# Inventory of Sources and Methods

## Price and Volume Measures in the Icelandic National Accounts

**Statistics Iceland**
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# Chapter 1.
# General procedure

## 1.1 Introduction

This report describes how the final Icelandic national accounts are calculated at constant prices. At current prices, national accounts can be estimated by using three methods, the expenditure approach, the production approach and the income approach. In Iceland's national accounts, GDP is not independently estimated using the income approach. From these reasons it is already impossible to use that method to measure GDP at constant prices. From a theoretical point of view the income approach is also excluded whereas one of the income components, the operating surplus, can not be split up between price and volume components so no volume estimate is possible.

Both of the other two methods, the production approach and the expenditure approach, can be used for calculating GDP at constant prices. In Iceland, both methods are used but the expenditure approach is the dominant one in determining the volume growth of GDP although the production approach is calculated in full detail. Both methods should give the same result but for the time being that is not the case in Iceland. So far the two methods are not balanced and already at this state of the description it is worth emphasising that a considerable difference occurs. For recent years the differences are as follows.

**Table 1.1 The GDP growth rate in Iceland, a comparison between the two methods**

|  | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|---|
| Growth rate, the expenditure approach | 4.1 | 4.3 | 3.9 | 0.1 | 2.4 | 7.7 | 7.1 |
| Growth rate, the production approach | 5.2 | 5.9 | 4.6 | -0.7 | 3.5 | 6.9 | 7.4 |

In some of the years this difference is of a great concern and due to that a special development work was undertaken by Statistics Iceland in order to eliminate this difference by constructing supply and use table at constant prices for the years 2002 and 2003. The first result of that work was completed in September 2007 and sent to Eurostat which supported the work financially. The result of that supply and use table showed a growth rate in the range between the expenditure and the production approach. This result is still considered as preliminary and it has not yet been incorporated into the regular published data.

In both the expenditure and production approaches annual chain linking has been applied since September 2005 and all time series have been revised back to 1990 according to the chain linking methods.

The description given in this report is preliminary in the sense that it refers to the present methods before any amendments have been incorporated from the forthcoming balanced supply and use table of 2002 and 2003.

The structure of this report follows recommendations from Eurostat B1/CN 496e. The methods used are classified into A, B or C method. This classification follows the criteria given in the *Handbook on price and volume measure in national accounts*, published by Eurostat. A quick look at the methods applied, indicates that the C methods are still used in far too many cases. However, it is worth mentioning that although the C method is used in many activities, these are often small. In order to emphasize the importance of the C method,

its share is shown explicitly for each activity section. One of the conclusions which can be drawn from this report is that in some important cases the share of the C methods can be diminished merely by a more careful selection of price indices. So far this has not yet been done so the methods described here are the methods which are followed now. Some improvement will be introduced soon.

## 1.2 The expenditure approach

In section 3.3 below a more detailed description will be given on how the individual components of the expenditure approach are calculated at constant prices. A summary description of the calculation procedure is given here.

The household final consumption expenditure at current prices is available in a COICOP breakdown down to 3 digit level. The total number of items individually estimated is approximately 142 items. The calculation at constant prices is carried out at the same level of disaggregating covering 142 items. The various sub-indices of the consumer price index are widely used for the constant price estimates and this is the main method used. For some products such as agricultural products, electricity and hot water, the constant price estimates are based on direct estimates of quantities multiplied by the unit prices of same products at the base year prices. The latter method is only considered acceptable when the quantities are detailed, well defined and easily recognized. In some cases the base year values are extrapolated with volume indices. An example of this is the gross rentals of dwellings.

The government final consumption expenditure at current prices is available in COFOG breakdown down to 4 digit level for central and local governments. The constant price estimates are made on an aggregated level and entirely from the cost side where the compensation of employees, the consumption of fixed capital and intermediate consumption are each deflated on an aggregated level by the most appropriated price index. So far, no direct estimate of output has been calculated for government final consumption.

The gross fixed capital formation at current prices is available for most of the activities in a cross classification by 10 type of assets and by industry down to 4 digit level of activity in NACE rev.1 classification. The constant price estimates are made on a 2 digit activity breakdown where each activity is broken down to the same 10 types of assets. Each time the most appropriate price indices are used like building cost index, unit value indices for specified imported goods, wage indices in the private sector, market price indices for dwellings and price indices for personal computers as a sub-item in consumer price index.

Exports and imports of goods at current prices follow the Icelandic Customs Tariff, which is an eight digit classification that complies with the six digit HS classification, with the addition of two digits that are used in some instances for more detailed breakdown according to Icelandic requirements. From this detailed classification, unit value indices are calculated and used for constant price estimates of exports and imports.

Exports and imports of services are available at a much less disaggregated level than goods. The main items are transportation, travel and other services and these items are deflated by some general price indices like current exchange rate and the inflation rate in OECD countries.

## 1.3 The production approach

In Icelandic National Accounts the production approach plays a secondary role to the expenditure approach. However, in recent years there exists a detailed disaggregation of production accounts by activity whereas the number of production accounts at current prices

is now around 420. So far, production accounts do not exist at constant prices, only gross factor incomes. For all market activities the gross factor incomes at constant prices are derived from the volume indices of output value of each activity. By doing that it is assumed implicitly that constant input/output ratio prevails. Double deflation of production accounts, i.e. deflation of both output and intermediate consumption, is never used in these calculations. Several years ago, double deflation methods were developed and used in agriculture and fishing with bad results, due to inaccurate information of products used as intermediate consumption and of price developments of these products.

For non-market activity gross factor incomes are entirely derived from the cost side, that is by deflating separately compensation of employees, consumption of fixed capital and intermediate consumption by the most appropriate price indices. So far no direct volume indicators have been developed for non-market activities.

## 1.4 Annual and quarterly chaining

In September 2005 annual chain linking was introduced, replacing constant prices with a fixed base year of 1990. The new methods were applied back to 1990. The new methods were applied both for the output and expenditure approaches. Prior to that point of time the annual chain linking already had been used for several years for the output approach and volume changes by activity were chain linked from 1990 onwards.

The constant price estimates are undertaken in such a way that the current price values are deflated with price indices having the previous year as base year. Thus the base year changes annually. Subsequently the individual year-to-year growth rates are chained and thereby a combined chain index has been compiled. This is done on the most detailed level as described in section 3.2 below.

Quarterly growth rates of GDP were also chain linked in September 2005 and all time series recalculated back to 1997, 1st quarter which is the first period of quarterly national accounts in Iceland. The method used is the annual overlap method where each quarter of the current year is estimated at the annual average prices of the previous year.

## 1.5 Publishing of the Icelandic national accounts at constant prices

At constant prices the Icelandic national accounts are published both as volume indices and values where the year 2000 is the reference year. Annual chain linking has the property that the volumes of sub-aggregates "line by line" do not add up to the volume of the aggregate, also calculated "line by line". This causes the non-additive problem in all time series except for the reference year and the year t+1, where t is the reference year.

When publishing chain indices in the Icelandic national accounts the non-additive indices are published directly and no attempt is done in trying to eliminate discrepancy of this kind.

# Chapter 2.
# General information on main sources used

## 2.1 Introduction

In this chapter a description is given of the price data sources from which deflators are taken. Due to intensive use of consumer price index and its various sub-indices a rather detailed description is given of that price index below. A less detailed description is given on building cost index, the unit value indices of exported and imported goods and producer price indices.

## 2.2 The Consumer Price Index (CPI)

### 2.2.1 Concepts and definitions

The concepts and definitions used in the CPI for Iceland follow the *CPI Manual* and are also in line with the recommendations of the *1995 ESA*. There is one exception: illegal goods and services are excluded from the CPI. However, this exclusion is standard practice in price indices and is in agreement with specific EU regulations for HICP.

The weights for the CPI are largely based on the yearly Household Expenditure Survey (HES). The concepts and definitions for the HES follow international standards and closely apply with those of the CPI.

Expenditure estimates from the HES are compiled at a sufficient level of detail for commodities and services to allow compilation and detailed analysis of price movement.

### 2.2.2 Scope

The *Consumer Price Index Act, 12/1995* provides that the index must reflect prices throughout the country as far as practicable. Accordingly, Statistics Iceland collects prices in Reykjavik and three other major centres. However, no regional weights are used in calculating the national CPI, nor are any regional or city indices produced. There is no significant user demand for such indices.

The CPI covers the expenditures of all resident non-institutional households (both urban and rural), where at least one member of the household is aged between 18 and 74 years. All income groups are covered. Also included are households whose major activity involves an unincorporated business activity with separate records for business and consumption purchases. Similarly, households whose primary activity is farming or fishing are included.

The CPI reflects purchases of all goods and services offered to households in Iceland, including the shelter services of owner-occupied dwellings. The CPI weights include own-account production of vegetables, meat, and fish for own final consumption. As noted above, the CPI excludes illegally sold goods and services.

The Icelandic CPI includes owner-occupied dwellings on the basis of simple user cost.

The structure of the CPI, based on COICOP, involves 12 major groups (2-digit COICOP), 39 classes (three-digit), 98 subclasses (four-digit), 654 basic headings (seven-digit), and approximately 4,000 items.

### 2.2.3  Basis for recording

The weights for the goods and services in the consumer basket are valued at purchasers' prices including trade and transport margins and value added tax. Own-produced consumption of vegetables, meat, and fish is valued at market purchasers' prices.

The product specifications included in the CPI are usually very detailed and include price determining characteristics relating to the terms of transactions. For example, prices include the effects of unconditional discounts and rebates where applicable.

Up to January 2008 prices were obtained in respect of the first two working days of each month.  As of January 2008, the timing of the data collection for the compilation of CPI and the calculation of the CPI changed, cf. Act no. 27/2007. This is in accordance with HICP regulation. From January 2008 the CPI is based on prices prevailing around the middle of each month. Prices are collected monthly for most items. Prices for public tariffs, such as garbage, sewerage and water supply usually change annually but other public tariffs such as kindergarten fees, and medical services can change more frequently.   In such case price checks are made regularly and when a price change is detected it is  incorporated in the CPI in that month.

The recording of prices for packaged holidays occurs in the month in which consumption at the observed price commences, not the month in which the actual price is paid. For example, summer packaged holidays are consumed in August but may be paid for several months earlier. Such prices are recorded in the CPI when the services are actually consumed, i.e., August.

### 2.2.4  Sources

The basis of the consumer price index is Household Expenditure Surveys (HES), which Statistics Iceland carries out regularly. A survey was carried out in 1995 and the index from 1997-2001 was largely based on its results. From the year 2000 household expenditure surveys are carried out continuously and from March 2002 the results are used for annual rebasing.

The survey cycle is three years and SI selects as a single-stage random sample for the HES for approximately 1,200 household units each year from the national population register. The actual number of responding households over the three-year period is in the interval 1,700-1,800 each year; the response rate being 45-49 percent due to non-response and other factors. Statistics Iceland corrects for the bias attributable to the non-respondents, using data obtained from the HES and from other sources on family size and type and other major household characteristics. Statistics Iceland also compares the data with geographical distribution data from the population register.

The samples of households for each year are spread evenly over the year in 26 two-week sub samples. Respondents submit information of day-to-day expenses and also report expenditures for a three-month period for less frequently occurring expenses. Extensive use is made of the receipt approach by collecting cash register receipts in place of purchases itemized in diaries provided to respondents. By 2002, 77 percent of all entries were taken from cash register receipts. In the case of food and beverages, 89 percent of entries were

taken from cash register receipts. In the remaining cases, Statistics Iceland used itemized data reported by respondents in diaries.

Household expenditure data are compiled on a three-year moving average basis. For example, data have been compiled for the years 2004 to 2006. The data for 2004 and 2005 were recalculated at 2006 prices for the purposes of deriving CPI weights. Standard errors are calculated for the main aggregates arising from the HES data. Standard errors for total expenditures are less than 2 percent and for groceries less than 1 percent. Where standard errors are greater than 20 percent, those particular data cells show an asterisk accompanying the figure indicating that the figure should be used with caution.

## 2.2.5  Missing prices, new products and quality changes

For missing prices in groceries, the price change is calculated in respect of items available in two consecutive periods. For other goods and services, a missing price can be carried forward for a maximum of three months before a replacement is selected which is in accordance with Eurostat's rules for the HICP. A replacement item is selected by choosing a close substitute for the replaced item. Products that become permanently unavailable are replaced in the sample.

