

# Quantifying The Economic Impact of Companies

**Measuring the GDP Contribution of a Company by Calculating the Gross Value Added**

---

Dr. Richard Scholz  
Dr. Nora Albu  
Louisanne Knierim

## Imprint

### **Version**

January 2023

### **Publisher**

WifOR Darmstadt  
Rheinstraße 22  
D-64283 Darmstadt  
Phone: +49 6151 50155-0  
E-Mail: [dennis.ostwald@wifor.com](mailto:dennis.ostwald@wifor.com)

WifOR Berlin  
Joseph-Haydn-Straße 1  
D-10557 Berlin  
Phone: +49 30 2325666-50

### **Authors**

Dr. Richard Scholz  
Dr. Nora Albu  
Louisanne Knierim

### **Acknowledgement**

This paper has been produced as part of the collaboration between WifOR and the VBA, and in close cooperation with the VBA Methodology Team. We would like to thank Thomas Birmeyer, Vikram Nagendra, Michael Verbücheln and Awaz Alfadir for their valuable feedback.

## **Table of Contents**

<b>List of Figures</b> .....	<b>I</b>
<b>List of Abbreviations</b> .....	<b>II</b>
<b>1 Introduction</b> .....	<b>1</b>
<b>2 GDP as the key indicator of the national accounts</b> .....	<b>2</b>
<b>3 Measuring the GDP contribution of companies</b> .....	<b>5</b>
<b>4 A Brief Outlook</b> .....	<b>11</b>
<b>Bibliography</b> .....	<b>XIII</b>



**List of Figures**

**Figure 1: Output vs. value added ..... 3**

**Figure 2: How to calculate the gross value added ..... 4**

**Figure 3: Example of GDP contribution: Income statement by nature of a pasta firm - Output approach..... 6**

**Figure 4: Example of GDP contribution: Income statement by function of a pasta firm - Output approach ..... 7**

**Figure 5: Income statement by function - Output approach vs. income approach ..... 9**

**Figure 6: GDP contribution & output from R&D ..... 10**

**Figure 7: GDP contribution including output from R&D activities ..... 11**

**Figure 8: The OECD well-being conceptual framework ..... 12**



## List of Abbreviations

<b>GAAP</b>	<b>General Accepted Accounting Principles</b>
<b>GDP</b>	<b>Gross Domestic Product</b>
<b>GOS</b>	<b>Gross Operating Surplus</b>
<b>GVA</b>	<b>Gross Value Added</b>
<b>GNI</b>	<b>Gross National Income</b>
<b>HGB</b>	<b>Handelgesetzbuch (German Commercial Code)</b>
<b>IFRS</b>	<b>International Financial Reporting Standards Foundation</b>
<b>NDP</b>	<b>Net Domestic Product</b>
<b>NNI</b>	<b>Net National Income</b>
<b>P&amp;L</b>	<b>Profit and Loss</b>
<b>PPP</b>	<b>Purchasing Power Parity</b>
<b>R&amp;D</b>	<b>Research and Development</b>
<b>SNA</b>	<b>System of National Accounts</b>
<b>VAT</b>	<b>Value Added Tax</b>
<b>VBA</b>	<b>Value Balancing Alliance</b>



# 1

## Introduction

The purpose of a business is to provide value through products and services to customers, who pay for it with money or its equivalent. A company's stability and growth therefore depend largely on the wealth it creates through the collective efforts of all stakeholders - shareholders, debt providers, employees, and the government. Traditional financial accounting systems in the form of income statements or profit and loss statements reflect only the information interests of shareholders (i.e., owners). However, the contribution of the company to other stakeholders is not evident from the income statement.

One way to show the value created benefiting all stakeholders - not just shareholders - is through assessing the business' contribution to the gross domestic product (GDP). The business' GDP contribution as an indicator is thus a much broader measure of success than profit, which is only related to the owners of the company.

GDP is a well-established measure of the market value of goods and services produced by a country to satisfy the needs of final consumers. It combines in a single figure, and with no double counting, all the production related value added from goods and services created by all firms, non-profit institutions, government bodies and households in a given country during a given period, regardless of the type of goods and services produced, provided that the production takes place within the country's economic territory (Lequiller and Blades 2014).

