Ratios from financial statements of German enterprises

Notes

Introduction

Special Statistical Publication 6 provides insights into the financing and profitability ratios of German firms differentiated by enterprise category. The ratios shown have not been extrapolated and therefore directly reflect the data as submitted to the Bundesbank. Consequently, the publication complements the annual studies on the profitability and financing of German enterprises[1] as well as Special Statistical Publication 5[2] in which representative aggregates, which were extrapolated using the ratio estimation procedure, are presented.

Data sources

The ratios are based on the Bundesbank’s Financial Statement Data Pool. This collates balance sheet and income statement data on legally independent German non-financial corporations from various sources. These include anonymised data provided by credit institutions and credit insurers as well as data obtained from the Bundesbank's refinancing operations[3] and from public sources. Duplicate financial statements are identified and eliminated by cross-checking selected items while ensuring anonymity. In return, the Bundesbank provides the participating institutions at regular intervals with key ratios on enterprise categories that are as differentiated as possible.[4]

Scope and form of the analysis

The data pool contains single-entity financial statements of legally independent firms domiciled in Germany and operating outside the banking and insurance sectors. Up to 140,000 financial statements of non-financial corporations have been available per financial year since 1997, the starting year of the database. This is after duplicate data, which make up more than one-third of the total, have been factored out.

There are around 116,000 financial statements available for the 2016 financial year, although it should be noted that the inflow of data, for small and medium-sized enterprises, in particular, is not yet complete. However, only a little more than three-quarters of the data (83,000 statements) are suitable for the analysis presented here. About 8% of the financial statements are filtered out because information has not been differentiated sufficiently, no sales were generated or there are extreme values that might distort the results. Just over 1% of the financial statements belong to economic sectors that are not included in the analysis for various reasons. Just under one-fifth of the financial statements are not included in the analysis because the ratios shown in the tables are calculated on the basis of “cylindered samples”, which take into account only the financial statements of firms for which data are available in the relevant enterprise category for both reporting years. This means that, in the case of changes in economic sector or size category, too, the financial statements of that enterprise will not be used. The advantage of this procedure is that

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[1] Last published in Deutsche Bundesbank, German enterprises’ profitability and financing in 2017, Monthly Report, December 2018, pp. 33 ff.

[2] Deutsche Bundesbank, Extrapolated results from financial statements of German enterprises 1997 to 2013, Special Statistical Publication 5, May 2015. Current figures can also be downloaded as an Excel file at https://www.bundesbank.de/en/statistics/enterprises-and-households/-/tables-796244

[3] Financial statements are sent to the Bundesbank to enable it to verify the eligibility of securitised non-marketable assets in the form of bank loans to enterprises, which credit institutions use as collateral to cover their liabilities to the Bundesbank. Pursuant to Article 18.1 of the Statute of the European System of Central Banks and of the European Central Bank, it must ensure that all lending to credit institutions is backed by adequate collateral. See Deutsche Bundesbank, The Common Credit Assessment System for assessing the eligibility of enterprises, Monthly Report, January 2015, pp. 33 ff.

[4] See Deutsche Bundesbank, German enterprises' profitability and financing – an analysis based on a new dataset, Monthly Report, October 2005, pp. 31 ff.

changes in ratios between the two reporting years are not affected by changes in the composition of the data (sample effect). As results from two different samples are available for each reporting year, the impact of the sample effect on the results can also be determined.

The data pool contains a disproportionately large number of financial statements from large firms whereas medium-sized and, in particular, small firms are represented much less prominently. The financial statements of enterprises with sales of more than €50 million included in this publication represent 78% of the total sales of this size category – measured in terms of figures from the Federal Statistical Office's business register which, to a certain extent, reflect the underlying reporting population[5] (see sheet "Representativeness"). In the case of financial statements with sales of between €10 million and €50 million, or between €2 million and €10 million, the percentage is no more than 47% and 16% respectively; in the case of microenterprises with sales of less than €2 million, it is only 3%.

The discrepancies in the classification by size category are also reflected in the breakdown by economic sector and legal form. In the sector "Manufacture of motor vehicles, trailers and semi-trailers", the share of sales – measured in terms of the figures from the Federal Statistical Office's business register – reaches 88% owing to the great importance of large enterprises. In the case of manufacturing overall, the coverage rate is 67%. By contrast, the corresponding ratios for the sectors dominated by small and medium-sized enterprises, such as accommodation and food service activities, business services or construction, are far smaller (15%, 26% and 30% respectively). For the same reason, non-corporations have a lower coverage rate than corporations (39% compared with 65%).

