Economic and finance statistics

Gross Domestic Product – production approach

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Gross Domestic Product

- is a key aggregate of the system of National Accounts measuring production activities
- is widely used to assess the economic development of a country
  - Longer term: structural developments based on detailed annual data
  - Short term: quick quarterly aggregated data
- Main basis for economic forecasts and for some administrative purposes
- can be compiled from 3 sides
  - production approach
  - expenditure approach
  - income approach

GDP quotations

- “WIESBADEN - According to first calculations of the Federal Statistical Office (Destatis), the price adjusted gross domestic product (GDP) was 5.0% lower in 2020 than in the previous year. After a ten-year growth period, the German economy suffered a deep recession in 2020, the year of the corona, ……. “

  (Destatis, Pressrelease #020 from 14 January 2021)

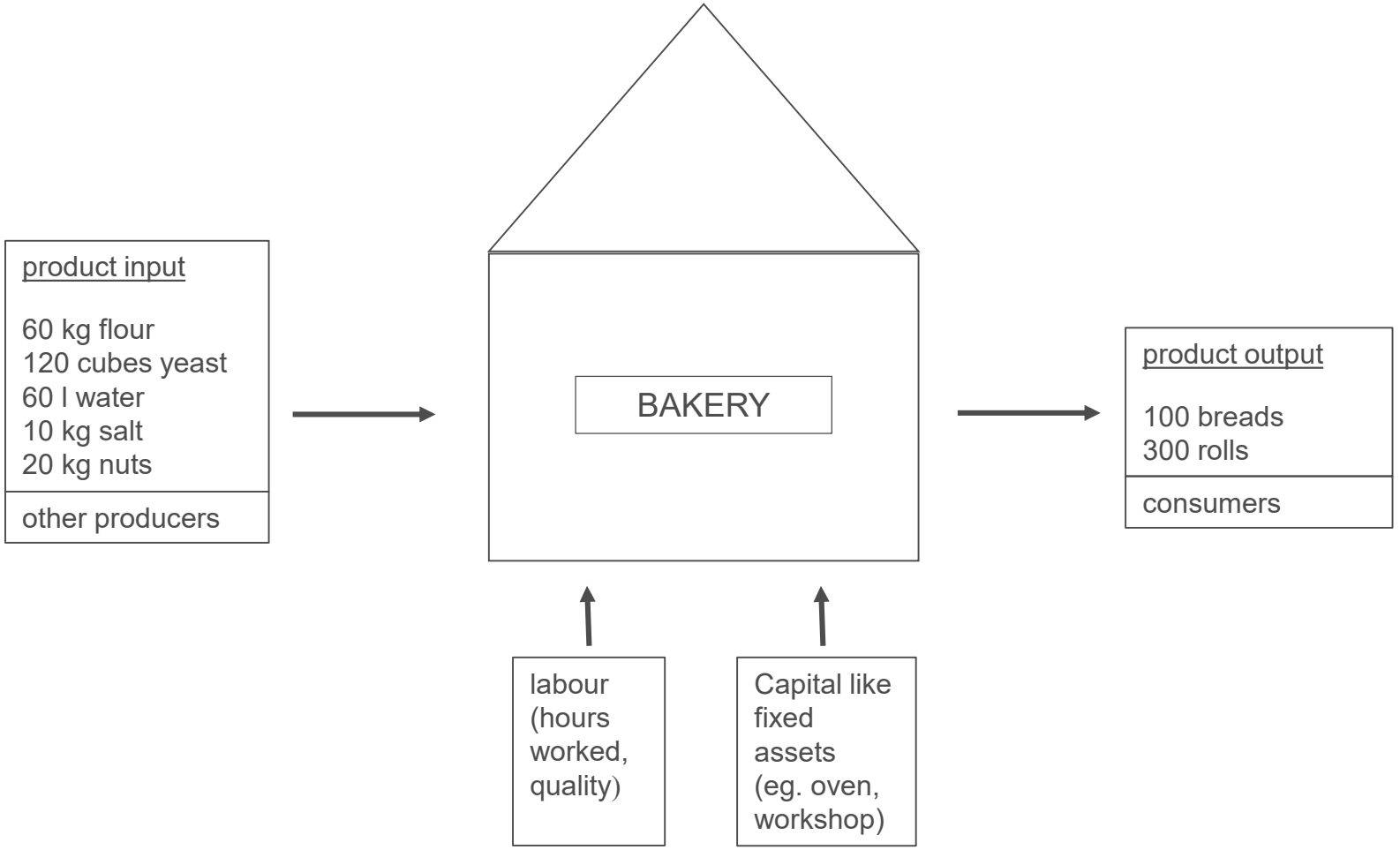
- “….. According to a first estimation of annual growth for 2020, based on……, GDP fell by 6.8% in the **euro area** and 6.4% in the **EU**. …. “

