

3.2 Statistical methodology

3.2.1 Data sources

STs and ESTs are made available annually by the Central Balance Sheet Database of Banco de Portugal. The STs became available in 2006, while the ESTs provide corporate data from 2010 onwards.

Since 2006, the source for the annual data is the IES (simplified corporate information), which is an electronic reporting form that comprises accounting, tax and statistical information. IES was established by Decree-Law No 8/2007 of 17 January 2007 and is the result of a partnership between the Ministry of Finance, the Ministry of Justice, Statistics Portugal and Banco de Portugal. These four entities have access to a wide range of information with full coverage of non-financial corporations operating in Portugal (reporting has been mandatory since 2007 with data for 2006). With a single annual report, corporations are able to meet the needs of four separate public entities.

Figure I.3.14 outlines how the information is transferred from the IES, from the moment when enterprises submit their reports, to the above-mentioned public entities.

Figure I.3.14 • IES information transfer

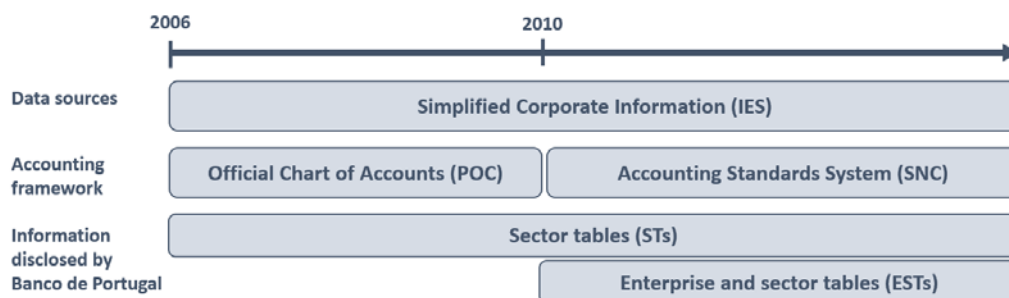


Of the various annexes making up the IES form, the Central Balance Sheet Database refers to the accounting and statistical information in Annex A, reported on a non-consolidated basis.

Information reported by enterprises under IES is submitted to quality control procedures by Banco de Portugal, which include a comparison with data obtained from other statistical systems for which the Bank is responsible, in addition to a number of validations on the temporal plausibility and consistency of every economic year. This procedure may lead to the adjustment of data sent by enterprises, chiefly due to partial non-responses, incorrect/simplified data reported, and different choices when recording the same operation in the accounts.

It should be noted that there have been changes to the information reported in the IES since its implementation, with an emphasis on the introduction in 2010 of the SNC (Accounting Standards System), which replaced the previous Official Chart of Accounts (POC). This change affected the accounting information reported by corporations as a result of the underlying accounting concepts being recast (Figure I.3.15).

Figure I.3.15 • Information transferred from IES and disclosure of STs and ESTs



3.2.2 Reference population

The reference population of the non-financial corporations sector is estimated by the Statistics Department of Banco de Portugal from information taken from the Central Registry of Companies (Ficheiro Central de Pessoas Coletivas), within the remit of the Instituto de Registos e Notariado (Registry and Notary Institute), and from microdata available in the data systems managed by Banco de Portugal for the purpose of producing statistics under its remit. Thus, in addition to IES and the Quarterly Survey on Non-financial Corporations, the Bank uses the Securities Statistics Integrated System (Sistema Integrado de Estatísticas de Títulos), the Central Credit Register (Central de Responsabilidades de Crédito), the Balance of Payments and the International Investment Position.

The enterprise population is relevant to identify the corporations to be included in the annual information of the Central Balance Sheet Database, to classify enterprises in terms of sector of economic activity (CAE), size class, geographical location of the head office, legal form and age.

The STs only comprises data from corporations in the non-financial corporations sector,²² excluding all entities in sections K – Financial and Insurance Activities, O – Public Administration and Defence; Compulsory Social Security, T – Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use and U – Activities of extraterritorial organisations and bodies, as well as Subclass 70100 – Activities of head offices of the Portuguese Classification of Economic Activities – 3rd Revision (CAE-Rev.3).

