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FOREWORD

This issue of Kroon & Economy gives an overview of financial accounts, which form a part of the system of national accounts. Eesti Pank started to publish financial accounts regularly in January 2007.

Financial accounts have recently gained importance as a source of information in various countries, including the euro area. They serve as a basis in analysing the financial situation of economic sectors, forecasting future developments and assessing the financial behaviour of economic agents.

Moreover, foreign investors often find financial accounts very useful, as they provide essential and reliable information that has been compiled according to international methods and that is also comparable with the data on other countries. The information included in the accounts enables to obtain a preliminary overview of the country of interest, thus establishing a basis for further possible investment decisions.

In addition, the present issue studies the calculation and revisions of gross domestic product in more detail, since GDP is one of the key aggregate indicators of national accounts.

FINANCIAL ACCOUNTS IN THE NATIONAL SYSTEM OF ACCOUNTS

Sünne Korasteljov

The following article introduces financial accounts – an important part of the national system of accounts. It outlines the purposes and principles of the compilation of accounts and describes their contribution to economic forecasting and analyses as well as economic policy decision-making.

INTRODUCTION

Having an overview of one's assets and liabilities seems so simple and elementary. In case of individuals this is generally true – they know exactly what kind of financial assets they own, whether their money is deposited in a bank or invested in securities (e.g. bonds, stocks, fund shares). Usually they also have a clear overview of financial liabilities: from whom they have received loans or where they have payables. Likewise, the financial manager of a company is familiar with the company's financial assets and liabilities. Based on this data it is easy to conclude whether a person or an enterprise is operating sustainably, on the edge of coping or even beyond means. The situation becomes more complicated when it comes to the entire national economy: what are its financial assets and liabilities, why are they structured exactly as they are, how they evolve as the economic situation changes, what are the saving habits of residents, which sectors are exposed to greater risks, etc.

The financial assets and liabilities and respective transactions of an entire economy are reflected in national financial accounts. Financial accounts are essential particularly with regard to the macro level of the economy. Financial accounts give an overview of the total economy as well as the development of individual economic sectors and relations between sectors. As financial accounts include the financial assets and liabilities of all sectors, they provide important information to economic policy developers, foreign investors, economists and economic forecasters.

During recent years, financial accounts have become a necessary tool for central bankers. Above all, they offer background information for comprehending the monetary policy transmission process. The analyses of financial accounts enable to study how economic policy decisions change the financial behaviour of economic entities. For instance, in the United States financial accounts are compiled by the Federal Reserve and they are used for making monetary policy decisions.

The European Central Bank (ECB) uses the quarterly data on the euro area's financing and financial investments in order to analyse the economic situation of companies and households[1]. These

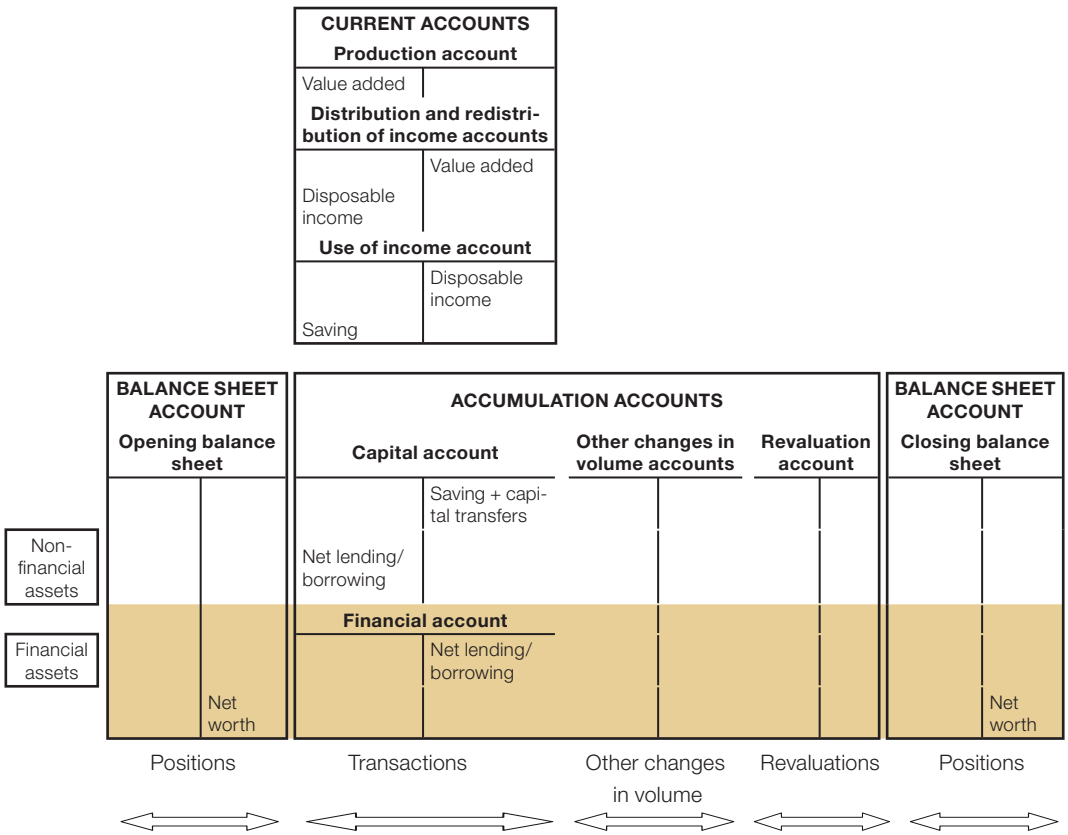
[1] Euro area countries submit financial account time-series to the ECB pursuant to the amended guideline of the European Central Bank on the statistical reporting requirements of the European Central Bank in the field of quarterly financial accounts (ECB/2002/7 as amended by ECB/2005/13 and ECB/2006/2).

provide an input for monetary policy decisions. For instance, a press release published after raising the key interest rate on 8 June 2006 expressed concern for the rapid loan growth (housing loans in particular) in the euro area's household sector and its potential effects on inflation.

MAIN CONCEPTS AND CLASSIFICATION OF FINANCIAL ACCOUNTS

Financial accounts are a part of the national system of accounts. The purpose of the system of national accounts is to generate a comprehensive picture of the economy, rendering a thorough overview of the transactions between various sectors (companies, general government, etc.) as well as transactions with the rest of the world. It comprises the key indicators of the national economy (e.g. GDP, national income, savings). National accounts reflect economic activity from the generation and use of income to its accumulation into assets (see Figure 1).

