



Transforming for  
competitiveness



**Data annex**

EUROPEAN INVESTMENT BANK INVESTMENT REPORT  
**2023/2024**

# Transforming for competitiveness

## **Data annex**



European  
Investment Bank

### **Investment Report 2023/2024: Transforming for competitiveness.**

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#### **About the report**

The annual EIB report on investment and investment finance is a product of the EIB Economics Department. The report provides a comprehensive overview of the developments and drivers of investment and investment finance in the European Union. It combines an analysis and understanding of key market trends and developments, with a thematic focus explored in greater depth. This year, the focus is on Europe's transition to an innovative and green future. The report draws extensively on the results of the annual EIB Investment Survey (EIBIS) and the EIB Municipality Survey, combining internal EIB analysis with contributions from leading experts in the field.

#### **About the Economics Department of the EIB**

The mission of the EIB Economics Department is to provide economic analyses and studies to support the Bank in its operations and to help define its positioning, strategy and policy. The director of Economics Department, Debora Revoltella, heads a team of 40 economists.

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#### **Published by the European Investment Bank.**

Printed on FSC® paper

#### **Disclaimer**

The views expressed in this publication are those of the authors and do not necessarily reflect the position of the EIB.

#### **Acknowledgements**

Centre for Research and Development Monitoring (ECOOM), KU Leuven, for its research assistance. Annalisa Ferrando for useful comments and guidance. Benjamin Freudenstein for research assistance.

# Data annex



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<https://www.eib.org/en/publications/20230323-investment-report-2023>

Available as:

pdf: ISBN 978-92-861-5648-9 ISSN: 2599-8277

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## Data annex

The availability and quality of the data on investment are critical to supporting effective policymaking. In addition to national accounts, economists need to rely on other sources of macroeconomic data to analyse important aspects of investment, including infrastructure investment and intangible investment, and they increasingly make use of firm-level data.

The EIB runs a survey on corporate investment and investment finance and has created a database on patents broken down by activity, based on patent data counted using the European Patent Office's PATSTAT database. This annex outlines these datasets and provides references to detailed methodological notes.

### EIB Investment Survey

#### General module

The EIB carries out an annual survey of firms in the European Union (EIBIS General Module) with the aim of monitoring investment and investment finance activities and capturing potential barriers to investment. The survey covers approximately 12 000 companies across the European Union and slightly more than 800 firms in the United States since 2019. It is administered by telephone (in the local language) and takes an average of 25 minutes to complete. The first wave of the survey took place in 2016 and the survey completed its eighth wave in 2023, with interviews held between April and July 2023.

Using a stratified sampling methodology, the EIBIS General Module is representative of all 27 Member States of the European Union and the United States. It is representative of four firm size classes (micro, small, medium and large) and four sector groupings (manufacturing, services, construction and infrastructure) within the individual countries.

Firms have to have a minimum of five employees to be interviewed, with full-time and part-time employees counted as one and employees working less than 12 hours per week excluded. Eligible respondents are employees in senior positions with responsibility for investment decisions.

The survey is designed to build a panel of observations over time, and is set up in such a way that survey data can be linked to firms' reported balance sheet and profit-and-loss data (see EIBIS-Orbis matched dataset below). Approximately 40% of the companies interviewed in each wave are companies that have already taken part in the survey in the previous wave.

The EIBIS General Module complements pre-existing information on investment activities in the European Union. It adds a firm-level dimension to the macroeconomic data available and thus facilitates a more fine-grained analysis of firm investment patterns. It also adds to existing firm-level surveys at a national level by providing full comparability of results across countries. The survey complements the European Commission investment survey by asking a much wider set of qualitative and quantitative questions on firm investment activities. It rounds out the European Central Bank/European Commission SAFE survey by focusing on the link between firm investment and investment finance decisions.

**Table 1**  
**EIBIS at a glance**

27	EU Member States are all consistently represented by the survey – more specifically, non-financial enterprises with at least five employees and belonging to NACE categories C to J.
4	industry groupings and size classes determine the representativeness of the data within almost every member country.
12 030	firms in the European Union participated in the last wave of the survey.
802	US firms participated in the last wave of the survey.
44%	of all firms participating in the last wave responded in at least two consecutive waves.
80%	of firms surveyed in 2023 agreed to be contacted again for next year's survey.

The EIBIS is a very powerful instrument built according to the highest scientific standards. To guarantee top quality, every step of the survey process is executed and closely monitored by experts in the field. All steps – sampling and weighting, questionnaire development and translation, the fieldwork, and quality control and data processing – are also subject to strict controls and validation. More information on these technical aspects can be found in the technical report produced by the market research company conducting the survey (Ipsos MORI, 2020). Table 1 presents key numbers about EIBIS.

All aggregated data using the EIBIS General Module in this report are weighted by value added to reflect the contribution of different firms to economic output more closely. The aggregate survey data and a detailed account of the survey methodology are available on [www.eib.org/eibis](http://www.eib.org/eibis).