  (*Eurostat, newsrelease, 23/2021 - 16 February 2021)*

- France: “GDP declined in Q4 2020 (– 1.3%), marked by the second lockdown; over the year 2020, GDP declined by 8.3%..... “

  (INSEE, Informations rapides Nº 026, Published on 29/01/2021)

1.1 Basics – production process



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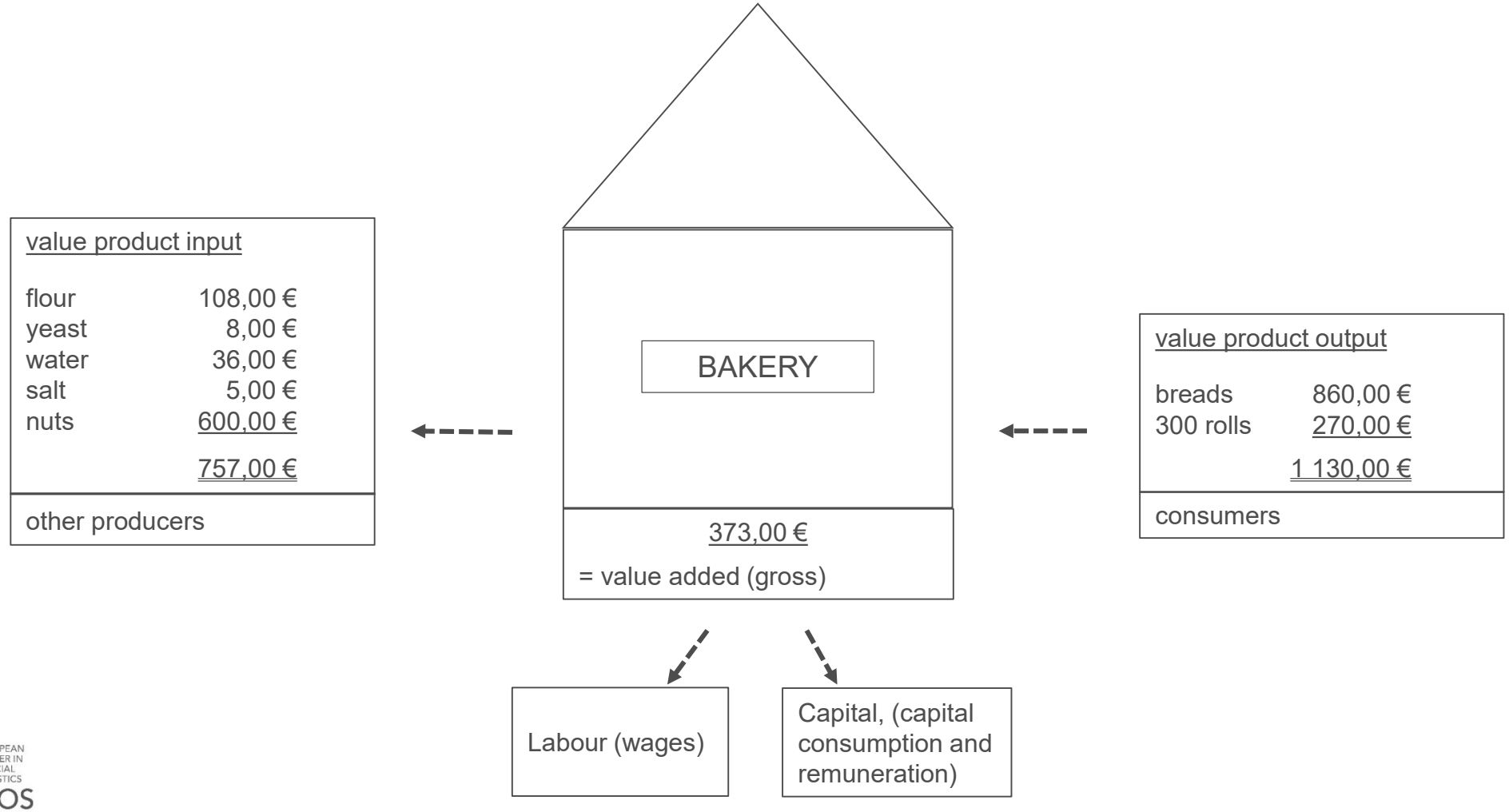

