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Indicators of Economic Development I.



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*System of National Accounts and the
Production Side of GDP*

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System of National Accounts and the Production Side of GDP

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1 Introduction

Indicators of the performance and development of the economy and changes therein are highly important for economic policy and macroeconomic analyses. The wealth of households, the profitability of enterprises, the situation of the budget and the economy's balance of payments position all strongly depend on the volume of income generated in the economy. Furthermore, economic performance also impacts the development of inflation. Accordingly, the evaluation of real economy processes – the generation, distribution and use of income – plays a key role in all macroeconomic analyses and forecasts.

In this handbook, we present the real economy indicators that are used in macroeconomic analysis, following the logic of the system of national accounts. In addition to the content of these indicators, we also touch upon the methodology of their production, as well as the possibilities for their use.

Section 2 presents the key features of the national accounts and thus mainly contains basic information on economic statistics. The indicators used in macroeconomic analysis are discussed in Sections 3 to 5, separately presenting the key indicators of the generation, distribution and use of income. Section 6 describes the source of income generation, the production side of economy and the related expert statistics, as well as the methods of evaluating its situation.

2 System of National Accounts

The real economy is primarily measured in the system of national accounts, a macroeconomic statistical system of accounts, summarising the economic activity of the given country, which compares the sources and expenditures. The international standard of the national accounts is the System of National Accounts (SNA) elaborated by the United Nations Statistical Commission. The first methodological recommendation related to SNA was made in 1947. Currently, the recommendations of the SNA 2008 comprehensive framework are in force, which was introduced in 2012. Creation of the European System of Accounts (ESA) commenced in the 1970s. The principles of ESA are consistent with the international standard laid down by SNA, but, due to the narrower range and more homogenous nature of the countries involved, it was possible to develop more accurate, stricter rules within this framework. Based on the changes in SNA introduced in 2008, the ESA framework was also revised, and thus the effective version is ESA 2010, used by the EU Member States since 2014.

One of the key indicators of the national accounts is the gross domestic product (GDP), which measures the income generated by the residents of the country. GDP can be interpreted from several approaches: i.e. from the aspect of income generation, from the expenditure side and the redistribution among the factors of production (Table 1). The GDP produced from the three directions must, by definition, be equal.¹

¹ However, the statistical practice of the United States does not equate the GDP calculated from three aspects. Since the three approaches use different data sources, they are not necessarily identical due to measurement errors. Thus, the US practice makes the measurement errors explicit. By contrast, the usual practice (also applied in Hungary) regards the consistency of the three sides as a primary consideration and distributes the measurement error among the various items.

Table 1		
Estimation approaches for the gross domestic product		
Production side	Expenditure side	Income side
Value added by industries (at basic price)	Consumption	Compensation of employees
	Gross fixed capital formation	
	Inventories	Gross operating surplus
Balance of taxes and subsidies	Net exports	
GDP (at market price)		

2.1 Integrated accounts of the national economy

The System of National Accounts is built on a series of interrelated accounts (Table 2). The individual accounts relate to different types of economic activities: production; generation, distribution and redistribution of income. Each account has a **balancing item**, derived as the difference of the given account's resources and expenditures, and this will be the opening item of the next account. The accounts are supplemented by the balance sheets, presenting the value of assets and liabilities at the beginning and the end of the period, which are in close relation to the accounts.

Table 2		
System of National Accounts		
Current accounts	Accumulation accounts	Balance sheets
0. Goods and services account	III.1 Capital account	IV.1 Opening balance sheet
I. Production account		
II.1.1 Generation of income account	III.2 Financial account	IV.2 Changes in the balance sheets
II.1.2 Allocation of primary income account		
II.2 Secondary allocation of incomes		
II.3 Redistribution of income in kind account		
II.4 Use of income account	III.3 Other changes in the volume of assets account	IV.3 Closing balance sheets

2.1.1 Production account

The production account presents the generation of goods and services by industries and sectors. Its resources and uses comprise of the **gross output** and **intermediate consumption**,² respectively, while its balancing item is the **gross value added**, expressing the contribution of the given industry or sector to the gross domestic product. The gross value added is also the source of primary incomes in the income accounts.

The national accounts take into consideration the industries' value added at **basic price** (at the price realised by the producer). On the other hand, the gross domestic product is measured at **market price** (at the price paid by the consumers). The difference between gross value added measured at market value and basic price represent the **balance of taxes and subsidies on products**, which is also included in the production account. Taxes on products denote the payments related to the procurement, sales and transfer of goods and services.³ The monetary flow data of the closing account prepared on the financial year appear as the data source during accounting. It should be noted that only actually collected tax revenue and actually paid subsidies are recognised, as there is no adjustment for uncollected taxes. The subsidies on products are the unreturned current payments provided by the general government and the institutions of the European Union to the producers, typically for the purpose of influencing production quality and prices, and for the remuneration of the factors of production.⁴

Gross value added = gross output – intermediate consumption + taxes – subsidies

² The depreciation of fixed assets does not form part of the intermediate consumption.

³ This includes, for example, the customs duty, excise tax, consumption tax and value added tax (VAT), as well as export subsidies.

⁴ HCSO recognises the interest subsidy, the wage and labour force subsidy, the subsidies aimed at reduction of pollution, and the various subsidies granted to agricultural producers as subsidies on products.

2.1.2 Income account

The income accounts separately reflect the **generation** of income from production processes, the **distribution** of income among organisational units participating in the generation of value added and the **redistribution** of income, implemented primarily via the general government in the form of social insurance and taxation, and the use of the income as final consumption or saving.

Generation of income

The generation of income reflects the distribution of value added by the contribution of the factors of production, i.e. it determines the compensation of employees, the other production taxes and subsidies and the operating surplus. In the household sector – since in small enterprises it is difficult to separate the compensation of employees related to the owners' work from the return on capital – the income account states these two items together as **mixed income**. (An exception to this is the housing service, recognised in the case of flats occupied by the owner at imputed market price, which is regarded as the operating surplus of the household sector.) Accordingly, the balancing item of the generation of income account is the **operating surplus/mixed income**. The latter refers to the income earned by the units through the use of their own capital goods, and it shows the income retained by the economic unit after the paid compensation of employees and taxes/contributions on production from the generated value added.

Primary distribution of income

While the generation of income account treats the sectors as producers, the **distribution of primary income regards the individual sectors as income owners (institutional units)**. The 'primary' attribute means that the actors receive labour or ownership income.

- The compensation of employees and the mixed income mean the income of households.
- The balance of taxes and subsidies on production represents the income of the general government.