New products are mainly introduced when the index is rebased in March each year. Occasional exceptions are made when items become significant items. For example, a new road with a toll charge was introduced immediately, replacing a ferry service. A certain amount of overpricing goes on in which items are priced for several months before being actually incorporated in the CPI compilation. This allows the possibility of deferring introduction of a new item until it is being sold in reasonable quantities and avoids the effects of introducing a new item at a relatively high price, which may subsequently fall significantly when the item is sold in larger quantities.

Some clothing, recreational, and food items are regarded as seasonal items with different ranges of goods being priced in the summer and winter seasons. The prices of the summer goods are repeated in the index at the close of summer, and the same treatment is applied to winter goods. The method is consistent with international guidelines.

Prices are adjusted to remove the effects of quality changes. The procedures used vary according to the nature of the changes. In many cases attempts are made to obtain a "bridge" between the former and new product so that the difference in price implicitly reflects the difference in quality. Car prices are obtained, together with prices for various options. The option prices are used to identify and eliminate the effects of quality change. On occasions, when there are significant changes in quality, it is necessary to evaluate the effects of quality directly through an examination of car specifications.

## 2.2.6  Statistical concepts

Theoretically speaking, there are two leading types of index calculations:

- fixed base indices
- cost of living indices.

In a fixed base price index, consumption patterns are kept constant and usually the index is of Lowe type. Special cases of a Lowe index are Laspeyres with an older base or Paasche index with a new base. Superlative indices are symmetric and reflect theoretically a true cost of living index by taking into consideration both old as well as new base.

Five methods of calculation are used in the compilation of the Icelandic consumer price index:

- Relative of geometric mean prices (Jevon) for calculating approximately 56% of the expenditures in the base.

- The weighted relative of geometric mean prices on groceries, extending to approximately 18% of the expenditures.

- A Lowe, or relative of average prices (Duot), covering approximately 21% of the expenditure.

- A superlative index (Fisher), figuring in approximately 1% of the expenditures.

- Indices comprising approximately 4% of the expenditure.

## 2.3 The building cost index
### 2.3.1 Concepts and definitions

The building cost index shows changes to the cost of building a certain type of house (residential block of flats) in the capital area. The building cost index has been calculated from the year 1939 but its base has been changed four times, in years 1955, 1975, 1983 and last in 1987. The base of the index is decided on in collaboration with the Icelandic Building Research Institute, which is also consulted regarding revisions to the index. In addition to the index on apartment buildings an index for non-residential buildings is calculated.

The building cost index is an input price index based on the pricing of both labour and material needed to construct a residential building. The index is a Laspeyres fixed base index and average prices are calculated as a relative of average prices (Duot). The index is categorised according to type of activity and building stages.

### 2.3.2 Sources

The basis of the index is the building cost of a certain "index house", which is a block of flats in Reykjavik.

Every month prices in about 90 companies and stores are surveyed. However, some prices are collected less frequently. Prices are collected through faxes, email, telephone interviews with outlets as well as over the internet.

The index is based on pricing in the middle of every month. The index is based on accurate accounting of costs at the building of the index house and is therefore fundamentally accurate and reliable. However, like fixed base indices it does not measure changes in substituion or productivity in construction.

## 2.4 The unit value indices of exported and imported goods

For exported and imported goods, unit value indices are calculated using Fischer formula for accumulated monthly and annual figures. Unit value and volume indices are based on data from the external trade database of Statistics Iceland. Imports are classified by main economic categories and exports by mode of processing. Classification used to define commodity groups for which index numbers are calculated is the 8 digit Icelandic Custom Tariffs which follows the Harmonized System (HS) to the level of 6 digits. The data is also classified by countries.

Preliminary quarterly indices are calculated by using Laspeyres formula but final quarterly figures are based on Fisher formula. Volume index numbers are the quotient of the value and unit value index numbers. Price index numbers are calculated using Laspeyres formula.

The use of value indices as an approximation for price indices has several drawbacks.

The main problems that arise are connected to composition changes and the attempt to eliminate quality changes from price changes. This can be explained as follows:

- Although the Custom Tariff classification in its most disaggregated form is rather detailed the possibility cannot be ruled out that one number contains more than one commodity or commodities that are of different quality, and therefore at different prices. By using stratification by countries, within each tariff number an attempt is made to minimize these problems.

- Frequently changes are made to the definition of the tariff numbers, i.e. new numbers are added (one number is split into many) or numbers are deleted and they included with others. By paring old and new numbers together problems of this type can be eliminated to some extent.

Another problem is how to exclude from the calculations extreme price changes, which are considered to reflect changes in composition rather than in prices. This is done by using upper and lower limits for price changes. In general these boundaries are set as 50% increase and 33% decrease in the unit prices in foreign currency plus the inflation rate in Icelandic main trading countries plus change in exchange rate. It is possible to change the boundaries for individual commodities if direct information indicates that price changes are exceeding these limits.

## 2.5 The Producer Price Index (PPI)

The *1995 ESA* is followed regarding determination of index output weights for the PPI. Concepts and definitions given in the *Producer Price Index Manual (PPI Manual)* are followed regarding the specification of individual goods and services and the price measurement.

The weighting concept is the market output of finished goods and services (as defined in *1995 ESA*) or value of production (as defined in the *PPI Manual*).

Basic prices are obtained and used in the PPI. Only actual transaction prices are used. The export prices obtained for both manufacturing products and fish products are f.o.b. prices and are calculated from quantities and values obtained monthly from the selected respondents. Prices and quantities for industrial products are collected electronically directly from the firms.

The index is compiled using superlative formulas (Fisher) at the elementary level as well as the aggregate level. Elementary weights are calculated from the values of sales reported by each respondent. The aggregate weights are estimated annually using the PRODCOM survey on total value of sales of manufacturing products. The weights are then updated monthly using submitted data on production value in the previous month.

Average prices for each respective month are used in the index calculation. Monthly prices for manufacturing products are compiled from quantities and values of sales for the month as reported by respondents.

Apart from fish products, the regular dissemination of PPI started in May 2004 with the 4th quarter of 2003 as the reference period. The producer price index was initially compiled with the 4th quarter of 2003 as a reference period. The 4th quarter of 2005 was established as a reference point alongside an increase in the number of published PPI sub-indices in 2006. As of January 2007 the index is compiled as a monthly index with the 4th quarter of 2005 as a reference point. The total is also disaggregated between products exported and sold domestically.

Until 2006 two sub-indices of the producer price index were compiled and published quarterly, one for fish products and the other for manufacturing products excluding fish. As of the first quarter of 2006 sub-indices for products sold domestically, exported products and exported products excluding fish were introduced. As of 2007 the index is published monthly and sub-indices for food production, power intensive industry products and finally exports excluding marine products and power intensive industry products are available, compiled back to the 4th quarter of 2005.

The PPI is still in the development process and the use of it in national accounting so far is limited to fish products only. So far, this index looks promising and in 2008 it is on the work programme to disaggregate the index on 2 digit NACE level within manufacturing for internal use in Statistics Iceland.

Statistics Iceland intends further to develop the PPI. The next steps will be PPI for electricity production but the development of PPI for services is not yet on the agenda.

## 2.6 The wage index

The wage index is a quarterly price index and shows the changes of regular hourly wages in the private sector by occupational group and economic activity. The index also shows changes of wages in the public sector. The wage index by activity is available from the 1st quarter of 2005.

The index is based on a sample survey conducted by Statistics Iceland. The data are collected elctronically on a monthly basis directly from the company's payroll systems and contain information on all labour cost. A sample is drawn out of following activities of the private sector:

- Section D, Manufacturing

- Section F, Construction

- Section G, Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods

- Section I, Transport, storage and communication

- Section J, Financial intermediation

For the public sector the data is collected directly from the payroll systems of local governments and from the Financial Management Authority. The sample covers around 24 thousand employees in the private sector and 14 thousand employees in municipalities, including the capital city of Reykjavik. Statistics Iceland collects monthly data on salaries of all state employees from the *Financial Management Authority* (around 20 thousand employees). In order to detect changes in wages caused by structural changes, which have occurred occasionally in the public sector, partly through collective agreements, a separate random sample of 600 state employees is used for control purposes to approach more "pure" price changes.

The use of the wage index for estimation of volume changes in national accounts is limited. The most important use of it concerns non-market activities which are deflated from the cost side. Other examples are deflation of output where labour services are the main component. Until March 2007 the wage index was only disaggregated into two activities, the private sector and the government sector including banking. At that time Statistics Iceland published the present index, disaggregated as described above, with a backwards calculation until the 1st quarter of 2005. That is a big step forward and it will enable more intensive use of the wage index in national accounting in future.

# Chapter 3.
# Methodologies by activity and final expenditure

## 3.1 Introduction

The first sections of this chapter contain a description of the methods used for constant price estimation by activity according to the Icelandic version of NACE Rev.1. In the final sections of the chapter, a similar account is given of the main categories of final expenditure, i.e. household final consumption expenditure, government final consumption, gross fixed capital formation, changes in inventories and exports and imports of goods and services.

A description is given of how the actual deflation is performed and the methods applied are assessed against the background of the recommendations for deflating in the EU "Handbook on price and volume measures in national accounts", Eurostat 2001.

In accordance with the Commission Decision of 30 November 1998, the Handbook divides the deflation methods into three groups as follows:

- A methods: most appropriate methods

- B methods: those methods which can be used in case an A method cannot be applied

- C methods: those methods which shall not be used

A-methods require that a price index which is used relates to the products for which the constant-price calculations are to be made. The index is supposed to show values at basic prices for output and purchasers´ prices for final demand and take notice of changes in quality.

B-methods make use of producer price indices (or purchasers´ prices when relevant) that do not exactly relate to the items for which constant price calculations are to be made or take account of changes in quality.

Alternatively, a volume index that takes changes in quality into account or a CPI that relates to most of the current product or product group, meets the requirements of an A-method. For example, the output of hairdressing can be deflated by means of CPI for hairdressing, adjusted for any changes in taxes, subsidies or margins.

C-methods are based on input methods or price indices that are not relevant to products in question, e.g. wage index, total CPI or PPI relating to input in the product group to be defined.

The distinction between A, B and C methods in the production approach is a little more complicated. The key element is the value added which is the difference between output and intermediate consumption. Value added is therefore a balancing item where there is no price or volume component. Value added at constant prices has to be defined by convention. ESA95 states that the theoretically correct method to calculate value added at constant prices is by double deflation, i.e. deflating separately the two flows of the production account output and intermediate consumption and calculating the balance of these two deflated flows. The

only A method for value added is the double deflation method or the "double indicator method" as it is termed in the manual.

When evaluating the methods described below it should be kept in mind, as described in section 1.1 above, that the growth rates varies between expenditure and production approaches and they are still not balanced in a supply and use table at constant prices. The expenditure approach is the dominant one and the one used in global aggregates.

# 3.2 The production approach
## 3.2.1 General description

In absence of any supply and use tables at constant prices, another and more inaccurate methods have to be used with the consequences that discrepancy in growth rates occur between production and expenditure approaches. At current prices approximately 420 production accounts are constructed following the NACE activity classification at 5 digit level. For every single of these activities, a separate volume index is calculated. That index is calculated by first constructing *a comparison table* for every single activity containing following characteristics:

- Output at current prices (basic prices)
- Intermediate consumption at current prices
- Value added at current prices
- Gross factor income at current prices
- Consumption of fixed capital at current prices
- Net factor income at current price
- Compensation of employees
- Operating surplus
- Calculated ratio: Intermediate consumption/Output
- Calculated ratio: Compensation of employees/Output
- Wages and salaries paid according to the Pay-as-you-earn Register
- Volume indicators, one or more, for that specific activity if available
- VAT turnover in that specific activity
- Number of persons employed in that activity
- CPI total
- Building cost total
- Sub-items of CPI or building cost index when applicable
- Wage index in either the private sector or in the public sector and banks

After compiling the above items for each activity, a quality check is carried out on the size and cost structure of the production account at current prices by comparing time series of the ratios of intermediate consumption and output and compensation of employees and output. Compensation of employees is also compared with wages and salaries paid according to the PAYE register, taking into account employers´ social contributions which are included in compensation of employees but excluded from the PAYE register. This is a further quality check of the check already performed when the production accounts at current prices were

constructed. Amendments of the production accounts at current prices are made if they do not pass the quality check.