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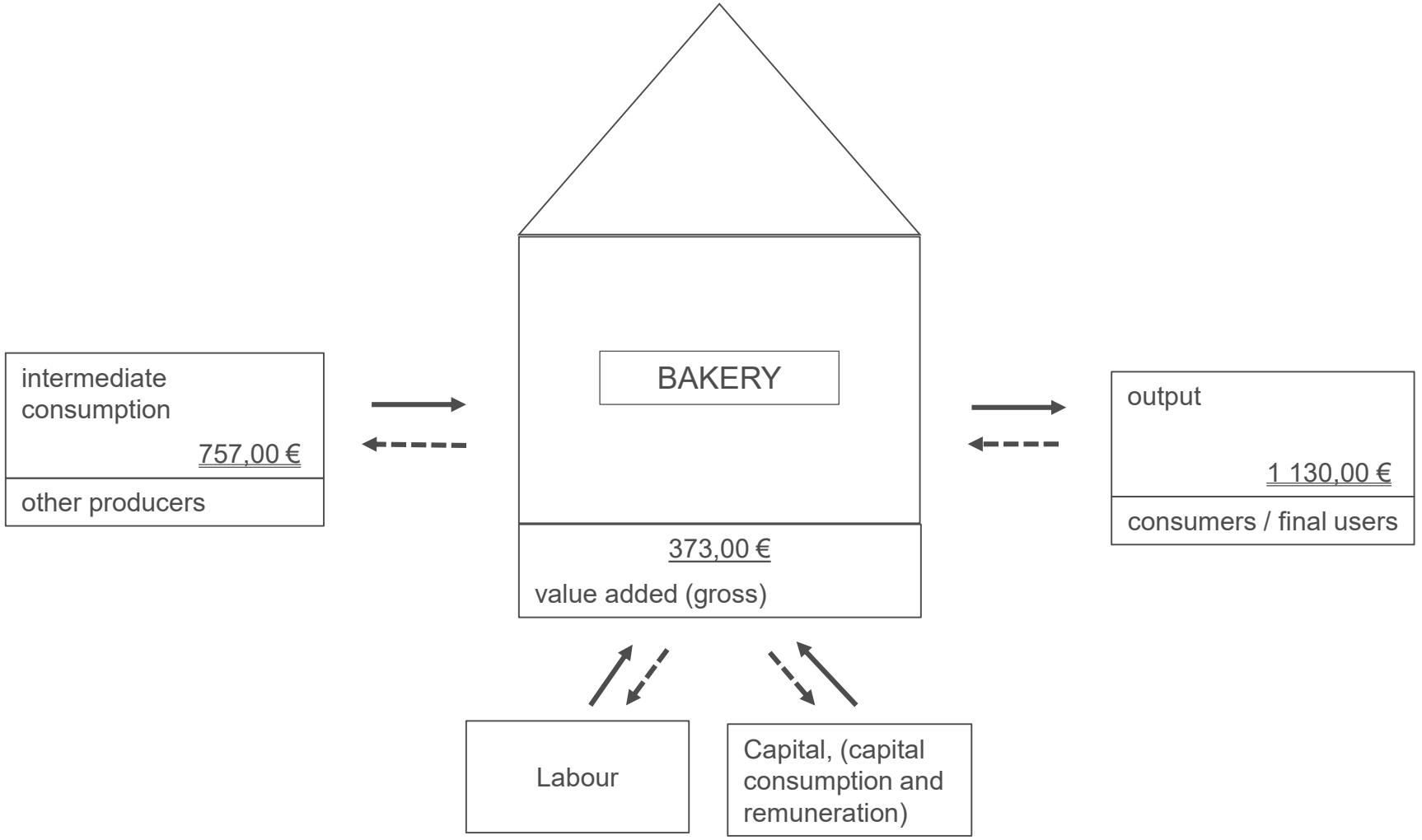