- The operating surplus remains in the sectors generating the value added. The interests and shares receivable in respect of the capital tied up in production, the financial investments and loans, as well as the reinvested earnings of foreign direct investments are recognised on this account.

The balance of primary income at the level of the national economy is the **gross national income**, and thus the national income is a notion related to income rather than to production.

Secondary distribution of income

The distribution of secondary income account presents **other items of income distribution**. For example, this is where the payment of income taxes, monetary social benefits, credit transfer of the non-life insurance premiums and compensation of damages are recognised. Its balancing item in the entirety of the national economy is the **gross national income available** for consumption and capital formation.

Redistribution of income in kind account

The redistribution of income in kind account includes the uses of products and services provided to households free of charge, serving individual consumption (e.g. education, healthcare).

2.1.3 Use of income account

The use of income account reflects the way disposable income is shared between final consumption and savings. According to the interpretation of the system, only the general government, non-profit institutions supporting households and households have final consumption expenditure. Investment should be treated as accumulation of assets.

The final balancing item of the use of income account and at the same time of the income accounts is **saving**, which also represents the opening item of capital accounts. The balance shows how much the given sector is able to save after the consumption expenditure. Saving can have two types: capital accumulation or cash saving.

The **current external balance** – the result of the current operations of the national economy with non-residents (foreign trade in goods and services, primary income, current transfers) – is also at the end of the income accounts. If the result shows a surplus, the external transactions account's balancing item is negative, while in the case of a deficit it is positive. (The external transactions account always captures the events from non-residents' point of view.) The current external balance corresponds to the current account balance in the balance of payments.

2.1.4 Capital account

The accumulation accounts present the changes in the wealth of organisational units. The accumulation accounts consist of two accounts: the capital account (which contains the change in net worth and the accumulation of real assets sub-accounts) and the financial account. The capital account tracks the changes in non-financial assets. Its main items are gross fixed capital formation, changes in inventories and capital transfers. The financial account shows the composition of the reallocation of the financial assets among individual sectors.

The balance sheet takes stock of the national economy's financial and non-financial assets item by item in respect of a given period. The balance sheet reflects the value of the assets and liabilities at the organisational units at the beginning and the end of the accounting period. All economic transactions or price changes affect the level of assets and liabilities. The accumulation accounts register the change in wealth resulting from economic transactions, while the other change in assets accounts deduce the impact of price changes and non-economic events. Thus, the system monitors all events between the opening and closing balance sheet. The difference between the assets and liabilities in the closing balance sheet is the net worth as of the end of the accounting period.

The financial account statistics include those parts of the balance sheets and accumulation accounts that reflect the holdings of financial instrument and the components of their flows. The financial account in the narrow sense reflects the transactions in the financial assets and liabilities. The balance of transactions corresponds to net lending, which is also the

closing balance of the capital account. This identity reflects that the difference between savings and investments results either in financial accumulation or in the assumption of liabilities. The revaluation account describes the flows in the real and financial assets and liabilities resulting from price changes. The other changes in volume account is used for posting flows attributable to special, primarily to non-economic, reasons. These may include flows arising due to natural disasters or technical reasons. The economic events other than valuation changes or other changes in volume constitute the transactions in the system.

Box 1

Input-output tables

The input-output tables (IOTs) and the supply and uses tables serve to describe the economic processes and present the interrelated scheme of production, consumption and accumulation. The consistency of the system permits the use of the data for analytical purposes, while the proper classification of the economic units and transactions ensure transparency.

The table of sources contains the supply of products and services at basic price. As regards its structure, it is broken down into products and services by lines and into domestic output and import, detailed by industries, by columns.

The uses table presents the uses of products and services at market acquisition price. By lines, similarly to the supply table, it is broken down by product and service groups, while by columns it is broken down by purpose of use (intermediate consumption by industry): final consumption expenditures of household, general government and non-profit institutions supporting households, gross fixed asset accumulation, changes in inventories and exports. The table presents the gross value added in a breakdown by sector.

The symmetric input-output tables can be created by the mathematical transformation of the supply and uses tables, and using supplementary information,⁵ which is meant to describe the production relations between the sectors of the national eco-

⁵ Elements of the IOT system: source matrix, use matrix, deduction matrices (trading margin matrix, separately charged transportation fee matrix, matrix of the balance of product surtaxes and subsidies), relation between the supply and use tables and the sectoral accounts, symmetric input-output table and import matrix. Administrative data sources are also used as supplementary information, and the statistical offices use estimates as well to supplement the missing data.

nomy, as well as the structural relation of production and final consumption. In the case of a symmetric input-output table, the breakdown of output and use by sector is identical both in terms of content and sequence.

As regards the publication of the IOTs, it can be stated that the HCSO publishes sources and uses tables annually, while the symmetric input-output table is prepared every five years (in years ending on 0 and 5). In contrast to the national accounts, no regular data revisions are performed in the input-output tables.

2.2 A few principles of creating the national accounts

A few **principles** of creating the national accounts.

- **The economy as a whole is determined through the concept of resident units.** a unit may be regarded as the resident unit of a country, if the centre of its economic interest is in the territory of the given country, i.e. if it pursues economic activity for a longer period (for at least one year) in the territory of the given country. The resident units perform economic transactions with non-resident units (i.e. with units resident in other economies). These transactions are accounted for on the given economy's external economic transactions and non-residents account.
- With the exception of some indicators related to the population and labour force, the system **expresses all processes and holdings in monetary terms. Market prices serve as basis for the valuation.**
- **The system recognises the processes on an accrual basis**, i.e. when the economic value or the receivables and payables arise, change or cease to exist.

3 Sectors of the economy

In the System of National Accounts, the economic agents are categorised in the following sectors.

3.1 Household sector

The household sector consists of individuals and groups of individuals, as consumers and – in certain cases – as entrepreneurs producing market products or providing services (i.e. market producers). In the case of entrepreneurs, the condition of allocation to the household sector is that the economic activity should not be performed by a separate organisational unit that is to be treated as a quasi-enterprise. Individuals or groups that produce products or provide non-market services solely for own final use also belong to this sector. Based on this, the household sector can be broken down into two main groups: households as entrepreneurs (sole traders) and households as consumers, producing products or services for their own final use (such as own housing service, building of own house or primary producer activity).