Statistical preparation

The economic sector classification is based on the official German Classification of Economic Activities of the Federal Statistical Office, 2008 edition (WZ 2008). Sales are generally used as a criterion for distinguishing between size categories. In line with the classification recommended by the EU, sales of €2 million, €10 million and €50 million are used as threshold values.[6] It is only in the case of enterprises in the real estate activities and activities of head offices sectors that the size categories are formed on the basis of the balance sheet total, which, owing to the importance of tangible fixed assets and long-term financial assets in these economic sectors, is a more appropriate size indicator than sales.

Owing to the great importance of the breakdown by legal form for interpreting the balance sheet and the income statement, separate results for the two legal form groups corporations and non-corporations are presented for some economic sectors. For example, the return on sales – particularly for small enterprises – is relatively high in the case of non-corporations, since the entrepreneur's remuneration is included in the annual result (see explanatory notes on the income statement). By contrast, the equity ratio of this legal form is often distorted downwards, since the balance sheet often does not include all of the liable capital utilised for borrowing.

Corporations include public limited companies, partnerships limited by shares, private limited companies, cooperative societies and public-law institutions, foundations, etc. Non-corporations include partnerships which take the form of limited partnerships, including partnerships designated Kapitalgesellschaft & Co, general partnerships and civil-law associations as well as sole proprietorships which take the form of registered traders, craftsmen, self-employed persons, etc.

[5] Due, in particular, to divergent classifications of economic sectors for individual enterprises in the two sets of statistics, it cannot be ruled out that, in some sectors, the sales figures in the Financial Statement Data Pool exceed those in the business register.

[6] Commission Recommendation of 6 May 2003 (2003/361/EC).

In addition to the information on legal form, the publication also contains figures for “All economic sectors” broken down by selected legal forms, i.e. public limited companies, private limited companies, cooperative societies, Kapitalgesellschaft & Co, limited partnerships, general partnerships and sole proprietorships. The ratios given in the first two sections of the publication relate to Germany as a whole. Section III additionally contains figures for eastern Germany[7] for selected sectors. Moreover, data broken down by federal state is presented for the first time in Section IV.

Calculation and interpretation of the ratios

The ratios are calculated as weighted averages and quartiles. They are shown for the structural ratios of the balance sheet and the income statement as well as for other ratios. Naturally, the reference variable for the structural ratios of the balance sheet is the balance sheet total. The structural ratios of the income statement are based on the denominator gross revenue, which, besides sales, comprises changes in finished goods and other own work capitalised. As these last two items also contribute to overall expenses and therefore have little impact on profit, the annual result (before taxes on income), among the other ratios, is also calculated as a percentage of sales.

For the weighted averages of the ratios, the weights of the individual enterprises are calculated from their relative shares in the reference variable (e.g. balance sheet total, gross revenue, sales, etc.). In the categories not broken down by size, these averages are therefore very strongly influenced by the ratios of large enterprises which, as already explained, are overrepresented in the data pool. For example, enterprises with sales of €50 million or more represent about 85% of the total sales in the data evaluated here, compared with a weight of only 64% of the total population according to the business register.

It therefore makes sense to differentiate the analysis by size category. If aggregate results are required for an economic sector or for the totality of all small, medium-sized and large enterprises, use of the Bundesbank's extrapolated results[8] is recommended, in which size category-specific differences in the representativeness of the data are evened out as far as possible by the calculation method.

The quartile data are distribution parameters and may be used to analyse the dispersion of ratios within a given enterprise category. To determine the quartile data, the ratios calculated for the individual firms in a specific enterprise category are first placed in ascending order. The next step is to determine the threshold values which are not exceeded by one-quarter, half and three-quarters of the firms in a given category (referred to as the 25th, 50th and 75th percentiles). It must be remembered here that for quartiles – in contrast to aggregate data (sum totals or average data) – the arithmetical relationship between the individual items in the balance sheet or the income statement no longer exists. Only the ranking of the enterprises is relevant for the individual ratios. The advantage of quartile data is that they are not affected by extreme values and they show the typical figures for the sector concerned. A comparison of the weighted average and the median figure clearly shows, amongst other things, the extent to which the weighted average is dominated by fairly large enterprises.