### Representativeness of the general module

The EIB Investment Survey is designed to be representative for the European Union and the United States at a country level and for most countries at a country-industry-group and country-size-class level.

In an EIB working paper (Brutscher et al., 2020), we assessed the data quality of the EIBIS in three steps. First, we benchmarked the sampling frame from which all survey respondents are drawn, the Bureau van Dijk Orbis database, against official statistics to see how well our sampling frame captures the relevant business population.

Second, we compared the final EIBIS sample against firms drawn at random from the same sampling frame and compared statistics constructed from the financial information included in that sampling frame. The purpose of this exercise was to assess whether and to what extent firms' willingness or unwillingness to participate in the survey may have led to a selection bias.

Last, we compared aggregate statistics calculated from the final EIBIS sample to corresponding statistics from Eurostat and the Organisation for Economic Co-operation and Development (OECD). In addition, we compared statistics based on financial information calculated from the EIBIS to the counterpart data obtained from the CompNet database. This purpose of this exercise was to evaluate both the level and dynamics of the financial information calculated from firm-level data.

Overall, the results from all three steps are very positive. First, the assessment of the sampling frame (a comparison of the Bureau van Dijk Orbis dataset with the Eurostat Structural Business Statistics (SBS) for the European Union and the United Kingdom <sup>1</sup> for the relevant sector/size classes) showed coverage ratios (number of firms in Orbis/number of firms in the SBS database) between 75% and 100% for the majority of countries. The ratio is between 50% and 75% in a few countries, and in only four – Cyprus, Greece, Luxembourg and Poland – does the coverage ratio fall below 50%. <sup>2</sup>

<sup>1</sup> For the United States, the statistics were compiled from the US Census Bureau and the Bureau of Economic Analysis.

<sup>2</sup> An important driver of the positive coverage ratio is that the EIBIS samples firms with five or more employees. Coverage ratios tend to be higher for larger firms, so excluding the smallest firms from sampling significantly boosts coverage.

The sampling frame must cover a high percentage of the population of interest for the EIBIS survey results to reflect what is happening in the non-financial corporate sector in the European Union. However, this condition alone is not sufficient because, like any other survey, the EIBIS runs the risk of selection bias if there are systematic differences between firms that are willing to participate in the survey and firms that are not.

Secondly, to test whether (and if so, to what extent) the EIBIS sample is subject to such selection issues, we compared the distribution of a set of financial ratios in the final EIBIS sample against those of five samples drawn at random from the same sampling frame. The financial ratios were calculated using information in Orbis. The idea was that statistically identical distributions between the EIBIS sample and the random samples would provide evidence that selection bias does not pose a major issue for representativeness and vice versa.

Using a Kolmogorov-Smirnov approach to compare the two samples, we find that for almost all countries, the percentage of variables for which the null hypothesis of equal distribution in the EIBIS and random samples is rejected is very low, suggesting a high degree of resemblance between EIBIS and the random sample.<sup>3</sup> In other words, comparing the final EIBIS sample with a series of random samples from the same sampling frame provides little evidence of sampling bias in our data.

Finally, a comparison of the financial information from Orbis for firms in the final EIBIS sample to CompNet data also suggests good coverage of both EIBIS and Orbis information. The CompNet data are based on a distributed micro-data approach. Relevant data are extracted from often-confidential firm-level datasets available within national central banks or national statistical institutes and aggregated so that the confidentiality of firm data is preserved. The outcome of CompNet is a wide range of indicators at the country-sector-size-class level.

To assess the final EIBIS sample; we reproduced the same country-sector-size-class level indicators using the Orbis information for firms in the EIBIS (where possible) and compared them to those in the CompNet dataset. What we found is a very close match between the two datasets, with the financial variables in the EIBIS and the CompNet database showing very similar trends.

More information on both the general module and the add-on module in the EIB Investment Survey is available upon request by email to [eibis@eib.org](mailto:eibis@eib.org).

## EIB Municipality Survey 2022

In 2022, the EIB Municipality Survey polled 750 municipalities in the European Union on their infrastructure investment activities and associated barriers.

The survey was administered by telephone (in the local language) among mayors, treasurers and/or municipalities' chief civil engineers. It took a median average of 20 minutes to complete. Fieldwork took place between June and August 2022. As part of the survey, 750 municipalities were interviewed in all 27 Member States.

The sample frame from which municipalities were randomly selected was a comprehensive list of European municipalities. All larger municipalities were eligible to be included in the exercise.

Regional and European Union-wide figures are weighted based on the urban population in each country to take size differences into account.

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<sup>3</sup> The Kolmogorov-Smirnov (KS) test is a nonparametric statistical test for the equality of probability distribution between two samples. Unlike a t-test, KS does not just compare the means of a variable, but also tests the null hypothesis that two samples are drawn from the same distribution by quantifying the distance between the empirical distribution functions of two samples. It therefore compares the shapes of the two distributions and evaluates whether the vertical differences between them are statistically significant.