The household sector receives the full amount of factor incomes, which corresponds to the total net income. The factor incomes primarily consist of wage, interest and profit. Household income is supplemented by the transfers received from the government and non-profit organisations, as well as the yield realised on financial instruments. Households use their incomes for consumption, tax payment and saving. Consumption and tax payment represent actual use of income, in contrast to savings, which increases the wealth of the household and is also available later on. Saving equals the received income after deducting final use.

3.2 Business sector

The **business sector is engaged in market production**; financial and non-financial corporations are separated within the sector. The income of corporations corresponds to the value of output, as all goods are produced and sold by the business sector. In addition, the receipts may be increased by transfers provided by the general government, such as, for example, subsidies on production. The income of production factors are paid from the income of enterprises: the wages, interests and profit, as well as the taxes. The enterprise also has own savings, representing the difference between the aforementioned incomes and expenditure: it equals the depreciation, the balance of the transfers and taxes affecting the enterprise, as well as the retained profit.

3.3 Public sector

The allocation of economic agents to the public sector changed from September 2014, in line with the introduction of ESA2010. According to the methodological change, a producer belongs to the public sector:

- **If it managed to cover less than 50 percent of its costs by sales revenue for several years.** Expenditures mean the intermediate consumption, compensation of employees, depreciation of fixed assets, and other production taxes, while incomes include the sales revenue and subsidies related to sale and the volume of output. Within ESA2010 net interest expense also became part of expenditures.
- In addition, the development of quality criteria– assessing the relation of the general government and the producer – is also a new element. The assessment covers the existence of market conditions and prices. The contractual relation based on market prices and market conditions cannot be proven if **a producer delivers primarily to the general government and the general government also procures the given products and services primarily from this producer.** In this case the producer should be allocated

to the public sector. Upon the categorisation the quality criteria prevail over the 50 percent rule.

3.4 Non-resident sector

The non-resident sector directly changes the goods market and the capital market relations: the volume of goods realised on the goods market increases with the **amount of imports, while the use of produced real income is increased by exports. The difference between these two factors represents the saving of the non-resident sector.** If the **value of imports** exceeds exports, non-residents realise higher income than the amount spent in the given country. From the country's perspective this means that it spent more abroad than non-residents purchased from it. This is only possible if it took on loans, i.e. it raised non-resident savings.

4 Quarterly national accounts

The quarterly national accounts play a key role in analytical work, as they provide a coherent system of short-term indicators, which is available shortly after the reporting period and provide a general view of the performance of the economy.

The quarterly accounts constitute the interrelated series of financial and non-financial economic transactions, accounts and balancing items recognised quarterly. They use the same principles, definitions and structure as the annual accounts,⁶ although they have some special features due to their different frequency.

- **Compared to the annual national accounts, the quarterly national accounts are less comprehensive.** These accounts focus on measuring GDP, the resources and uses of the goods and services, and the generation of incomes; they provide limited information on the activity of the sectors and on the individual transactions.
- **The time series of the quarterly national accounts show seasonal volatility and calendar effects as a result of the quarterly frequency.**⁷ Seasonal volatility is eliminated by seasonal and calendar adjustments.
- **The quarterly national accounts are built on a more limited data source than the annual national accounts;** during their compilation statistical and econometric methods must be relied on to a larger degree.

⁶ The accounting principles and rules are the same in the case of the annual and quarterly accounts, and thus the SNA contains no separate recommendation whatsoever in relation to the quarterly national accounts. The first recommendations in respect of this topic were made by ESA issued in 1995, albeit only a chapter of one and a half page dealt with the subject. However, later on it gained increasing importance and attention. In 1999, Eurostat issued the manual of the Quarterly National Accounts, and thereafter, in 2001, the IMF also published a Quarterly National Accounts Manual.

⁷ Seasonal volatility and the calendar effect primarily impact the activities concentrated in certain parts of the year. The quarterly measure of such activities, e.g. agricultural output, construction activity and tourism, also depends on external factors, e.g. the weather and the number of official bank holidays. The payment of wages, taxes, social benefits and dividends may be influenced by periodic quarterly effects, such as annual bonuses paid in a specific month of the year.

Disclosure of the quarterly GDP data takes place in two steps. The HCSO publishes the **preliminary** GDP data no later than 45 days after the end of the given quarter. This disclosure contains only a flash estimate of the GDP volume. The **detailed** data – containing the production and expenditure side data at current and constant prices – are published no later than 65 days after the given quarter. The volume of GDP may change compared to the preliminary release, but usually this change is less than ± 0.2 percent.

The **quarterly data are regularly revised**; the process of the revision is regulated by EU requirements. The essence of the revision policy is that it is possible to revise the data retrospectively, if the related data based on annual data sources have not yet been published. The revision resulting from the integration of the annual data sources takes place each December, upon publishing the detailed GDP data for the third quarter. This is when data revisions resulting from the introduction of methodological improvements may also be performed (Table 3).

Table 3
Rules pertaining to the revision of the quarterly national account data

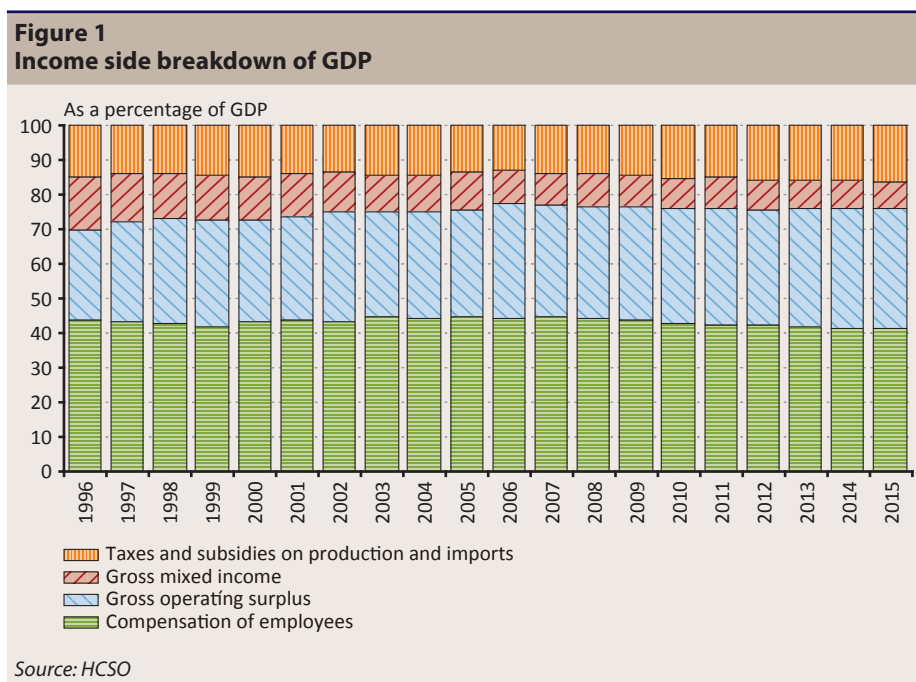
Date of publication	Periods that may be revised	2009				2010				2011			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
2010	June												
	September												
	December												
2011	March												
	June												
	September												
	December												
2012	March												