After passing the quality check the next step is the deflation of the output and VAT turnover according to the most appropriate price index. When applicable sub-items of CPI or building cost index are available they are used, otherwise CPI total or building cost total. Compensation of employees and wages and salaries are also deflated using either the wage index for the private sector or the public sector and banks. Value added is deflated by the same price index as output, mostly used for information. From these calculations the following volume indices and indicators of growth rates are derived:

- Output growth rate

- VAT growth rate

- Direct volume growth rate when available

- Growth in the number of persons employed

- Growth of compensation of employees in excess of wage index

- Growth of wages and salaries paid in excess of wage index

- Growth of value added

Each one of these indicators is carefully investigated and a comparison is made. Provided that there is not a big difference between the 3 first items, i.e. output growth, VAT growth and direct volume growth, the last one, the volume growth, is chosen as the volume growth rate for that activity. Frequently, discrepancy occurs and then some investigation is made to try to understand it. In many cases the final decision is an average of two or more of the above indices, provided that the long term developments do not differ considerably. In general, it can be stated that the three first indicators are more frequently used than the other.

From these evaluations one ends up with a volume index for each activity. This volume index is used as a volume index of value added. This is apparently an approximation. Following the ESA 95 manual "the theoretical correct method to calculate value added at constant prices is by double deflation, i.e. deflating separately the two flows of the production account (output and intermediate consumption) and calculate the balance of these two revalued flows". Following the price and volume manual the term "double deflation" might be better expressed as "double indicator method", since it also encompasses methods that are based on volume extrapolation.

In the price and volume manual it is stated that the double indicator method is the only accepted A method. Double indicator method is never used for estimating growth rates for any of the activities in Iceland. Several years ago this method was used in agriculture and fishing but with doubtful results, due to extreme fluctuations in growth rates. From this it can already be concluded that no volume indices for activities in Iceland are calculated by methods which are acceptable as A methods. In all cases single indicator methods are used.

According to the price and volume manual such methods can be used as B methods if intermediate consumption is a large share of output and the data required applying double indicator methods are not reliable enough. It can be stated that in the case of Iceland, data on intermediate consumption is not reliable enough to be used for double deflation. This is also confirmed by the past experience of using double deflation in agriculture and fishing.

From this the final remark to be made is that the volume growth rate by industry in Iceland is mainly based on price deflation of output or volume extrapolation of output. Such methods can never be A methods but the question is: Are the output measures applied sophisticated

enough to be called B methods? The answer to this varies by activities as can be seen in the following sections.

Based on the *comparison table* as described above, various growth rates are conducted and the most appropriate indicator is selected for each activity group down to 5-digit level. In some cases an average of two or more indicators is taken.

In the following an overview is given of the indicators used for estimating the growth rates within each activity. The indicators of the growth rates used are classified in the following categories I to VIII. In sections 3.2.2 to 3.2.14 below a reference is given to these categories and the methods used are ranked into A, B or C methods.

**Indicators used for estimating growth rates of activities, classified into categories I to VIII**

| | |
|---|---|
| I | Output deflated by the most appropriated price index, most often a sub-item of CPI |
| II | VAT turnover deflated by the most appropriated price index, most often a sub-item of CPI |
| III | The average of I and II |
| IV | Volume growth rate derived from production statistics by activity |
| V | The average of I and IV |
| VI | Output deflated by a general price index like CPI or building cost index |
| VII | The two main components of value added, the compensation of employees and consumption of fixed capital, deflated by the most appropriate labour cost index and the building cost index, respectively |
| VIII | Compensation of employees deflated by the wage index in the private sector |

## 3.2.2   Agriculture, hunting and forestry  (NACE Rev.1; A)

The institution mainly responsible for compiling statistics on production in volume, sale and unit prices of agricultural products is the *Farmers Association of Iceland* (FAI). The product specifications in these statistics are very detailed giving homogenous products. Statistics Iceland utilizes this information for constant price calculations for farming of animals (NACE 01.2) accounting for over 95% of the output value. In growing of crops, market gardening and horticulture, the most appropriate sub-items of CPI are used for deflating the output value.

Until recently the year 1990 was used as a base year for estimating volume changes of products in agriculture. At the time of writing the methods are under revision and annual chain linking methods will be developed using the prices of previous year.

In the early stages of developing the methods of the production approach at constant prices in the 1980s, an attempt was made to deflate intermediate consumption in agriculture separately and thereby to construct a double indicator method. The reason behind this was the common knowledge of a fluctuation of the input/output ratio in agriculture due to different weather conditions. After several years of double deflation, this method was discontinued in 1993 because it brought results which were not credible. Since then, single indicator method has been applied. Table 3.1 shows the methods used by activities in agriculture. Approximately 10% of gross factor income in agriculture is still deflated by C method. The remaining part is considered to qualify as a B method and then it is assumed that the unit value prices are detailed enough to take into account changes in quality.

**Table 3.1 Indicators used for estimating the growth rates in agriculture, section A**

| | Gross factor Income 2004 | | Indicators used for estimating growth rates | Classific. into A, B and C methods |
|---|---|---|---|---|
| | Mill. ISK | % of all activities | | |
| **Agriculture, Section A** | **11.289** | **1,45%** | **...** | **...** |
| 01 Agriculture, hunting and related service activities | 11234 | 1,44% | ... | ... |
|   01.1 Growing of corps; market gardening; horticulture | 1406 | 0,18% | I | B |
|     01.11 Growing of cereals and other crops n.e.c. | 274 | 0,04% | I | B |
|     01.12 Growing of vegetables, horticultural specialties and nursery prod. | 1132 | 0,14% | I | B |
|   01.2 Farming of animals | 8654 | 1,11% | IV | B |
|   01.23 Farming of swine | 612 | 0,08% | IV | B |
|   01.24 Farming of poultry | 412 | 0,05% | IV | B |
|   01.25 Other farming of animals | 7629 | 0,98% | IV | B |
|   01.25.1 Farming of mixed livestock | 7364 | 0,94% | IV | B |
|   01.25.2 Farming of fur animals | 264 | 0,03% | IV | B |
|   01.4 Agric. and animal husbandry service, ex. Veterinary | 1161 | 0,15% | Aver. of VI and VIII | C |
|   01.5 Hunting and related service activities | 14 | 0,00% | Aver. of VI and VIII | C |
| 02 Forestry, logging and related service activities | 55 | 0,01% | VI | C |
| **C methods, share of the section** | | **10,4%** | | |

In view of that the measurement of output qualify as an A method as soon as the annual chain linking methods have been introduced. However that is not good enough because the final aim is not to measure the output but the value added. In estimating value added at constant prices, single indicator method cannot be an A method. It only qualifies as a B method. Due to former experience of the double deflation method it turned out to be not reliable enough in agriculture.

## 3.2.3 *Fishing (NACE Rev.1; B)*

The production accounts in fishing are constructed from the aggregated operating accounts of enterprises in this activity, derived from the Enterprise Accounts Register.

The fish catch in tons and value is compiled by the *Directorate of Fisheries*. Figures are compiled on quantity and value of the total fish catch and individual species for all Icelandic fishing vessels independently of whether the catch is landed domestically or abroad. This enables calculations of unit prices by the same disaggregating. From these data Statistics Iceland calculates annual volume changes based on the prices of next to previous year, year T-2.

In the case of fish farming such detailed information is not available. Fish farming accounts for less than 2% of the output value in fishing. The output value of fish farming at current prices is derived from the Enterprise Accounts Register and the output is deflated by the average changes of output deflated by the most characteristic items of CPI and compensation of employees deflated by the wage index in the private sector.

As for agriculture, an attempt was made to develop double deflation method in fishing, excluding fish farming. The result was bad and single indicator method was introduced again but a few years later than in agriculture.

Table 3.2 shows the methods used by activities in agriculture. The methods used for calculating the volume changes of the output of fishing industry are sophisticated enough to

qualify as A methods with the exception of fish farming which is a C method. A considerable improvement is foreseeable in estimating volume changes in fish farming where it is planned to make use of already available direct volume measure of slaughtered trout, salmon and other species cultivated in fish farming.

Although the volume changes of output qualify as an A method, the volume changes of value added do not satisfy the requirements of an A method as single indicator methods are applied. Therefore the method used in fishing is a B method with the exception of fish farming where the C method is still applied due to more inferior information of volume changes where the value is deflated by a general price index.

Less than 1% of the gross factor income in fishing is still deflated by C method. This refers to fish farming only. The unit value indices in fishing are considered to be detailed enough to take into account changes in quality.

**Table 3.2 Indicators used for estimating the growth rates in fishing, section B**

|  | Gross factor Income 2004 | | Indicators used for estimating growth rates | Classific. into A, B and C methods |
|---|---|---|---|---|
|  | Mill. ISK | % of all activities |  |  |
| **05  Fishing, op. of fish hatcheries and fish farms.** | **39.368** | **5,04%** | **...** | **...** |
| 05.0  Fishing, fish farming and related services | 39.368 | 5,04% | IV | B |
| 05.01  Fishing | 39.144 | 5,01% | IV | B |
| 05.01.1  Operation of trawlers | 5.410 | 0,69% | IV | B |
| 05.01.2  Operation  fish-processing vessels | 13.205 | 1,69% | IV | B |
| 05.01.3  Operation of fishing vessels over 10 GRT. | 17.654 | 2,26% | IV | B |
| 05.01.4  Operation of fishing boats | 2.875 | 0,37% | IV | B |
| 05.02  Operation of fish hatcheries and fish farms. | -251 | -0,03% | Aver. of VI and VIII | C |
| 05.03  Service activities incidental to fishing | 475 | 0,06% | Aver. of VI and VIII | C |
| **C methods, share of the section** |  | **0,6%** |  |  |

## 3.2.4  Mining and quarrying  (NACE Rev.1; C)

Activity C is of a tiny importance in Iceland and consists mainly of quarrying of sand. The output value of the activity at current prices is derived from the Enterprise Accounts Register. In recent years this activity is now covered by the manufacturing production statistics and that enables improved output statistics and quantity statistics. This new source will be implemented soon. So far the output has been deflated by using the building cost index which is definitely a C method. As soon as the production statistics has been implemented the B method will replace the C method in this activity.

**Table 3.3 Indicators used for estimating the growth rates in mining and quarrying, section C**

|  | Gross factor Income 2004 | | Indicators used for estimating growth rates | Classific. into A, B and C methods |
|---|---|---|---|---|
|  | Mill. ISK | % of all activities |  |  |
| **14  Other mining and quarrying** | **979** | **0,13%** | **VI** | **C** |
| 14.2  Quarrying of sand and clay | 814 | 0,10% | VI | C |
| 14.3  Mining of chemical and fertilizer minerals | 17 | 0,00% | VI | C |
| 14.4  Production of salt | 0 | 0,00% | VI | C |
| **C methods, share of the section** |  | **100,0%** |  |  |

### *3.2.5  Manufacturing  (NACE Rev.1; D)*

Methods applied for estimating volume changes in manufacturing are described in two parts. In the first part a description of processing and preserving of fish and fish products is given. The second part describes the remaining part of manufacturing. The reasons are that due to the importance of fish and fish processing in Iceland much more data are available and of higher quality for that industry than other activities of manufacturing.

*Processing and preserving of fish and fish products (NACE Rev.1; 15.2)*

Both in the case of fish processing and other manufacturing, the Enterprise Accounts Register is the main source for constructing the production accounts. The fish processing differs from other manufacturing in having production statistics which is a far more detailed than for other activities. That enables to construct more sophisticated volume indices.

At current prices the activity 15.2 Fish processing is further broken down into 9 sub groups and a separate volume index is constructed for each one. The volume indices are derived from the value of exported fish products and the unit value indices which are calculated from the most detailed breakdown of the custom tariff followed in the external trade statistics as described in section 2.4 above.

No attempt has been made to estimate volume changes for intermediate consumption. The changes in volume calculated for output also applies for value added.

The methods used for calculating the volume changes of the output of fish processing industry qualify easily as an A method. For value added, double deflation is not used and therefore this does not qualify as an A method, but the method used is considered to be B method.

*Manufacturing excluding processing and preserving of fish and fish products (NACE Rev.1; D except 15.2)*

The activities within this section are very diverse and different methods are used to estimate the size of each activity at current prices. The main data source is the Enterprise Accounts Register but with some modifications.

For constant price estimates one of the indicators constructed is the annual volume index of manufacturing production. That index might be the one most straight forward to use, at least for measuring volume changes of output. That index has been available since 1996 and has been gradually incorporated. However, this index has some serious drawbacks. One is that it expresses sales, not production. Another is that the sample varies and is often of uncertain coverage. Therefore, that source must be used with a care and other indicators utilized.

In manufacturing a comparison table as described in section 3.2.1 is also necessary. Such a table is constructed for every single activity down to the 5-digit level.