Figure 1. System on integrated economic accounts



National accounts are classified into current and accumulation accounts. Current accounts reflect transactions related to production (e.g. gross production, intermediate consumption and value added by sectors), generation of income (e.g. wages, operating surplus), distribution of income (e.g. dividend payments, social transfers) and use (e.g. private consumption, government consumption). Accumulation accounts reflect capital transactions (e.g. fixed investments, changes in stocks) and financial transactions (e.g. depositing, borrowing, transactions with stocks).

The European System of Accounts 1995 (ESA 95) is a methodological framework including concepts, definitions and classifications. Adhering to this framework is mandatory for European Union Member States (incl. Estonia). The following section introduces the **concepts and definitions** of the European national accounts system that are essential to financial accounts.

Economic entities and sectors

In the national system of accounts, institutional units are divided into clearly distinguished sectors based on their economic behaviour:

- non-financial corporations;
- financial institutions, i.e. the financial sector;
- general government;
- households;
- non-profit institutions serving households (NPISHs).

Institutional units are economic entities that can independently own assets and liabilities and carry out transactions with other units. The sectors together form the country's **total economy**. Relations of domestic sectors with other countries are observed under **rest of the world** sector. Although these data are reflected in the balance of payments and international investment position, the rest of the world is also pointed out separately in the financial accounts so as to ensure balance and integrity. Moreover, the classification of financial instruments in the balance of payments and financial accounts differs in some respects.

Some primary sectors are divided into sub-sectors. The financial account presents the financial sector in greatest detail, because a large share of financial instruments move through the financial sector. It has the following sub-sectors: central bank, other monetary financial institutions (credit institutions, savings and loan associations, money market funds), other financial intermediaries, financial auxiliaries, insurance companies and pension funds. Besides the financial sector also the general government is observed more closely, being divided into the central government (units financed from the state budget), local governments (units financed from the budgets of local governments) and social security funds (e.g. the Estonian Unemployment Insurance Fund, the Estonian Health Insurance Fund).

Financial instruments

Financial accounts outline financial assets and liabilities in seven main categories (see Table 1). This division is mainly based on the liquidity of financial assets. If necessary, instruments are broken down more specifically as subcategories (for instance, loans are divided into short-term and long-term loans).

Table 1. Structure of financial instruments

1	Monetary gold and special drawing rights (SDRs)
2	Currency and deposits
3	Securities other than shares
4	Loans
5	Shares and other equities
6	Insurance technical reserves
7	Other accounts receivable/payable

Flows and positions of assets and liabilities

Financial accounts present the **stocks** of financial assets and liabilities (balance sheets) at the beginning and end of a period as well as changes in financial assets and liabilities that occurred during the period (flows). The latter are divided into transactions and other changes in assets. **Transactions** are performed between institutional units or in some cases within a unit pursuant to mutual agreements. **Other changes in assets** are changes that do not result from transactions. These are, for instance, changes in value arising from price or currency exchange rate fluctuations, reclassifications, changes in the value of assets or liabilities resulting from extraordinary events.

COMPILATION PRINCIPLES OF FINANCIAL ACCOUNTS

The compilation of financial accounts proceeds from very clear principles. The most important of them are as follows:

- Financial instruments and transactions always have two sides: the financial assets of one sector constitute equal financial liabilities of another (it may also be an intra-sector transfer). Determining the counter-party to the transaction guarantees the balance of the system.
- All financial account transactions are recorded in **transaction prices**, positions at the beginning and end of a period are reflected in **market value**. For instance, bond issuers often estimate their liabilities at the contractual sum to be repaid, whereas bond purchasers estimate the value of bonds by the sum of acquisition. In the compilation of financial accounts, assets and liabilities are both estimated at an equal value at market prices (e.g. stock market quotations).

- Financial assets and liabilities are reflected on accrual basis: a transaction is registered at the moment the transaction is carried out between parties or when ownership changes, regardless of whether the payment has actually been received or paid.
- The sum of the financial assets of all economic sectors (i.e. total economy plus the rest of the world) must be equal to the sum of the financial liabilities of all economic sectors with respect to every financial instrument (except the positions of the item "monetary gold and SDRs"). The last column of Table 2 reveals, for example, that the sum of the total economy's and rest of the world's currency and deposits is equal both on the side of assets and liabilities.

Table 2. Example of a transaction account on the financial account

		S.1	S.11	S.12	S.13	S.14	S.15	S.2	S1+S2
		Total economy	**Non-financial corporations**	**Financial corporations**	**General government**	**House-holds**	**NPISHs**	**Rest of the world**	
	Transactions with financial assets	**13,679**	**6,775**	**3,590**	**1,915**	**1,452**	**-54**	**7,355**	**21,033**
F.1	Monetary gold and special drawing rights (SDRs)	**0**		0					
F.2	Currency and deposits	**-897**	-209	-1,601	432	404	78	1,814	**917**
F.3	Securities other than shares	**694**	-267	1,015	59	20	-134	-177	**517**
F.4	Loans	**4,344**	1,296	3,069	-22	3	-1	2,092	**6,437**
F.5	Shares and other equities	**1,005**	-417	682	576	167	-2	2,951	**3,957**
F.6	Insurance technical reserves	**526**	12	0	0	514	0	0	**526**
F.7	Other accounts receivable/payable	**8,007**	6,361	425	872	345	6	673	**8,680**
	Transactions with financial liabilities	**17,374**	**10,521**	**3,849**	**504**	**2,451**	**50**	**3,659**	**21,033**
F.1	Monetary gold and special drawing rights (SDRs)	**0**		0				0	**0**
F.2	Currency and deposits	**2,081**		2,081				-1,164	**917**
F.3	Securities other than shares	**-806**	61	-818	-63	14	0	1,322	**517**
F.4	Loans	**5,027**	2,593	905	50	1,431	48	1,410	**6,437**
F.5	Shares and other equities	**3,345**	**2,153**	**742**	**0**	**451**	**0**	**611**	**3,957**
F.6	Insurance technical reserves	**526**		526				0	**526**
F.7	Other accounts receivable/payable	**7,201**	5,714	414	518	555	1	1,479	**8,680**
F.90	Net lending (+) / net borrowing (-)	**-3,695**	**-3,745**	**-259**	**1,411**	**-999**	**-104**	**3,695**	**0**

KEY INDICATORS OF FINANCIAL ACCOUNTS AND RELATIONS TO OTHER MACROECONOMIC INDICATORS

In order to balance the transaction accounts of the system of national accounts the balancing indicators are used. The balancing indicator of the transactions account is **net lending (+)/net borrowing (-)**. It is the difference between transactions performed with financial assets and liabilities during a period and shows to what extent a sector has involved resources or, in case of a surplus, financed other sectors.