- Revision due to data related to year t-2
- Revision due to data related to year t-1
- Revision due to changes in the quarterly underlying data
- New quarter
- Unchanged

Source: HCSO

5 Indicators of the GDP's income side

The generation and distribution of income constitutes the bridge between the production and expenditure side of the GDP. Knowing the income accounts, it can be assessed in what way the economic agents generating the consumption and investment spending earn their income. **The annual national accounts provide a comprehensive picture of these processes (Figure 1). It is primarily the generation of labour and capital incomes that can be examined with quarterly frequency.**



In the Hungarian national accounts, the calculation of the gross value added from the income side is not the result of an independent estimation; all income components are constituted directly or based on the residual principle. The gross domestic product on the income side is the sum of the compensation of employees, the gross operating surplus (including the use of fixed asset, i.e. the depreciation), the mixed income and the balance of the taxes and

subsidies on production. The compensation of employees, the taxes and subsidies are calculated from different data sources by direct estimation, while the gross operating surplus is determined using the residual principle.

5.1 Compensation of employees

The compensation of employees includes all remunerations in cash or in kind paid by the employer to the employee as consideration for the work performed during the accounting period. The wages and salaries include all gross cash payments, as well as the goods and services provided in kind by the employers to the employees in the period under review. The wages and salaries in kind are goods, services and other benefits, provided by the employers free of charge or at reduced price, that the employees may use during their own time and at their own choice, to satisfy their own requirements and needs or those of other members of their household. Goods, services and other benefits are not absolutely necessary for the employers' production processes. These wages and salaries in kind represent supplementary income for the employees.

The compensation of employees includes the wages and salaries, as well as the employers' social insurance contributions, which may be further broken down into actual and imputed. The employers' actual social insurance contributions include the payments made by the employers for the benefit of their employees to the insurers (social security funds and private insurance schemes). These payments may be statutory, conventional, contractual or voluntary contributions related to insurances for risks or needs covered by social insurance. The employers' imputed social insurance contributions represent the offsetting items for those extra-fund social benefits that the employers pay directly to their employees or former employees.

In order to monitor **labour costs**, in 1992 the HCSO introduced the Labour Cost Survey. The related data collection was initially conducted at four-year intervals and subsequently on a yearly basis. Labour costs mean the total expenditure borne by employers for the purpose of employing labour force.

In addition to the compensation of employees paid for their work (wages and salaries), labour costs include:

- employers' retirement and health insurance contributions;
- employers' contribution to unemployment funds and disability schemes;
- contributions in kind and social contributions and
- reimbursements and costs of vocational education, training, retraining, costs of workforce recruitment.

Costs relating to the employment of human labour are increased by tax items related to employees' remuneration or to the number of employees and reduced by wage and contribution subsidies.

The Labour Cost Survey covers enterprises and budgetary institutions with at least 5 employees, but small enterprises (5–49 employees) are only included at four-year intervals (for more detailed information see: Labour market methodological paper). The survey supports analyses using the concepts and definitions of the ILO and also wide-ranging international comparisons. The HCSO publishes data on average monthly labour cost developments on an annual basis.

5.2 Gross operating surplus

The gross operating surplus is the result of market production activity.

The compensation of employees and the other production taxes must be deducted from the gross value added and it must be increased by other subsidies on production. In the case of non-market activities, the gross operating surplus corresponds to the depreciation, as non-market activity cannot have an operating surplus by definition. In the household sector, the gross operating surplus corresponds, by definition, to the operating profit from own housing service.

5.3 Gross mixed income

Gross mixed income is the income of sole traders. The mixed income is the income originating from the activity of small enterprises owned by households, where the owner also invests his own labour in the enterprise, and thus it is not possible to separate the income from labour and the income realised on the capital invested. The income generated by the consumption from own production also belongs here. This category is estimated based on the residual principle and equals the gross value added, less compensation of employees, less other taxes on production, plus other subsidies on production. In the quarterly income accounts it is stated as gross operating surplus, while in the annual income accounts the operating surplus is broken down into gross value added and intermediate consumption.

5.4 Taxes and subsidies on production and imports

The two main groups of the product surtax and tax on production are the tax on products and other taxes on production. The product surtax is levied on the sales, transfer or acquisition of goods or services (e.g. non-reclaimable VAT, consumption tax, customs duty). The other taxes on production include all other taxes, which may be linked to production processes and cannot be regarded as tax on products (however, the corporate income tax does not belong to this category). Upon accounting for taxes and subsidies, the cash flow data of the closing account prepared in respect of the financial year are used as data source. Of the options offered by Regulation No. 2516/2000 of the European Parliament and of the Council for the accrual accounting of taxes and social security contributions, the time adjusted cash method is used. The preference is fundamentally influenced by the availability of the monetary flow data. Only actually received taxes and paid subsidies are recognised, i.e. the data are not adjusted for uncollected taxes.

Subsidies are the unreturned current payments provided by the general government or by the institutions of the European Union to resident producers, to influence their production quality and prices, or to remunerate the factors of production. Subsidies on products are the direct payments made in respect of the produced, sold (exported) products, the services rendered

and the factors of production. The other subsidies on production include the subsidies other than subsidies on products received by the resident producer units as a result of their participation in production, i.e. the wage and workforce subsidies, the agricultural subsidies and other subsidies.

In practice, the aforementioned production and other subsidies may also represent a subsidy scheme, where the institution granting the respective subsidy pays a minimum procurement price to the producers and guarantees direct payments in respect of the plants grown. Thus, it provides EU farmers with financial security, ensuring the production of agricultural goods in the required volume. The interest subsidy on working capital loans necessary for farming is another form of the unreturned current payments. In this case, the producer may receive an interest subsidy – based on the debit entry made by the financial institution – for the loan taken from a financial institution for maximum one year to cover the costs of the cultivation of plants, horticulture, animal husbandry, mixed farming, hunting, forestry and fishing, if the county agricultural office registered it.

