher than regions without the EIBG's presence.** According to this specification, the effect materialises after two years and remains up to three years after the EIBG investment. To control for the possibility that results are influenced by regional human capital and labour market characteristics, Columns (2) and (3) add the complete set of control variables. The estimated association between the presence of the EIBG in the regional equity market and the amount of equity investments remains positive and statistically significant especially in Column (3), suggesting that the equity market is influenced by both the EIBG's intervention and by other countries' local conditions such as human capital and labour market characteristics (such as employment density). The statistical significance of the coefficients associated with geographic-year fixed effects (not reported) indicates that the development of the equity market is also driven by political, cultural and financial matters. This specification suggests that the mobilisation effects start to materialise after one year.

Columns (4), (5), and (6) add a complete set of geographical dummy variables at regional level (fixed effects) that capture regional time-invariant characteristics beyond human capital and labour market characteristics. If not properly accounted for, such regional characteristics that cannot be observed could bias the results. The analysis corroborates the finding discussed above.[119]

There could be endogeneity problems in the model because of the two-way relationship between the dependent and independent variables (that is, anticipation effects), additional possible omitted variables or measurement error. In particular, the presence of the EIBG in a specific regional market is likely to be one of the causes for other investors to enter the market but at the same time the EIBG could follow private capital inflows and enter regions which have attracted larger investments. In the latter case, reverse causality remains a concern. To mitigate the fact that reverse causality could bias the results, the model has been estimated according to the GMM instrumental variable approach, where the dynamic panel structure of the model makes the error term correlated with EIBG related-investment variables and, in turn, the OLS estimator, including the FE estimator, inconsistent.[120]

[119] In Column (4), our variables of interest turn positive and statistically significant at time t-2 and t-3. However, when other control variables are included together with regional fixed effects (Column 5), we fail to find any statistical evidence of a contribution by the EIBG to equity investment attractiveness. The specification in Column (6) removes regional fixed effects and adds country-year fixed effects. This was necessary to prevent country fixed effects from being absorbed by regional effects.

[120] Even when the coefficient on the lagged dependent variable is not relevant to our aim, allowing for autoregressive dynamics in the underlying process is key for retrieving consistent estimates of other parameters (see Bond 2002).

Columns (7), (8), and (9) report the findings using the difference GMM method (GMM-dif), while Columns (10), (11), and (12) apply the system GMM method (GMM-sys).[121] Instruments proliferation (over-identification) and over-fitting are the main drawbacks of GMM methods. The J-test of Hansen (1982) provides guidance on possible excess of instruments,[122] while the two-step procedure ensures more efficient estimates asymptotically.[123] We use this approach in the following analysis. While the results are in line with previous specifications, it seems now that the impact (coefficients) associated with the presence of the EIBG reduces their predictive power[124], especially when trying to control for other factors which may be associated with the development of the equity market in the region such as the level of employment, the level of tertiary education or geographical features (Columns 8,9,11,12). This suggests that, while the EIB Group-backed investments have a positive role in encouraging other investors to join, there are many other factors which play a role and influence such investment decisions including human capital, labour market characteristics and other local features mentioned above.

Overall and quite consistently across different model specifications, **the analysis indicates that there could be a positive and significant effect after two or three years from the EIBG's investments, pointing to possible crowding-in effects in the medium term** in line with results by Kraemer-Eis at al. (2016), which are included in Table 24 in the grey columns for the sake of comparability.[125] To put it differently, **the findings of the analysis can be interpreted to exclude a crowding-out effect generated by the EIBG**. Indeed, there are no specifications with negative and statistically significant coefficients on the EIBG equity investments-related variables, which would have pointed to either a decrease or at least growth at a slower pace as compared to regions where the EIB Group is not present. According to our analysis, this is not the case.

[121] GMM-dif (Holtz-Eakin, Newey and Rosen 1988; Arellano and Bond 1991) treats the model as a system of equations, one for each time period. The equations differ only in their moment condition sets. The predetermined and endogenous variables in first-difference are instrumented with suitable lags of their own levels. Strictly exogenous regressors enter the instrument matrix in first differences, with one column per instrument. In GMM-sys the original equations in levels are added to the system, so that additional moment conditions could increase efficiency. In these equations, predetermined and endogenous variables in levels are instrumented with suitable lags of their own first differences. Instead of transforming the regressors to remove the fixed effects, GMM-sys transforms (in first differences) the instruments to make them exogenous to the fixed effects. The main assumption behind the GMM-sys is that the unobserved region fixed effects are not correlated with changes in the instrumenting variables (Roodman 2006)

[122] S-test of Sargan (1958; 1988) in the homoskedastic case and J-test of Hansen (1982) in the heteroskedastic case test the validity of the instruments set. The statistics are distributed as a chi-square with a degree of freedom equal to the number of moment conditions. Under the null hypothesis, over-identification restrictions are valid. We fail to reject it (p-values are reported in the Table 18) so our instruments set is valid.

[123] We have one and two-step variants with two-step estimates asymptotically more efficient, although simulation studies suggest very modest efficiency gains from two-step, even in the presence of heteroskedasticity (Blundell, Bond and Windmeijer 2000). In the two-step GMM estimator there is an extra variation because the optimal weight matrix depends on estimated parameters. Asymptotic standard errors do not take into account this extra variation in a small sample as a result inference in a small sample is unreliable. Thus the two-step asymptotic standard errors are too small and t-statistics too big; in other words there is an over-fitting bias in a small sample (this extra variation is negligible in a large sample). In this sense the t-tests based on the one-step procedure are more accurate. In any case, Windmeijer (2005) provides corrected standard errors and t-tests that are as reliable as those based on the one-step GMM estimator.

[124] For instance, most of the coefficients in the GMM specifications are only significative at the 10% level instead of at the 5% or 1% level.

[125] As mentioned above, Kraemer-Eis at al. (2016) uses the market size in natural log (not scaled) and the EIBG equity investment amount in log, therefore not as a binary variable as we did. We also re-run our analysis using the EIBG equity investment amount instead of the binary treatment. Results are similar to those presented in Table 18.