1.2 Basics – Gross value added & GDP

- Valuation of products enables to add completely different goods and services.
- Gross value added is the appropriate measure to quantify the economic performance of producer units from the production side:
  - GVA avoids double-counting in economies with division of labour, since only the additional contribution of any producer is taken into account. This is obtained by estimating the value of output and deducting the value of intermediate consumption (i.e. the products purchased from other producers).
  - Value added can also be compiled by adding the relevant costs of production, i.e. labor costs (wages, salaries) and capital costs.
- Value added of all producers is the most important ingredient for the production side GDP:

  "There are three ways of measuring GDP (*at market prices*):

  (1) the production approach, as the sum of the values added by all activities which produce goods and services, plus taxes less subsidies on products; " *(ESA 2010, § 1.133)*

1.3 Basics – Compilation methods GVA & GDP

Market producer
Output-method

Output (at basic prices)

./. Intermediate consumption (at producer prices)

= **Gross value added**

Non-market producer
Production costs method

Wages + salaries

+ capital consumption

= **Gross value added**

+ taxes on products

./. Subsidies on products

= **GDP at market prices**

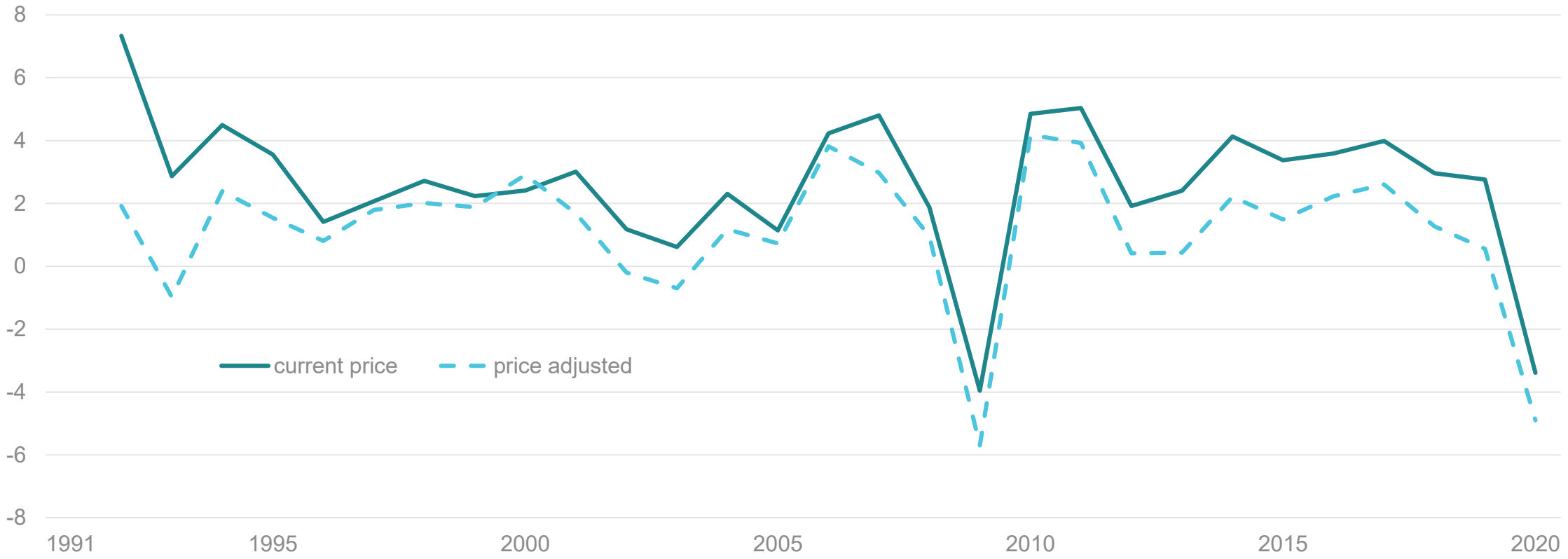
1.4 Basics – GDP and inflation

- Challenge of comparing nominal values / current price GDP: inflation and deflation