Table 3.1 shows which one of the indicators I to VIII described in section 3.2.1 above are used in each activity. Aggregation of the results shows that method B is used in approximately 80% of manufacturing, using the gross factor income as a share of measuring. This means that the C method is used in the remaining 20% of manufacturing.

In the case of large equipment, special purpose machinery and computers no special methods are applied. Of these activities the most important one is the building and repairing of ships and boats etc. In that case the method VI is used and thus the output is deflated by a general price index, here the building cost index, classified as C method.

**Table 3.4 Indicators used for estimating the growth rates in manufacturing, section D**

| | Gross factor Income 2004 | | Indicators used for estimating growth rates | Classific. into A, B and C methods |
|---|---|---|---|---|
| | Mill. ISK | % of all activities | | |
| **Manufacturing total, Section D** | **99.698** | **12,76%** | ... | ... |
| 15 Manufacture of food products and beverages | 33.285 | 4,26% | ... | ... |
| 15.1 Production, processing and preserving of meat and meat prod. | 3.451 | 0,44% | IV | B |
| 15.11 Production and preserving of meat | 962 | 0,12% | IV | B |
| 15.12 Production and preserving of poultry meat | 296 | 0,04% | IV | B |
| 15.13 Production of meat and poultry meat products | 2.193 | 0,28% | IV | B |
| 15.2 Processing and preserving of fish and fish products | 18.649 | 2,39% | IV | B |
| 15.20 Processing and preserving of fish and fish products | 18.649 | 2,39% | IV | B |
| 15.20.1 Processing of frozen marine products | 11.059 | 1,42% | IV | B |
| 15.20.2 Processing and preparation of salted fish prod. | 2.941 | 0,38% | IV | B |
| 15.20.3 Processing and preparation of salted herring | 0 | 0,00% | IV | B |
| 15.20.4 Processing and preparation of whole stockfish | 0 | 0,00% | IV | B |
| 15.20.5 Processing and preparation of dried fish fillets | 0 | 0,00% | IV | B |
| 15.20.6 Preparation of fresh marine products | 1.392 | 0,18% | IV | B |
| 15.20.7 Manufacture of fish meal and crude fish oils | 2.857 | 0,37% | IV | B |
| 15.20.8 Canning and preserving of marine prod. | 271 | 0,03% | IV | B |
| 15.20.9 Processing fish products n.e.c. | 129 | 0,02% | VI | C |
| 15.3 Processing and preserving of fruit and vegetables | 249 | 0,03% | V | B |
| 15.4 Manufacture of vegetable and animal oils and fats | 470 | 0,06% | V | B |
| 15.5 Manufacture of dairy products | 2.481 | 0,32% | V | B |
| 15.6 Manufacture of grain mill products, starches and starch products | 144 | 0,02% | V | C |
| 15.7 Manufacture of prepared animal feeds | 1.021 | 0,13% | I and VII | C |
| 15.8 Manufacture of other food products | 4.930 | 0,63% | ... | ... |
| 15.81 Manuf. of bread; manuf. of fresh pastry goods. | 2.808 | 0,36% | IV | B |
| 15.82 Manuf. of rusks and biscuits; manuf. of preserved pastry goods and cakes | 10 | 0,00% | IV | B |
| 15.84 Manuf. of cocoa; chocolate and sugar conf. | 941 | 0,12% | IV | B |
| 15.85 Manuf. of macaroni, nodles, couscous and similar farinaceous prod. | 6 | 0,00% | I | C |
| 15.86 Processing of tea and coffee | 135 | 0,02% | IV | B |
| 15.87 Manufacutre of condiments and seasonings | 147 | 0,02% | IV | B |
| 15.89 Manufacture of other food products n.e.c. | 883 | 0,11% | IV | B |
| 15.9 Manufacture of beverages | 1.889 | 0,24% | V | B |
| 17 Manufacture of textiles | 1.423 | 0,18% | ... | ... |
| 17.1 Preparation and spinning of textile fibres | 130 | 0,02% | I | B |
| 17.4 Manufacture of made-up textile articles, except apparel | 146 | 0,02% | VI | C |
| 17.5 Manufacture of other textiles | 977 | 0,13% | ... | ... |
| 17.52 Manuf. of cordage, rope, twine and netting | 975 | 0,12% | I | B |
| 17.54 Manufacture of other textiles n.e.c. | 3 | 0,00% | III | B |
| 17.6 Manufacture of knitted and crocheted fabrics | 68 | 0,01% | III | B |
| 17.7 Manufacture of knitted and crocheted articles | 102 | 0,01% | III | B |
| 18 Manuf. of wearing apparel. | 661 | 0,08% | ... | ... |
| 18.2 Manufacture of other wearing apparel and accessories | 475 | 0,06% | I | B |
| 18.3 Dressing and dyeing of fur; manuf. of articles of fur | 186 | 0,02% | I | B |
| 19 Tanning and dressing of leather. | 24 | 0,00% | VI | C |
| 20 Manuf. of wood and of prod. of wood and cork. | 1.524 | 0,20% | ... | C |
| 20.1 Sawmilling and planing of wood, impregnation of wood | 25 | 0,00% | VI | C |
| 20.3 Manufacture of builders´carpentry and joinery | 1.345 | 0,17% | VI | C |
| 20.4 Manufacture of wooden containers | 30 | 0,00% | VI | C |
| 20.5 Manuf. of wood; manuf. of articles of cork, straw and plaiting mat. | 124 | 0,02% | VI | C |
| 21 Manufacture of pulp, paper and paper products | 765 | 0,10% | IV | B |

| | | | | |
|---|---|---|---|---|
| 22 Publishing, printing and reproduction of recorded media | 9.231 | 1,18% | ... | ... |
| 22.1 Publishing | 4.999 | 0,64% | ... | ... |
| 22.11 Publishing of books | 868 | 0,11% | I | B |
| 22.12 Publishing of newspapers | 2.450 | 0,31% | VI | C |
| 22.13 Publishing of journals and periodicals | 481 | 0,06% | VI | C |
| 22.14 Publishing of sound recordings | 879 | 0,11% | VI | C |
| 22.15 Other publishing | 322 | 0,04% | VI | C |
| 22.2 Printing and service activities related to printing | 4.232 | 0,54% | VI | C |
| 22.21 Printing of newspapers | 0 | 0,00% | VI | C |
| 22.22 Printing n.e.c. | 3.553 | 0,45% | VI | C |
| 22.23 Bookbinding and finishing | 75 | 0,01% | VI | C |
| 22.24 Composition and plate-making | 543 | 0,07% | VI | C |
| 22.25 Other activities related to printing | 60 | 0,01% | VI | C |
| 24 Manufacture of chemicals and chemical products | 8.798 | 1,13% | ... | ... |
| 24.1 Manufacture of basic chemicals | 740 | 0,09% | IV | C |
| 24.3 Manuf. of paints, varnishes and sim. coatings | 530 | 0,07% | VI | C |
| 24.4 Manuf. of pharmaceuticals products | 6.998 | 0,90% | I | B |
| 24.5 Manuf. of soap and detergents etc, perfumes and toilet prep. | 370 | 0,05% | IV | B |
| 24.6 Manufacture of other chemical products | 160 | 0,02% | VI | C |
| 25 Manufacture of rubber and plastic products | 2.590 | 0,33% | ... | ... |
| 25.1 Manufacture of rubber products | 500 | 0,06% | III | B |
| 25.2 Manufacture of plastic products | 2.090 | 0,27% | III | C |
| 25.21 Manuf. of plastic plates, sheets, etc. | 255 | 0,03% | III | C |
| 25.22 Manufacture of plastic packing goods | 633 | 0,08% | IV | B |
| 25.23 Manufacture of builders' ware of plastic | 67 | 0,01% | III | C |
| 25.24 Manufacture of other plastic products | 1.135 | 0,15% | III | C |
| 26 Manuf. of other non-metallic mineral products | 4.725 | 0,60% | ... | ... |
| 26.1 Manufacture of glass and glass products | 424 | 0,05% | IV | B |
| 26.2 Manuf. of non-refractory and refractory ceramic products | 18 | 0,00% | III | C |
| 26.5 Manufacture of cement, lime and plaster | 235 | 0,03% | IV | B |
| 26.6 Manufacture of articles of concrete, plaster and cement | 2.497 | 0,32% | I | B |
| 26.7 Cutting, shaping and finishing of stone | 221 | 0,03% | I and VIII | C |
| 26.8 Manufacture of other non-metallic mineral products | 1.330 | 0,17% | IV | B |
| 27 Manufacture of basic metals | 15.870 | 2,03% | ... | ... |
| 27.3 Other first proc. of iron & steel and prod. of non-ESCE ferro-alloys | 1.629 | 0,21% | IV | B |
| 27.4 Manufacture of basic precious and non-ferrous metals | 14.107 | 1,81% | I | B |
| 27.42 Aluminium production | 14.107 | 1,81% | I | B |
| 27.5 Casting of metals | 133 | 0,02% | III | C |
| 28 Manuf. of fabricated metal prod., except mach. and equipm. | 6.012 | 0,77% | ... | C |
| 28.1 Manufacture of structural metal products | 388 | 0,05% | IV | C |
| 28.2 Manuf. of metal tanks and containers of radiatiors and boilers | 336 | 0,04% | II | C |
| 28.4 Forging, pressing, stamping and roll forming of metal | 21 | 0,00% | II | C |
| 28.5 Coating of metals; general mechanical engineering | 4.931 | 0,63% | II | C |
| 28.6 Manufacture of cutlery, tools and general hardware | 26 | 0,00% | III | C |
| 28.7 Manufacture of other fabricated metal products | 310 | 0,04% | III | C |
| 29 Manufacture of machinery and equipment n.e.c. | 4.682 | 0,60% | III | C |
| 30 Manufacture of office machinery and computers | -1 | 0,00% | III | C |
| 31 Manuf. of el. machinery and apparatus n.e.c. | 825 | 0,11% | ... | ... |
| 31.1 Manufacture of electric motors, generators and transformers | 128 | 0,02% | III | C |
| 31.2 Manufacture of electricity distribution and control apparatus | 240 | 0,03% | III | C |
| 31.4 Manuf. of accumulators, primary cells and primary batteries | 42 | 0,01% | IV | B |
| 31.5 Manufacture of lighting equipment and electric lamps | 39 | 0,00% | III | C |
| 31.6 Manufacture of electrical equipment n.e.c. | 376 | 0,05% | III | C |
| 32 Manuf. of radio, TV and communication equipm. and apparatus | 43 | 0,01% | III | C |

| | | | | |
|---|---|---|---|---|
| 33 Manuf. of med., prec. and opt. instrm. | 2.667 | 0,34% | VI | C |
| 33.1 Manuf. of med. and surg. eq. and orth. appl. | 2.399 | 0,31% | VI | C |
| 33.2 Manuf. of instruments and appliances for measuring, checking etc. | 236 | 0,03% | VI | C |
| 33.3 Manufacture of industrial process control equipment | 32 | 0,00% | VI | C |
| 34 Manuf. of motor veh., trailers and semi-trailers | 262 | 0,03% | III | C |
| 35 Manufacture of other transport equipment | 3.482 | 0,45% | VI | C |
| 35.1 Building and repairing of ships and boats | 1.998 | 0,26% | VI | C |
| 35.3 Manufacture of aircraft and spacecraft | 1.428 | 0,18% | VI | C |
| 35.5 Manufacture of other transport equipment n.e.c. | 56 | 0,01% | VI | C |
| 36 Manufacture of furniture; manufacturing n.e.c. | 2.218 | 0,28% | ... | ... |
| 36.1 Manufacture of furniture | 1.524 | 0,20% | VI | C |
| 36.2 Manufacture of jewellery and related articles | 212 | 0,03% | III | B |
| 36.3 Manufacture of musical instruments | 18 | 0,00% | III | B |
| 36.4 Manufacture of sports goods | 0 | 0,00% | . | . |
| 36.5 Manufacture of games and toys | 38 | 0,00% | III | C |
| 36.6 Miscellaneous manufacturing n.e.c. | 426 | 0,05% | III | C |
| 37 Recycling | 612 | 0,08% | VI | C |
| **C methods, share of the section** | | **35,3%** | | |

## 3.2.6  Electricity, gas and water supply  (NACE Rev.1; E)

Production accounts for these industries at current prices are derived from the company accounts. The structure in these industries is characterized by few big companies owned by the central government and the biggest municipalities on the one hand and a few small companies owned by small municipalities on the other. The *National Energy Authority* compiles production statistics from all suppliers and average unit prices by main categories of usage. That refers both to electricity and hot water but the product specification of electricity is hardly sufficient. However, these statistics enable construction of chain-linked volume indices of output of A type but the value added volume index will be of B type as no estimates are available on volume changes of intermediate consumption. Statistics Iceland intends to collect more detailed breakdown of the output data in order to improve the quality of the volume change calculations.

