

WHAT IT IS

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Ratio analysis is an attempt to express the relationship between two or more accounts or variables in a simpler, more comprehensive way. Ratios are usually derived from financial statements as a basis of comparison, evaluation, and prediction.

Given the large number and variety of possible financial ratios, it is important to focus on those amounts that are functionally related. For example, the relationship between bad debt expense and credit sales is more meaningful than the relationship between bad debt expense and total sales. (See the modules on [Sampling](#) and [Trend Analysis](#) for more information.)

Many of the State’s performance measures (outcomes, outputs, efficiencies) are expressed as ratios -- for example, administrative support cost as a percentage of total expenditures. This module focuses only on analysis of *financial* ratios.

WHEN TO USE IT

Ratio analysis is useful when the goal is to reduce financial data to fewer expressions or variables. This goal often arises when the underlying relationships between the elements of the ratio are of interest, when data are not expressed in absolute dollar amounts, and/or when financial condition must be reviewed over time.

HOW TO PREPARE IT

Especially in the private sector, financial ratios are generally used to measure current financial position, equity position, or operating results.

- **Current position ratios** focus on working capital and usually serve as supplements to the statements of income and cash flow. Current position ratios arise in two categories, ratios measuring ability to pay short-term obligations such as:

$$\text{Acid Test Ratio} = \frac{\text{Cash} + \text{A/R} + \text{Marketable Securities}}{\text{Current Liabilities}}$$

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

and ratios measuring activity (or turnover), including:

$$\text{Average Collection Period for A/R} = \frac{\text{Average Accounts Receivable}}{\text{Net Credit Sales/365 Days}}$$

$$\text{Inventory Turnover} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

- **Equity position ratios** measure long-term solvency of an entity and its potential capacity to generate and obtain investment resources. Examples include:

$$\text{Creditor's Equity to Total Assets} = \frac{\text{Total Liabilities}}{\text{Total Assets}}$$

$$\text{Debt to Equity Ratio} = \frac{\text{Total Liabilities}}{\text{Owner's Equity}}$$

- **Operating results ratios** relate to statements of income rather than financial position and most often measure profitability. Examples include:

$$\text{Profit Margin} = \frac{\text{Income}}{\text{Net Sales}}$$

$$\text{Return on Investment} = \frac{\text{Investment Income}}{\text{Average Portfolio Balance}}$$

RATIO ANALYSIS FOR GOVERNMENT

Ratio analysis is not as widespread in government as in the private sector. A general consensus exists that determining the financial position of government units is relatively more difficult. The primary problems are weaknesses in how key information needed for assessing financial condition is reported. Even though reporting has improved, financial analysts must be knowledgeable enough to draw information from a variety of sources. It is generally quite difficult to ascertain a government entity's financial condition solely from information contained in the entity's financial reports.

More specifically, GASB notes the following principle weaknesses in public sector financial reporting:

- Economic and demographic information is reported sporadically, if at all.
- Little interjurisdictional comparison is performed.
- The impact of politics cannot be gleaned from financial statements.
- Development and use of data on service efforts and accomplishments (performance measures) is often inadequate.

This does not mean that financial condition cannot be assessed in public sector entities. Such assessment can be accomplished, and ratio analysis facilitates this process. However, general guidelines for using ratios in government are effective only for certain units. At the state government level, financial condition can be measured, but generalized ratios are hard to compare from state to state since the unit of government is so large and complex.

Similarly, no generally applicable ratios have been developed for use at the level of the individual state agency owing to the difficulty in comparing agencies. State agencies have very different missions, values, and goals; perform widely disparate functions; and often have quite different financial reporting mechanisms. Thus, ratios useful for one agency may not apply to another.

However, some notable success has been achieved in developing applicable ratios for interpreting the financial condition of local governments and institutions of higher education. These public sector units are smaller, less complex, and generally more comparable with each other. For example, all cities are likely to fund police departments, repair roads, and issue permits. Universities have similar revenue sources and types of expenditures. Nonetheless, while it may be tempting to extrapolate the use of the ratios applicable to entities at other levels or units of government, including state government entities, such extrapolation may yield inaccurate or misleading results and is not advised except under the most controlled circumstances.

RATIO ANALYSIS IN LOCAL GOVERNMENTS

The following are some ratios and indicators used for assessing the financial condition of local governments. These indicators relate to particular conditions which can give rise to poor financial condition. The examples below are not all inclusive. Further, in the absence of set benchmarks, indicators must be followed over a set period of time.