**Table 25: Total equity market (private equity + venture capital). The impact of EIBG investments on market development. Period 2010 – 2020.**

| Dependent variable is: Equity market (GDP %) | (1) POLS 1 | (2) POLS 2 | (3) POLS 3 | Results by Kraemer-Eis et al. (2016) | (4) FE 1 | (5) FE 2 | (6) FE 3 | Results by Kraemer-Eis et al. (2016) | (7) GMM-dif 1 | (8) GMM-dif 2 | (9) GMM-dif 3 | Results by Kraemer-Eis et al. (2016) | (10) GMM-sys 1 | (11) GMM-sys 2 | (12) GMM-sys 3 | Results by Kraemer-Eis et al. (2016) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equity market size | | | | | | | | | | | | | | | | |
| Private equity market size (GDP share) (t-1) | 35.110*** | 24.857*** | 21.529*** | 0.5813*** | -5.404 | -10.517* | 21.529*** | 0.0189 | -3.503 | -7.360* | -7.360* | 0.0580 | 46.38*** | 32.6*** | 26.31*** | 0.1496*** |
| | (5.590) | (5.698) | (5.593) | (0.040) | (4.555) | (6.128) | (6.542) | (0.045) | (3.720) | (4.145) | (4.145) | (0.063) | (7.873) | (5.613) | (6.023) | (0.055) |
| EIBG equity investments-related variables | | | | | | | | | | | | | | | | |
| EIBG equity investments (t-1) | -0.212 | 0.010 | -0.051 | -0.1444 | -0.031 | 0.115 | -0.051 | -0.1465 | ---- | 0.055 | 0.055 | **2.6762**** | -0.036 | ---- | ---- | **1.1416*** |
| | (0.170) | (0.093) | (0.091) | (0.225) | (0.028) | (0.125) | (0.105) | (0.454) | ---- | (0.241) | (0.241) | (1.315) | (0.04) | ---- | ---- | (0.821) |
| EIBG equity investments (t-2) | **0.064**** | 0.027 | 0.029 | 0.0124 | **0.042*** | -0.011 | 0.029 | -0.0317 | **0.130***** | **0.078*** | **0.078*** | **-0.1862*** | **0.179**** | **0.082*** | 0.072 | -0.1241 |
| | (0.026) | (0.027) | (0.026) | (0.035) | (0.023) | (0.032) | (0.028) | (0.030) | (0.039) | (0.047) | (0.047) | (0.103) | (0.075) | (0.071) | (0.056) | (0.091) |
| EIBG equity investments (t-3) | **0.067***** | 0.038 | **0.045*** | **0.1176***** | **0.069***** | 0.005 | **0.045**** | **0.0449*** | **0.118***** | 0.007 | 0.007 | **0.1004*** | -0.007 | -0.005 | -0.006 | **0.0899**** |
| | (0.026) | (0.026) | (0.025) | (0.028) | (0.023) | (0.034) | (0.023) | (0.024) | (0.027) | (0.037) | (0.037) | (0.055) | (0.032) | (0.031) | (0.031) | (0.044) |
| Control variables | | | | | | | | | | | | | | | | |
| Tertiary education level (t-1) | | 0.008*** | 0.005 | 1.3767* | | 0.005 | 0.005 | -0.8917 | | 0.010 | 0.010 | 6.9865 | | 0.010** | 0.008 | 6.0255* |
| | | (0.003) | (0.004) | (0.724) | | (0.007) | (0.004) | (2.993) | | (0.008) | (0.008) | (6.678) | | (0.005) | (0.005) | (3.127) |
| Unemployment rate (t-1) | | 0.758 | 0.489 | -0.1377 | | 5.181** | 0.489 | 0.0192 | | 7.021** | 7.021** | 0.2373 | | 1.978 | 1.228 | -0.3031 |
| | | (0.632) | (0.728) | (0.095) | | (2.129) | (0.711) | (0.261) | | (3.411) | (3.411) | (0.365) | | (1.515) | (1.331) | (0.307) |
| | | | | | | | 0.083*** | | | | | | | | | |
| Employment density (ln) (t-1) | | 0.076*** | 0.083*** | -0.1581 | | 1.221** | | 3.7891 | | 1.763** | 1.763** | 9.6173 | | 0.095** | 0.094** | 0.2258 |
| | | (0.021) | (0.022) | (0.182) | | (0.579) | (0.027) | (5.999) | | (0.750) | (0.750) | (12.621) | | -0.990 | -1.089 | (1.606) |
| EIBG equity investments (t-1) X Tertiary education level (t-1) | | 0.002 | 0.004 | 0.0497 | | -0.004 | 0.004 | 0.0807 | | -0.002 | -0.002 | -0.789** | | -0.004 | -0.001 | -0.3682 |
| | | (0.004) | (0.004) | (0.068) | | (0.005) | (0.005) | (0.135) | | (0.008) | (0.008) | (0.380) | | (0.007) | (0.007) | (0.239) |
| EIBG equity investments (t-1) X Unemployment rate (t-1) | | -0.487 | -0.401 | -0.0018 | | -0.531 | -0.401 | -0.0081 | | ---- | ---- | 0.0275 | | -0.990 | -1.089 | 0.0183 |
| | | (0.361) | (0.362) | (0.005) | | (0.500) | (0.405) | (0.007) | | ---- | ---- | (0.017) | | (0.767) | (0.732) | (0.014) |
| Unemployment rate (t-1) X Employment density (ln) (t-1) | | -0.342** | -0.297** | 0.0305 | | -1.226** | -0.297** | 0.0077 | | -1.606* | -1.606* | -0.0861 | | -0.540 | -0.391 | -0.540 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (0.140) | (0.142) | (0.022) | | (0.560) | (0.145) | (0.062) | | (0.905) | (0.905) | (0.072) | | (0.417) | (0.326) | (0.417) |
| Constant | 0.298* | -0.277*** | -0.303** | | 0.318*** | -4.804** | -0.303** | | | | | | 0.351 | -0.256 | -0.161 | |
| | (0.173) | (0.101) | (0.120) | | (0.042) | (2.370) | (0.122) | | | | | | (0.328) | (0.238) | (0.241) | |
| Region FE | | | | | Yes | Yes | No | Yes | Yes | Yes | Yes | | Yes | Yes | Yes | |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Country X Year FE | No | No | Yes | | No | No | Yes | | No | No | Yes | | No | No | Yes | |
| EIBG equity investments (t-1) X Macro-Region FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 1 381 | 1 172 | 1 172 | 1 551 | 1 381 | 1 172 | 1 172 | 1 551 | 1 182 | 1 003 | 1 003 | 1 328 | 1 381 | 1 172 | 1 172 | 1 551 |
| Number of regional clusters | | | | | 202 | 175 | 175 | | 200 | 172 | 172 | | 202 | 175 | 175 | |
| F-test (p-value) | 0.000 | 0.000 | 0.000 | | 0.0341 | 0.0001 | 0.0001 | | 0.000 | 0.000 | 0.000 | 0.019 | 0.000 | 0.000 | 0.000 | |
| Hansen (p-value) | | | | | | | | | 0.685 | 0.990 | 0.990 | 0.693 | 0.483 | 0.985 | 1.000 | |
| Arellano and Bond AR (2) (p-value) | | | | | | | | | 0.325 | 0.426 | 0.426 | 0.163 | 0.119 | 0.103 | 0.104 | |
| Number of instruments | | | | | | | | | 290 | 305 | 305 | 170 | 209 | 287 | 308 | |