A company's GDP contribution shows the economic value created for its customers in market prices (and only if there exist a market price). In economic theory, the market price is usually a result of demand and supply. The supply and demand curve for the produced good or service under consideration is a (according to textbook economics) representation of the preferences (willingness to pay and willingness to accept a payment) of individuals, firms or other stakeholders (Mankiw 2003). Accordingly, the GDP contribution corresponds in a way to the utilization value of the produced good.<sup>1</sup>

It is important to note, that GDP contribution measures only the economic impact of companies that is captured in market prices. Neither unpaid or underpaid goods and services are captured by this indicator, nor does it represent a net economic impact of the companies. For the production of goods and services, companies might extensively use different resources (provision of labour, capital, but also e.g., state infrastructure). Partly, especially when market transactions take place, the use of these resources is captured in the calculation. For example, the use of labour is captured by wages, other inputs such as state infrastructure are usually not captured in the calculation at all. The indicator provides a measure of the value of the goods and services produced, but not of whether the provision of the goods produced is worth the input of the required resources. Negative impacts that occur in the production of these goods, such as suffering at the workplace, wear and tear of state infrastructure, or destruction of natural capital, are not subtracted.

Nonetheless, GDP has long been used to measure not only the economic performance, but also societal progress and, ultimately, a nation's wealth (Callen 2020). In addition, the indicator builds a bridge to the national accounts and thus enables stakeholder communication with society. Since GDP (as well as most other political

---

<sup>1</sup> Exchange values are not a well-fare measure in themselves but the price at which the market clears under the given market structure. In economics, well-fare is instead commonly measured as the consumer and the producer surpluses, which capture the differences of consumers' willingness to pay to the price, and the producers' cost of production to the exchange value. In the impact to society approach it is attempted to measure changes of well-being. It can be shown that the exchange value reflects the marginal change of well-being in case of well-functioning markets (SEEA).



targets) is measured on the country level, this is also the level playing field of stakeholder communication. Accordingly, the GDP contribution of a company needs to be considered in relation to the national GDP.

The system of national accounts (SNA) provides a comprehensive conceptual and accounting framework to calculate key aggregates such as GDP to analyze and evaluate the performance of an economy. Despite some major boundaries, of which the SNA are aware and will be discussed later, it has become the standard system used with little or no modification by most countries in the world for informed, rational policymaking and decision taking. Calculating the GDP contribution (or gross value added (GVA)) of a company should thus follow the definitions of the SNA (European Commission et al. 2008).<sup>2</sup>

## 2 GDP as the key indicator of the national accounts

The technical term of the GDP contribution of a company is the gross value added (GVA). Summing the gross value added of all economic actors in a territory plus taxes and minus subsidies will yield the GDP of the respective country (Eurostat 2010). For this reason, the gross value added of a company can also be referred to as the GDP contribution.

The system of national accounts provides the following definition:

**Gross value added** is the value of output less the value of intermediate consumption (European Commission et al. 2008).

While output and intermediate consumption are defined as follows:

**Output** is the total of products created during the accounting period (Eurostat 2013).

**Intermediate consumption** consists of goods and services consumed as inputs by a process of production, excluding fixed assets whose consumption is recorded as consumption of fixed capital. The goods and services are either transformed or used up by the production process (Eurostat 2013).

The valuation of output and intermediate consumption is carried out under the consideration of basic prices which refer to the price that the producer receives by selling its good or service to the purchaser. Taxes and subsidies are not included (Eurostat 2017a).<sup>3</sup>

### Output vs. value added

---

<sup>2</sup> It should be noted that partial overlaps may exist between GVA and other indicators such as living wage and training, depending on how those indicators are defined. Further methodological work will be required to develop approaches that would allow adjusting for such overlaps. In the meantime, it is important to note that GVA and social impacts are not additive. Potential overlaps should be made transparent and balancing GVA against other impacts is to be avoided as the results would be misleading.

<sup>3</sup> The valuation could be alternatively done with producer prices (inclusion of taxes and subsidies). However, the majority of taxes are added for the consumer and concern households instead of companies. Since we analyze on the company level, this point is neglected, and basic prices are used.



The difference between output and value added and why the value added is the better indicator to measure economic activities is depicted in *figure 1* (Lequiller and Blades 2014). The explanation is supported by an example that refers to firm A and its pasta production. Only considering the output as an indicator can be very misleading depending on the firm's structure. In case there is only firm A that produces all goods needed for the production by itself, the output results in 100 000€, which corresponds here as well to the value added. In the other case when the firm splits into firm A1 and firm A2 the situation changes. Firm A1 still produces the pasta but firm A2 makes the wheat which is needed for the pasta and sells it to firm A1. If we still use the output as the indicator it would appear as an increased total output of 130 000€ (instead of 100 000€) although nothing changed. However, the intermediate consumption of the wheat has not been taken into account, which is what distinguishes the value added from the output. Hence, subtracting the intermediate consumption from firm A1's output results again in a total value of 100 000€. Therefore, the value added is the more reliable indicator to depict the value of economic activity.