In addition to the net lending/borrowing indicator, financial accounts also include other important financial indicators, such as the growth rate of financial assets and liabilities, the structure of financial assets and liabilities and respective changes through time.

The net lending/borrowing of the total economy equals the sum of the current account and capital account of the balance of payments. Thus, while the current account of the balance of payments provides information on funds received from or allocated to the rest of the world, the financial account shows which sector is causing the surplus or deficit and what instruments have been used to attract funds (e.g. deposits, bonds, loans, equity capital, etc.).

In the system of national accounts, the indicator of net lending/borrowing is also the balancing item of the capital account. The net lending/borrowing of the financial and capital accounts should be equal across all institutional sectors. However, in reality these indicators tend to differ from one another due to the usage of different calculation methods and data sources. Likewise, the balance of payments includes a row for errors and omissions. The extent of statistical discrepancies helps to assess the quality of accounts.

USE OF FINANCIAL ACCOUNTS

As financial accounts comprise a great deal of systematised data about the whole economy that are classified and comparable, financial accounts constitute a valuable tool for all economists and financial and economic policy developers. Financial accounts are the only statistical output that includes all financial assets and liabilities of all economic sectors.

In principle, there are three main fields where financial accounts are employed:

- **Macroanalysis and economic policy decision-making**. Financial accounts enable to analyse in detail the financial position of various economic sectors (incl. risks taken, past financial behaviour and vulnerability resulting from interest rate rises or political decisions). For example, financial accounts provide information on the level of household indebtedness or the saving instruments used. Financial accounts are

also useful for making forecasts as well as for analysing the economic effects of past decisions.

- **Foreign investors**. Financial accounts are often used by foreign investors who, based on that data, receive initial and rather adequate information about the situation and potential of a country's economic sectors (e.g. the capitalisation and indebtedness of companies).
- **International comparison**. Financial accounts have been compiled pursuant to international methods and are thus comparable with the respective data on other countries. The comparability of data guarantees the application of common classification and assessment principles. The comparability of data enables to analyse prior economic crises of other countries and estimate their probability in other countries.

COMPILATION OF FINANCIAL ACCOUNTS IN EESTI PANK

Eesti Pank began preparations for compiling financial accounts already a few years ago, considering the necessity of drafting financial accounts when updating its reporting system.

The central bank started compiling quarterly financial accounts[2] for several reasons. Firstly, financial accounts offer important and complete information that can be used for forecasting and analysing. Secondly, the European Central Bank compiles the euro area financial accounts based on the quarterly accounts of the euro area countries. After becoming a member of the Economic and Monetary Union (EMU) the compilation of financial accounts will also become mandatory for Estonia. Thirdly, financial accounts help to coordinate the cooperation of different statistics providers and **improve the general quality of statistics**. This is mainly achieved through harmonising the classification of institutional units and financial instruments.

To date, Eesti Pank has completed the stock and transaction accounts from the end of 2003 until the third quarter of 2006. So far, financial accounts have been used in the analyses of Eesti Pank, for example in the Financial Stability Review, in order to reflect the financial position of the corporate and household sectors. Quarterly financial accounts are made available for the general public at the beginning of 2007, when Eesti Pank starts publishing them regularly on its website.

Data from a variety of sources are used in the compilation of the financial accounts; there are no separate studies or surveys conducted for that purpose. The primary data sources are the following: the statistics of credit institutions; Estonia's balance of payments and international investment position data; the balance sheet data of Eesti Pank; the statistics of leasing companies; the

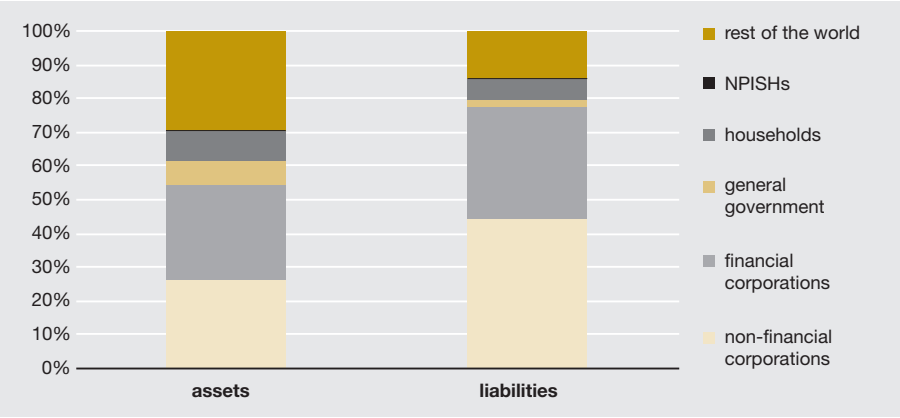
[2] All national accounts, incl. annual financial accounts, are compiled by the Statistical Office. Eesti Pank drafts only quarterly financial accounts.

reports of investment funds; the reports of savings and loan associations; the statistics on securities (data of the Estonian Central Depository for Securities); the reports of investment firms; fund managers' reports; insurance statistics; the reports of other financial institutions and financial auxiliaries (quarterly survey of the Statistical Office); the annual statistics of companies and the survey based on the quarterly financial indicators of major enterprises (the Statistical Office); the quarterly and annual statistics of the general government, etc. In addition, other survey results (e.g. household financial survey) and also indirect estimates are used.

Pursuant to the compilation principles of financial accounts, the financial assets of one sector always equal the liabilities of another sector. Therefore, data originating from different sources must be balanced. For that purpose, the so-called priority sector's information is used. Generally, the central bank, general government and the rest of the world are regarded as priority sectors, because there is more representative data on them. The indicators of companies and households are mainly compiled based on the information of other sectors.

Figure 2 shows which sectors' assets and liabilities hold the largest share in the financial accounts as at end-2005. From among domestic sectors, these are the financial and business sectors.

Figure 2. Structure of financial assets and liabilities by sectors at the end of 2005



Hopefully, the financial accounts will provide consumers with useful information about the financial behaviour of economic sectors. As the compilation of quarterly accounts is still in its initial phase, we welcome any feedback from users.