The quality of output statistics in division 41, Distribution of cold water is much lower. Here the output value is deflated by using the building cost index as a proxy for price changes. That is a C method. A summary of the methods used for estimating volume changes in section E is given in table 3.5. Aggregation of the results shows that method B is used in approximately 95% of section E but C method is still used in 5% of the section. The gross factor income is used as a measurement.

**Table 3.5 Indicators used for estimating the growth rates in electricity, gas and water supply, section E**

| | Gross factor Income 2004 | | Indicators used | Classific. into |
|---|---|---|---|---|
| | Mill. ISK | % of all activities | for estimating growth rates | A, B and C methods |
| **Electricity, gas and water supply Section E** | **28.557** | **3,66%** | **...** | **...** |
| 40 Electricity, gas steam and hot water supply | 26.893 | 3,44% | IV | B |
| 40.1 Production and distribution of electricity | 21.654 | 2,77% | IV | B |
| 40.3 Steam and hot water supply | 5.240 | 0,67% | IV | B |
| 41 Collection, purification and distribution of water | 1.664 | 0,21% | VI | C |
| **C methods, share of the section** | | **5,8%** | | |

## 3.2.7  Construction  (NACE Rev.1; F)

At current prices most of the production accounts within section F, Construction, are based on the Enterprise Accounts Register. Compared with manufacturing the main differences are that production statistics are more limited in construction. The *Land Registry of Iceland* collects various data on buildings, both residential construction and for industrial use. However, the emphasis in this data collection is for tax purposes where the tax object is the volume and value of the stock at a definite point of time, i.e. at the end of each year, not the value of produced buildings during the year. Due to frequent revaluations and corrections, the difference of stock data from the beginning to the end of the year must be used with a care for estimating the addition to the stock, i.e. the production during the year. However, this source is used for estimating the volume changes for residential construction. Apart from these differences in available production statistics in manufacturing and construction, the methods used for estimating volume changes in these two sections are comparable.

**Table 3.6 Indicators used for estimating the growth rates in construction, section F**

|  | Gross factor Income 2004 | | Indicators used for estimating growth rates | Classific. into A, B and C methods |
|---|---|---|---|---|
|  | Mill. ISK | % of all activities |  |  |
| **Construction, section E** | **66.359** | **8,49%** | **...** | **B** |
| 45.1  Site preparation | 1.797 | 0,23% | VI | B |
| 45.2  Bld of compl. constr.; civ. eng. | 36.320 | 4,65% | VI | B |
| 45.3  Building installation | 7.636 | 0,98% | VI | B |
|     45.31  Installation of electrical wiring and fittings | 4.975 | 0,64% | VI | B |
|     45.33  Plumbing | 2.662 | 0,34% | VI | B |
| 45.4  Building completion | 16.381 | 2,10% | I | B |
|     45.41  Plastering | 1.126 | 0,14% | I | B |
|     45.42  Joinery installation | 2.361 | 0,30% | I | B |
|     45.43  Floor and wall covering | 606 | 0,08% | I | B |
|     45.44  Painting and glazing | 2.495 | 0,32% | I | B |
|     45.45  Other building completion | 177 | 0,02% | I | B |
|     45.49  Own-account construction | 9.615 | 1,23% | I | B |
| 45.5  Renting of constr. or demol. Eq. with operator | 4.225 | 0,54% | I | B |
| **C methods, share of the section** |  | **0,0%** |  |  |

A summary of the methods used for estimating volume changes in section F is given in table 3.6. Aggregation of the results shows that the methods used in all groups qualify as a B method. In most cases the volume changes are derived from the output value deflated by the most appropriated price indices. The indices chosen are often of a general character like the building cost index reflecting the fact that the individual industries are also covering a wide range of activity.

## 3.2.8  Wholesale and retail trade; repair of motor vehicles, motor cycles and personal household goods (NACE Rev.1; G)

The products in this section fall into two groups. The first one is the wholesale and retail trade where the output is defined as the trade margin on goods purchased for resale. The other product group which is much smaller consists of repair services and maintenance of household consumer durables.

Wholesale and retail trade is treated rather differently than other activities in the national accounts. The output of these activities is the trade margin which is the difference between goods sold and purchased. At constant prices, two methods are accepted following ESA 95.

One is to deflate the goods purchased separately and the goods sold separately and measure the difference. The alternative method is to extrapolate the trade margin of the base year either by the volume of sales or by the volume of purchases made by the wholesale and retail traders. To be correct this alternative has to take into account the fact that trade margins vary amongst different products.

In Icelandic national accounts the alternative method is the one applied where an attempt is made to estimate the volume of the trade margin by deflating the margin by the most appropriate price index.

A summary of the methods used for estimating volume changes in section G is given in table 3.7. Aggregation of the results shows that method B is used in roughly 80% of section G but C method is still used in more than 20% of the section. The gross factor income is used as a measurement.

**Table 3.7 Indicators used for estimating the growth rates in wholesale and retail trade, section G**

| | Gross factor Income 2004 | | Indicators used for estimating growth rates | Classific. into A, B and C methods |
|---|---|---|---|---|
| | Mill. ISK | % of all activities | | |
| **50 + 51+ 52 Wholesale and retail trade, section G** | **82.872** | **10,61%** | **...** | **B** |
| 50  Sale, maint. rep. of motor veh; ret. sale of fuel | 12.544 | 1,61% | | |
| 50.1  Sale of motor vehicles | 6.572 | 0,84% | V | B |
| 50.2  Maintenance and repair of motor vehicles | 4.104 | 0,53% | I | B |
| 50.3  Sale of motor vehicle parts and accessories | 1.434 | 0,18% | I | B |
| 50.4  Sale and repair of motorcycles and related parts | 55 | 0,01% | I | B |
| 50.5  Retail sale of automotive fuel | 379 | 0,05% | III | B |
| 51  Wholes. and commission trade, ex. of motor vehicles | 29.887 | 3,83% | ... | ... |
| 51.1  Wholesale on a fee or contract basis | 3.554 | 0,45% | ... | ... |
| 51.11  Sale of agricultural raw materials, live animals through agents | 41 | 0,01% | VI | C |
| 51.12  Sale of fuels, ores, metals and industrial chemicals through agents | 163 | 0,02% | VI | C |
| 51.13  Sale of timber and building materials through agents | 285 | 0,04% | I | B |
| 51.14  Sale of machinery, industrial equipment, ships and aircraft through agents | 131 | 0,02% | VI | C |
| 51.15  Sale of furniture, household goods, hardware etc. through agents | 23 | 0,00% | VI | C |
| 51.16  Sale of textiles, clothing, footwear and leather goods through agents | 29 | 0,00% | I | B |
| 51.17  Sale of food, beverages and tobacco through agents | 2.449 | 0,31% | ... | B |
| 51.17.1  Sale of marine products through agents | 1.494 | 0,19% | I | B |
| 51.17.2  Fish markets | 554 | 0,07% | I | B |
| 51.17.9  Sale of food etc., excl. marine products through agents | 401 | 0,05% | VI | C |
| 51.18  Sale of particular products or ranges of products n.e.c. through agents | 288 | 0,04% | VI | C |
| 51.19  Sale of a variety of goods through agents | 146 | 0,02% | VI | C |
| 51.2  Wholesale of agr. raw mat. and live animals | 108 | 0,01% | I | B |
| 51.3  Wholesale of food, beverages and tobacco | 3.640 | 0,47% | I | B |
| 51.4  Wholesale of household goods | 5.333 | 0,68% | I | B |
| 51.5  Wholesale of non-agricultural intermediate products | 9.198 | 1,18% | VI | C |
| 51.6  Wholesale of mach., eq. and sup. | 5.382 | 0,69% | VI | C |
| 51.7  Other wholesale | 2.674 | 0,34% | VI | C |
| 52  Retail trade,rep. of pers. and household goods | 40.441 | 5,18% | | |
| 52.1  Retail sale in non-specialized stores | 14.270 | 1,83% | I | B |
| 52.11  Ret. sale in non-spec. stores with food predomin. | 13.331 | 1,71% | I | B |
| 52.12  Other retail sale in non-specialized stores | 938 | 0,12% | I | B |
| 52.2  Retail sale of food products in specialized stores | 1.561 | 0,20% | I | B |
| 52.23  Retail sale of fish, crustaceans and molluscs | 223 | 0,03% | I | B |

| | | | | |
|---|---|--:|--:|:-:|:-:|
| 52.25 | Retail sale of alcoholic and other beverages | 679 | 0,09% | I | B |
| 52.27 | Other ret. sale of food products in spec. stores | 659 | 0,08% | I | B |
| 52.3 | Re. sale of medical goods, cosmetic articles etc. | 3.556 | 0,46% | I | B |
| 52.31 | Dispensing chemists | 3.398 | 0,43% | I | B |
| 52.32 | Retail sale of medical and orthopaedic goods | 1 | 0,00% | I | B |
| 52.33 | Retail sale of cosmetic and toilet articles | 157 | 0,02% | I | B |
| 52.4 | Other retail sale of new goods in specialized stores | 20.000 | 2,56% | I | B |
| 52.41 | Retail sale of textiles | 177 | 0,02% | I | B |
| 52.42 | Retail sale of clothing | 2.332 | 0,30% | I | B |
| 52.43 | Retail sale of footwear and leather goods | 190 | 0,02% | I | B |
| 52.44 | Retail sale of furniture and household articles n.e.c. | 2.437 | 0,31% | I | B |
| 52.45 | Re. sale of electrical household appliances, radio etc. | 1.045 | 0,13% | I | B |
| 52.46 | Retail sale of hardware, paints, wallpapers etc. | 5.274 | 0,68% | I | B |
| 52.47 | Retail sale of books, newspaper and stationery | 1.336 | 0,17% | I | B |
| 52.48 | Other retail sale in specialized stores | 2.213 | 0,28% | I | B |
| 52.49 | Other retail sale in specialized stores | 4.996 | 0,64% | I | B |
| 52.5 | Retail sale of second-hand goods in stores | 6 | 0,00% | VI | C |
| 52.6 | Retail sale not in stores | 454 | 0,06% | VI | C |
| 52.7 | Repair of personal and household goods | 594 | 0,08% | I | B |
| **C methods, share of the section** | | | **22,8%** | | |

## 3.2.9  Hotels and restaurants  (NACE Rev.1; H)

This section covers hotels and other short-stay accommodation services, restaurants and canteens.

The production accounts of hotels and restaurants are mainly based on the Enterprise Accounts Register. Like in wholesale and retail trade some activities in this industry are distributive in nature like selling alcoholic drinks in bars. The output of such activities should be defined as the retail margin made on such sales. However, this is not done here and therefore the output and the intermediate consumption are strictly speaking not conceptually correct. What is most important here is that such inaccuracy has no impact on value added.

The volume changes in this section are derived by deflating the output by the most relevant price index which is a sub-item of CPI. Price discrimination is widespread here and therefore by using such sub items of CPI it is assumed that prices for business people and private consumers move in a similar way.

**Table 3.8 Indicators used for estimating the growth rates in hotels and restaurants, section H**

| | Gross factor Income 2004 | | Indicators used for estimating growth rates | Classific. into A, B and C methods |
|---|--:|--:|:-:|:-:|
| | Mill. ISK | % of all activities | | |
| **55 Hotels and restaurants, section G** | **12.485** | **1,60%** | **I** | **B** |
| 55.1 Hotels | 3.961 | 0,51% | I | B |
| 55.2 Camping sites; other provision of short-stay accom. | 480 | 0,06% | I | B |
| 55.3 Restaurants | 6.447 | 0,83% | I | B |
| 55.4 Bars | 1.110 | 0,14% | I | B |
| 55.5 Canteens and catering | 487 | 0,06% | I | B |
| **C methods, share of the section** | | **0,0%** | | |

In the near future, Statistics Iceland will investigate if a further improvement of these estimates of volume changes can be reached by making use of already available volume indi-

cators like the number of overnight stays of tourists and total number of tourists arriving from abroad.

A summary of the methods presently used for estimating volume changes in section H is given in table 3.8. Aggregation of the results shows that methods used qualify as a B method in all cases provided that the price indices used are considered as relevant.