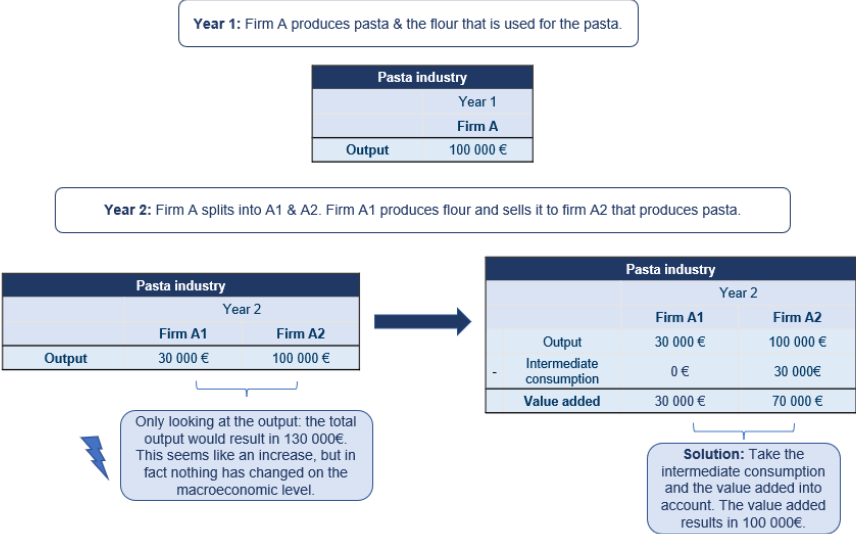


Figure 1: Output vs. value added

The national accounts allow to calculate the GDP in three ways: output approach, income approach and final demand approach. These three approaches show the same indicator from different perspectives. The most applicable and reliable method to calculate the gross value added of a company is the output approach. Nevertheless, all three are briefly presented below.

1. The **output approach** or value added approach shows how much value is contributed at each stage of production: It is calculated by summing the gross value added of all economic actors. Gross value added for each economic actor is calculated based on output and intermediate consumption.

$$Gross\ valued\ added\ (GVA) = output - intermediate\ consumption \tag{1}$$

2. The **income approach** measures GDP by adding the incomes that companies need to pay to the different production factors, labor and capital, that contribute to the output. The relevant elements are compensation of employees and gross operating surplus (including mixed income<sup>4</sup>).

$$Gross\ value\ added\ (GVA) = compensation\ of\ employees + gross\ operating\ surplus \tag{2}$$

<sup>4</sup> Mixed income is the remuneration for work done by the firm's owner or family (OECD 2001) and thus can be ignored for our purpose.



Definition: **Compensation of employees** is defined as the total remuneration, in cash or in kind, payable by an enterprise to an employee in return for work done by the latter during the accounting period (European Commission et al. 2008).

Definition: The **gross operating surplus** is a balancing item of the income account. It is calculated as a measure of the surplus accruing from processes of production before deducting any explicit or implicit interest charges, rent or other property incomes payable on the financial assets, land or other natural resources required to carry on the production. It is gross because it makes no allowance for consumption of fixed capital. By deducting **consumption of fixed capital** from gross operating surplus one calculates the **net operating surplus** (Eurostat 2017b).

Definition: **Consumption of fixed capital** reflects the decline in the value of the fixed assets. Fixed assets decline in value due to normal wear and tear, foreseeable ageing (obsolescence) and a normal rate of accidental damage. Unforeseen obsolescence, major catastrophes and the depletion of natural resources, however, are not included. Unlike “depreciation” in business accounting, consumption of fixed capital in national accounts is not a method for allocating the costs of past expenditures on fixed assets over subsequent accounting periods. Rather, it is the decline in the future benefits of the assets due to their use in the production process (Eurostat 2017c).

- The **final demand approach** takes into account that all produced goods need to be purchased and used by someone. It thus shows the sum of the final uses of goods and services.<sup>5</sup>

$$\text{Gross value added (GVA)} = \text{consumption} + \text{investment} + \text{net export} \quad (3)$$

These three approaches show that GDP contribution simultaneously embodies first the utility value of the goods and services produced by the company (final demand approach), second the value that the company has added to them (output approach), and third the monetary exchange value that the company's various stakeholders receive in exchange for their contribution to the production value (income approach).