When analysing the ratios, it is advisable to note the number of enterprises given as a memo item. The higher the number of underlying financial statements, the more reliable and representative the figures. Ratios that are based on a very small sample (e.g. fewer than 30 enterprises) should therefore be interpreted with great caution. In these cases, extreme changes in the single-entity financial statements of just a few enterprises – which may not, moreover, necessarily reflect economic phenomena, but instead may be due to accounting, tax or company

[7] Owing to the problems of differentiating between west and east Berlin, Berlin is excluded.
[8] See publication references in footnotes 1 and 2.

law considerations – could have an especially strong impact.

Breakdown and classification of items in the balance sheet and income statement

The prerequisite for a financial statement to be included in the data pool is that the differentiation in the methods used to record balance sheet and income statements satisfies minimum criteria which are essentially based on the reporting requirements laid down in the German Commercial Code (*Handelsgesetzbuch*) for large corporations. The financial statements, which are from various sources and, if necessary, reported in a special item classification format, are correspondingly transformed into a standardised item classification format. The ratios in the balance sheet and the income statement are mainly the items which large corporations are required to report pursuant to Sections 266 and 275 of the Commercial Code. The definitions of items used in calculating the ratios are given in the overview (see sheet "Definitions of items").

Notes on individual items

Selected ratios from the income statement

Less than 1% of the income statements in the Bundesbank's data pool have been drawn up using the cost-of-sales accounting method. These are transformed into a total cost format, taking into account supplementary information.

Reductions in earnings in the form of price discounts (e.g. customer discounts, rebates) and refunds (e.g. credits owing to defects) are deducted from sales. Excise duties were previously reported under sales. Due to new accounting rules under the German Accounting Directive Implementation Act (*Bilanzrichtlinie-Umsetzungsgesetz*), excise duties are, as of the 2016 reporting year, no longer recorded under sales but rather under operating taxes. By contrast, reclassification in connection with the Accounting Directive Implementation Act has resulted in parts of what was previously other operating income being recorded under sales.

Changes in finished goods comprise the increase or decrease in the stocks of internally produced finished goods and work in progress. These include changes in stocks of orders being processed. The item also includes other own work capitalised, notably internally produced plant and major repairs carried out in-house.

As already mentioned, gross revenue (comparable with gross output in the national accounts) corresponds to sales plus changes in finished goods.

Other income includes income from long-term equity investments, from the release of provisions and from disposals and write-ups of fixed assets. The reclassification of parts of other operating income as sales in connection with the Accounting Directive Implementation Act has resulted in other income becoming a smaller reporting item as of the 2016 reporting year.

Income from profit transfers and the costs arising from loss transfers on the part of parent companies, as well as the profit and loss transfers of subsidiaries, are not included under other income or other expenses. In this way, the effects of intra-group netting, which would impair the analysis, are eliminated when calculating the annual result.

The cost of materials comprises the cost of raw materials, consumables and supplies, purchased merchandise and services, and energy. In the case of trading companies, the cost of goods (including incidental procurement costs) takes the place of cost of materials.

Personnel expenses include not only wages and salaries but also the statutory social security contributions, voluntary social benefits and transfers to provisions for pensions, which may also contain a corresponding interest portion. Expenses for temporary agency work can be booked under personnel expenses, the cost of materials as well as other operating expenses.

Depreciation of tangible fixed assets includes amortisation and write-downs of intangible fixed assets, tax-privileged special write-downs and accelerated deductions as well as impairments.

Operating taxes comprise all taxes other than taxes on income (e.g. tax on land and buildings, motor vehicle tax) or incidental procurement cost. Excise duties such as mineral oil tax and tobacco tax were previously recorded as an expense by those enterprises which paid these levies to the tax office, but, as of the 2016 reporting year, they are no longer recorded under operating taxes and as part of sales. In the case of those enterprises which use, for example, consumables (such as heating oil or petrol) that are subject to excise duties, this outlay is included under the cost of materials.

Other expenses comprise all other expenses not listed above. In connection with the German Accounting Directive Implementation Act, however, there were, as of 2016, changes in reporting at the expense of other operating expenses and in favour of the cost of materials, which mirrored the changes in other operating income and in sales. As mentioned above, this item does not contain costs arising from loss transfers or profit transfers.