Numbers in parentheses denote heteroskedasticity-robust t-statistics. *** p<0.01, ** p<0.05, * p<0.1. The symbol "---" indicates that the coefficient was not estimated because of multicollinearity. The variables EIBG equity investments (t-1), EIBG equity investments (t-2), and EIBG equity investments (t-3) are binary variables which are equal to 1 if in the region i there is at least one equity investment supported by the EIBG at the time t and 0 otherwise.

If a crowding-in effect materialises, one might be interested to quantify it and ask what the impact of EIBG intervention on the equity market is. To assess the EIBG's attractiveness, we look at marginal effects of the EIBG intervention at t-1, t-2 and t-3. The total impact from GMM specifications is reported in Table 26 and calculated from Eq. 8 as follows:

$$EIBG\ impact\ on\ equity\ market = \frac{\delta Equity\ inv_{i,t}}{\delta\ EIBG\ inv_{i,t-1}} + \beta_2 + \beta_3 \qquad 9$$

where:

- $\frac{\delta Equity\ inv_{i,t}}{\delta\ EIBG\ inv_{i,t-1}}$ is the derivative of our dependent variable on the EIBG intervention at t-1. It measures how much the size of equity market changes (as a share of GDP) after one year from the EIBG intervention as compared to the regions without the presence of the EIBG. Note that the variable $EIBG\ inv_{i,t-1}$ enters Eq. 8 in different ways, both as a single variable and in interaction with other variables. Therefore, its marginal effect does not coincide with the coefficient $\beta_1$ in Eq. 8.
- $\beta_2$ is the derivative (marginal effect) of our dependent variable on the EIBG intervention at t-2.
- $\beta_3$ is the derivative (marginal effect) of our dependent variable on the EIBG intervention at t-3.

**Table 27: Marginal effects of EIBG equity investments on total equity market (GDP %)**

| Dependent variable is: Equity market (GDP %) | (7) GMM-dif 1 | (8) GMM-dif 2 | (9) GMM-dif 3 | (10) GMM-sys 1 | (11) GMM-sys 2 | (12) GMM-sys 3 |
|---|---|---|---|---|---|---|
| EIBG equity investments-related variables | | | | | | |
| EIBG equity investments (t-1) | -0.038 | -0.034 | -0.034 | 0.009 | **0.150*** ** | 0.127 |
| | (0.028) | (3.083) | (3.083) | (0.045) | (0.080) | (0.085) |
| EIBG equity investments (t-2) | **0.130*** ** | **0.078*** | **0.078*** | **0.179** ** | **0.082*** | 0.072 |
| | (0.039) | (0.047) | (0.047) | (0.075) | (0.071) | (0.056) |
| EIBG equity investments (t-3) | **0.118*** ** | 0.007 | 0.007 | -0.007 | -0.005 | -0.006 |
| | (0.027) | (0.037) | (0.037) | (0.032) | (0.031) | (0.031) |
| **EIBG impact on equity market** | **0.248** | **0.078** | **0.078** | **0.179** | **0.232** | **0** |

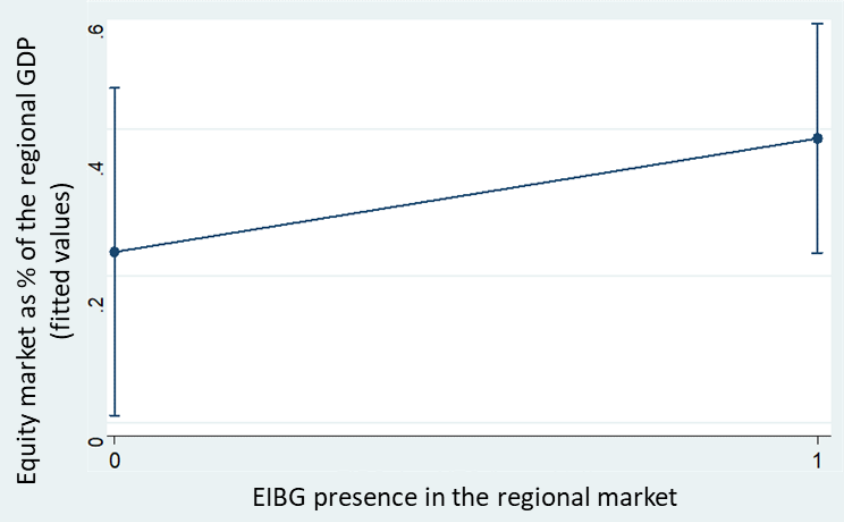
Numbers in parentheses denote heteroskedasticity-robust t-statistics. *** p<0.01, ** p<0.05, * p<0.1. The coefficients associated with EIBG equity investments (t-1) are calculated as the difference between the marginal effects of EIBG equity investments (t-1) =1 and EIBG equity investments (t-1)=0. The total impact is the sum of the coefficients. Coefficients that are not statistically different from zero are treated as zeros when calculating the total impact.

According to our analysis, the total impact of the presence on the EIBG on the regional equity market as a share of GDP ranges from 0% to 0.23% (from 0% to 0.08% per year on average) depending on the specification. Given the maximum impact of 0.08% and the average GDP of €70 billion in a region-year, **the catalytic effect would stand at €56 million each year, corresponding to 19% of the market value per year.**[126]

The Figure below visualises the EIBG impact on the market. Without the EIBG (EIBG presence =0) the equity market would stand at 0.23% of the regional GDP. The EIBG intervention would produce a catalytic effect of an additional 0.23% (that is, 0.08% per year on average), increasing the market value up to 0.46% of the regional GDP.