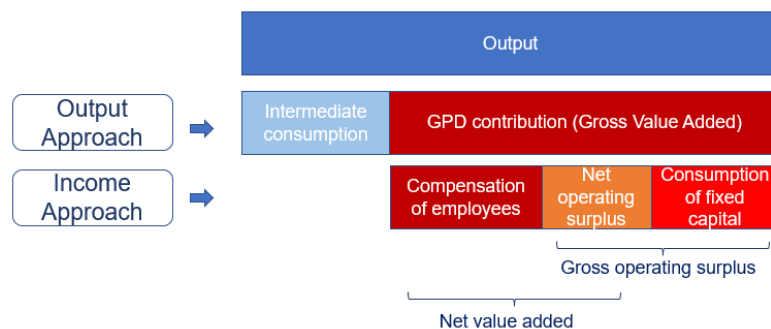


Figure 2: How to calculate the gross value added

Furthermore, value added can be measured either gross or net, that is, before or after deducting consumption of fixed capital. Although less widely used than GDP, the net domestic product (NDP) is, in theory, a better measure of the wealth produced since it deducts the cost of wearing out the machinery and other capital assets used in production. However, OECD economists tend to prefer GDP or gross national income (GNI) (over NDP and NNI) for two reasons: First, methods for calculating consumption of fixed capital are complex and tend to differ between countries, thus creating doubts about the comparability of results. Second, when ranking countries or analyzing growth, the differences between GDP and NDP are small and do not change the conclusions (Lequiller and Blades 2014).

<sup>5</sup> Since we analyze on the company level, this approach is not practicable and will be disregarded from here.



Accordingly, GDP is most commonly used in policy communication as well as the formulation of different targets (e.g. SDG targets). Therefore, we emphatically suggest using the GDP contribution and additionally recommend publishing the net value added if feasible.

# 3 Measuring the GDP contribution of companies

The key elements of direct GVA should be available from the company's financial reports, particularly the profit and loss statement. However, the availability of the single items heavily depends on the applied accounting standard. To ensure consistent and comparable financial reporting, the EU and more than 140 jurisdictions require companies to prepare their financial statements in accordance with a single set of international standards called IFRS (International Financial Reporting Standards). IFRS have replaced many different national accounting standards around the world, but have not replaced the separate accounting standards in the United States where U.S. GAAP is applied (OECD 2007).

The following sections focus on the calculation of the GDP contribution using an income statement following the IFRS guidelines. In the context of the analysis of US-GAAP financial statements, the calculation of the GDP contribution is usually more complicated, and probably additional datapoints that are not part of the income statement are required. In contrast, the application of other national reporting standards such as the German HGB<sup>6</sup> make it much easier to calculate the GDP contribution.

All data sources only allow an approximate derivation of the contribution to the GDP since these income statements contain some mix-up of relevant and irrelevant factors for the calculation of the GDP contribution. According to IFRS, the income statement can be structured in two different ways: by nature or by function. The relevant differences regarding financial components and calculations are summarized in the following paragraphs.

## GDP contribution using an income statement by nature

Within an income statement structured by nature, the **output** is derived by adding up the following items:

- revenue
- inventory production of finished goods and work in progress
- own work capitalized

Other operating income may only be added if it clearly corresponds to the definition of output from the SNA. The following items do not correspond to the definition of output and should not be included:

- financial income
- interest gains
- exchange rate gains
- other valuation and liquidation gains

---

<sup>6</sup> Handelsgesetzbuch (German commercial code).



Insofar as no amounts of this valuation and liquidation income are given, the other operating income should not be added to the output due to its mixed character. This approach ensures that the output value is not overstated. The second crucial component is the **intermediate consumption** that consists of goods and services consumed as inputs by a process of production. Undoubtedly this refers to the cost of material and the item "other expenses" usually consists primarily of intermediate consumption as well. However, there are several types of costs that do not match the definition of the SNA and must therefore be deducted from "other expenses", such as:

- liquidation gains and losses
- valuation gains and losses
- foreign exchange losses
- taxes
- interest payments
- donations
- compensation for members of the Supervisory Board, an advisory board or similar bodies

Figure 3 shows an income statement by nature of the firm A2 producing pasta from the example in figure 1. The firm's revenues from selling their pasta products amount to 100,000 € during the reported year. By adding the inventory production of finished goods and work in progress, as well as own work capitalized and other operating income to the revenue, the output amounts to 105,000 €. To determine the GDP contribution, the intermediate consumption has to be calculated, i.e., referring to purchased goods such as wheat, eggs, oil. For the example of the firm producing pasta, the intermediate consumption amounts in 55,000 €. GDP contribution equals the difference between output and intermediate consumption. Thus, the pasta firm's GDP contribution equals 50,000 €.