## 3.2.10 Transport, storage and communication (NACE Rev.1; I)

At current prices most of the production accounts within section I is based on the Enterprise Accounts Register. Some of the industries in this section are characterized by small units which were registered as unincorporated companies until recently, like taxi operation and freight transport by road.

From 2001 unincorporated companies are now also included in the Enterprise Accounts Register as well as private limited companies. These changes have considerably increased the importance of the Enterprise Accounts Register as a source, especially in activities characterized by small units.

The volume changes in this section are derived mostly by deflating the output by the most relevant price index. The most relevant sub-items of CPI and building cost index are used for activities like taxi operation, freight transport and partly for scheduled air transport. Other specific price indices are used in export of transport services where the output is deflated by a special price index reflecting changes in the exchange rate of the Icelandic currency and the average price changes in the OECD countries. Such indicators are considered to be of a more general character and do not qualify as B method, only as a C method.

**Table 3.9 Indicators used for estimating the growth rates in transport, storage and communication, section I**

| | Gross factor Income 2004 | | Indicators used for estimating growth rates | Classific. into A, B and C methods |
|---|---|---|---|---|
| | Mill. ISK | % of all activities | | |
| **Transport, storage and communication, section I** | 59.433 | **7,61%** | ... | ... |
| 60  Land transport; transport via pipelines | 7.935 | 1,02% | ... | ... |
| 60.2  Other land transport | 7.935 | 1,02% | ... | ... |
| 60.21  Other scheduled passenger land transport | 1.481 | 0,19% | I | B |
| 60.22  Taxi operation | 891 | 0,11% | I | B |
| 60.23  Other land passenger transport | 1.401 | 0,18% | VI | C |
| 60.24  Freight transport by road | 4.162 | 0,53% | VI | C |
| 61  Water transport | 6.999 | 0,90% | VI | C |
| 62  Air transport | 13.274 | 1,70% | VI | C |
| 62.1  Scheduled air transport | 10.039 | 1,29% | VI | C |
| 62.2  Non-scheduled air transport | 3.234 | 0,41% | VI | C |
| 63  Supporting transport activities; travel agencies | 13.174 | 1,69% | ... | ... |
| 63.1  Cargo handling and storage | 725 | 0,09% | VI | C |
| 63.2  Other supporting transport activities | 8.262 | 1,06% | VI | C |
| 63.3  Travel agencies; tourist assistance activities n.e.c. | 2.453 | 0,31% | I | B |
| 63.4  Other transport | 1.733 | 0,22% | VI | C |
| 64  Post and telecommunications | 18.051 | 2,31% | I | B |
| 64.1  Post and courier activities | 3.149 | 0,40% | I | B |
| 64.2  Telecommunications | 14.902 | 1,91% | I | B |
| **C methods, share of the section** | | **61,5%** | | |

At present, Statistics Iceland is examining the possibility to use more intensively some volume indicators already available in this section, like the number of tonne-kilometres for freight transport and by air.

A summary of the methods presently used for estimating volume changes in section I is given in table 3.8. Aggregation of the results shows that method B is used in only 40% of section I but C method is still used in over 60% of the section. The gross factor income is used as a measurement.

## 3.2.11 Financial intermediation  (NACE Rev.1; J)

Most of the companies in this industry are subject to government supervision and therefore the company accounts are compiled and processed by the *Financial Supervisory Authority*. This supervision covers financial intermediation, insurance and pension funds. The accounts are of almost total coverage so hardly any grossing up is needed. However, other amendments have to be made for national accounts purposes. That refers both to division 65, Financial intermediation and division 66, Insurance and pension funding. Different methods are needed for these two divisions. Therefore they are described separately.

### Division 65 Financial intermediation, except insurance and pension funding

In the case of banks special methods are needed owing to the fact that most of the services produced by banks are not paid directly. Instead these services are financed by banks via the interest margin which is the difference between interests received by banks from the borrowers and interest paid by the banks to the depositors. Earnings from the interest margin are called "Financial intermediation services indirectly measured", FISIM.

FISIM is one of the two groups of products generated by banks. The other one is financial services outside FISIM which are services paid directly, like fees, commissions etc. These two groups require widely different deflation methods.

The first one of the two groups of products, FISIM, should be calculated at constant prices by estimating the change in the constant price value of stocks of loans and deposits. The price concept applied is the interest margin on loans and deposits.

The second one, the financial services outside FISIM, should be calculated at constant prices either by use of volume indicators like total number of transactions, which is a B method or by deflating the charged services by using the most appropriate price index. The use of a price index without a quality adjustment would be a B method. The Handbook on price and volume measure recommends the use of quality adjusted output price indices for a representative set of those services. Such index qualify as an A method.

The present methods applied in the Icelandic national accounts are quite different from the above description following the handbook. The division 65, Financial intermediation, except insurance and pension funding, at constant prices is calculated from the cost side by deflating compensation of employees using the wage index for the public sector and bank employees and deflating consumption of fixed capital by using the building cost index. This method is definitely a C method but Statistics Iceland intends to revise these methods very shortly in line with the recommendations in the handbook.

### Division 66 Insurance and pension funding, except compulsory social security

With some simplifications it can be said that the output of insurance services (service charge) is measured as the total premiums earned plus premium supplements less total claims due. Holding gains and losses are to be ignored in the measurement of output of insurance following the general principles of national accounting. From this definition it can be seen

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that a direct measure of the output price of the service provided is impossible because of the nature of the components of the output. For same reasons, deflating the service output on basis of output price statistics is impossible. An A method is therefore considered not possible. Volume indicators have to be used, like acquisition and administration of policies and the administration of claims. Such methods require indicators at a very detailed level that take into account changes in the product mix.

Similarly to financial intermediation the present methods applied in the Icelandic national accounts are quite different from the recommendations in the handbook. The Insurance and pension funding at constant prices is calculated from the cost side by deflating compensation of employees using the wage index for the public sector and bank employees and deflating consumption of fixed capital by using the building cost index. This method is definitely a C method but Statistics Iceland intends to revise these methods very shortly in line with the recommendations in the handbook.

### Division 67 Activities auxiliary to financial intermediation

This division is of minor importance. The methods applied for constant price estimates are the same as in insurance and pension funding. Calculations are made from the cost side by deflating the compensation of employees and the consumption of fixed capital by using the most appropriate price indices.

**Table 3.10 Indicators used for estimating the growth rates in transport, financial intermediation, section J**

| | Gross factor Income 2004 | | Indicators used for estimating growth rates | Classific. into A, B and C methods |
|---|---|---|---|---|
| | Mill. ISK | % of all activities | | |
| **Financial intermediation, section J** | 63.622 | **8,14%** | **VIII** | **C** |
| 65 Financial intermediation | 54.502 | 6,98% | VIII | C |
|     65.1 Monetary intermediation | 54.502 | 6,98% | VIII | C |
|     65.2 Other financial intermediation | 0 | 0,00% | ... | ... |
| 66 Insurance and pension funding | 7.232 | 0,93% | VIII | C |
| 67 Activities auxiliary to financial intermediation | 1.888 | 0,24% | VIII | C |
| **C methods, share of the section** | | **100,0%** | | |

# 3.2.12 Real estate, renting and business activities (NACE Rev.1; K)

This section covers a wide range of heterogeneous services that are mainly provided to industries. A large part of the services within the section is a "knowledge" service, like the service of accountants, lawyers etc. Such services are frequently tailor-made or subject to a contract. Therefore it is not straightforward to compile ordinary price indices whereas quality adjustments are nearly always necessary.

Within section K there are five divisions, i.e. division, 70, 71, 72, 73 and 74. Each one of these sections will be discussed individually. Table 3.11 shows how each one of the activities in this section is classified in A, B and C categories. The conclusion is that no one of the methods used for these activities qualify as an A method but the share of the B method, measured as gross factor income, just exceeds 50% for the activities in section K. Compared with other sections, the share of the C method is exceptionally high in this section and in many cases it might be difficult to abolish that method owing to conceptual difficulties and in other cases owing to lack of usable data.

## Division 70 Real estate activity

Division 70.2 Letting of own property includes letting of dwellings of owner-occupiers. That activity accounts for around a half of the section K. At current prices, the output of dwelling services is based on a special survey on rented dwellings undertaken by Statistics Iceland in 1999. The residential housing market in Iceland is characterized by a very high percentage of owner occupied dwellings. In 1995 that percentage was 81% and according to the most recent household budget survey covering the period 2003-2005 the percentage was a little higher or 83%. The survey was stratified in 5 strata and the actual rent from the survey of 1999 was linked to the most similar properties of owner occupied dwellings. This allowed the imputation of a nominal rent for the services owner-occupiers receive from their property. Before that some modifications were needed on the observed rent from the rent survey like taking into account rent compensation to low income families and zero rent families.

From the benchmark year of 1999 the volume changes are based on extrapolation of the housing stock. That extrapolation is based on the annual changes of market value of the housing stock deflated by the changes in market prices. For comparison data on quantity changes of the stock in square metres is also collected. The applied method for letting of dwellings is considered to be B method.

For letting of non-residential buildings the output at current prices is deflated by the building cost index as an indicator of a more general character. That is a C method and this activity accounts for around 1/5 of the division 70.2.

## Division 71 Renting of machinery and equipments without operator

At current prices the production accounts in division 71 are based on the Enterprise Accounts Register. The output of group 71.1, renting of automobiles is deflated by using the sub-group of CPI referring to those specific services. This qualifies as an A method for output and a B method for value added. Other groups in division 71 are deflated by more general price indices, most frequently the CPI, witch downgrade the methods to C methods.

## Division 72 Computer and related activities

The single biggest activity within this division is 72.2, software consultancy and supply, which amounts to around 70% of the total value added in the division. The output is deflated by the overall CPI less housing cost. The use of such a general price index qualifies as a C method. The output of this division can be divided into two types, i.e.

- packaged software

- software consultancy

The relative share of each one is not available but provided that software consultancy is the major part it is worth considering if the use of a relevant sub item of the labour cost index would be more appropriate. That will be investigated further but whatever the result will be the method will remain a C method.

## Division 73 Research and development

One company, *DeCode genetics* which is listed on NASDAQ,, accounts for around 2/3 of the activity in this division. That company is privately owned research company in bio-technology. It was established ten years ago. During that period the operation has been financed partly by research sponsorship and partly by own equity. The expected income will only be realised when or if the research activity turns out to be successful. Until this happens the operation of this activity continues to be substantially negative except it is allowed to record as income the expensed researches. Eurostat was consulted on that issue and based on that result it was decided to record as income only the sponsorship and realised income each

year. That has resulted in a huge negative operating surplus for that company and the division as a whole. In view of this it might be very troublesome to define the volume changes of the output in this section. Volume indicators of important cost components, like number of persons employed etc. are misleading because the use of these components reflects both recognized and unrecognized output at each time. The method chosen was to deflate the output and compensation of employees by the labour cost index and take the average of these two. This is definitely a C method and could hardly be otherwise except if the output could be better defined.

## Division 74 Other business activities

Like the name of this division indicates most of these services are in fact provided to companies, like the services of consulting engineers, business consultants, advertising agencies etc. In some cases the customers can be both companies and households. Rather poor price statistics is available for this division. Because of that more general price indices are used like CPI. These are C methods. Statistics Iceland intends to eliminate such methods and will evaluate the possibilities of collecting data on hourly fees or some charge-out rates. Such improvement would already upgrade the methods to B methods in some cases. These would not qualify as A methods since they would miss out some of the expected productivity changes.

