

STAN Indicators

Collection of Calculation Formula

I. Notation

II. List of indicators

A. International Trade	2
B. Industrial Composition	5
C. Business Enterprise R&D	6
D. Employment And Productivity	7
E. Investment	10

I. Notation

The following notation is used in the presentation of the definitions of indicators:

Variables

ANBERD	business enterprise R&D <i>at current prices</i>
EMPN	number engaged (total employment)
EXPO	total exports <i>at current prices</i>
GFCF	gross fixed capital formation <i>at current prices</i>
IMPO	total imports <i>at current prices</i>
LABR	labour compensation <i>at current prices</i>
PROD	production <i>at current prices</i>
VALK	value added <i>volumes</i>
VALU	value added <i>at current prices</i>

Qualifiers and indices

i	ISIC Rev.3 activity sector
total	total of all activity sectors
manuf	total of manufacturing sectors

Definitions of the underlying variables can be found in the [documentation file](#) of STAN Database for Structural Analysis (www.oecd.org/sti/stan).

II. LIST OF INDICATORS

This section details the calculation of each indicator and provides some explanations regarding their interpretation, and potential limits.

A. INTERNATIONAL TRADE

These indicators address the question of trade specialisation and performance in international markets.

Note: Up to and including 1990, the data for Germany refer to western Germany (Federal Republic of – Germany, including West Berlin). From 1991, data for Germany include Eastern Germany.

1) Indicators based on Exports and Imports only

Intra-industry trade (IITR)

Contribution to manufacturing trade balance (CMTB)

Export import ratio (EXIM)

Trade balance (TBAL)

Composition of total exports of goods (XSHT)

Composition of exports of manufacturing goods (XSHM)

Composition of total imports of goods (MSHT)

Composition of imports of manufacturing goods (MSHM)

2) Indicators based on Exports, Imports and Production

Export share of production (XSHP)

Import penetration (MPEN)

Intra-industry trade

Intra-industry trade is the value of total trade remaining after subtraction of the absolute value of net exports or imports of an industry. For comparison between countries and industries, the measures are expressed as a percentage of each industry's combined exports and imports. For total manufacturing, the calculation is the summation of the value of total trade remaining after subtraction of the absolute value of net exports or imports for all manufacturing industries.

This index varies between zero and 100. If a country exports and imports roughly equal quantities of a certain product, the IIT index is high. If trade is mainly one-way (whether exporting or importing), the IIT index is low.

For individual industries:

$$IITR_i = \left(1 - \frac{|expo_i - impo_i|}{expo_i + impo_i} \right) \times 100$$

For total manufacturing:

$$IITR_{manuf} = \left[1 - \frac{\sum_i^{manuf} |expo_i - impo_i|}{\sum_i^{manuf} (expo_i + impo_i)} \right] \times 100$$

Contribution to manufacturing trade balance

The "contribution to the trade balance" makes it possible to identify an economy's structural strengths and weaknesses *via* the composition of international trade flows. It takes into account not only exports, but also imports, and tries to eliminate business cycle variations by comparing an industry's trade balance with the overall trade balance. It can be interpreted as an indicator of "revealed comparative advantage", as it indicates whether an industry performs relatively better or worse than the manufacturing total, no matter whether the manufacturing total itself is in deficit or surplus.

If there were no comparative advantage or disadvantage for any industry *i*, a country's total trade balance (surplus or deficit) should be distributed across industries according to their share in total trade. The "contribution to the manufacturing trade balance" is the difference between the actual and this theoretical balance:

$$CMTB_i = \left[\frac{(expo_i - impo_i) - (expo_{manuf} - impo_{manuf}) \frac{expo_i + impo_i}{expo_{manuf} + impo_{manuf}}}{expo_{manuf} + impo_{manuf}} \right] \times 100$$

A positive value for an industry indicates a structural surplus and a negative one a structural deficit. The indicator is additive and individual industries can be grouped together by summing their respective values: by construction, the sum over all industries is zero. To allow comparisons across countries, the indicator is generally expressed as a percentage of total trade or of GDP.