GROSS DOMESTIC PRODUCT CALCULATIONS AND REVISIONS

Tõnu Mertsina

INTRODUCTION

In the increasingly integrating world it is important that statistics characterising economic development in different countries should be comparable. This is ensured by the System of National Accounts 1993 (SNA 93) underlying the European System of Accounts 1995 (ESA 95). The System of National Accounts includes definitions, classifications and accounting rules. While SNA 93 is recommended, implementation of ESA 95 principles is compulsory to the European Union Member States. Since Statistics Estonia is part of the European system of statistics, we have to ensure compliance of our accounting methods with the methods and accounting principles concerning the whole Europe. Statistics Estonia has been applying ESA 95 when compiling national accounts statistics since 1996.

SNA 93 was developed already more than ten years ago, thus the United Nations Statistical Commission commenced revising it in 2003. The objective was to bring accounting in line with changed economic environment and consumer needs. Meanwhile, SNA still has to be consistent with the balance of payments compilation manual of the International Monetary Fund and other manuals used in national accounting. The ongoing revision of SNA mainly concerns non-financial assets, the government sector, financial institutions and instruments, as well as balance of payments. The revised SNA 93, i.e. SNA 93 rev. 1, is scheduled to be adopted in March 2008, meanwhile the revision of the European System of Accounts based on the new SNA is going to continue for at least another three years. Hence, the supplemented ESA 95 is presumably not going to be implemented before 2011. Naturally, this means a revision of the entire System of National Accounts also in Estonia and recalculation of the entire GDP time series, if needed.

Besides gross national income, gross domestic product (GDP) is one of the principal aggregate national accounts indicators. The GDP (in market prices) is the total of the value added generated by residents across the entire national economy plus net taxes on products. Entities that participate in economic activity on the country's economic territory during a year or longer are regarded as the country's residents. Gross national income is obtained through adding the primary income received from non-residents while subtracting the primary income paid to non-residents.

Regular GDP recalculation in national accounts is carried out upon changes in accounting rules, definitions and classifications. Meanwhile, recalculation of earlier periods is also carried out if methods are improved or new methods adopted. The aim of this article is to provide an **overview of GDP calculation methods applied by Statistics Estonia as well as of GDP recalculations carried out in recent years.**

GDP ACCOUNTING METHODS

Statistics Estonia calculates GDP using three methods: the production method, the consumption method, and the income method.

The **production method** is the principal national accounting method in Estonia since these data are the most exhaustive for calculating GDP.

Transactions with goods and services are commonly entered into national accounts by the accrual method of accounting. In case of market output[1] and manufacturing for own end use, the output and value added are assessed in basic prices[2] and intermediate consumption in purchaser's prices[3].

All in all, GDP in national economy is calculated by economic activities and by institutional sectors, which is published as aggregated in 15 economic activities. The value added is calculated as the difference between the output of an economic activity and the intermediate consumption needed for producing that output. Aggregate value added does not include net taxes on products[4] that are calculated altogether across the whole national economy. When net taxes on products are added to the value added, we receive GDP in market prices.

In Estonia, the economic activities with the highest ratio of value added are the real estate and business activities, manufacturing, wholesale and retail trade, as well as transportation, storage and communication, whose changes affect GDP growth the most. Besides the above-mentioned fields of activity, the gross value added is also significantly affected by financial intermediation due to fast growth thereof (see Table 1). The contribution of the five economic activities above to the growth of the gross value added was some 79% in 2005.

In Estonia, economic activities are classified according to the classification of economic activities (EMTAK 2003), which is based on the statistical classification of economic activities in the European Union (NACE rev. 1.1). In compliance with NACE, EMTAK defines the classification of the economic activities in which national accounts are compiled. Currently accounting is made, depending on the indicator, either by 6, 17, 31 or 60 economic activities. As from 2009 national accounts will be compiled according to the revised statistical classification of economic activities in the European Union

[1] Market output consists of output that is sold on the market at economically significant prices or is at least intended to be disposed of on the market.

[2] Basic price is a price paid to the manufacturer by the buyer less net taxes on products.

[3] Purchaser's price in case of intermediate consumption is the price that does not include VAT or other deductible taxes.

[4] Net taxes on products represent the difference between product taxes and product subsidies.

Table 1. Brakedown of value added by economic activities and contribution of value added growth to total value added growth in 2005 (%)

	Share of field of activity in total value added	Contribution of value added growth to total value added growth
Agriculture. hunting and forestry	3.5	0.7
Fishing	0.2	0
Mining	1	9.3
Manufacturing	16.8	20.8
Electricity. gas and water supply	3.4	1.7
Construction	7.3	9.4
Wholesale and retail trade	15.2	20.9
Hotels and restaurants	1.6	3.3
Transport. storage and communications	12.1	10.3
Real estate. renting and business activities	18.8	13.6
Financial intermediation	3.8	13.2
Public administration and defence; statutory social insurance	5.4	1.1
Education	4.5	0.3
Health care and social welfare	3.2	1.3
Other community. social and personal service activities	3.3	1.4
Total value added	100	100

- NACE rev. 2, which is why the Estonian classification of economic activities is also going to be changed. According to the new classification, national accounts across areas of activity are to be compiled in more detail, i.e. by 10, 21, 38 and 65 economic activities, respectively.

Such a change implies an exhaustive revision of the GDP time series since changing classifications leads to a change in the placement of economic units into economic activities and hence also to the recalculation of GDP. According to a preliminary agreement, the first part of the recalculated time series (either from 2000 or 2005) is to be published in September 2011.

The economic activities underlying GDP calculations are classified by five institutional sectors[5]. Under ESA 95, GDP in Estonia is compiled regarding the following institutional sectors:

- non-financial corporations (in short “corporations”);
- financial institutions;
- general government sector;
- non-profit institutions serving households (NPISH);
- households.

[5] These five sectors constitute total economy.

The above-mentioned institutional sectors comprise resident institutional units. The sector carrying the biggest weight is the corporations sector whose value added accounts for 70% of the gross value added of institutional sectors. It is also noteworthy that the share of the corporations sector has been consistently increasing in recent years. The share of NPISH has also somewhat increased, but it still accounts for less than 1% of the gross value added.