Pasta firm		in €
Revenues		100 000
+ Changes in inventory of finished goods and work in progress		- 1 000
+ Capitalized own work		3 000
+ Other (operating) income		3 000
<b>= Output</b>		<b>105 000</b>
- Intermediate consumption		55 000
<b>= GDP contribution</b>		<b>50 000</b>

Intermediate consumption		in €
Costs of raw material		40 000
+ Other expenses		15 000
<b>= Intermediate consumption</b>		<b>55 000</b>

Figure 3: Example of GDP contribution: Income statement by nature of a pasta firm - Output approach

### GDP contribution using an income statement by function

The basis for calculating the **production value** based on the income statement by function is revenue. However, when using the income statement structured by function "changes in inventory" can usually only be approximated with the help of the balance sheet. Also, "capitalized own work" is subject to voluntary disclosure. In this respect, the calculation of the output based on an income statement structured by function can be subject to greater inaccuracy.

Furthermore, it is usually not possible to derive **intermediate consumption** directly from the income statement. An income statement structured by function contains costs listed by functions, such as cost of goods sold,

distribution costs, administrative expenses, and other expenses. All these costs may include intermediate consumption but also depreciation, personnel expenses, and/or other costs.

Thus, a **subtractive method** is used. First, the total of the costs needs to be determined by adding up cost of goods sold, distribution costs, administrative expenses, and other expenses. Second, the following cost items that do not correspond to intermediate consumption need to be subtracted from the total of the costs:

- personnel expenses
- depreciation & amortization
- liquidation gains & losses
- valuation gains & losses
- foreign exchange losses
- taxes
- interest payments
- donations
- compensation for members of the Supervisory Board, an advisory board, or similar bodies

Figure 4 revives our previous example referring to the firm producing pasta from figure 1. The main difference here is the calculation for the intermediate consumption due to the income statement structured by function instead of by nature. In case of a very accurate estimation, the values from both calculations do not differ.

Pasta firm	in €
Revenues	100 000
+ Changes in inventory of finished goods and work in progress	- 1 000
+ Capitalized own work	3 000
+ Other (operating) income	3 000
<b>= Output</b>	<b>105 000</b>
- Intermediate consumption	55 000
<b>= GDP contribution</b>	<b>50 000</b>

Estimation of intermediate consumption	in €
Costs of goods sold	70 000
+ Administrative costs	5 000
+ Distribution costs	5 000
+ Other costs	5 000
<b>= Total Expenses</b>	<b>85 000</b>
- Depreciation and amortization	5 000
- Compensation of employees	20 000
- Liquidation and valuation gains,..	5 000
<b>= Intermediate consumption</b>	<b>55 000</b>

Figure 4: Example of GDP contribution: Income statement by function of a pasta firm - Output approach

It is not always easy to retrieve these datapoints; however, the most important items such as personnel expenses, depreciation and amortization are usually available.<sup>7</sup> Further, it should be noted that all cost items in the income statement structured by function are related to the revenues and not the produced goods and services. This creates another inaccuracy in the calculation that usually cannot be avoided.

## Taxes & Subsidies

Note that taxes and subsidies on products, such as the value added tax (VAT), are not taken into account in either approach. These taxes are collected by businesses but are typically borne by the final consumer (European Commission 2008), and they represent the difference between the sum of national GVA in basic prices and the nation's GDP in market prices.

<sup>7</sup> According to the German Commercial Code (HGB) for instance, they need to be provided in the annex or the balance sheet of the financial reports.

## Consolidation

Direct GVA shows the direct contribution of the company to a country's GDP. Hence, it is necessary to calculate the direct GVA on a country basis. Especially large multinational companies face the challenge of coping with substantial intra-company trade that needs to be considered.

To calculate the GDP of a company in a certain country, **all sites/legal entities/business units within each country** should be considered as one aggregated entity. Returning to our pasta producing firm example: Assuming that firm A1 and firm A2 (specialized in making flour) are part of the same company, and both are located in the same country, sales from firm A2 to A1 should not appear as revenues in A2 or as costs in A1 to avoid the risk of double counting. In case of a transfer of goods produced and no additional production, it would appear as additional value added which was already added along the firm's internal supply chain.