[126] The average value of the equity market in a region-year net of the EIBG investments is about €290 million. The impact of 21% is given by the ratio €56/290 million.

**Figure 60: EIBG total impact on the equity market (GDP %)**




The Figure shows the total impact of the EIBG intervention in the equity market. Impact is calculated on estimates from specification GMM-sys 2 in Column 11, Table 3.

### 3.3.2 Results of the crowding-in analysis for the venture capital and private equity markets

Table 28 and Table 29 report estimates of Equation 8 for venture capital and private equity respectively over the period 2010-2020. We focus on the coefficients relative to the lagged values of the EIBG venture capital and private equity investments. The specifications in the tables follow the same rationale as the total market discussed above.

**In the case of private equity investments**, **the analysis shows similar findings to the total market**: **if the EIBG investments generate a crowding-in effect, it materialises after two or three years after the EIBG intervention** (Table 30). **In any case, the econometric analysis rejects a crowding-out effect.**

**Regarding the venture capital market**, the evidence is mixed. The impact of the EIBG intervention on the venture capital market development seems to be negative in the first and second year after the intervention (Columns 5, 6, 8, 9 in Table 31), while it becomes positive from the third year (Columns 4, 6, 7, 10). This suggests that, **if any, mobilisation effects in this market need more time to materialise as compared to the private equity market.**

The potential total impact prompted by the EIBG in the venture capital and private equity markets is calculated by summing up the respective marginal effects in Table 6 for venture capital and Table 32 for private equity.

Table 6 show that **a potential crowding-in effect generated by the EIBG in the venture capital market goes** from 0% to 0.027% of the regional GDP (0% to 0.009% per year). Considering the maximum impact of 0.009% and given the average GDP of €70 billion in a region-year, the catalytic effect would stand at €6.3 million each year, **corresponding to 17% of the venture capital market value per year**.[127]

**As for the private equity market**, the estimates point instead to a potential crowding-in effect that ranges from 0% to 0.18% of the regional GDP (0% to 0.06% per year) mobilising about €42 million per year on average. This **corresponds to 13% of the private equity market value per year**.[128]

In conclusion, while no crowding-out generated by EIBG investments is observed, the econometric analysis points instead to a potential crowding-in effect, prompted by the EIBG's intervention on the European venture capital and private equity capital markets in the 2010-2020 period.

[127] The average value of the venture capital market in a region-year net of the EIBG venture capital investments is about €36 million. The impact of 17% is given by the ratio €6.3/36 million.
[128] The average value of the private equity market in a region-year net of the EIBG venture capital investments is about €331 million. The impact of 13% is given by the ratio €42/331 million.

**Table 33: Venture capital market. The impact of EIBG venture capital investments on market development. Period 2010 – 2020**