6 Production side of GDP and output indicators

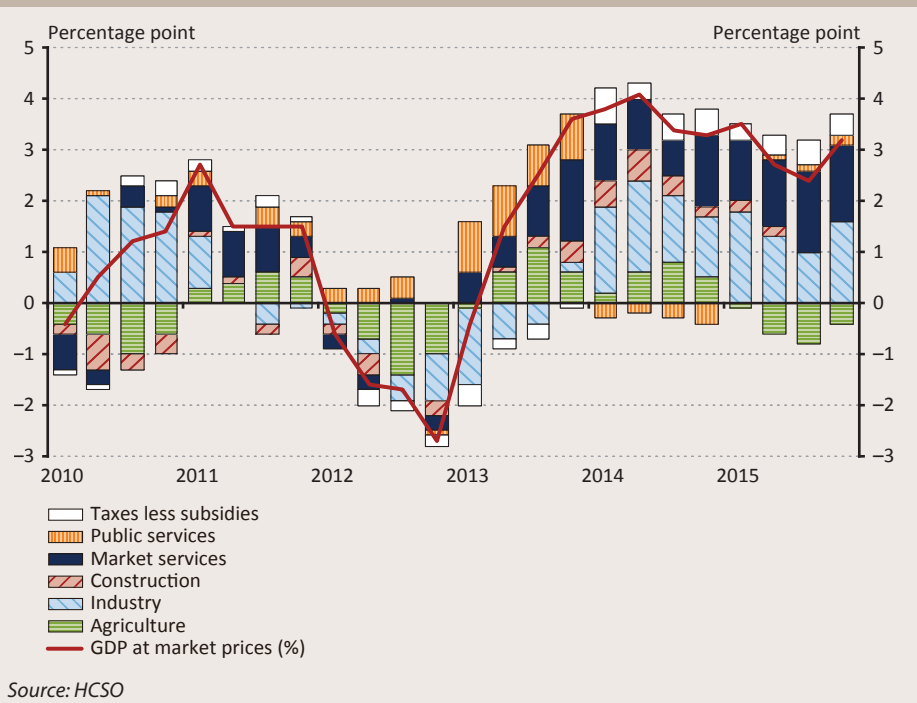
In the quarterly national accounts, the statistics generate the gross domestic product from the production side. For this purpose, the HCSO uses various indicators, which may be available with monthly frequency (the estimation methodology of preliminary release is presented by Cserháti et al, 2009). Accordingly, in the assessment of the current performance of the economy and in the short-term forecast (1-2 quarters), the production side indicators (mainly the industrial and construction output and orders, the retail and accommodation goods turnover, and the various business activity indicators and confidence indices) bear primary importance.

In aggregating the GDP from the production side, the value added by the individual producer sectors serves as a starting point. As of 1 January 2009 the HCSO introduced TEÁOR '08 (Standard Classification of All Economic Activities) for defining the core activity of economic units, and it calculates and publishes the various economic and social indicators based on this classification. The Standard Classification of All Economic Activities (TEÁOR) is consistent with the activity classification used by the European Union (NACE Rev.2).

Table 4		
Gross value added by sector		
Industry code (NACE Rev. 2 / TEAOR '08)	National economy branch	Distribution at current price in 2015 (%)
A	Agriculture, forestry and fishing	4.1
B	Mining, quarrying	0.2
C	Manufacturing	24.6
D	Electricity, gas, steam supply and air conditioning	2.0
E	Water and waste management	1.0
(B+C+D+E)	Total industry	27.8
F	Construction	4.1
G	Wholesale and retail trade, repair of vehicles	10.4
H	Transportation, storage	6.4
I	Accommodation and food services	1.7
J	Information, communication	4.9
K	Financial, insurance activity	3.7
L	Real estate activities	7.7
M	Professional, scientific and technical activities	5.5
N	Administrative services	3.4
(G+H+I+J+K+L+M+N)	Total market services	43.8
O	Public administration, defence, social security	8.4
P	Education	4.7
Q	Human healthcare, social care	4.2
(O+P+Q)	Total public services	17.3
R	Arts, entertainment, recreation	1.3
S	Other services	1.6
T	Activity of households	0.0
U	Extra-territorial organisation	0.0
(R+S+T+U)	Other	2.9
<i>Source: HCSO</i>		

Industry, which bears outstanding importance in the structure of the Hungarian economy, produced 27.8 percent of the gross value added in 2015 (Table 4, Figure 2). The weight of the sector is primarily attributable to the performance of manufacturing. Of the thirteen subsectors of the sector, the key drivers are the manufacture of transport equipment, food industry, chemical industry and electronics.

Figure 2
Contribution of economic branches to the annual changes in GDP



In the case of non-financial corporations, output covers all products and services produced by resident producers in one year. The HCSO values the output at basic price, i.e. it ignores taxes related to the products and services (VAT, excise and consumption taxes, balance of customs duties). In the System of National Accounts, the primary data sources in respect of non-financial corporations include the corporate tax returns and the annual performance statistics; then the data series of output, intermediate consumption, value added and employees' income can be derived by imputation. Imputation means the supplementation of data based on the available background information.

6.1 Industrial statistics

The industrial statistics regard the set of the mining, manufacturing and energy (B, C and D) national economy branches together as the entire industrial sector. Until 1992, the mid-year industry statistical observations covered all enterprises classified as industry. However, as of 1993, with the increase in the number of economic units, the HCSO introduced data collection based on sampling. The range of observations covered organisations with more than 20 persons before 1995, more than 10 persons between 1995 and 1998 and more than 5 persons after 1998. From 1998, the summary data of industrial production are derived in part as the result of the comprehensive (over 49 persons), in part of the representative observations (between 5 and 49 persons), and in part of the estimates relying on other data sources (below 5 persons). The data published in the sectoral and other breakdown, relate to a narrower range of enterprises, varying over time with the expansion of the range of observations, while the order book data cover only those enterprises of the designated sectors that are observed in full.

The time series for **industrial production**⁸ is the most determinant production side indicator, because in Hungary industry accounts for more than one-quarter of the total value added. The time series measures the net sales adjusted for the flows in the self-produced inventories, i.e. the production value of industrial activity. The most important time series related to the volume of industrial production, published with monthly frequency (unadjusted, adjusted for working day and seasonal effects), are published in the preliminary release at the beginning of the second month following the reporting month, while the data broken down by sectors are published in the detailed data dissemination, in the middle of the second month following the reporting month.