Expenses are recognised prior to the deduction of taxes on income; consequently, the balance of total income and total expenses represents the annual result before taxes on income (excluding income and expenditure arising from intra-group netting). This variable is best suited to assessing profitability. The result before taxes on income is the preferable variable as taxes on income are levied at different levels depending on the legal form of the enterprise in question. For example, corporations book corporate income tax as a tax expense. By contrast, the income tax of partners and sole proprietors does not appear as an expense in the income statements of their businesses. Besides corporate income tax paid by corporations, taxes on income also include trade earnings tax.

It should also be noted that, in corporations, all management costs appear under personnel expenses. If partnerships and sole proprietorships are managed by the partners or proprietors themselves, however, management costs are not entered as an expense in the financial statements but instead, as previously mentioned, included in the annual result as the "entrepreneur's remuneration".

Selected balance sheet ratios

The classification of receivables and liabilities as short-term or long-term is based primarily on their economic character or their designation. Trade receivables and trade payables, bills and payments received on account of orders are regarded as short-term. Other receivables and liabilities for which financial statements give maturities are classified in the statistics according to their residual maturity – in line with the provisions of the Commercial Code for classifying the financial statements of corporations. Receivables and liabilities are deemed to be short-term if they are payable within one year, while those payable in one year's time or later are considered to be long-term.

Receivables from affiliated companies and receivables from other long-term investees and investors are also shown as short-term receivables unless they are recognisably long-term.

In financial statements structured in accordance with the Commercial Code, long-term receivables are the loans reported under long-term financial assets. In other financial statements, they include loans granted, mortgages, the surrender values of insurance policies and other receivables.

Securities comprise short-term securities (if the party drawing up the balance sheet does not intend to hold them long-term) and long-term securities. Fixed-income securities (debentures, Pfandbriefe, bonds) and shares are classified as securities unless they are recorded by enterprises under other long-term equity investments. This item also includes the excess of plan assets over pension liability introduced in the German Act to Modernise Accounting Law (*Bilanzrechtsmodernisierungsgesetz*).

Other long-term equity investments are shares in other enterprises intended to serve the enterprise's own business by establishing a permanent link with those enterprises, regardless of whether or not the shares are securitised. In cases of doubt, shares in a corporation that in the aggregate exceed one-fifth of the nominal capital of that company shall be treated as a long-term equity investment.

Equity comprises the share capital of public and private limited companies and the amount paid up (*Geschäftsguthaben*) on the shares of cooperative societies. In the case of enterprises with other legal forms, the capital accounts of all proprietors or partners and the loans of general partners to the partnership are shown as equity. Equity further comprises the reserves, including the retained profits brought forward and half of the special tax-allowable reserve. As they are equity equivalents, liabilities to partners with a subordinate claim are likewise deemed to be equity. The equity total is adjusted by deducting various items (see adjustment items in the overview, sheet "Definitions of items").

These adjustments to equity are also deducted from the balance sheet total. If equity is negative, the sum of the liabilities, provisions and deferred income reported is more than the balance sheet total, with the result that debt capital expressed as a percentage of the balance sheet total is greater than 100%. In these cases, the negative equity ratio is equal to the amount by which the debt ratio exceeds 100, while the balance sheet total is determined by the sum of the assets reported in the balance sheet.

The asset-side deduction of payments received on account of orders on the face of the balance sheet is reversed. Where payments on account of order were deducted from inventories on the face of the balance sheet, they are shown as short-term liabilities, and the inventories are increased accordingly. This reclassification is the result of the gross concept used to ensure the consistency of the statistical analysis.

As in the case of the receivables, the liabilities to affiliated companies also include liabilities to other long-term investees and investors as well as liabilities to shareholders. Liabilities on bills are included under trade payables. The liabilities reported as long-term are adjusted for liabilities to shareholders with a subordinate claim.

Provisions include provisions for taxes and for pensions as well as half of the special tax-allowable reserve.

Other ratios

As benchmarks for debtor days and creditor days, the publication provides the ratios "trade receivables as a percentage of sales" and "trade payables as a percentage of cost of materials".

Moreover, the publication also contains ratios for the aggregate item "Annual result and depreciation"; this can be seen as a proxy for the cash flow, which cannot be completely calculated for data reasons. The ratio "long-term equity and liabilities as a percentage of fixed assets" is provided as the equity-to-fixed-assets ratio.