| Dependent variable is: Venture capital market (GDP %) | (1) POLS 1 | (2) POLS 2 | (3) POLS 3 | Results by Kraemer-Eis et al. (2016) | (4) FE 1 | (5) FE 2 | (6) FE 3 | Results by Kraemer-Eis et al. (2016) | (7) GMM-dif 1 | (8) GMM-dif 2 | (9) GMM-dif 3 | Results by Kraemer-Eis et al. (2016) | (10) GMM-sys 1 | (11) GMM-sys 2 | (12) GMM-sys 3 | Results by Kraemer-Eis et al. (2016) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equity market size | | | | | | | | | | | | | | | | |
| Venture capital market size (GDP share) (t-1) | 88.361*** | 85.718*** | 84.049*** | 0.5813*** | 43.613*** | 32.094*** | 82.225*** | 0.0189 | -3.503 | -7.360* | -7.360* | 0.0580 | 46.38*** | 32.6*** | 26.31*** | 0.1496*** |
| | (6.551) | (7.237) | (7.452) | (0.040) | (10.404) | (9.761) | (12.648) | (0.045) | (3.720) | (4.145) | (4.145) | (0.063) | (7.873) | (5.613) | (6.023) | (0.055) |
| EIBG venture capital Investments-related variables | | | | | | | | | | | | | | | | |
| EIBG venture capital investments (t-1) | (0.003) | (0.003) | (0.003) | -0.1444 | **0.003*** | **-0.020*****| **-0.029*****| -0.1465 | ---- | ---- | ---- | **2.6762**** | ---- | ---- | ---- | **1.1416*** |
| | 0.002 | 0.001 | 0.001 | (0.225) | (0.002) | (0.007) | (0.008) | (0.454) | ---- | ---- | ---- | (1.315) | ---- | ---- | ---- | (0.821) |
| EIBG venture capital investments (t-2) | (0.002) | (0.002) | (0.002) | 0.0124 | 0.002 | **-0.004**** | 0.000 | -0.0317 | **0.006**** | **-0.007**** | **-0.007**** | **-0.1862*** | **0.010**** | 0.008 | 0.007 | -0.1241 |
| | **0.007***** | **0.005**** | **0.005**** | (0.035) | (0.002) | (0.002) | (0.002) | (0.030) | (0.003) | (0.003) | (0.003) | (0.103) | (0.004) | (0.076) | (0.087) | (0.091) |
| EIBG venture capital investments (t-3) | (0.002) | (0.002) | (0.002) | **0.1176***** | **0.008***** | -0.000 | **0.004**** | **0.0449*** | **0.008***** | -0.005 | -0.005 | **0.1004*** | 0.000 | 0.001 | 0.001 | **0.0899**** |
| | (0.003) | (0.003) | (0.003) | (0.028) | (0.002) | (0.002) | (0.002) | (0.024) | (0.002) | (0.003) | (0.003) | (0.055) | (0.003) | (0.071) | (0.044) | (0.044) |
| Control variables | | | | | | | | | | | | | | | | |
| Tertiary education level (t-1) | | 0.000*** | 0.001** | 1.3767* | | -0.000 | 0.000 | -0.8917 | | 0.000 | 0.000 | 6.9865 | | -0.000 | -0.000 | 6.0255* |
| | | (0.000) | (0.000) | (0.724) | | (0.001) | (0.000) | (2.993) | | (0.001) | (0.001) | (6.678) | | (0.006) | (0.005) | (3.127) |
| Unemployment rate (t-1) | | 0.060 | 0.122** | -0.1377 | | 0.654*** | 0.123** | 0.0192 | | 0.715*** | 0.715*** | 0.2373 | | 0.105 | 0.081 | -0.3031 |
| | | (0.041) | (0.050) | (0.095) | | (0.222) | (0.050) | (0.261) | | (0.274) | (0.274) | (0.365) | | (1.647) | (0.391) | (0.307) |
| Employment density (ln) (t-1) | | 0.003** | 0.005*** | -0.1581 | | 0.191** | 0.005*** | 3.7891 | | 0.274** | 0.274** | 9.6173 | | 0.002 | 0.003 | 0.2258 |
| | | (0.021) | (0.022) | (0.182) | | (0.579) | (0.027) | (5.999) | | (0.108) | (0.108) | (12.621) | | (0.030) | (0.020) | (1.606) |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EIBG venture capital investments (t-1) X Tertiary education level (t-1) | | ---- | ---- | 0.0497 | | 0.001*** | 0.001*** | 0.0807 | | 0.001 | 0.001 | -0.789** | | -0.004 | -0.001 | -0.3682 |
| | | ---- | ---- | (0.068) | | (0.000) | (0.000) | (0.135) | | (0.001) | (0.001) | (0.380) | | (0.007) | (0.007) | (0.239) |
| EIBG venture capital investments (t-1) X Unemployment rate (t-1) | | -0.003 | 0.010 | -0.0018 | | -0.007 | 0.011 | -0.0081 | | -0.021 | -0.021 | 0.0275 | | -0.129 | -0.082 | 0.0183 |
| | | (0.029) | (0.030) | (0.005) | | (0.025) | (0.025) | (0.007) | | (0.095) | (0.095) | (0.017) | | (2.272) | (0.946) | (0.014) |
| Unemployment rate (t-1) X Employment density (ln) (t-1) | | -0.010 | -0.023** | 0.0305 | | -0.135** | -0.025** | 0.0077 | | -0.147** | -0.147** | -0.0861 | | -0.011 | -0.014 | -0.540 |
| | | (0.010) | (0.010) | (0.022) | | (0.059) | (0.011) | (0.062) | | (0.068) | (0.068) | (0.072) | | (0.185) | (0.144) | (0.417) |
| | | | | | | | | | | | | | | | | |
| Constant | 0.011** | -0.008 | -0.021 | | 0.017*** | -0.763* | -0.010 | | | | | | -0.003 | 0.062 | -0.038 | |
| | (0.005) | (0.008) | (0.014) | | (0.003) | (0.402) | (0.014) | | | | | | (0.005) | (5.635) | (0.150) | |
| Region FE | | | | | Yes | Yes | No | Yes | Yes | Yes | Yes | | Yes | Yes | Yes | |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Country X Year FE | No | No | Yes | | No | No | Yes | | No | No | Yes | | No | No | Yes | |
| EIBG venture capital investments (t-1) X Macro-Region FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | | | | | | | | | | | | | | | | |
| Observations | 1 346 | 1 107 | 1 107 | 1 551 | 1 346 | 1 107 | 1 107 | 1 551 | 1 181 | 971 | 971 | 1 328 | 1 346 | 1 107 | 1 107 | 1 551 |
| Number of regional clusters | | | | | 198 | 170 | 170 | | 196 | 169 | 169 | | 202 | 175 | 175 | |
| F-test (p-value) | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.019 | 0.000 | 0.000 | 0.000 | |
| Hansen (p-value) | | | | | | | | | 1.000 | 0.990 | 0.990 | 0.693 | 0.068 | 0.955 | 1.000 | |
| Arellano and Bond AR (2) (p-value) | | | | | | | | | 0.100 | 0.349 | 0.349 | 0.163 | 0.119 | 0.955 | 0.911 | |
| Number of instruments | | | | | | | | | 309 | 354 | 354 | 170 | 225 | 271 | 292 | |

Numbers in parentheses denote heteroskedasticity-robust t-statistics. *** p<0.01, ** p<0.05, * p<0.1. The symbol "---" indicates that the coefficient was not estimated because of multicollinearity. The variables EIBG venture capital investments (t-1), EIBG venture capital investments (t-2), and EIBG venture capital investments (t-3) are binary variables which are equal to 1 if in the region i there is at least one equity investment supported by the EIBG at the time t and 0 otherwise.

**Table 34: Private equity market. The impact of EIBG private equity investments on market development. Period 2010 – 2020**