On the other hand, **trade between your company sites or units located in different countries** should be accounted for since the calculation is based on the country. Assuming A1 is located in Switzerland while A2 is located in Germany, sales from A2 to A1 should be accounted for and should show up as revenue in A2 but also as costs in A1.

### Additional comment on the income approach

As described above, the income approach neatly distributes the components of GVA to the different stakeholder groups that are being remunerated by the company and also provide a value in return. Employees experience an improvement in their material conditions from receiving monetary compensation for their labor. The gross operating surplus is the return for the shareholders' investment and affects their material conditions.

While compensation of employees is available in the financial reports and corresponds quite well to the definition of the SNA, the gross operating surplus is a balancing item in the SNA and does not necessarily correspond to profits, depreciation and amortization in the income statement.

However, assuming that there are

- no internal R&D activities
- no own work capitalized (only for the income statement structured by function)
- no changes in inventories (only for the income statement structured by function)
- no valuation and liquidation gains
- no donations

the GDP contribution calculated by the income approach corresponds to the GDP contribution calculated by output approach (*figure 5*).



Output Approach		in €
Revenues		100 000
+ Changes in inventory of finished goods and work in progress		0
+ Capitalized own work		0
+ Other (operating) income		0
<b>= Output</b>		<b>100 000</b>
- Intermediate consumption		60 000
<b>= GDP contribution</b>		<b>40 000</b>

Estimation of intermediate consumption		in €
Costs of goods sold		70 000
+ Administrative costs		5 000
+ Distribution costs		5 000
+ Other costs		5 000
<b>= Total expenses</b>		<b>85 000</b>
- Depreciation and amortization		5 000
- Compensation of employees		20 000
<b>= Intermediate consumption</b>		<b>60 000</b>

Income Approach		in €
Compensation of employees		20 000
+ Depreciation and amortization		5 000
+ Profits (revenue – total expenses)		15 000
<b>= GDP contribution</b>		<b>40 000</b>

Figure 5: Income statement by function - Output approach vs. income approach

### Treatment of internal Research and Development (R&D) as investments

Research and development (R&D) enables new combinations of existing resources, and is thus regarded as the origin of knowledge-based long-run economic growth. In addition, R&D is crucial for maintaining competitiveness by generating new concepts and innovations. The Europe 2020 strategy includes innovation policy measures to promote and improve conditions for R&D (European Commission 2010). Besides, 27 of 37 OECD countries set R&D intensity targets at the national level in relation to their GDP. These targets differ significantly from 1.2% in Slovakia to 4% of the GDP in Finland, for example (VTT Research 2021).

The importance of R&D has also been taken up by the national accounts. In the latest revision of the international accounting rules (the worldwide System of National Accounts 2008 and the European System of Accounts 2010), R&D is no longer treated as an expense, but as an investment and asset. It is thus understood as generating a return that can be estimated in terms of value added. Hence, the new treatment of R&D as an investment in intellectual property leads to a noticeable increase in the level of GDP as well as other economic aggregates. These changes were implemented as part of the 2014 general revision of the national accounts, the detailed results of which were published by several National Statistical Offices in September 2014.

The “Guidelines for Collecting and Reporting Data on Research and Experimental Development,” published by the OECD in 2015, laid the foundation of how to recognize expenditures on R&D as capital formation. Known as the Frascati Manual, it represents a binding framework for statistical authorities on a global scale within the System of National Accounts 2008 (SNA 2008).

The treatment of R&D as capital investment can equally be transposed from macro to micro level units, i.e. from a national to a company level (Zubrzycki 2020). The new accounting standard has already been applied by several companies, including Sanofi-Aventis Germany GmbH, Novartis and others (WifOR Institute 2019, 2020). In the following, the conceptual requirements in line with the OECD’s Frascati Manual are briefly outlined (OECD 2015). Treating internal R&D as investment or asset rather than cost means that R&D activities need to be treated as production process. Thus, the outcome of this process needs to be measured as output. According to the SNA, the value or output of R&D for market producers should be calculated using the **income approach**.

Direct economic effect of R&D activities	in €
Compensation of employees for R&D	10 000
+ Gross operating surplus for R&D	10 000
= <b>GDP contribution from R&amp;D</b>	<b>20 000</b>
+ Intermediate consumption for R&D	5 000
= <b>Output from R&amp;D</b>	<b>25 000</b>

Figure 6: GDP contribution & output from R&D

That calculation requires the compensation of employees, the gross operating surplus, the intermediate consumption, and how all three reflect on the firm's R&D activities.