3.2.3 Nonresponse

Although the main source of information for the STs (IES) are censuses, there are specific situations that make it impossible to obtain individual information from some corporations that are part of

²² The NFC sector represents one of the economy's institutional sectors. The institutional sectorisation of economic agents is carried out in accordance with the 2010 European System of National and Regional Accounts (ESA 2010), approved by the European Parliament and by the Council through Regulation (EU) No 549/2013 of 21 May 2013. ESA 2010 is a harmonised benchmark on the compilation methodology with a deadline for release of the national accounts of EU countries, including statistics under Banco de Portugal's responsibility. The study series is based on the delimitation of the ESA 2010 population. Based on the national accounts regulation, sole proprietors are included in the households' institutional sector. Hence, all data on the NFC sector throughout this study exclude sole proprietors (in Portugal these represent around two-thirds of the number of enterprises, but only 5% of the respective turnover).

the reference population of the STs in time. The Central Balance Sheet Database deals with nonresponse issues by producing data based on IES information from another available period, with a maximum deviation of four years, as well as information from other sources of information, such as the Quarterly Survey on Non-financial Corporations and regular VAT returns.

3.2.4 Classification criteria

Economic activity sector

Each enterprise is classified by sector of economic activity, according to SICAE.²³ This classification is made at the most detailed level (five digits, corresponding to subclass) in line with CAE-Rev.3, which is published on Statistics Portugal's website.²⁴ Following the most elementary classification, enterprises may be aggregated at any CAE-Rev.3 level, in particular class (four digits), group (three digits), division (two digits) and section (one letter).

Size class

The criterion for the enterprise classification by size was taken from the EC Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises. According to this Recommendation, micro, small and medium-sized enterprises are defined in line with the number of employees and their turnover or annual balance sheet total:

- Micro-enterprises are defined as enterprises that employ fewer than 10 persons and whose annual turnover or balance sheet total does not exceed €2 million;
- Small enterprises are defined as enterprises that employ fewer than 50 persons and whose annual turnover or balance sheet total does not exceed €10 million;
- Medium-sized enterprises are defined as enterprises that employ fewer than 250 persons and whose annual turnover does not exceed €50 million or whose annual balance sheet total does not exceed €43 million;

Large enterprises are any enterprises that are not classified within the European Commission criteria for micro, small and medium-sized enterprises.

Geographical location of the head office

This corresponds to NUTS 3 (Nomenclature of Territorial Units for Statistics, 2013 version) classification of where the enterprise head office is located, covering any region in mainland Portugal and the Autonomous Regions. It also includes an item 'with no identified location', for when there is no information available regarding the geographical location of the head office.

Age

This reflects the number of years that have elapsed between the date when the corporation was set up and the reference year for the data. Corporations are grouped into four categories, according to their age: 'up to 5 years old', 'from 6 to 10 years old', 'from 11 to 20 years old' and 'over 20 years old'.

²³ Available at <http://www.sicae.pt/>

²⁴ Available at <http://metaweb.ine.pt/sine>

3.2.5 Metrics and measurement units

Aggregate average

In the case of indicators related to financial statements (e.g. total assets, financial debt or cash flow indicators), the aggregate average corresponds to the average indicator value established for the enterprises included in the aggregate. Calculated as follows:

$$\text{Aggregate average: } \frac{\sum_{i=1}^N \text{individual ratio}_i}{N}$$

In the case of economic and financial ratios, the average of the aggregate is the ratio of the total aggregate amount for the variables in the numerator and denominator, obtained as follows:

$$\text{Aggregate average: } \frac{\sum_{i=1}^N \text{individual value of ratio numerator}_i}{\sum_{i=1}^N \text{individual value of ratio denominator}_i}$$

Quartile distribution

Quartiles (Figure I.3.16), which are available only for the ratios, make it possible to analyse the distribution of the corporations for a given indicator, allowing each corporation to be able to know its position in relation to the other corporations in the aggregate.

In order to determine the quartiles of a distribution it is necessary to arrange the individual values of the corporations in ascending order, resulting in:

- The first quartile (Q1) is the value that corresponds to 25% of the ratios distribution; i.e. around one quarter of the corporations in the aggregate fall below the first quartile or, in an equivalent manner, three quarters of the corporations rank higher than the first quartile;
- The second quartile (Q2), also known as median, corresponds to the central value of the distribution, i.e. the one dividing the distribution in half. This means that half of the corporations in the aggregate show values below/above this value;
- The third quartile (Q3) is the value that corresponds to 75% of the distribution ratios; i.e. around three quarters of corporations fall below the upper quartile or, similarly, a quarter of all corporations post values higher than the third quartile.