| Dependent variable is: Private equity market (GDP %) | (1) POLS 1 | (2) POLS 2 | (3) POLS 3 | Results by Kraemer-Eis et al. (2016) | (4) FE 1 | (5) FE 2 | (6) FE 3 | Results by Kraemer-Eis et al. (2016) | (7) GMM-dif 1 | (8) GMM-dif 2 | (9) GMM-dif 3 | Results by Kraemer-Eis et al. (2016) | (10) GMM-sys 1 | (11) GMM-sys 2 | (12) GMM-sys 3 | Results by Kraemer-Eis et al. (2016) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equity market size | | | | | | | | | | | | | | | | |
| Private equity market size (GDP share) (t-1) | 29.863*** | 20.586*** | 16.991*** | 0.5813*** | -7.212 | -10.953* | 16.529*** | 0.0189 | -11.845** | -16.366** | -16.366** | 0.0580 | 20.269** | 18.61** | 14.808 | 0.1496*** |
| | (5.579) | (5.363) | (5.317) | (0.040) | (5.356) | (6.252) | (5.958) | (0.045) | (6.036) | (6.673) | (6.673) | (0.063) | (9.440) | (7.633) | (322.225) | (0.055) |
| EIBG private equity Investments-related variables | | | | | | | | | | | | | | | | |
| EIBG private equity investments (t-1) | -0.142 | **0.096*** | 0.096 | -0.1444 | 0.009 | **0.223*** | -0.019 | -0.1465 | ---- | 0.185 | 0.185 | **2.6762**** | ---- | -0.044 | -0.006 | **1.1416*** |
| | (0.147) | (0.052) | (0.061) | (0.225) | (0.028) | (0.129) | (0.109) | (0.454) | ---- | (0.239) | (0.239) | (1.315) | ---- | (0.244) | (14.363) | (0.821) |
| EIBG private equity investments (t-2) | 0.001 | -0.039 | -0.034 | 0.0124 | -0.010 | -0.043 | -0.035 | -0.0317 | 0.003 | **0.084**** | **0.084**** | **-0.1862*** | 0.014 | -0.039 | -0.026 | -0.1241 |
| | (0.027) | (0.028) | (0.026) | (0.035) | (0.021) | (0.029) | (0.025) | (0.030) | (0.028) | (0.037) | (0.037) | (0.103) | (0.037) | (0.028) | (2.226) | (0.091) |
| EIBG private equity investments (t-3) | **0.094***** | **0.055**** | **0.061**** | **0.1176***** | **0.077***** | 0.029 | **0.059***** | **0.0449*** | **0.072***** | -0.012 | -0.012 | **0.1004*** | **0.094***** | **0.057**** | 0.054 | **0.0899**** |
| | (0.026) | (0.027) | (0.025) | (0.028) | (0.022) | (0.034) | (0.022) | (0.024) | (0.023) | (0.033) | (0.033) | (0.055) | (0.030) | (0.025) | (1.302) | (0.044) |
| Control variables | | | | | | | | | | | | | | | | |
| Tertiary education level (t-1) | | 0.007*** | 0.004 | 1.3767* | | 0.007 | 0.002 | -0.8917 | | 0.024** | 0.024** | 6.9865 | | 0.009** | 0.002 | 6.0255* |
| | | (0.002) | (0.003) | (0.724) | | (0.008) | (0.004) | (2.993) | | (0.012) | (0.012) | (6.678) | | (0.004) | (0.495) | (3.127) |
| Unemployment rate (t-1) | | 0.617 | 0.335 | -0.1377 | | 4.762** | 0.301 | 0.0192 | | 6.328* | 6.328* | 0.2373 | | -0.643 | 0.396 | -0.3031 |
| | | (0.677) | (0.748) | (0.095) | | (2.125) | (0.671) | (0.261) | | (3.407) | (3.407) | (0.365) | | (0.797) | (48.699) | (0.307) |
| Employment density (ln) (t-1) | | 0.066*** | 0.077*** | -0.1581 | | 1.069* | 0.076*** | 3.7891 | | 2.257*** | 2.257*** | 9.6173 | | 0.038 | 0.083 | 0.2258 |
| | | (0.023) | (0.024) | (0.182) | | (0.602) | (0.026) | (5.999) | | (0.705) | (0.705) | (12.621) | | (0.029) | (2.387) | (1.606) |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EIBG private equity investments (t-1) X Tertiary education level (t-1) | | ---- | ---- | 0.0497 | | -0.004 | 0.004 | 0.0807 | | -0.004 | -0.004 | -0.789** | | 0.004 | 0.007 | -0.3682 |
| | | ---- | ---- | (0.068) | | (0.004) | (0.004) | (0.135) | | (0.006) | (0.006) | (0.380) | | (0.008) | (0.342) | (0.239) |
| EIBG private equity investments (t-1) X Unemployment rate (t-1) | | -0.609* | -0.574 | -0.0018 | | -0.834* | -0.563 | -0.0081 | | -0.540 | -0.540 | 0.0275 | | -0.584 | -0.922 | 0.0183 |
| | | (0.355) | (0.380) | (0.005) | | (0.493) | (0.393) | (0.007) | | (1.274) | (1.274) | (0.017) | | (0.925) | (64.590) | (0.014) |
| Unemployment rate (t-1) X Employment density (ln) (t-1) | | -0.337** | -0.298* | 0.0305 | | -1.153** | -0.304** | 0.0077 | | -1.213 | -1.213 | -0.0861 | | -0.201 | -0.332 | -0.540 |
| | | (0.155) | (0.155) | (0.022) | | (0.580) | (0.145) | (0.062) | | (0.852) | (0.852) | (0.072) | | (0.184) | (12.775) | (0.417) |
| Constant | 0.299* | -0.138 | -0.037 | | 0.323*** | -4.296* | 0.023 | | | | | | 0.203 | -0.010 | -0.117 | |
| | (0.153) | (0.101) | (0.152) | | (0.042) | (2.485) | (0.163) | | | | | | (0.198) | (0.137) | (7.967) | |
| Region FE | | | | | Yes | Yes | No | Yes | Yes | Yes | Yes | | Yes | Yes | Yes | |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Country X Year FE | No | No | Yes | | No | No | Yes | | No | No | Yes | | No | No | Yes | |
| EIBG private equity investments (t-1) X Macro-Region FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 1 194 | 1 014 | 1 014 | 1 551 | 1 194 | 1 014 | 1 014 | 1 551 | 988 | 838 | 838 | 1 328 | 1 194 | 1 014 | 1 014 | 1 551 |
| Number of regional clusters | | | | | 199 | 172 | 172 | | 190 | 163 | 163 | | 199 | 172 | 172 | |
| F-test (p-value) | 0.000 | 0.000 | 0.000 | | 0.0007 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.019 | 0.000 | 0.000 | 0.000 | |
| Hansen (p-value) | | | | | | | | | 0.986 | 0.990 | 0.990 | 0.693 | 0.847 | 0.161 | 1.000 | |
| Arellano and Bond AR (2) (p-value) | | | | | | | | | 0.759 | 0.680 | 0.680 | 0.163 | 0.109 | 0.134 | 0.920 | |
| Number of instruments | | | | | | | | | 322 | 366 | 366 | 170 | 242 | 290 | 310 | |

Numbers in parentheses denote heteroskedasticity-robust t-statistics. *** p<0.01, ** p<0.05, * p<0.1. The symbol "---" indicates that the coefficient was not estimated because of multicollinearity. The variables EIBG private equity investments (t-1), EIBG private equity investments (t-2), and EIBG private equity investments (t-3) are binary variables which are equal to 1 if in the region i there is at least one equity investment supported by the EIBG at the time t and 0 otherwise.