- **Compensation of employees for R&D** is the most important datapoint and is usually available in the financial accounts of the company
- **Gross operating surplus for R&D** consists of the contribution of capital services for R&D and the net operating surplus reflecting a mark-up due to the need to generate sufficient operating surplus to meet the dividend expectations of the owners.<sup>8</sup> The mark-up is a valuation estimate related to the value added on the R&D activity. Both datapoints are usually not available from the financial accounts of a company. Accordingly, the datapoints need to be estimated in line with the established macro-economic frameworks. The Frascati Manual as well as the SNA provide guidelines on how to estimate capital services and the net operating surplus. The mark-up method is used as suggested by state-of-the-art academic literature assuming that the ratio of operating surplus to compensation of employees is the same as that of the industry in question (Eurostat 2014a). Specifically, the gross operating surplus can be estimated using the following formula (WifOR institute 2020):

$$GOS (company) = \frac{GOS(industry)}{Employee COMP (industry)} \times Employee COMP (company)$$

$$GOS (industry) = GVA (industry) - Employee COMP (industry),$$

where *GOS* refers to gross operating surplus, *GVA* to gross value added, and *employee COMP* to compensation of employees. Both the gross value added and the employee compensation of the respective industry can be derived from data providers such as Eurostat, OECD, or national statistical offices in national accounts systems.

- **Intermediate consumption of R&D** is often not reported in the financial accounts. So usually, this datapoint needs to be estimated. Normally, companies have values on the total internal costs of R&D. By subtracting compensation of employees from the total internal costs, one gets an upper bound of the intermediate consumption. Additional information may be retrieved from procurement data. If no further data is available, industry statistics on R&D expenditure might be used to estimate the share of intermediate consumption to total R&D expenditure or employee compensation.

Once the output value of internal R&D is calculated, it can be added to the overall output of the company to calculate the GDP contribution, including the activities from R&D. This step is depicted in *figure 7*. In addition to the overall GDP contribution, we suggest reporting the GDP contribution of R&D activities separately.

<sup>8</sup> Note: One could argue that data on capital services for R&D might be available through data on depreciation & amortization of the R&D function. However, usually past R&D can contribute to future R&D, and so these assets should also be included in estimating capital services. Since past R&D is usually not treated as capital investments in the financial accounts it becomes nearly impossible in practice to measure this. Therefore, by convention, it is acceptable to ignore these expenditures unless specific information is available.

	in €
Revenues	100 000
+ Changes in inventory of finished goods and work in progress	- 1 000
+ Capitalized own work	3 000
+ <b>Immaterial capitalized own work from R&amp;D</b>	<b>25 000</b>
+ Other (operating) income	3 000
<b>= Output</b>	<b>130 000</b>
- Intermediate consumption	55 000
<b>= GDP contribution</b>	<b>75 000</b>

Direct economic effect of R&D activities	in €
Compensation of employees for R&D	10 000
+ Gross operating surplus for R&D	10 000
<b>= GDP contribution from R&amp;D</b>	<b>20 000</b>
+ Intermediate consumption for R&D	5 000
<b>= Output from R&amp;D</b>	<b>25 000</b>

Figure 7: GDP contribution including output from R&D activities

# 4 A Brief Outlook

The use of GDP or GVA as a measure of progress or as a definition of value has been criticized. The accusation refers to the GDP being an insufficient measure considering other pressing social needs, as it does not capture a population's quality of life or well-being (Shinwell and Shamir 2018).

However, ongoing research is exploring the link between the improvement in material conditions experienced by the beneficiaries of GVA creation and the resulting improvement in quality of life and well-being (e.g. Kapoor and Debroy 2019). The elements of the OECD's well-being framework, for example, are interconnected (see *figure 8*) (OECD 2017). An increase in income may facilitate a change in housing conditions, which could, in turn, improve personal security and health. Further development of the methodology should focus on better quantifying these secondary effects to enhance our understanding of the impact and value of GVA creation.