Everything produced in the national economy is either consumed domestically or exported. Besides goods and services produced in Estonia, also imported goods and services are consumed. In order to know the consumption rate of the residents, GDP is also calculated according to the **consumption method**. When using this method GDP is calculated as a total of households', general government sector's and non-profit institutions' serving households final consumption expenditure, investments, changes in inventories and goods and services exports of resident households less imports of goods and services. Final consumption expenditure and gross fixed capital formation are estimated in purchaser's prices. In GDP calculations, exports and imports of goods and services are shown in FOB prices, which refers to the value of goods and services on the frontier of the exporting country.

The total of final consumption expenditure of all sectors, investments and changes in inventories adds up to domestic demand.[6] Households' final consumption expenditure[7] has the biggest share in domestic demand, accounting for approximately 50–55% of GDP. In GDP calculations households' final consumption expenditure is calculated on the basis of residents' expenditure in the Estonian economic territory and abroad.

The share of households' final consumption expenditure in GDP has been declining since 2002, mainly arising from the growth in investment (gross fixed capital formation) and the volume of goods and services exports and imports. The increase in the share of investments is mainly caused by larger capital formation of the corporations' sector, which accounts for approximately 70% of gross fixed capital formation. Investment activities have remained rapid due to the decline in interest margins and moderate inflow of foreign investment. The accession to the European Union in 2004 and the disappearance of double customs duties on trade between Estonia and Russia activated Estonia's foreign trade, leading to increased external demand and by accelerating exports growth rate.

GDP calculation by the consumption method enables to check the accuracy of the GDP indicator received through calculation by the production method as well as to counterbalance the GDP calculated by the production and consumption method.

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[6] For the classification of household's final consumption expenditure, the consumption classification COICOP (Classification of Individual Consumption by Purpose) is used. The International Classification of the Functions of Government (COFOG) serves as a basis for accounting government final consumption expenditure.

[7] Also the definition "private consumption expenditure" is used.

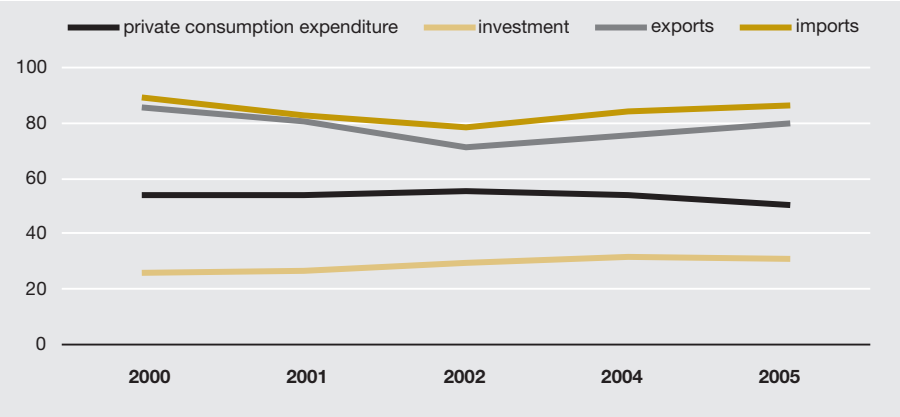

Figure 1. Change in the share of private consumption expenditure, investment and exports and imports of goods and services in GDP in 2000–2005 (%)

In principle, production and consumption in the entire economy must be fully balanced in national accounts. In reality, however, it is not always so, therefore a statistical discrepancy exists. There are various reasons behind the emergence of a statistical discrepancy, one of which being the fact that quarterly and annual GDP calculation is not sufficiently detailed on the level of products and services, but in a more aggregate form by groups of products and services. In this way, differences may emerge in production and consumption methods of calculation.

Detailed accounting by products and services in national accounts is possible by applying supply and use tables (SUTs). These are matrixes that show how the output of an economic sector has been placed by types of products and how the domestic supply of goods and services and imports is distributed between intermediate and final consumption and exports. Use tables also show the structure of production costs and generation of income by economic sectors. One of the statistical tasks of SUTs is to find incompatibility in source data. Hence, differently from regular GDP calculation, the annual GDP calculated by SUTs by production and consumption methods is fully balanced and there is no statistical discrepancy.

The third GDP calculation method, the **income method**, does not constitute a separate accounting in Estonia, but is calculated on the basis of the production method. By the income method, GDP is calculated as a sum of compensation of employees, consumption of fixed capital, production and import taxes (less production subsidies) and operating surplus.

All in all, GDP computation based on the production, the consumption, or the income method must meet the following equation:

Gross Domestic Product (GDP) =

= output - intermediate consumption = value added + net taxes on products

= final consumption expenditure + gross fixed capital formation + changes in inventories + exports - imports

= compensation of employees + consumption of fixed capital + net production taxes + operating surplus

GDP CALCULATION IN CONSTANT PRICES

In order to compare GDP change in time and obtain information about real GDP growth, the impact of price changes has to be eliminated. In order to evaluate real GDP growth, the components thereof must be calculated using the average prices of the base year (currently 2000) or constant prices. GDP calculation in constant prices is applied to both production and consumption methods. It is not applied to the income method since this one does not include transactions with goods and services that could be converted into base year prices.

In 2007, Statistics Estonia is scheduled to develop and adopt the chain-linking method[8] for calculating constant prices. A single fixed base year is not applied in this method, as every following calendar year is used as a base for calculations (i.e. every year preceding the accounting year serves as a base year) and volume indices are calculated for every year in previous year's prices. This enables to measure real changes more accurately, since the precision of assessing volume changes decreases as the base year becomes more distant. Along with the changeover to the chain-linking method, the GDP calculations in constant prices have to be revised across the entire time series.

In constant price calculations it is assumed that changes in output[9] and value added are in line, which, in essence, implies to the single deflation, i.e. converting to constant prices. This means that if a change in output is estimated on the basis of a price index (comparing to the preceding year according to the chain-linking method), the same change is taken into account also in case of value added. With double deflation, different price indices are applied to output and intermediate consumption. In that case the dynamics of aggregate output growth in constant prices differs from that of value added since intermediate consumption price indices change differently.

Single deflation is applied because sufficient details regarding products included into intermediate consumption are not available. But these are available regarding output. The problem with single deflation is that if value added in current prices is index-linked with product price indices while the prices of expenditure items included in intermediate consumption change faster than product

[8] Compulsory changeover to chain-linking has been provided by the decision of the European Commission.