**Table 3.11 Indicators used for estimating the growth rates in real estate, renting and business services, section K**

| | Gross factor Income 2004 | | Indicators used for estimating growth rates | Classific. into A, B and C methods |
|---|---|---|---|---|
| | Mill. ISK | % of all activities | | |
| **Real estate, renting and business services, section K** | 123.163 | **15,77%** | | |
| 70  Real estate activities | 66.337 | 8,49% | | |
|   70.1  Real estate activities with own property | 283 | 0,04% | VIII | C |
|   70.2  Letting of own property | 63.490 | 8,13% | IV Average | B |
|   70.3  Real estate activities on a fee or contract basis | 2.563 | 0,33% | VI and VIII | C |
| 71  Renting of machinery and equipment | 2.411 | 0,31% | ... | ... |
|   71.1  Renting of automobiles | 640 | 0,08% | I | B |
|   71.2  Renting of other transport equipment | 69 | 0,01% | VI | C |
|   71.3  Renting of other machinery and equipment | 1.509 | 0,19% | VI | C |
|   71.4  Renting of personal and household goods n.e.c. | 192 | 0,02% | VI | C |
| 72  Computer and related activities | 11.930 | 1,53% | VI | C |
| 73  Research and development | 4.118 | 0,53% | VIII | C |
| 74  Other business activities | 38.367 | 4,91% | | |
|   74.1  Legal, accounting and auditing activities; consultancy | 17.587 | 2,25% | | |
|     74.11  Legal activities | 4.152 | 0,53% | VI | C |
|     74.12  Acc., auditing activities; tax consultancy | 5.035 | 0,64% | VI | C |
|     74.13  Market research and public opinion polling | 660 | 0,08% | VI | C |
|     74.14  Business and management consultancy activities | 2.575 | 0,33% | VI Average | C |
|     74.15  Management activities of holding companies | 5.164 | 0,66% | VI and VIII Average | C |
|   74.2  Architectural and engineering activities. | 10.705 | 1,37% | VI and VIII | C |
|   74.3  Technical testing and analysis | 821 | 0,11% | VI Average | C |
|   74.4  Advertising | 1.882 | 0,24% | VI and VIII Average | C |
|   74.5  Labour recruitment and prov. of personnel | 155 | 0,02% | VI and VIII | C |
|   74.6  Investigation and security activities | 1.554 | 0,20% | I | B |
|   74.7  Industrial cleaning | 2.592 | 0,33% | I | B |
|   74.8  Miscellaneous business activities n.e.c. | 3.072 | 0,39% | VI | C |
|     74.81  Photographic activities | 384 | 0,05% | VI | C |
|     74.82  Packaging activities | -2 | 0,00% | VI | C |

| | | | | |
|---|---|---|---|---|
| 74.83  Secretarial and translation activities | 510 | 0,07% | VI | C |
| 74.84  Other business activities n.e.c. | 2.179 | 0,28% | VI | C |
| **C methods, share of the section** | | **44,6%** | | |

## 3.2.13 Public administration and defence; compulsory social security  (NACE Rev.1; L); Education (NACE Rev.1 M); Health and social work (NACE Rev.1 N)

Below the sections L, M and N will be discussed individually although the present methods of calculating the volume changes are the same.

### Section L Public administration and defence; compulsory social security

Section L consists entirely of non-market services. The production accounts are deflated from the input side. The calculation has been based on separate deflation of two components:

- Compensation of employees which is deflated by the wage index for the public sector

- Consumption of fixed capital which is deflated by the building cost index

The sum of these two components at constant prices is used as an indicator of volume changes in value added, as well as intermediate consumption and output, provided that the constant input/output ratio prevails. The wage index is not adjusted for changes in the level of skill over time. For that reason it can be concluded that the labour cost index includes some quality increases in the labour force and therefore it exaggerates the price increases. Consequently the volume change might be underestimated by the same degree. However, adjustments are made for changes in the composition of the labour force concerning occupation and education.

The building cost index used for deflating the consumption of fixed capital is not quality adjusted and therefore it might include some quality changes as well and underestimate the volume changes. The size of this degree of inaccuracy is unknown.

In view of all this and deflating the input side by such price indices of a general character the method only qualifies as a C method.

The C method should be avoided following the manual but for collective services, input methods can be B methods provided that the volume of each input is estimated separately and quality changes of inputs are taken into account.

### Section  M Education

Section M consists of both market and non-market services. The share of market services is less than 20% of the output in this section but increasing. At current prices the production accounts for non-market services are based on general government and local government accounts of a total coverage but the non-market services are based on a small sample of enterprises from the Enterprise Accounts Register which is grossed up on the basis of the Pay-As-You-Earn Register. Both market and non-market services in this section are deflated from the input side following the same method as described for section L above.

Education services are primarily provided on an individual basis and in principle this enables the collection of volume indicators for output as recommended by the manual. Statistics Iceland intends to develop methods in this direction but for the time being the methods used are definitely C methods.

*Section  N Health and social work*

Section N consists of both market and non-market services. The share of market services is approximately one third of the total output in this section. The methods of constructing the production accounts at current prices and estimating the volume indicators are the same as for section M. Same reservations hold also and the method used is C method.

**Table 3.12 Indicators used for estimating the growth rates in public administr., compulsory social security and education, sections L+M+N**

| | Gross factor Income 2004 | | Indicators used for estimating growth rates | Classific. into A, B and C methods |
|---|---|---|---|---|
| | Mill. ISK | % of all activities | | |
| **75+80+85 Public administr., education and health, section L+M+N** | **164.777** | **21,09%** | **VIII** | **C** |
| 75  Public administration; compulsory social security | 45.631 | 5,84% | VIII | C |
| 80  Education | 42.076 | 5,39% | VIII | C |
| 85  Health and social work | 77.070 | 9,87% | VIII | C |
| **C methods, share of the section** | | **100,0%** | | |

# 3.2.14 Other community, social and personal services (NACE Rev.1; O)

This section comprises a wide range of heterogeneous services, representing membership organisations of all types, refuse disposal, radio, TV, theatres, hairdressers etc.

In table 3.13 an overview is given of the main methods followed in deflating individual activities. In general the relevant sub-item of CPI is used where applicable. This refers to such activities as cinemas, radio and TV, washing and cleaning, hairdressing etc.

**Table 3.13 Indicators used for estimating the growth rates in other community, social and personal services, sections O**

| | Gross factor Income 2004 | | Indicators used for estimating growth rates | Classific. into A, B and C methods |
|---|---|---|---|---|
| | Mill. ISK | % of all activities | | |
| **90 til 98 Other community, social and personal services** | **41.757** | **5,35%** | | |
| 90  Sew. and refuse disposal, sanitation. | 2.657 | 0,34% | VII | C |
| 91  Activities of membership organization n.e.c. | 7.995 | 1,02% | VII | C |
| 92  Recreational, cultural and sporting activities | 13.258 | 1,70% | ... | ... |
|    92.1  Motion picture and video activities | 1.335 | 0,17% | VI | C |
|    92.2  Radio and television activities | 3.197 | 0,41% | I | B |
|    92.3  Other entertainment activities | 2.757 | 0,35% | I | B |
|    92.4  News agency activities | 44 | 0,01% | VI | B |
|    92.5  Library, museums and other cultural activities | 2.206 | 0,28% | VI | B |
|    92.6  Sporting activities | 3.382 | 0,43% | VI | B |
|    92.7  Other recreational activities | 338 | 0,04% | I | B |
| 93  Other service activities | 4.102 | 0,53% | ... | ... |
|    93.0  Other service activities | 4.102 | 0,53% | ... | ... |
|      93.01  Washing and dry cleaning of tex. and fur prod. | 1.006 | 0,13% | I | B |
|      93.02  Hairdressing and other beauty treatment | 1.753 | 0,22% | I | B |
|      93.03  Funeral and related activities | 92 | 0,01% | IV | B |
|      93.04  Physical well-being activities | 1.170 | 0,15% | Average of I and VIII | C |
|      93.05  Other service activities n.e.c. | 82 | 0,01% | VI | B |
| 95 Private households with employed persons | 588 | 0,08% | I | B |
| **C methods, share of the section** | | **100,0%** | | |

In other cases volume changes are estimated by deflating input components like compensation of employees. This refers to division 95 private households with employed employees where the compensation of employees is the major part of the output.

In section 90, Sewage and refuse disposal and activity of membership organization the two main components of value added, i.e. compensation of employees and consumption of fixed capital are deflated separately and the sum used as an indicator of output and value added. The indices used are the general wage index and the building cost index respectively.

A summary of the methods presently used for estimating volume changes in section O is given in table 3.13. Aggregation of the results shows that method B is used in 70% of section O but C method is still used in almost 30% of the section. The importance of activities is measured by using the gross factor income.

# 3.3 The expenditure approach

## 3.3.1 Household final consumption expenditure

Household final consumption is classified according to the Classification of Individual Consumption by Purpose (COICOP). In estimating the consumption figures at current prices it is appropriate to classify the consumption in various groups based on available data sources. First of all, a distinction is made between imported consumer goods and domestically produced goods. Approximately 44% of household final consumption is estimated by calculating directly the purchasers´ prices of imported consumer goods. The remaining part of the household consumption is derived from various statistical sources  such as company accounts, direct information of domestical production, household expenditure surveys, dwelling services etc.

As a general rule, volume calculations of household consumption expenditure are based on the deflation of each product's final consumption expenditure estimates by means of the equivalent sub-index of the Consumer Price Index. Depending on the product, the sub-items of the CPI are often regrouped to fit with the relevant items of the consumption expenditure. In the case of imported consumer goods they are even deflated on a more detailed CPI level and in this case a careful comparison is undertaken between the volume changes of imported consumer goods at c.i.f.-prices and the volume changes of same groups at purchasers´ prices.

The second column of table 3.14 shows which sub-items of the CPI are used for each one of the consumption expenditure items following the COICOP classification.

**Table 3.14 CPI deflators for COICOP classification**

| COICOP | CPI Deflators |
|---|---|
| 0111  Bread and Cereals | 0111    Bread and cereals |
| 0112  Meat | 01121  Beef (fresh or frozen) |
|  | 01123  Pork (fresh or frozen) |
|  | 01124  Lamb (fresh and frozen) |
|  | 01125  Poultry (fresh or frozen) |
|  | 01126  Cured meat |
| 0113  Fish | 01131  Fish (fresh and frozen) |
|  | 01132  Fish, dried or smoked |
|  | 01133  Crustaceans and other seafood (fresh and fr.) |
|  | 01139  Other seafood (preserved or processed) |
| 0114  Milk, Cheese & Eggs | 01141  Whole milk |
|  | 01142  Low-fat milk and skimmed milk |
|  | 01144  Yoghurts |
|  | 01145  Other milk products |
|  | 01146  Cheese |

| Code | Description | Code | Description |
|---|---|---|---|
| | | 01147 | Eggs |
| 0115 | Oils and Fats | 01151 | Butter |
| | | 01152 | Margarine and other vegetable fat |
| 0116 | Fruit | 01161 | Citrus fruit and other fresh fruit |
| | | 01169 | Frozen and preserved fruit |
| 0117 | Vegetables | 0117 | Vegetables including potatoes and other tubers |
| 0118 | Sugar, Jam, Honey, Chocolate & Confectionery | 01184 | Confectioneries |
| 0121 | Coffee, Tea & Cocoa | 0121 | Coffee, tea and cocoa |
| 0122 | Mineral Waters, Soft Drinks & Fruit Juices | 0122 | Mineral waters, soft drinks and juices for Soft Drinks |
| 021 | Alcoholic beverages | 0211 | Spirits |
| | | 0212 | Wine |
| | | 0213 | Beer |
| 022 | Tobacco | 022 | Tobacco |
| 031 | Clothing & Repairs | 031 | Clothing |
| | | 0314 | Repair and hire of clothing |
| 0321 | Footwear | 032 | Footwear |
| 0322 | Shoe repairs | 0321 | Shoes and other footwear |
| 043 | Maintenance & repair of dwellings | 043 | Regular maintenance and repair of the dwelling |
| 044 | Water supply and misc. services relat. to dwellings | 0441 | Refuse collection |
| | | 0442 | Sewerage services |
| | | 0443 | Water supply |
| 051 | Furniture, furnishings, carpets & other floor coverings | 051 | Furniture, furnishings and decorations, carpets and other floor coverings and repairs |
| 052 | Household textiles | 052 | Household textiles |
| 053 | Household appliances | 0531 | Major household appliances whether electric or not |
| 0533 | Repair of household appliances | 0915 | Repair of audio-visual, photographic and data processing equipment and accessories |
| 054 | Glassware, tableware & H/H utensils | 054 | Glassware, tableware and household utensils |
| 055 | Tools and equipment for house and garden | 055 | Tools and equipment for house and garden |
| 0561 | Non durable household goods | 0561 | Non-durable household goods |
| 0562 | Domestic services and household services | 0562 | Domestic services and home-care services |
| 061 | Medical products, appliances & equipment | 061 | Medical products, appliances and equipment |
| 062 | Doctor & dental outpatient services | 0621 | Medical services |
| | | 0622 | Dental services |
| | | 0623 | Paramedical services |
| 063 | Hospital services & nursing homes | 0621 | Medical services |
| 0711 | Motor cars | 0711 | Motorcars |
| 0712 | Motor cycles | 0712 | Motorcycles |
| 0713 | Bicycles, caravans | 0713 | Bicycles |
| 0721 | Car accessories | 0721 | Spare parts and accessories |
| 0722 | Petrol & oil | 0722 | Fuels and lubricants |
| 0723 | Motoring expenses | 0723 | Maintenance and repairs |
| 0724 | Other services in respect of personal transport equipment | 0724 | Other services in respect of personal transport equipment |
| 073 | Transport services | 07 | Transport |
| | | 0732 | Passenger transport by road |
| | | 0733 | Passenger transport by air |
| | | 0734 | Passenger transport by sea and inland waterway |
| 08 | Communication | 0811 | Postal services |
| | | 0813 | Telephone, telegraph and telefax services |
| | | 081311 | Household telephone services |
| 091 | Audio-visual, photographic and information processing equipment | 0911 | Equipment for the reception, recording and reproduction of sound and pictures |
| | | 09111 | Television sets, videos, radios, etc. |
| | | 09112 | Stereo systems |
| | | 0912 | Photographic and cinematographic equipment, optical instruments |
| | | 0913 | Data processing equipment |
| | | 0914 | Recording media for pictures and sound |
| | | 0915 | Repair of audio-visual, photographic and data |