The HCSO publishes the time series of **industrial sales** in the detailed data dissemination on industrial production. The data of domestic and export sales, expressed in forint, are available separately. Since manufactured goods

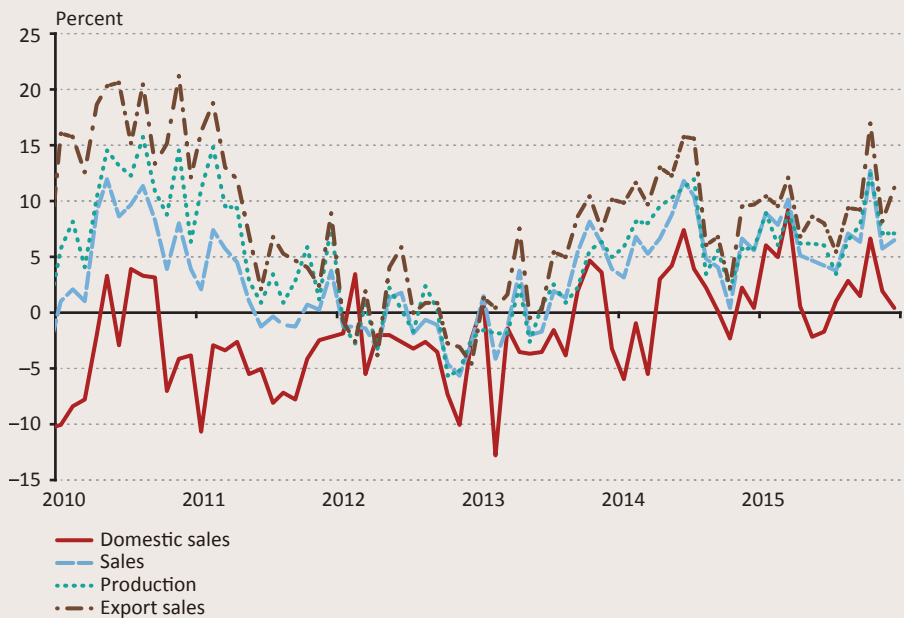
⁸ Under industrial activity, the HCSO means the production of self-made industrial goods by the organisations belonging to the industry sector and the industrial goods produced and the industrial services rendered with the involvement of subcontractors.

account for a major part of exports, the developments in industrial exports may also assist with the assessment of export developments included in the national accounts (goods and services) (Figure 3).

By comparing industrial production and sales, changes in inventories can be assessed. Production exceeding (falling short of) sales in the current month may indicate the accumulation of (decrease in) inventories.

The **stock of orders and new orders** data of the industrial statistics help forecast manufacturing business activity. The time series of priority sectors related to orders, covering roughly 65 percent of manufacturing output, are also published with the detailed data. New export orders typically precede sales developments, while domestic new orders are coincident indicators of domestic sales. The HCSO registers the orders received and accepted in the reporting month by the reporting agent from the customer as new orders, irrespective of fulfilment, while the stock of orders data relates to the orders received and

Figure 3
Annual changes in industrial production and turnover

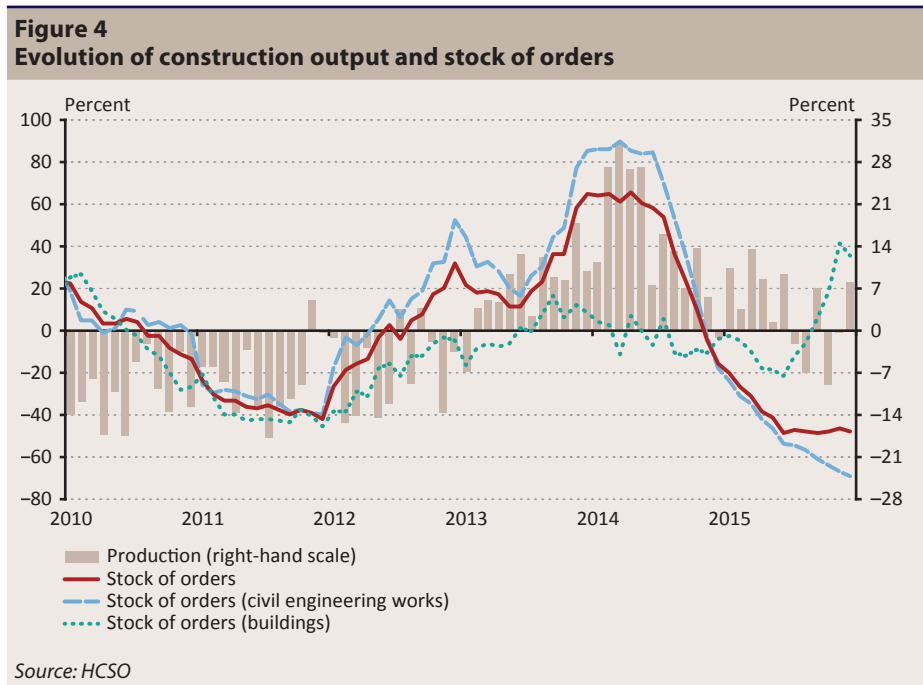


Note: Seasonally adjusted data.
Source: HCSO

accepted for industrial goods and services, but not yet fulfilled. It considers the value of the orders at the price including price subsidies, net of turnover tax, with the data covering enterprises employing more than 49 people.

6.2 Construction statistics

The mid-year construction statistics contain the data necessary for the calculation of the monthly construction output production value, the new contracts, the stock of contracts, and the volume indices calculated from such (Figure 4). Since 1995, the construction statistics are prepared monthly, in a structure similar to the current one. The data are available in aggregated form, as well as broken down into buildings and other structures (e.g. road, railway, utilities). Thus, the construction data also provide information on the developments in and the structure of the construction investments.



The **construction output** is the (gross) production value of the construction activity of the enterprises allocated to the sector, i.e. the net sales of the construction activity, less the value of services used and mediated, adjusted

for the changes in the stock of self-produced inventories. **Sales** corresponds to the net sales of the construction activity.

The **stock of orders** is the value of the contracts received and accepted by the reporting entity from the customer for construction activity, calculated at a price without turnover tax and containing price supplement. The value of the low-value orders, concluded verbally, must be also reported among the contracts. The HCSO publishes the contract portfolio at month-end value, and the data include orders not yet fulfilled. **New contracts** represent the value of all contracts received and accepted in the reporting month, irrespective of whether or not they have been fulfilled in the given month.

6.3 Retail trade statistics

The purpose of retail trade statistics is to determine the value of national retail sales volume and to measure the changes therein. The statistics are based on representative data collection, organised by activity. Data collection commenced in 1999, as an expert module of the mid-year integrated data collection system, in a much simpler form than at present, with significantly fewer observed product groups. The collected data were primarily used as the source data for the quarterly GDP calculation. The HCSO publishes the data since 2003 in the stADAT database in the present structure.