Export import ratio

This indicator shows exports as a percentage of imports.

$$EXIM_i = \frac{expo_i}{impo_i} \times 100$$

Trade balance

This indicator is calculated in real numbers of national currencies and highlights the trade pattern of each industry.

$$TBAL_i = expo_i - impo_i$$

Composition of total exports of goods

This indicator shows the exports of goods in a given industry as a percentage of total industries' exports of goods.

$$XSHT_i = \frac{expo_i}{expo_{total}} \times 100$$

Composition of exports of manufacturing goods

Composition of exports of manufacturing goods shows the exports in a given manufacturing industry as a percentage of total manufacturing exports.

$$XSHM_i = \frac{expo_i}{expo_{manuf}} \times 100$$

Composition of total imports of goods

Composition of total imports shows the imports in a given industry as a percentage of total industries' imports.

$$MSHT_i = \frac{impo_i}{impo_{total}} \times 100$$

Composition of imports of manufacturing goods

Composition of imports of manufacturing goods shows the imports in a given manufacturing industry as a percentage of total manufacturing imports.

$$MSHM_i = \frac{impo_i}{impo_{manuf}} \times 100$$

Export share of production

This indicator highlights the export effort and it is calculated as exports as a percentage of production.

$$\text{XSHP}_i = \frac{\text{expo}_i}{\text{prod}_i} \times 100$$

The export share of production shows the importance of the foreign market for a given industry in a country. This indicator may change over time as supply and demand conditions change in foreign and domestic markets.

It is important to bear in mind that exports can exceed production. This can occur for the following reasons:

(i) exports include re-exports (this particularly concerns countries such as Belgium and the Netherlands where there is a significant amount of ‘transit trade’);

(ii) production data are usually based on Industrial Surveys which record establishments' *primary activities*. Therefore, activities that are mainly secondary may be understated in terms of production by not being allocated to the relevant ISIC code while exports of the related commodities are allocated to that ISIC code;

(iii) bias introduced by the conversion from product-based trade statistics to activity-based industry statistics for certain sectors for certain countries.

Import penetration

$$\text{MPEN}_i = \frac{\text{impo}_i}{\text{prod}_i - \text{expo}_i + \text{impo}_i} \times 100$$

For a given country, a value close to 100 in a certain industry, implies that domestic demand is mainly fulfilled by imports and domestic production tends to be exported.

A value close to 0 means self sufficient, i.e. domestic demand is mainly satisfied by domestic production.

A value above 100 illustrates measurement problems which may occur when combining production and trade data.

It is important to bear in mind that exports can exceed production. This can occur for the reasons stated in the notes for “Export share of production”.

B. INDUSTRIAL COMPOSITION

These indicators attempt to reveal the importance of each industry in the economies of OECD countries.

Note: The valuation of value added differs among countries and may therefore influence the interpretation of these indicators - value added is measured *at basic prices* for all countries except Japan and the United States that use producer's or market prices.

Value added shares relative to total economy (VSHT)

Value added shares relative to total manufacturing (VSHM)

Value added share of production (VAPR)

Intermediate consumption share of production (INPR)

Value added share relative to total economy

This indicator shows each industry's value added as a percentage of value added for the total economy.

$$VSHT_i = \frac{valu_i}{valu_{total}} \times 100$$

Note: The valuation of value added differs among countries and may therefore influence the interpretation of these indicators - value added is measured *at basic prices* for all countries except Japan (at producer's prices) and the United States (at market prices).

Value added shares relative to manufacturing

This indicator shows the value added contributed by each manufacturing sector to total manufacturing.

$$VSHM_i = \frac{valu_i}{valu_{manuf}} \times 100$$

Note: The valuation of value added differs among countries and may therefore influence the interpretation of these indicators - value added is measured *at basic prices* for all countries except Japan (at producer's prices) and the United States (at market prices).

Value added share of production

This indicator is calculated as the ratio of value added over production for each industry.

$$VAPR_i = \frac{valu_i}{prod_i} \times 100$$

Intermediate consumption share of production

This indicator is calculated as the ratio of value added over production for each industry.

$$INPR_i = \frac{inti_i}{prod_i} \times 100$$

C. BUSINESS ENTERPRISE R&D

These indicators highlight the efforts undertaken by the OECD countries in the field of business enterprise expenditures in research and development; these measures also show the distribution of R&D expenditures within and across OECD countries, as well as R&D intensity.

Distribution of R&D expenditures across industries for the total economy (RDST)

Distribution of R&D expenditures across industries for total manufacturing (RDSM)

R&D intensity using value added (RDIV)

R&D intensity using production (RDIP)

Distribution of R&D expenditures across industries for the total economy

This indicator shows the R&D expenditures for an industry as a percentage of R&D expenditures for the total economy.

$$RDST_i = \frac{anberd_i}{anberd_{total}} \times 100$$

Distribution of R&D expenditures across industries for total manufacturing

This indicator shows the R&D expenditures for an industry as a percentage of R&D expenditures for total manufacturing.

$$RDSM_i = \frac{anberd_i}{anberd_{manuf}} \times 100$$

R&D intensity using value added

This indicator is calculated as the ratio of R&D expenditures in a certain industry to value added in that industry.

$$RDIV_i = \frac{anberd_i}{valu_i} \times 100$$

R&D intensity using production

This indicator captures the R&D intensity by calculating R&D expenditures in a certain industry as a share of production in that industry.

$$RDIP_i = \frac{anberd_i}{prod_i} \times 100$$

D. EMPLOYMENT AND PRODUCTIVITY

Indicators in this area address the issue of employment structure and compensation, labour costs and labour productivity.