**Table 35: Marginal effects of EIBG venture capital investments on venture capital market (GDP %)**

| Dependent variable is: Venture capital market (GDP %) | (7) GMM-dif 1 | (8) GMM-dif 2 | (9) GMM-dif 3 | (10) GMM-sys 1 | (11) GMM-sys 2 | (12) GMM-sys 3 |
|---|---|---|---|---|---|---|
| EIBG venture capital Investments-related variables | | | | | | |
| EIBG venture capital investments (t-1) | **0.013*** ** | -0.032 | -0.032 | **0.007*** ** | -0.033 | -0.033 |
| | (0.004) | (0.461) | (0.461) | (0.002) | (0.115) | (0.143) |
| EIBG venture capital investments (t-2) | **0.006** ** | **0.007** ** | **0.007** ** | **0.010** ** | 0.008 | 0.007 |
| | (0.003) | (0.003) | (0.003) | (0.004) | (0.076) | (0.087) |
| EIBG venture capital investments (t-3) | **0.008*** ** | -0.005 | -0.005 | 0.000 | 0.001 | 0.001 |
| | (0.002) | (0.003) | (0.003) | (0.003) | (0.071) | (0.044) |
| **EIBG impact on venture capital market** | **0.027** | **0.007** | **0.007** | **0.017** | **0** | **0** |

Numbers in parentheses denote heteroskedasticity-robust t-statistics. *** p<0.01, ** p<0.05, * p<0.1. The coefficients associated with EIBG venture capital investments (t-1) are calculated as the difference between the marginal effects of EIBG venture capital investments (t-1) =1 and EIBG venture capital investments (t-1)=0. The total impact is the sum of the coefficients. Coefficients that are not statistically different from zero are treated as zeros when calculating the total impact.

**Table 36: Marginal effects of EIBG private equity investments on private equity market (GDP %)**

| Dependent variable is: Private equity market (GDP %) | (7) GMM-dif 1 | (8) GMM-dif 2 | (9) GMM-dif 3 | (10) GMM-sys 1 | (11) GMM-sys 2 | (12) GMM-sys 3 |
|---|---|---|---|---|---|---|
| EIBG private equity Investments-related variables | | | | | | |
| EIBG private equity investments (t-1) | 0.103 | 0.190 | 0.190 | **0.091*** ** | **0.023*** ** | -0.035 |
| | (0.064) | (0.206) | (0.206) | (0.032) | (0.001) | (0.113) |
| EIBG private equity investments (t-2) | 0.003 | **0.084** ** | **0.084** ** | 0.014 | -0.039 | -0.026 |
| | (0.028) | (0.037) | (0.037) | (0.037) | (0.028) | (2.226) |
| EIBG private equity investments (t-3) | **0.072*** ** | -0.012 | -0.012 | **0.094*** ** | **0.057** ** | 0.054 |
| | (0.023) | (0.033) | (0.033) | (0.030) | (0.025) | (1.302) |
| **EIBG impact on private equity market** | **0.072** | **0.084** | **0.084** | **0.185** | **0.080** | **0** |

Numbers in parentheses denote heteroskedasticity-robust t-statistics. *** p<0.01, ** p<0.05, * p<0.1. The coefficients associated with EIBG private equity investments (t-1) are calculated as the difference between the marginal effects of EIBG private equity investments (t-1) =1 and EIBG private equity investments (t-1)=0. The total impact is the sum of the coefficients. Coefficients that are not statistically different from zero are treated as zeros when calculating the total impact.

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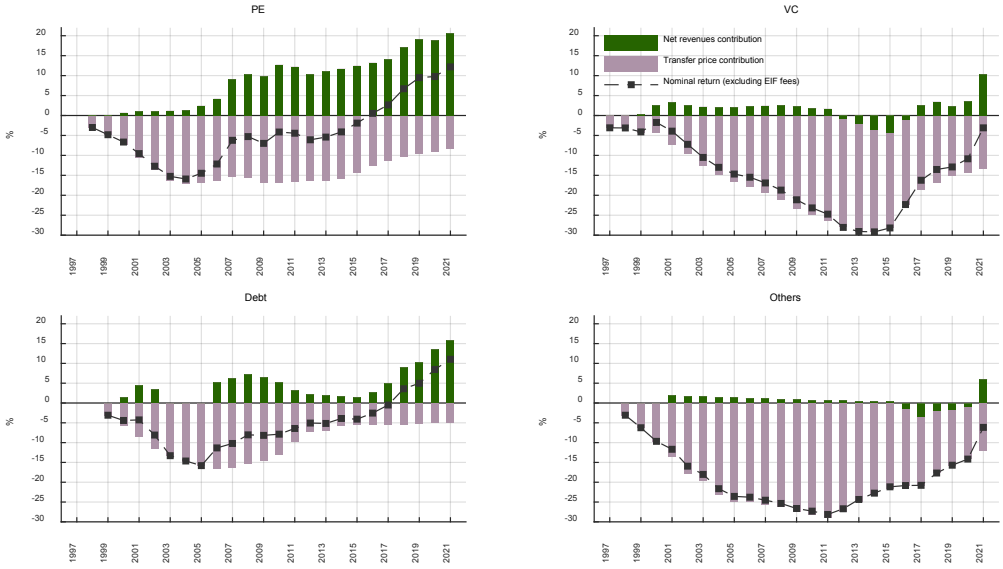
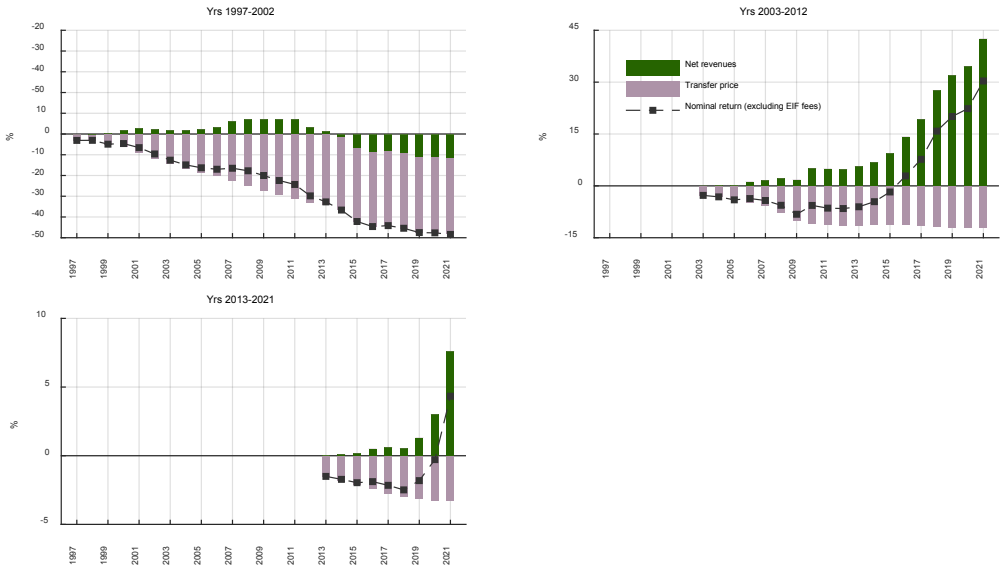
# Appendix 5: Additional details to the profitability and capital consumption analysis