[9] Output is a term used in national economy. After subtracting intermediate consumption we get value added.

prices, value added in constant prices is underestimated. However, if the prices of intermediate consumption input increase at a slower rate, the value added in constant prices is overestimated. Currently, the following principal indices are used upon deflation:

- consumer price indices per groups of goods and services;
- producer price indices per economic activities;
- construction price indices;
- export and import price indices.

Calculation of the value added of the general government sector is cost-based. Upon deflation of the GDP components of that sector the special case of physical volume index, i.e. the change in the number of employees, is applied. Volume indices are also used in calculations based on constant prices in several other economic activities (e.g. transport, mining industry, electricity, gas and water supply).

REGULAR GDP ADJUSTMENT

In order to meet the needs of those using statistics regarding as early as possible release of the GDP growth indicator for the preceding quarter, Statistics Estonia releases flash estimates as soon as 45 days after the end of the accounting period[10]. A flash estimate is based on the data received by that time as well as on expert assessments and forecasts regarding the data not yet obtained. Flash economic growth estimates are calculated only by the production method, i.e. on the basis of the increase in the value added of economic activities and institutional sectors. As time passes, more data that are more precise become available, which allows to improve the quality of GDP accounting and achieve a more accurate GDP value. Hence also earlier GDP estimates are regularly adjusted upon receipt of additional data or when the existing data are specified.

70 days after the end of the reference period a preliminary quarterly GDP is released, based on supplementary data and calculated by production, consumption and income methods. The average difference between flash economic growth estimates and preliminary quarterly GDP growth figures calculated during the past two years[11] has been 0.3 percentage points.

An annual adjustment of principal national accounts indicators calculated quarterly is carried out on the basis of the Structural Business Survey (Estonian version, EKOMAR) whose results are publicised 18 months after the end of the year subject to statistics adjustment. Corporate financial activities indicators are adjusted on the basis of respective EKOMAR indicators and the structure

[10] As of 2007.

[11] When flash economic growth estimate was released 65 days and preliminary quarterly GDP 90 days after the end of the reference period.

of ratios (e.g. on the basis of the share of intermediate consumption in total output, taxes to the total output ratio, the ratio of own-account produced fixed assets to net turnover, profit margin, salary, etc.). In 2007, Statistics Estonia, on the basis of EKOMAR, is adjusting the data regarding GDP components for the years 2005 and 2006 as well as respective quarters, which will probably lead to a change in the GDP value both at current and constant prices. The adjustment of the 2003 data on the basis of EKOMAR changed the indicators regarding major GDP components, corporations and private consumption expenditure in current prices by 4.4% and 5.7% and in constant prices by 4.4% and 5.9%. New indicators that are released repeal prior data.

Along with drawing up supply and use tables for respective years, the final GDP indicator is released three years after the end of the year examined.

GDP RECALCULATIONS

Besides regular GDP adjustments, several GDP recalculations have been carried out since 2001.

Revision of GDP components in 2001

The first adjustment concerning the entire GDP time series was carried out in 2001 in relation to a more accurate allocation of the exhaustiveness between economic activities and adjustment of financial sector indicators and net taxes on products. The adjustment mainly concerned GDP calculated by the production method.

New information about the parts of the economy that are complicated to measure, i.e. the exhaustiveness, was above all created when compiling supply and use tables. For the first time these tables were compiled for 1997. By comparing supply (production, imports) and use (consumption, exports) by product groups, it became possible to identify inaccuracies of statistical indicators that were not conspicuous when calculating on a more aggregate level.

Mainly GDP calculated by the production method was adjusted. In the corporations and households sectors, the principal change was the specification of the allocation of the exhaustiveness between economic activities. In earlier calculations the households' value added had been overestimated and that of the corporations sector had been underestimated. Consequently, the corporations sector grew at the expense of the households sector. Changes in the structure of the economic activities were accompanied by changes also in the growth in the value added value of the economic activities.

The relative importance of financial intermediation, forestry, manufacturing and transport increased while the share of trade as well as public, social and personal service activities in value

added decreased. Changes in financial intermediation calculations were the most radical. The accounting methods of indirectly measured financial intermediation services (FISIM) were converged with the Eurostat guidelines. Adjusting FISIM data changed the value added of the financial intermediation since FISIM is one of the principal components of the financial sector output. Meanwhile it should be noted that at that time it did not imply allocating FISIM between institutional sectors or consumption components, which was carried out in 2005.

As said above, national accounts have been drawn up on an accrual basis. However, before revising the 2001 data net taxes on products calculated by the production method were cash-based. In the new calculations net taxes on products were taken on accrual basis by making use of the data on changes in tax arrears and time adjustment of the value added tax[12].

As regards GDP calculated by the consumption method, private consumption expenditure and final consumption expenditure of the government sector and NPISH were adjusted. The change in final consumption expenditure of the general government sector was brought about by the addition of social assistance benefits in kind (medicines compensated by the health insurance fund, technical aid to disabled people, etc.).

Change of base year in calculating GDP at constant prices

2002 saw a base year change in calculating GDP at constant prices. The former base year (1995) was replaced by a new year – 2000. As a consequence of the revision, time series and growth indicators at constant prices of all the sectors and components calculated by two methods changed. Until 2001 the fixed base year used in Estonia for calculating GDP at constant prices was 1995. As a rule, the fixed base year is changed in every five years. Hence the year 2000 became the new reference year. However, 2005 will not be the next reference year, since in 2007, Statistics Estonia is going to work out respective methods and introduce chain-linked accounting at constant prices[13].

When converting value added of the corporations and households sectors into 2000 average prices, the chained volume index method was used. This method implies that volume indices (growth rate) of the years and quarters preceding the new base year remain unchanged by economic activities and institutional sectors, i.e. as such as they were with the prices and weights of the former base year.

Upon rebasing[14] the GDP components calculated by the consumption method, a method was applied according to which the calculations for 2000 were conducted in average prices of 2000 with

[12] Time adjustment of the value added tax means that it is not the VAT receipts of the current period that are taken into account, but it is done with a certain deviation in time, e.g. a month.

[13] Mandatory changeover to chain-linking has been provided by a decision of the European Commission.

[14] Rebasing means a change in the base period (year or quarter) that serves as a basis for accounting at constant prices.

respective price indices while earlier years (1993–1999) were then rebased with effective growth rate indicators. As a consequence, due to the difference in weights, the rate of growth of the components of the GDP consumption method changed.