Figure I.3.16 • Quartiles



Units of measurement

Depending on the indicator selected, data are presented in the following units:

- Percentage (%);
- Euro (€);
- Thousand (th);
- Million (m);
- Billion (bn).

Overall, ratios are shown as percentages and the balance sheet, profit and loss account and cash flow indicators are presented in thousands, millions or billions of euro.

3.2.6 Disclosure and confidentiality conditions

Confidentiality criteria

The STs shall be disseminated for all cross sections of the economic sector and size class, with a maximum breakdown for which there are corporations in that framework and provided that they comply with the confidentiality requirements laid down.

For the economic activity component classified according to CAE-Rev.3, the aggregates are published at subclass level (five digits). However, where this is not possible, higher levels of aggregation shall be considered, including: class (four digits), group (three digits), division (two digits) and section (one letter).

For the size class component of the aggregate, there are six levels: 'Large enterprises', 'Medium-sized enterprises', 'Small enterprises', 'Microenterprises', 'Micro, Small and Medium-sized enterprises', and 'All sizes'.

To preserve the confidentiality of individual data of enterprises in the Central Balance Sheet Database and the economic significance of the indicators, ESTs will not be released for aggregates where either of the following conditions occurs:

- They gather information on less than three enterprises reporting data;
- Turnover and total assets are below €1,000 and the enterprise has no employees, because such an aggregate is deemed to show no signs of relevant activity.

Direct implementation of the above rules determines, firstly, that a set of aggregates shall not be disclosed. Secondly, the release of other aggregates may also be suppressed following the implementation of a number of conditional decisions. The aim is thus to prevent a missing aggregate from being identified using other published aggregates.

Based on the above conditions, the default activity sector and size class in the ESTs is set out in as much detail as possible.

Irrespective of the release of other indicators, the publication of quartiles relating to the distribution of economic and financial ratios of an enterprise aggregate is also subject to the following rules:

- Distribution quartiles are only released if the number of enterprises in the aggregate totals or exceeds 11;
- From six to ten enterprises, the aggregate only presents the second quartile;
- No quartile information is provided on an aggregate with fewer than six enterprises.

Conditions for the calculation of economic and financial ratios

Due to their nature, the calculation of economic and financial ratios is subject to specific rules. The aim of these rules is to ensure that the results obtained include an economic interpretation and allow for a correct ordering of each enterprise's individual ratios. Therefore, ratios are not calculated when:

- **The denominator is zero or negative:** where the denominator is zero, it is not mathematically possible to calculate the ratio; in turn, a negative value of the ratio denominator jeopardises

its interpretation and distorts the distribution of individual results of the enterprises in the aggregate.

- By way of illustration, we should consider return on equity. When an enterprise has a net profit and a negative value for equity, its return on equity ratio will be negative, in spite of its activity being profitable. When all the enterprises in the aggregate are ordered, with a view to calculating the distribution quartiles of the ratio, the enterprise in this example would rank among the enterprises with losses, thereby not appropriately reflecting its situation.
- **The absolute value of the ratio exceeds a given threshold:** depending on the ratio, when the result obtained for the ratio is above a given threshold, it cannot be interpreted.
- Using as an example the current ratio: if the denominator, in this case current liabilities, is close to zero, and even if it is mathematically possible to calculate a value for the ratio, that value will tend to be too high and, therefore, bear no economic interpretation. In this context, it may be considered that if there are virtually no current liabilities, there is no point in calculating the current ratio.

After applying the calculation conditions to each ratio on an individual basis, the availability of the related ratios is assessed. For instance, the analysis of the breakdown of return on equity or of income distribution requires the joint analysis of a set of ratios. These ratios can only be meaningfully interpreted as a whole, therefore the suppression of any ratio implies the suppression of other ratios in the same block.

These rules apply to all ratio results, irrespective of the statistical measure, including the aggregate average. Two specific situations, however, may arise from the implementation of these rules for enterprises in a given aggregate:

- The aggregate values comply with the disclosure criteria, but no corporation meets such criteria on an individual basis. In this case, the aggregate average is published, but not the statistics on ratio distribution. This may occur when the values of the enterprises in the aggregate offset each other, thereby resulting in valid aggregate values.
- The aggregate values do not comply with disclosure criteria, but some enterprises meet such criteria on an individual basis, wherefore the statistics on ratio distribution are published, but not the average value of the aggregate. One possible situation is that a range of enterprises does not meet disclosure criteria but contribute significantly to the aggregate value.

Both of these situations are more likely to occur in aggregates with a small number of enterprises.