Note: For some countries when coverage for total employment data was weak, other employment measures were used for calculations (eg: *number of employees* for the Czech Republic, Mexico, the United Kingdom and *number of jobs full-time equivalent* for Switzerland); therefore comparisons across countries should be undertaken with caution.

Employment shares relative to total economy (ESHT)

Employment shares relative to total manufacturing (ESHM)

Labour compensation per employee for the total economy (LBET)

Labour compensation per employee for total manufacturing (LBEM)

Labour share of value added (LBVA)

Labour productivity (IPTY)

Unit labour cost (IULC)

Employment shares relative to total economy

This indicator shows each industry's employment as a percentage of employment for the total economy.

$$ESHT_i = \frac{empn_i}{empn_{total}} \times 100$$

Employment shares relative to total manufacturing

This indicator shows each industry's employment as a percentage of employment for total manufacturing.

$$ESHM_i = \frac{empn_i}{empn_{manuf}} \times 100$$

Labour compensation per employee in total economy

This indicator is calculated as the ratio of labour compensation for a particular industry (or industry group) to the number engaged divided by the ratio of labour compensation for the total economy to the number of persons engaged for the total economy.

$$LBET_i = \frac{labr_i}{empn_i} \bigg/ \frac{labr_{total}}{empn_{total}} \times 100$$

Labour compensation per employee in manufacturing

This indicator is calculated as the ratio of labour compensation for a particular manufacturing industry (or industry group) to the number engaged divided by the ratio of labour compensation for total manufacturing to the number of persons engaged for total manufacturing.

$$LBEM_i = \frac{labr_i}{empn_i} \bigg/ \frac{labr_{manuf}}{empn_{manuf}} \times 100$$

Labour share of value added in total economy

This indicator shows labour compensation in a certain industry as a percentage of value added in that industry.

$$LBVA_i = \frac{labr_i}{valu_i} \times 100$$

Note: Labour costs can exceed value added when an industry incurs losses or when an industry receives significant net subsidies (value added measured at producer's prices does not include subsidies). However, the occurrence of values exceeding 100 may also be due to measurement biases when certain series are estimates.

Labour productivity index

This indicator is the ratio of value added volumes to number engaged. Although hours worked would be preferable as a measure of labour input, at the present time consistent hours worked data are not available in STAN Database for all OECD countries at the industry level. Labour productivity represents the amount of output per unit of input, output being here defined as value added.

$$IPTY_i = \frac{valk_i}{empn_i} \bigg/ \frac{valk_{i,2000}}{empn_{i,2000}} \times 100$$

Note: The series are presented as indices. Most of countries use either 2000 or 2005 as reference years, while Canada uses 2002 and Mexico uses 2003.

Unit labour cost index

This indicator is the ratio of labour compensation at current prices to output as measured by value added volumes. It represents the current cost of labour to produce one unit of output and reflects how labour costs increase / decrease relative to output; it is an indicator of costs competitiveness.

$$IULC_i = \frac{labr_i}{valk_i} \bigg/ \frac{labr_{i,2000}}{valk_{i,2000}} \times 100$$

Note: Labour costs can exceed value added in certain cases; for example, when heavy losses are incurred within an industry or, more generally, when an industry's gross operating surplus is negative and/or it receives significant subsidies.

The series are presented as indices. Please find further explanations in the notes for "Labour productivity index".

E. INVESTMENT

Indicators in this area address the issue of the industrial distribution of investment efforts and the investment intensity in value added.

Investment intensity based on value added (INVV)

Investment shares relative to the total economy (INVT)

Investment shares relative to total manufacturing (INVM)

Investment intensity based on value added

This indicator is calculated as the ratio of gross fixed capital formation in a certain industry to value added in that industry.

$$\text{INVV}_i = \frac{\text{gfcf}_i}{\text{valu}_i} \times 100$$

Investment shares relative to total economy

This indicator represents the investment composition of the total economy. It is calculated by dividing each industry's gross fixed capital formation by gross fixed capital formation for total industries.

$$\text{INVT}_i = \frac{\text{gfcf}_i}{\text{gfcf}_{total}} \times 100$$

Investment shares relative to total manufacturing

This indicator represents the investment composition of manufacturing. It is calculated by dividing each manufacturing industry's gross fixed capital formation by gross fixed capital formation for total manufacturing.

$$\text{INVM}_i = \frac{\text{gfcf}_i}{\text{gfcf}_{manuf}} \times 100$$