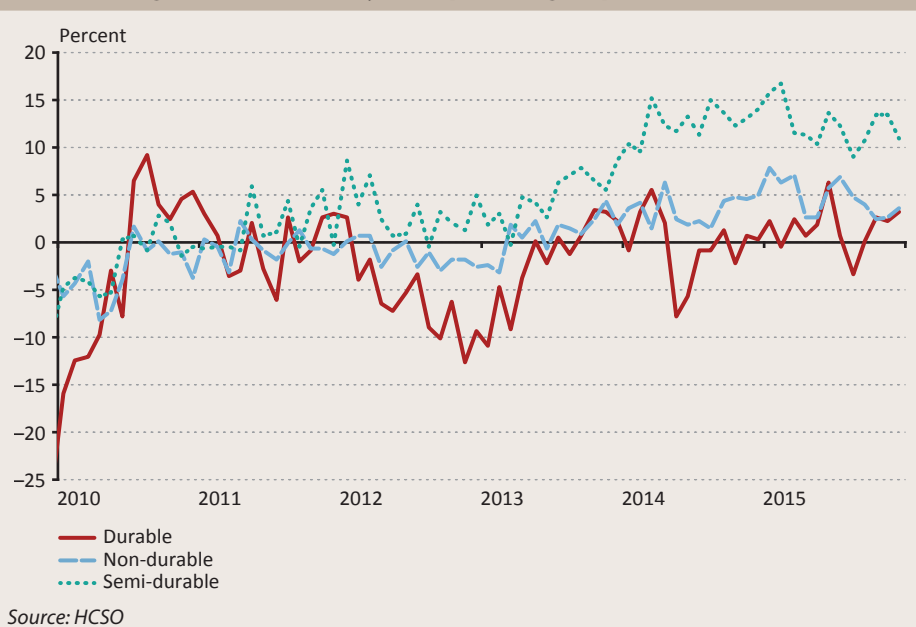
The key indicator of the statistics is the **retail sales volume**, being the value of the sales in the retail network, increased by VAT and consumption tax, measured at current price. The retail sales volume contains not only households' expenses, but also the purchases made by enterprises and non-residents (tourists) in the domestic retail trade units.

The **volume index of the retail sales** is created by deflating the value index of the retail sales volume, using the deflator calculated from the representatives of the consumer price observation.

The monthly data are available in a breakdown by shop type. In the analytical practice it is reasonable to aggregate these into a few main groups: durable, semi-durable, non-durable (Figure 5). The basis of the aggregation is that the consumer spending of households can be grouped by the durability

of the consumed goods. The differentiation between non-durable and durable goods is based on whether the given product can be used once or repeatedly several times or continuously during the observation period longer than one year. In addition, consumer durable goods, such as cars, refrigerators, washing machines or TV sets, represent relatively high value. Semi-durable goods differ from the consumer durable goods in the sense that their expected lifetime is much shorter than that of the consumer durable goods, and their value is also substantially lower. From an analytical point of view, it can be assumed of the sales of the various product groups that the less durable product is, the tighter the relation is between its sales volume and changes in current incomes. Thus, for example, food and fuel sales reflect short-term income and domestic demand processes pretty well. However, this approach sets out from the nature of the business activity, and thus it is suitable for assessing the actual structure of the turnover only to a limited degree. On the other hand, the retail data are also available **quarterly, broken down by the classification of individual consumption by purpose (COICOP).**⁹

Figure 5
Annual changes in retail sales by main product groups



⁹ <https://www.ksh.hu/docs/hun/info/02osap/nomen/COICOP.DOC>

Information on short-term developments in tourism demand is provided by the tourist traffic data of commercial accommodations. The key objective of the expert statistics is to measure the capacity, tourist traffic data and incomes of the commercial, business and non-business other accommodations. The statistics contain the capacity data of the commercial, and other non-business and business accommodations by type and category, the number of guests and overnight stays in resident and non-resident breakdown, and in the case of commercial accommodations the number of foreign guests and overnight stays broken down by the sender markets. In addition, the statistics also measure the employment data of commercial accommodations, room charges and other (catering, breakfast and other) income, and also contain information related to the use of other means of payment (leisure voucher, Széchenyi leisure card).

6.4 Industrial confidence indicators

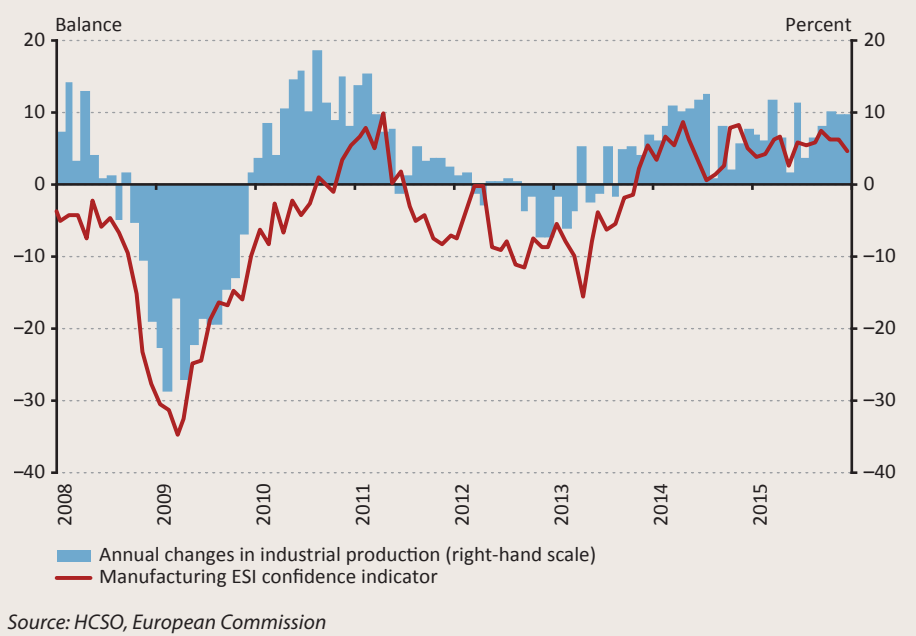
The various business survey indicators and **confidence indices** serve as important indicators of the short-term, production-side GDP forecast (Figure 6). On behalf of the European Commission, GKI Gazdaságkutató ZRt. prepares the indicators for Hungary with monthly and quarterly frequency, as part of the Economic Sentiment Indicator (ESI) survey. The questions of the survey cover the individual producer and service sectors (manufacturing, construction, trade and other services) comprehensively. One of the favourable features of the indices is that they are available relatively early, and the historic values of the time series are not revised after publication.