### EIB ETS Survey 2023

In 2023, the annual EIB Investment Survey polled 373 firms in the European Union on their decarbonisation strategies, the main drivers of and obstacles to decarbonisation, and the perception of decarbonisation progress achieved.

The survey was administered as a special add-on module of the annual EIB Investment Survey (EIB). The survey data were merged with the Emissions Trading System (ETS) emission data and firms' financial statements from Orbis.

The survey was administered by telephone (in the local language) among firm owners, finance managers, finance directors or heads of accounts, chief financial officers (CFOs) and chief executive officers (CEOs). Fieldwork took place between June and September 2023. As part of the survey, 373 firms from 23 EU countries were interviewed.

The sample frame from which firms were randomly selected was a comprehensive list of European firms that participate in the ETS market and owned at least one ETS installation in 2022. Only manufacturing firms were eligible to be included in the exercise.

### EIBIS-Orbis matched dataset

This report includes analysis based on a dataset that combines firm-level information from Bureau van Dijk's Orbis with the EIBIS – the EIBIS-Orbis matched dataset. The matching was carried out by the current survey provider Ipsos to preserve firms' anonymity. Orbis is a proprietary dataset that contains firm-level accounting information and ownership data, gathered and standardised according to a global format that makes accounting data comparable across jurisdictions. Items from the balance sheet and profit-and-loss accounts have been used to construct standard financial ratios for firms that reflect financing activity and financial health. All data were reviewed following standard cleaning procedures to eliminate outliers and inconsistencies. Negative values for fixed assets, total assets and other stock variables were removed and all ratios have been winsorised at 1%.

The matched dataset complements the cross-sectional perspective of the EIBIS with time series information starting in 2000. Custom panel datasets used in several analyses in this report were constructed thanks to this dataset.

### Patent data

Patents grant the applicant exclusive rights to produce or use a specific new device, apparatus or process for a limited period. More specifically, the legal protection gives patent-holders the exclusive right to make, use, sell or import the patented invention for a set period of time, usually 20 years from the filing date, in the country or countries covered.

By providing protection and exclusivity, a patent encourages investment in research and the subsequent innovative work that will put inventions to practical use. By providing temporary exclusive rights to intellectual property, patents give their holders a competitive advantage. Patents can also be licensed or used to help create or finance a spin-off company. Patent-holders, therefore, can derive value from patents even if they are unable to manufacture the product (as is the case of universities, for instance).

A patent filing contains a wealth of technical information that can be useful for follow-up inventions. In addition, the elaborate and well-structured information stored in patent documents facilitates systematic and objective quantitative analyses that can provide insights into technological progress. Indicators based on patent statistics are widely used to assess the inventive and innovative performance of a country or a region. As such, patents reflect a country's inventive activity and its capacity to use and develop knowledge for potential economic gain.

In addition to containing technical details about the innovation in question, patent applications also disclose material on prior inventions, such as any other relevant patents. While patent statistics can be used to measure innovation, statistics on patent citations can be used to assess the spread of knowledge and technology.

Nevertheless, some caveats exist for patent-based indicators. First of all, the propensity to patent varies by technological domain and country. Second, not all innovations are patented (for reasons of secrecy, for example), and not all patented inventions are innovative or even marketable products. Obtaining a patent does not necessarily mean the patented technology is important or has any commercial value. The value of patents varies widely. Last, some patent activity stems from strategic behaviour (such as blocking out or scaring off potential competitors) rather than innovative and valuable R&D efforts.

## PATSTAT

The patent data used in this chapter are sourced from PATSTAT (Worldwide PATent STATistical Database). PATSTAT is a patent statistics database held by the European Patent Office (EPO) and developed in cooperation with the World Intellectual Property Organisation (WIPO), the Organisation for Economic Co-operation and Development (OECD) and Eurostat.

PATSTAT was founded in 2006 and concentrates on raw data, leaving it up to licensed users to create indicators. PATSTAT's raw patent data are collected from more than 100 regional and national patent offices worldwide, including the most important and largest offices such as the EPO, the United States Patent and Trademark Office (USPTO), the WIPO, the Japanese Patent Office (JPO) and the Chinese Patent Office (SIPO).

PATSTAT is a relational database: more than 20 related tables contain information on relevant dates (filing, publication, grant, etc.), applicants and inventors, technological domains, references to prior art, etc. The database is updated twice a year, in the spring and autumn. The data sourced for this report were produced in collaboration with the Centre for Research and Development Monitoring (ECOOM) in Belgium.

## References

Brutscher, P.B., Coali, A., Delanote, J., & Harasztosi (2020). EIB Group survey on investment and investment finance: A technical note on data quality. *EIB Working Paper 2020/08*.

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