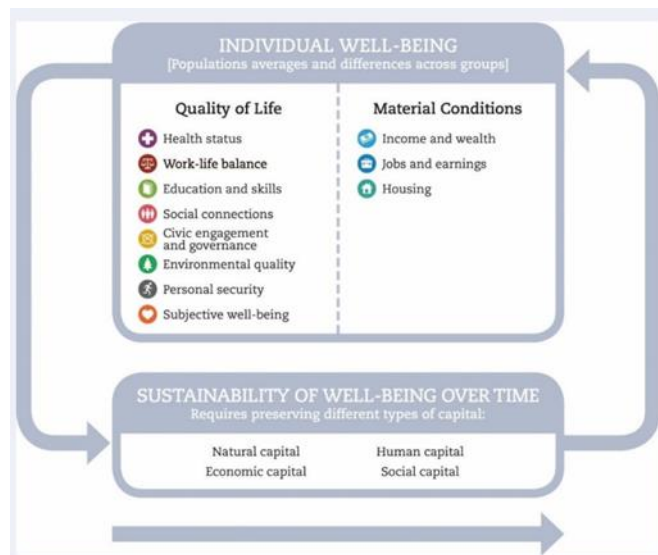


Figure 8: The OECD well-being conceptual framework

Many organizations have attempted to establish frameworks for a more complete measure of people's well-being. The OECD well-being conceptual framework (see figure 8) shows how components of GVA (income and earnings) might be incorporated into a holistic definition of individual well-being. Therefore, a new definition of value may include GVA as a foundation in understanding the contribution that a business makes to the well-being of its stakeholders. However, it is recognized that it is merely one facet of the impact that a company has on people.

# Bibliography

- Callen, T. (2020): Gross Domestic Product: An Economy's ALL, Available from Gross Domestic Product (GDP): An Economy's All - Back to Basics: GDP Definition (imf.org).
- Lequiller, F. and D. Blades (2014), Understanding National Accounts: Second Edition, OECD Publishing.
- European Commission, International Monetary Fund Organisation for Economic Co-operation and Development, United Nations and World Bank (2008): System of National Accounts. Available from <https://unstats.un.org/unsd/nationalaccount/docs/sna2008.pdf>.
- European Commission (2010): Europe 2020 A strategy for smart, sustainable and inclusive growth, Publications Office of the EU. Available from <https://op.europa.eu/en/publication-detail/-/publication/6a915e39-0aab-491c-8881-147ec91fe88a/language-en>
- Eurostat (2010): Glossary: Gross value added. Available from [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Gross\\_value\\_added](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Gross_value_added)
- Eurostat (2013): European system of accounts, ESA 2010.
- Eurostat (2014a): OECD Handbook on Deriving Capital Measures of Intellectual Property Products 2010.
- Eurostat (2014b): Manual on measuring Research and Development in ESA 2010.
- Eurostat (2017a): Glossary: Basic price. Available from [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Basic\\_price#:~:text=Glossary%3ABasic%20price%20The%20basic%20price%20is%20the%20amount,any%20transport%20charges%20invoiced%20separately%20by%20the%20producer.](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Basic_price#:~:text=Glossary%3ABasic%20price%20The%20basic%20price%20is%20the%20amount,any%20transport%20charges%20invoiced%20separately%20by%20the%20producer.)
- Eurostat (2017b): Glossary: Gross operating surplus. Available from [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Gross\\_operating\\_surplus\\_\(GOS\)\\_-\\_NA](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Gross_operating_surplus_(GOS)_-_NA)
- Eurostat (2017c): Glossary: Consumption of fixed capital (CFC), Available from [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Consumption\\_of\\_fixed\\_capital\\_\(CFC\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Consumption_of_fixed_capital_(CFC))
- Kapoor A. & Debroy B. (2019): GDP Is Not a Measure of Human Well-Being. Harvard Business Review. Available from <https://hbr.org/2019/10/gdp-is-not-a-measure-of-human-well-being>.
- Mankiw, N. G. (2003): Principles of economics, 3<sup>rd</sup> edition, South-Western.
- OECD (2007): Generally accepted accounting principles, Glossary of statistical terms. Available from <https://stats.oecd.org/glossary/detail.asp?ID=7295>
- OECD (2015): Frascati Manual 2015. Guideline for collecting and reporting data on research and experimental development. Available from <https://www.oecd.org/sti/inno/frascati-manual.htm>.



Shinwell M. & Shamir E. (2018): Measuring the impact of businesses on people's well-being and sustainability: Taking stock of existing frameworks and initiatives, OECD Statistics Working Papers, No. 2018/08, OECD Publishing, Paris.



**WifOR** is an independent economic research institute that originated from a spin-out of the Department of Public Economics and Economic Policy at the Technical University of Darmstadt, Germany. We see ourselves as an academic partner and think tank on a global scale. WifOR's fields of research include Economic, Environmental and Social Impact Analyses as well as Labor Market and Health Economy research.

## CONTACT

WifOR Institut  
Rheinstraße 22  
D-64283 Darmstadt  
Germany | Greece | Ireland | Latin America | USA

[www.wifor.com](http://www.wifor.com)