- **Ratios of economic vitality** include:

$$\frac{\text{Police and Social Services Expenditures}}{\text{Total Expenditures}}$$

$$\frac{\text{Sales Tax Collections}}{\text{Sales Tax Rate}}$$

- **Ratios of financial independence and flexibility** include:

$$\frac{\text{Debt Service Payments}}{\text{Total Revenues}}$$

$$\frac{\text{Federal and State Mandated Costs}}{\text{Total Expenditures}}$$

$$\frac{\text{General Obligation Long-Term Indebtedness}}{\text{Municipal Population}}$$

- **Ratios of municipal productivity** include:

$$\frac{\text{Total Number of Municipal Employees}}{\text{Municipal Population}}$$

- **Ratios of postponing costs to future fiscal periods** include:

$$\frac{\text{Capital Outlays}}{\text{Total Expenditures}}$$

$$\frac{\text{Notes Payable} + \text{Accounts Payable} + \text{Vouchers Payable}}{\text{Total Own Source Revenues}}$$

Other indicators are deferral of infrastructure maintenance or pension liabilities and use of long-term debt to fund current operations. Note that such use of long-term debt may also be illegal.

- **Ratios of the soundness of financial management practices** include:

$$\frac{\text{Actual Revenue}}{\text{Estimated Revenue}}$$

$$\frac{\text{Assessed Value of Real Estate/Assessment Ratio}}{\text{Selling Price}}$$

$$\frac{\text{Short-Term Investment Income}}{\text{Total Own Source Revenue}}$$

$$\frac{\text{Total Taxes and Fees Receivable at Year End}}{\text{Total Taxes and Fees Levied or Billed}}$$

Another indicator is reliance on risky or highly leveraged investments.

**RATIO ANALYSIS
FOR INSTITUTIONS OF
HIGHER EDUCATION**

The following ratios have been developed and used in the college and university environment. Using these ratios requires a working knowledge of the cost accounting terms common in the higher education environment. Although some rough benchmarks are indicated here, it is advisable to examine changes in all of these ratios over time.

- **Balance sheet ratios**

$$\frac{\text{Expendable Fund Balances}}{\text{Physical Plant Debt}} \text{ (Should Be 1/1 or Higher)}$$

$$\frac{\text{Expendable Fund Balances}}{\text{Total Expenditures and Mandatory Transfers}}$$

$$\frac{\text{Net Investment in Physical Plant}}{\text{Physical Plant Debt}} \text{ (Should Be 3/1 or Higher)}$$

$$\frac{\text{Nonexpendable Fund Transfers}}{\text{Total Expenditures and Mandatory Transfers}}$$

- **Contribution and demand ratios**

$$\frac{\text{Endowment Income}}{\text{Total Educational and General Expenditures and Mandatory Transfers}}$$

$$\frac{\text{Federal, State, or Local Revenues}}{\text{Total Educational and General Expenditures and Mandatory Transfers}}$$

$$\frac{\text{Tuition and Fees}}{\text{Total Educational and General Expenditures and Mandatory Transfers}}$$

Additional demand ratios are created by dividing each of the following expenditures by total educational and general revenues:

- academic support
- institutional support
- instruction
- operation and maintenance of plant
- public service
- research
- scholarships and fellowships
- student services

- **Credit worthiness ratios**

$$\frac{\text{Available Assets}}{\text{General Liabilities}} \text{ (2/1 or higher)}$$

$$\frac{\text{Debt Service}}{\text{Unrestricted Current Fund Revenues}}$$

$$\frac{\text{Opening Fall FTE Enrollment for Audit Year}}{\text{Opening Fall FTE Enrollment for Base Year}} \text{ (1/1 or higher)}$$

$$\frac{\text{Student Matriculants}}{\text{Completed Admission Applications}}$$

- **Net operating ratios** -- All the following should be positive percentages:

$$\frac{\text{Net Auxiliary Enterprise Revenues}}{\text{Total Auxiliary Enterprise Revenues}}$$

$$\frac{\text{Net Educational and General Revenues}}{\text{Total Educational and General Revenues}}$$

$$\frac{\text{Net Total Revenues}}{\text{Total Revenues}}$$

ADVANTAGES

Ratios can:

- communicate aspects of an entity's overall economic situation more broadly and succinctly than financial statement data alone
- facilitate understanding how certain variables may influence each other
- help determine a variety of financial aspects

DISADVANTAGES

Ratios can:

- distort comparisons by over-reliance on book values rather than market values
- involve comparative norms which are statistically unreliable due to bias and/or small sample size
- be costly to track over time, especially when norms change
- be difficult to obtain for use in public sector auditing
- lead to misleading conclusions if viewed out of context
- ignore unique factors which make entities fundamentally incomparable