**Figure A5.1: Evolution over time of strategies sub-portfolios' cumulative realised nominal return (with respect to paid-in) as of end-2021 — excluding EIF fees**



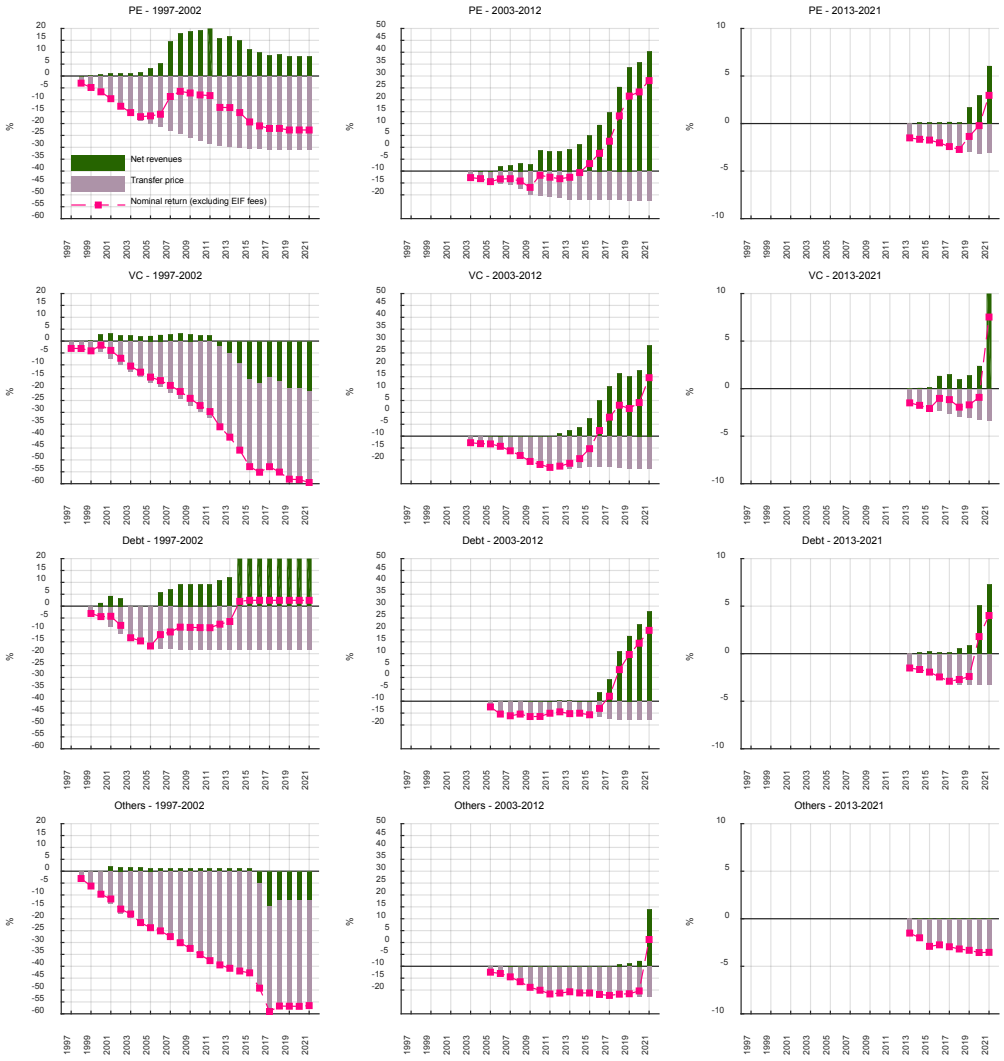

Source: EV computations based on EIF data and GR&C-RM/GFIN/ALM/AMU data

**Figure A5.2: Evolution over time of vintage years sub-portfolios' cumulative realised nominal return (with respect to paid-in) as of end-2021 — excluding EIF fees**




Source: EV computations based on EIF data and GR&C-RM/GFIN/ALM/AMU data

**Figure A5.3: Evolution over time of strategies by vintage years sub-portfolios' cumulative realised nominal return (with respect to paid-in) as of end-2021 — excluding EIF fees**




Source: EV computations based on EIF data and GR&C-RM/GFIN/ALM/AMU data

**Box A5.1: Data used in the profitability analysis of the direct quasi-equity portfolio**

- Disbursed and reimbursed capital;
- Fair value — NAV;
- Revenues — Upside remuneration, interest revenues, contractual fees, indemnities and administrative revenues (including non-contractual fees, among others);
- Loss — Write-off loss (principal) and pro-forma insolvency loss (principal);
- Negative value adjustment (under EU-GAAP);
- Operating costs — The analysis takes into account the costs of all operations, including those cancelled or not yet signed and that of the parent operation (namely, the global authorisation operation). The costs recorded under the parent operation mainly reflect the origination costs as the Serapis number for children/individual operations is only created once the deal receives the green light from the OPS team in their "go/no go" selection. In addition some portfolio monitoring/analysis is reported under the parent operation.
- Cost of funding/equity transfer price. The equity transfer price is computed, on a yearly basis, as the average outstanding value of the disbursed exposure (cumulative disbursements minus cumulative principal repayments) multiplied by the yearly average yield on the notional portfolio of own funds. Data on the fund transfer price (FTP) were provided by GR&C-RM/GFIN/ALM/AMU/-. Prior to December 2019 the FTP has been recalculated to adjust the impact of the change stemming from the switch from a Bund-based notional portfolio of own funds to a portfolio referenced to interest rate swaps. Given this, it is important to flag that the FTP rates computed are an approximation. The time series starts only in 1999, hence as a proxy for 1997 and 1998, the 1999 yield is used. This has a very marginal impact as the disbursed exposure in the first years is tiny.

Data sources: BO Serapis, SG/GS/PBA/MA, FC/FRA/FRD/LAU, PMM/TM/EUD and GR&C-RM/GFIN/ALM/MAU data.

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EIB GROUP EVALUATION

# Evaluation of EIB Group equity and quasi-equity support for small businesses and mid-caps

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