	GDP curr	Prices
• Country A	3,1 %	1,1%
• Country B	8,6 %	8,1%

- Solution: GDP volume or GDP in real terms (i.e. economic growth)
  - GDP current = Output - Intermediate consumption
  - GDP volume = (output : PI_out) – (Intermediate consumption : PI_ic)
- Double-deflation method preferred
  - GDP deflator = GDP current : GDP volume

1.5 GDP, Percentage change on previous year-DE



2.1 Economy and units

- Economy = territory where the same / similar rules apply (laws, money, administration etc.)
  - Usually: country (its geographic territory excluding areas used by foreign governments, EU or internat. organisations)
  - Also: - regions of a country (German Laender, French departements),
    - sum of countries (like EU or Euro-Area)
- Units with a similar economic behaviour are grouped together. Sectors are the standard grouping:
  - S.11 Non-financial corporations
  - S.12 Financial corporations
  - S.13 general government
  - S.14 / S.15 Households / non-profit institutions serving households
- Allocation of units based on market-nonmarket test (e.g.50% of production costs covered by sales); (*ESA2010, §3.32)*
- N.B. For GDP production approach an activity based classification of units is used (more detailed).

2.2 Production boundary

Definition: production is an activity carried out under the control, responsibility and management of an institutional unit that uses inputs of labour, capital and goods and services to produce outputs of goods and services *(ESA 2010, § 3.07)*

a. natural growth of managed fish stocks included, but not of unmanaged fish stocks in international waters

b. production of government services is covered, as well as that of private non-profit institutions

c. own-account production; i.e. goods retained by their producers are included

d. in case of private households included are:
   - own-account production, storage and processing of agricultural products
   - own-account construction of dwellings
   - own-account production of other goods if quantitatively important
   - domestic services produced by paid domestic staff
   - services of owner-occupied dwellings

e. Illegal activities (smuggeling, drug dealing, prostitution) are to be included

2.3 Valuation of goods and services

Time: “Output is to be recorded and valued when it is generated by the production process.”
(ESA 2010, §3.42)

Valuation: “All output is to be valued at basic prices” as general rule with exceptions.
(ESA 2010, §3.43)

<table>
<tr><td rowspan="2">basic price</td><td rowspan="2">+ separate transport margin</td><td rowspan="2">+ trade margin</td><td>+ taxes on product</td><td rowspan="2">purchaser price</td></tr>
<tr><td>./. subsidies on product</td></tr>
</table>

Valuation principle: a) basic price for output of market goods and services
b) purchaser prices for intermediate consumption of goods and services

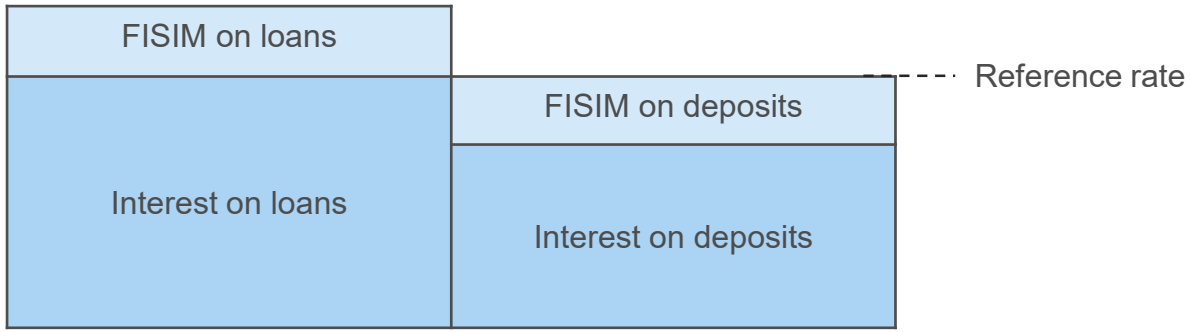
Non-market: costs of production of output of non-market services (at purchaser prices)

2.4 Output by industry

- a) output of agriculture, fishing, forestry
  - The output of agricultural products is recorded as being produced continuously over the entire period of production (and not only when the crops are harvested or animals slaughtered). – (*ESA2010, §3.54)*
- b) output of construction
  - In the case of the construction of a building or other structure extending over several accounting periods, the output produced each period is treated as being sold to the purchaser at the end of the period.
- c) output of wholesale & retail trade
  - The output of wholesale and retail services is measured by the trade margins realized on the goods they purchase for resale (holding gains or losses to be excluded).