GDP revision in relation to compliance with the pre-accession criteria imposed on national accounts methods prior to the accession to the EU

Similarly to the other countries that joined the European Union (EU) in 2004, Estonia had to comply with the pre-accession criteria imposed by the European Commission on national accounts methods. Meeting the criteria secured more complete comparability of the statistics with the other EU member states. Among the pre-accession criteria was the requirement to evaluate housing services products at imputed rental value. According to national accounts methods, housing services or residential space rental services are divided into actual and imputed rent. While actual rent means renting out residential space to other people, imputed rent means a value that the owners would have to pay for the housing they use if they were tenants. GDP recalculation in relation to the value of calculated rent is based on the population and housing census of 2000 and has been specially developed for the new EU member states based on the housing services accounts methods. Calculation of imputed rent was the principal factor affecting the level of GDP upon the changes in methods carried out in the spring of 2004.

Besides imputed rent changes were also made in calculating actual rent. Consumption of fixed capital was included into calculating actual rent in the government sector while actual rent computation regarding households and housing associations was carried out with the data adjusted according to the 2000 census. Besides the government sector, changes in calculating consumption of fixed capital also affected other institutional sectors since compared to earlier methods both price indices (affects the value of fixed assets that are depreciated) and the lifetime of fixed assets (which part is depreciated during each period) were adjusted.

The time series were adjusted by the new method since 1993; whereas the level of GDP increased 5–8% from before (8.3% in 2003).

Changes in indirectly measured financial intermediation services accounting measures (FISIM)

In 2005, the methods of calculating FISIM were changed in GDP calculation. According to the new methods, FISIM must be allocated between the sectors using the service (previously FISIM had been shown as a single separate indicator). Hence FISIM is no longer entered into the system of national accounts as entirely intermediate consumption, but also as final consumption, exports and imports.

Along with the revised FISIM accounting methods also financial sector output accounting methods changed.

Besides, it is noteworthy that a significant change was also introduced into government sector output accounting: employees' imputed social contribution was also included in the calculations of compensation of employees. This led to a rise in value added at current prices in 1995–2002. 213.8 million kroons at both current and constant prices were added to the value added of the base year, which affected the level of constant prices and growth rates of the following years.

New FISIM accounting changed the GDP by -0.3% to +0.7% at current prices and by -1.0% to +1.0% at constant prices in the 1993–2004 time series.

Revision of GDP accounting methods according to the system of supply and use tables

Under EU requirements, supply and use tables (SUTs) serve as a co-ordinating framework for regular GDP calculations. Therefore, in 2006 Statistics Estonia revised GDP accounting methods according to the system of SUTs and adjusted GDP calculations as from the year 2000. In contrast to the earlier regular GDP calculations, with the SUTs the annual GDP at current prices (in 2000–2002) calculated by the production and consumption methods is fully balanced. In that period the statistical discrepancy in the annual GDP calculated by production and consumption methods was eliminated. The GDP change includes specification of methods as well as use of more detailed supplementary administrative data sources. The recalculation affected more or less all GDP components (for a more precise description of the method, please refer to the statistical database of Statistics Estonia at www.stat.ee).

Compared to the indicators released before, the GDP calculated by the revised methods increased by 2.7–4.9% at current prices and by 2.7–6.0% at constant prices in 2000–2005 (see Table 2). Compared to the data released before, the annual real GDP growth in 2001–2005 increased by 0.3–1.2 percentage points (see Figure 2).

The biggest contributor to increased GDP at current prices was the growth in the value added in the corporations sector. Mainly methodological changes and changes in sector coverage, i.e. changes in the composition of companies belonging to the economic activities and to a certain degree also the structure of institutional sectors, affected the rise in value added.

In 2007, Statistics Estonia is adjusting the 1995-1999 time series by updated methods. In 2007, also SUTs will be compiled at current prices for 2003 and 2004. The respective data will then be integrated into the system of national accounts and the final GDP (at current prices) indicator for these years will be released. Statistics Estonia will release SUTs for 2000–2006 at constant prices in 2009 while in 2010 GDP time series will be recalculated according to SUTs. Only then it will be possible to eliminate the statistical discrepancy in the GDP also at constant prices.

Table 2. The difference between revised and previously published GDP at current and constant prices in 2000–2005 (%)

	2000	2001	2002	2003	2004	2005
Difference between the revised GDP and earlier published GDP at current prices (%)	2.7	3.6	3.8	4.4	3.7	4.9
Difference between the revised GDP and earlier published GDP at constant prices (%)	2.7	3.9	4.7	5.0	5.3	6.0

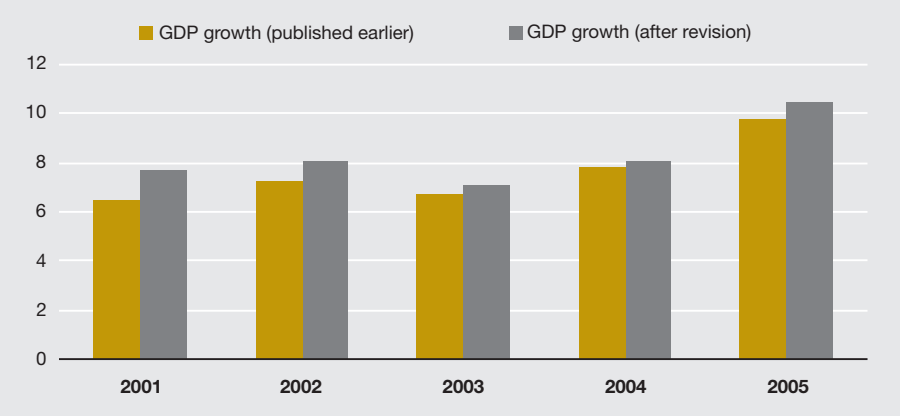

Figure 2. Annual GDP growth at 2000 constant prices in 2001–2005 (%)

CONCLUSION

Subsequent to providing a flash economic growth estimate, the value of GDP components is repeatedly and regularly adjusted so as to achieve a more precise GDP based on supplemented data sources. Besides regular adjustment, different GDP revisions have been carried out since 2001, whereas further supplementary GDP recalculations are foreseen in the near future.

The underlying reasons for such recalculations can be broadly divided into three groups:

- change in the rules, definitions and classifications of national accounts (e.g. the changeover from ESA 95 to ESA 95 rev 1 and from NACE rev 1 to rev 2);
- improvement of methods (e.g. GDP revision related to meeting the pre-accession criteria prior to joining the EU);
- adoption of new methods (e.g. new FISIM accounting methods).