The GKI business confidence index is the monthly business survey indicators published between the 12th and 17th day following the reporting month. The indicator is generated by weighting the responses given to the following three questions:

- production outlooks,
- assessment of the stock of orders,
- inventory level of finished products.

However, according to Pula-Reiff (2002), the questions in GKI's business confidence index do not capture changes in manufacturing business activity in a satisfactory manner. Accordingly, it is reasonable to develop an alternative

Figure 6
Industrial production and business confidence



weighting system for the questions in the survey, in order to optimise the forecasting power of the aggregated indicator. The alternative index used for the forecast of manufacturing output has the following components.

- Changes in production in the last quarter,
- Present level of EU orders,
- Situation of the company in the next six months,
- Development in production in the next six months,
- Development in domestic sales in the next six months,
- Development in EU sales in the next six months.

In addition, indicators related to the capacity utilisation are derived from both the ESI and the Kopint-Tárki surveys. The indicators typically cover manufacturing companies; the survey of the service sector only commenced last year. The index asks about the utilisation rate of the currently existing capacities and the future expansion plans; in addition, the Kopint-Tárki figures can be broken down into exporting companies and companies producing for domestic sales.

Box 2

Seasonal adjustment of the GDP time series

Gross domestic product is the most important indicator of real economy developments, and thus proper management of the GDP time series is of the utmost importance for the assessment of the macroeconomic situation. The interpretation of current economic processes is hampered by noise, and it is essential that we examine the series after seasonal adjustment in order to identify and manage this noise.

In the course of seasonal adjustment, the primary objective is to segregate the information content of the time series into various components. In practice, these non-observable components include the trend cycle showing the longer-term development of the time series, the components related to seasonality, holidays and working days, outliers and error terms.

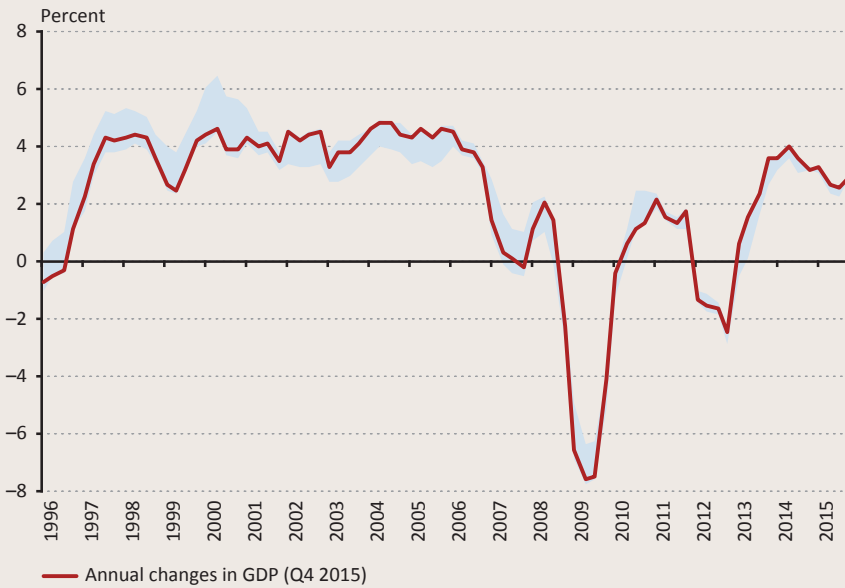
The Hungarian Central Statistical Office performs the seasonal adjustment of the GDP time series using the widely applied TRAMO-SEATS method. In accordance with the international recommendations, it records annually the settings of the adjustment (applied ARIMA model and the parameters of that, the regression variables quantifying the working day and holiday effect), which are changed only upon the revision of the underlying data or a major change in the behaviour of the time series. Although seasonal effects usually appear within the year, due to variance in the number of working days and holidays year by year, the calendar effect may change between the individual years, and thus in order to ensure the comparability of the seasonally adjusted quarterly data with the annual data, the HCSO performs a correction in accordance with the recommendations of Eurostat.

The seasonally adjusted series bear special importance in times of recession, as it is easier to identify the turning points of the business cycles relying on the adjusted short-base indices. The result, changing in the light of the newly received data (endpoint uncertainty), complicates the identification of a clear trend reversal even under favourable economic circumstances; however, the uncertainty in the data increased considerably as a result of the 2008 global economic crisis. Thus, the changing economic circumstances highlighted the seasonal adjustment both for the statistical offices and the economic analysts and decision-makers (Bánhegyi et al. 2010, Koroknai – Pellényi, 2010). Moreover, the regular revision of the GDP raw series also increases uncertainty, which may influence both the level and the dynamics of the variable.

The problem of endpoint uncertainty is well illustrated by the fact that at the start of the recession (2008 Q2) the seasonally adjusted GDP time series still showed undiminished growth and a continued decline in the gross domestic product in 2009 Q4, both of which proved to be erroneous conclusions subsequently. It is easy to see that

the seasonally adjusted time series is able to identify reversals in the business cycle only with considerable lags, and thus may provide a misleading view in real time for economic policymakers (Figure 7).

Figure 7
Real time seasonal adjustment of GDP



Note: The band on the figure shows the range of the seasonal adjustment, based on data reported earlier
Source: HCSO

Although there is no unequivocal solution to reduce the uncertainty involved in adjustment, several methods can be used to identify the economic processes more accurately. On the one hand, it can be generally stated that in assessing economic processes, it makes sense to use the information content of several time series, which may be useful also in the case of seasonal adjustment. GDP dynamics can be compared with the change in various disaggregated macroeconomic releases, as there are time series on the production, uses or income side sub-items with higher frequency. The motivation is that the information obtained during seasonal adjustment of these sub-items (change in seasonality, outliers) may ultimately be used for the aggregated GDP. Data are available the earliest on the production side processes (industrial, construction output, retail product turnover), but the use of the various confidence indices may also be of assistance.

In addition, the estimation of the degree of the expected data revisions is a priority topic in the statistical and economic forecast literature; however, their successful use is conditional on a sufficiently long time series. A similar result can be obtained in respect of seasonal adjustment as well. Using a reliable GDP forecast, the adjustment of the actual period's time series can be compared with the seasonal adjustment of the time series extended by the expected future values.

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