2.4 Output by industry 2

- d) bank service (FISIM)
  - Intermediation between deposit holder and lender: Each of the two parties pays a fee to the bank for the service provided: the unit lending funds pays by accepting a rate of interest lower than the 'reference' rate of interest, while the unit borrowing funds pays by accepting a rate of interest higher than the 'reference' rate of interest. The difference between the interest rate paid to banks by borrowers and the interest rate actually paid to depositors is a charge for FISIM.



- e) insurance service
  - Total premiums earned + premium supplements (from property income on technical reserves) less claims incurred

2.4 Output by industry 3

- f) owner-occupied dwellings
    - The output of services of owner-occupied dwellings is valued at the estimated rental value that a tenant would pay for the same accommodation (imputed rent). …. To estimate the value of owner-occupied dwelling services, the stratification method is used. The stock of dwellings is stratified by size, location, nature of dwelling and other factors that affect the rental. Information about actual rentals from rented dwellings is used to obtain an estimate of the rental
- g) research and development (R&D)
    - the output of R&D for use within the same enterprise is valued on the basis of the estimated basic prices that would be paid if the research were subcontracted. In the absence of a market for subcontracting R&D of a similar nature, it is valued as the sum of production costs plus a mark-up (except for non-market producers) for NOS or mixed income;

2.4 Output by industry 4

- h) arts, entertainment
    - (1) the output from the production of originals — an intellectual property product — is measured by the price paid if sold, …(or, if not sold, by substitute measures)
    - (2) If the owner has licensed other producers to make use of the original in production, the fees, commissions, royalties, etc. received from the licenses are the output of services.
- i) private households as employers
    - The output of household services produced by employing paid staff is valued by the compensation of employees paid; this includes any compensation in kind such as food or accommodation.
- h) public administration, defence, social security
    - Sum of wages and salaries, capital consumption, intermediate consumption

Production approach by industry 2020

industry	Germany				EU27	
	output	Intermediate consumption	Value added		Value added	
	EUR bill			%	EUR bill	%
Agriculture, forestry and fishing	56,905	34,816	22,089	-11,3	221,006	-1,3
Industry, excluding construction	1 959,369	1 269,094	690,275	-8,5	2 312,317	-6,0
Manufacturing	1 734,022	1 140,173	593,849	-9,9	1 935,330	-6,5
Construction	387,862	205,396	182,466	9,4	675,358	-1,5
Trade, transport, accommodation and food services	958,201	484,262	473,939	-5,4	2 125,281	-11,5
Information and communication	307,036	151,684	155,352	1,4	642,788	1,5
Financial and insurance activities	267,982	151,075	116,907	0,0	548,166	-1,4
Real estate activities	444,399	110,025	334,374	2,2	1 366,926	1,0
Business services	589,280	251,657	337,623	-6,6	1 324,883	-6,8
Public services, education, health	881,546	289,842	591,704	1,7	2 367,814	1,5
Other services	161,049	51,893	109,156	-8,4	353,895	-14,8
Total	6 013,629	2 999,744	3 013,885	-3,0	11 938,435	-4,4

3.1 Research Background

- Milestones
  - GDP / GNI developed in the early 1930s (“great depression”) by Simon Kuznet and team;
  - System of National Accounts developed by Richard Stone (1947 presentation to UN)
  - First System of National accounts (SNA) published 1952 (OECD, UN)
- Internationally agreed methodology for national accounts today:
  - world level: System on National Accounts (SNA) 2008 by United Nations et al.
  - EU-level: ESA 2010, based on SNA 2008, but more precise and compulsory (REG 549/2013 of EP+Council)
  - Updates from time to time; now under discussion proposals for SNA 2025.

3.2 Research Agenda

- Three headline research areas to develop the SNA 2025 (cf. UNSD-website):
  - Globalisation,
  - Digitalisation,
  - Wellbeing / Sustainability

- Scientific journals:
  - Eurostat: EURONA
  - Destatis: Wirtschaft und Statistik (Economy and Statistics)
  - IARIW: Review of income and wealth.

Thank you for your attention

Contact

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