Frequent GDP adjustment understandably causes inconvenience to those using statistics. At the same time, the objective of GDP revisions and data adjustment is to raise the quality of the calculations, which makes national economy indicators that provide the basis for analyses and economic policy decisions more reliable. Besides, GDP recalculations are needed in order to bring Estonia's accounting methods in line with the EU requirements and secure improved comparability with other countries.

MAIN QUARTERLY INDICATORS OF THE ESTONIAN ECONOMY

as at 12 January 2007

	Period	Indicator	Change compared to the previous period (%)	Change compared to the same period last year (%)	Source
GDP					
Current prices (EEK m)	Q3 06	51,972.0			ESA
Constant prices (EEK m)	Q3 06	40,118.3	-1.0	11.3	ESA
Production					
Volume index of industrial production (at constant prices (2000=100); %)	Q4 06			5.6	ESA
Agriculture					ESA
Livestock production					ESA
Meat (live weight; thousand tons)	Q4 06	27.1	10.6	-4.2	ESA
Milk (thousand tons)	Q4 06	163.2	-10.6	2.5	ESA
Eggs (m pieces)	Q4 06	39.1	-6.5	-27.9	ESA
Investments in fixed assets (at current prices; EEK m)	**Q3 06**	**9,272.5**	**17.8**	**44.9**	ESA
Construction					
Construction activities of construction enterprises (at current prices; EEK m)	Q3 06	14,366.0	23.2	32.6	ESA
Usable floor area of completed dwellings (thousand m2)	Q4 06	130.9	40.0	20.6	ESA
Usable floor area of non-residential buildings (thousand m2)	Q4 06	249.4	-9.2	-10.8	ESA
Consumption					
Retail sales volume index (at constant prices, 2000=100; %)	Q4 06		7	19	ESA
New registration of passenger cars (pieces)	Q4 06	18,016	-12.3	21.8	ARK
Prices					
Consumer price index (%)	Q4 06		0.5	4.5	ESA
Producer price index (%)	Q4 06		1.8	5.7	ESA
Export price index (%)	Q4 06		1.6	4.6	ESA
Import price index (%)	Q4 06		-0.1	3.6	ESA
Construction price index (%)	Q4 06		4.3	13.7	ESA
Estonian kroon real effective exchange rate index (REER; %)	Q4 06		-0.2	0.9	EP
Labour market and wages					
Employment rate (employed persons/working-age population, %; based on the Labour Force Survey)*	Q3 06	61.9	62.0	58.3	ESA
Unemployment rate (unemployed/labour force, %; based on the Labour Force Survey)*	Q3 06	5.4	6.2	7.0	ESA
Registered unemployed (according to the Labour Market Board)**	Q4 06	12,074	-7.7	-46.4	TTA
% of population between 16 years old and pension age*	Q4 06	1.4	1.6	2.8	TTA
Average monthly gross wages and salaries (EEK)***	Q3 06	9,068	-4.9	16.5	ESA

* Instead of changes comparing to previous periods, absolute figures for the periods are shown by this indicator.
** Before October 2000 the term 'registered unemployed job-seekers' was used.
*** Health insurance benefits are not included in monthly gross wages and salaries starting from 1999 (according to changes in the law, the employer no longer pays sick benefits)

	Period	Indicator	Change compared to previous period (%)	Change compared to same period last year (%)	Source
General government budget					
Revenue (EEK m)	Q2 06	21,314.7	37.4	28.2	RM
Expenditure (EEK m)	Q2 06	17,128.3	11.0	12.2	RM
Balance (+/-; EEK m)*, ****	Q2 06	4,186.5	87.0	1,360.0	RM
Period's revenue to the planned annual revenue (%)*	Q2 06	29.7	21.6	26.8	RM
Transport					
Carriage of passengers (thousands)	Q3 06	52,564.1	1	1.6	ESA
Carriage of goods (thousand tons)	Q3 06	23,543.0	3.7	-6.4	ESA
Tourism, accommodation					
Visitors from foreign countries received by Estonian travel agencies (thousands)	Q3 06	633.8	41.9	-23.0	ESA
Visitors sent to foreign tours by Estonian travel agencies (thousands)	Q3 06	134.4	14.2	5.4	ESA
Accommodated visitors (thousands)	Q3 06	809.5	33.7	8.0	ESA
o/w foreign visitors (thousands)	Q3 06	535.2	29.0	-2.2	ESA
Confidence indicators					
of industrial enterprises (%)*	Q4 06	19	24	10	EKI
of construction enterprises (%)*	Q4 06	34	43	35	EKI
of trade enterprises (%)*	Q4 06	14	37	12	EKI
of consumers (%)*	Q4 06	7	9	3	EKI
Foreign trade (special trade system)					
Exports (EEK m)	Q3 06	29,272.9	-4.3	18.1	EP
Imports (EEK m)	Q3 06	40,306.0	-2.8	22.0	EP
Balance (EEK m)*	Q3 06	-11,033.0	-10,887.1	-8,253.1	EP
Foreign trade balance/exports (%)*	Q3 06	-37.7	-35.6	-33.3	EP
Balance of payments					
Current account balance (EEK m)*	Q3 06	-6,634.4	-6,815.9	-4,006.4	EP
Current account balance to GDP (%)*	Q3 06	-12.6	-13.2	-9	EP
Foreign direct investment inflow (EEK m)*	Q3 06	5,459.1	3,130.4	4,296.6	EP
Foreign direct investment outflow (EEK m)*	Q3 06	-4,883.1	-3,635.2	-1,642.1	EP
International investment position					
Net international investment position (EEK m)	Q9 06	-178,058.6	1.9	7.4	EP
Direct investment in Estonia (EEK m)	Q9 06	184,204.3	2.5	9.1	EP
Net external debt (EEK m)	Q9 06	181,631.5	5.5	29.3	EP
o/w government (EEK m)	Q9 06	3,841.1	1.4	-7.9	EP
EEK/USD average quarterly exchange rate	Q4 06	**12.143**	**-1.1**	**-6.6**	EP

**** Net borrowing is not included here.
***** Based on estimate of economic growth.
ESA - Statistical Office of Estonia
ARK - Motor Vehicle Registration Centre
EP - Eesti Pank /Bank of Estonia
TTA - Labour Market Board
RM - Ministry of Finance
EKI - Estonian Institute of Economic Research