| | | | |
|---|---|---|---|
| | | | processing equipment and accessories |
| 092 | Major recreational durables | 092 | Other major durables for recreation and culture |
| | | 093 | Other recreational items and equipment; flowers, gardens and pets |
| | | 0931 | Games and toys; equipment for sport, camping and open-air recreation |
| | | 0932 | Flowers and gardening |
| | | 0933 | Pets etc. |
| 094 | Recreational and cultural services | 094 | Recreational and cultural services |
| | | 0942 | Cultural services |
| | | 09421 | Cinemas and rent of video tapes |
| | | 09422 | Theatre, concerts and opera |
| | | 09423 | Licence fees for television and radio broadcasting |
| | | 09429 | Other cultural services |
| | | 0943 | Games of chance |
| | | 09431 | Lotteries |
| 095 | Newspapers, books and stationery | 095 | Newspapers, books and stationery |
| | | 0951 | Books |
| | | 0952 | Newspapers and periodicals |
| | | 0954 | Stationery and drawing materials |
| 111 | Catering services | 1111 | Restaurants and cafés |
| | | 1112 | Canteens |
| 121 | Personal care | 12112 | Beauty salons |
| 123 | Personal effects n.e.c. | 122 | Personal effects n.e.c. |
| | | 1221 | Jewellery, clocks and watches |
| | | 1222 | Other personal effects |
| 124 | Social protection | 123 | Social protection |
| 125 | Insurance | 124 | Insurance |
| | | 1244 | Insurance connected with transport |
| 1261 | FISIM | | Consumer price index |
| 1262 | Other financial services n.e.c. | 125 | Financial services n.e.c. |
| 1270 | Other services n.e.c. | 126 | Other services n.e.c. |

For few items there are no price indices available and alternative solutions have to be utilized. Deflators for consumption by Icelanders abroad and by foreign visitors in Iceland, are examples of these items. The data on subsistence costs abroad are deflated using a specially constructed price index based on the CPI index for OECD total and the changes in the exchange rates of the Icelandic kronur (ÍSK). Data on expenditure in Iceland by foreign visitors are deflated using the CPI in Iceland and taking into account the structure of the expenditure of foreign visitors based on studies performed by Statistics Iceland and the Icelandic Tourist Board.

In some cases volume indicators are used instead of deflating values. Most important examples of these are items like actual and imputed rental for houses, electricity, heating, educations and accommodation services.

A vast majority of the deflated items of the household final consumption qualify as an A method due to the fact that the CPI price indices are quality adjusted.

The combined (implicit) price index for household consumption expenditure tends to be fairly close to the total CPI. However some discrepancy may arise and often there might be good reasons for such differences. The main reason is the different weights used in the national accounts from those used for the CPI. Another reason is that housing is treated differently in the national accounts from the practices in the CPI.

Purchases of vehicles are yet another example of different treatment in national accounts and CPI. The coverage of consumption by households also differs somewhat. Consumption by

Icelandic households abroad, for example, is included in the national accounts, but consumption by foreign visitors in Iceland is not. Neither of these items is included in CPI.

### 3.3.2  Government final consumption expenditure

Government final consumption expenditure consists of the output value of those parts of activities L, M and N which belongs to general government minus revenue from sales. The calculations of volume changes are derived from the cost side where the figures are split into compensation of employees and consumption of fixed capital. The methods are similar to those described in section 3.2.13 above where a description is given of volume estimates of activities L, M and N. These methods qualify only as a C method.

### 3.3.3  Gross fixed capital formation

In estimating the Gross fixed capital formation at current prices four main sources are exploited:

- The Enterprise Accounts Register

- The Land Registry of Iceland

- The c.i.f. value of imported capital goods

- The financial accounts of central and local government

Of these sources the far most important one is the Enterprise Account Register (EAR). That register covers all incorporated and unincorporated enterprises and contains a breakdown by activity down to 5 digit ISAT classification which corresponds to NACE rev.1. That register allows a rather detailed breakdown of fixed assets by type of assets. The assets are classified by type in 10 groups depending on the rate of depreciation allowed in the tax laws. These groups are the following:

1. Motor vehicles for industrial use

2. Ships, aircraft and pertaining equipment

3. Manufacturing machinery and equipment

4. Office machinery and computers

5. Machinery and equipment other, such as vans, coaches, taxis, bulldozers etc.

6. Constructions

7. Non-renewable subsoil assets such as non-metallic mineral reserves, sand pits etc.

8. Intangible non-produced assets, such as purchased goodwill, patented entities etc.

9. Assets, not depreciated, according to tax laws, such as land, fishing quotas, valuables etc.

10. Other assets, not depreciated, such as production rights in agriculture, start-up costs etc.

Each of these depreciation groups are further disaggregated by type of assets into various assets. The quality of this data source is considered very high but these are values at current prices only.

For estimating volume changes a use is made of various price indices. Below are the most important ones and an attempt is also made to classify the methods used as an A, B or C methods:

1.  Non-residential building construction is deflated by means of the building cost index. This is classified as a B method owing to the fact that the building cost index is of a more general character.

2.  Roads and bridges are deflated by building cost index. This is classified as a C method owing to the fact that this index is not as representative as required.

3.  Imported capital goods are deflated by a special price index of imported goods in that category. The same index is used for office machinery other than computers. This is classified as a B method for same reasons as in 1. above.

4.  Computers are deflated by a special price index for computers derived from the CPI where the "overlapping" technique is applied. This is classified as an A method because the price index used is considered to represent fully the deflated products and the price index is quality adjusted.

5.  Software is deflated by a special price index of imported capital goods. Presently these indices are under review in order to identify more proper indices. This is classified as a B method for same reasons as in 1. above.

6.  Motor vehicles for industrial use are deflated by a special price index for that category. This is classified as a B method for same reasons as in 1. above.

7.  Special projects in power intensive industries and power plants are deflated by a price index which is a weighted average of the building cost index and a special price index of capital goods excluding transport machinery where these two indices have equal weights. This is classified as a B method for same reasons as in 1. above.

8.  The residential construction is based on data from the Land Registry of Iceland and the volume changes are derived from the same source where a comparison is undertaken between direct volume changes in square metres and deflated values. The method qualify as an A method.

Taking all together it can be concluded that for estimating the volume changes for fixed capital formation, the vast majority of the products are deflated following the B method, approximately a quarter of the value might qualify as an A method but around 10% only qualify as a C method.

### 3.3.4 Acquisition less disposal of valuables

Acquisition less disposal of valuables represents a new main category of gross capital formation. In Icelandic national accounts this item is not yet recorded. So far the only data available on valuables are imported valuables of trivial importance. These valuables are all classified as household final consumption, not fixed capital formation.

### 3.3.5 Changes in inventories

In Icelandic national accounts there is a discrepancy in the coverage of inventories between the output and expenditure approaches.

On the output side changes in inventories from the beginning to the end of the year in all activities are recorded in business accounts. The inventories are valued at prices prevailing at the beginning and the end of the year. During periods of changing prices, the changes in inventories include holding gains or losses which do not reflect any physical change in inventories. Price corrections are made to the business accounts figures where an attempt is made to eliminate the estimated holding gains and losses on inventories and these corrected figures are used as changes in inventories on the output side of the national accounts. These

price corrected figures are available for all activities and they are incorporated in the output side of national accounts.

On the expenditure side changes in inventories are only calculated for following industries:

- Marine products

- Aluminium products

- Ferrosilicon products

- Oil products

The changes in inventories of these industries are valued at the average current prices of the year and then deflated to the prices of previous year by means of the unit value indices of export prices in each of these main groups.

The changes in inventories actually published in Icelandic national accounts are those from the expenditure side. The methods used, qualify as the B method taking into account that the price indices used are unit value indices. However, consideration is now given of using the PPI which is more appropriate for this purpose.

### 3.3.6  *Exports and imports of goods and services*

*Exports and imports of goods*

Exports and imports of goods in the Icelandic national accounts are deflated by products by means of unit value indices. These indices are calculated by using Fischer formula for accumulated monthly and annual figures. Unit value indices and implicit volume indices are based on data from the external trade database of Statistics Iceland. Imports are classified by main economic categories and exports by mode of processing. Classification used to define commodity groups for which index numbers are calculated is the 8 digit Icelandic Custom Tariff which follows the Harmonized System (HS) to the level of 6-digits.

Preliminary quarterly indices are calculated by using Laspeyres formula but final quarterly figures are based on Fisher formula. Volume index numbers are the quotient of the value and unit value index numbers. Price index numbers are calculated using Laspeyres formula.

The use of value indices as an approximation for price indices has several drawbacks.

The main problems that arise are connected to composition changes and the attempt to eliminate quality changes from price changes. This can be explained as follows:

- Although the Custom Tariff classification in its most disaggregated form is rather detailed the possibility cannot be ruled out that one number contains more than one commodity or commodities that are of different quality, and therefore at different prices. By using stratification by countries, within each tariff number an attempt is made to minimize these problems.

- Frequently changes are made to the definition of the tariff numbers, i.e. new numbers are added (one number is split into many) or numbers are deleted and they included with others. By paring old and new numbers together problems of this type can be eliminated to some extent.

Another problem is how to exclude from the calculations extreme price changes, which are considered to be more of the character of composition changes. This is done by using upper and lower limits for price changes. In general these boundaries are set as 50% increase and

33% decrease in the unit prices in foreign currency plus the inflation rate in Icelandic main trading countries plus change in exchange rate. It is possible to change on an individual basis the boundaries for individual commodities if direct information indicates that price changes are exceeding these limits. There are several examples of price fluctuations exceeding such limits during the last few decades.

The methods used for estimating volume changes of exports and imports of goods and services do not qualify as an A method as the unit value index is not a proper price index. The methods must be considered as B methods. The PPI for relevant export products is probably more proper index to use and Statistics Iceland is now considering to adopt it in these calculations.

## *Exports and imports of services*

Both exports and imports of services are deflated on a far more aggregated basis than exports and imports of services. A use is made of the following breakdown of both exports and imports:

- Transportation

- Travel

- Other

These values are deflated by using two price indices only. Exports of travel, i.e. expenditure of foreign tourists in Iceland are deflated by the overall CPI. All other items are deflated by a special price index composed of changes in the overall CPI in OECD countries, excluding high inflation countries, and the price index of foreign currency expressed in Icelandic currency.

These methods hardly qualify as B methods and must be considered as C methods due to the fact that the price indices are of a general character and are hardly as related to the deflated items as required.

# Chapter 4.
# Methods for other parts of the system

## 4.1 Value added

According to the Handbook on price and volume measures in national accounts the A method for value added is use of double deflation where the output and intermediate consumption is separately estimated at constant prices and the difference of these two items is taken. In section 3.2 above a description is given of the methods used in estimating volume changes in individual activities. From that description it becomes apparent that the double deflation method is never used in Icelandic national accounts. Instead various indicators are used to estimate volume changes in activities. These volume changes indicate both changes in output and value added.

## 4.2 Taxes and subsidies on products

Volume changes of taxes less subsidies on products are not directly published in Icelandic national accounts. However, an attempt is made to follow the main principles of the handbook by using the tax rates of previous year when values are re-valued at the prices of previous year. Taxes and subsidies are not directly deflated but values including the taxes and subsidies are deflated. In every case it is carefully checked that the price indices used for deflating reflect changes in taxes and subsidies.

## 4.3 Real national income

Real national income is calculated by adding the so-called real impact of terms of trade on GDP at constant prices, and taking into account primary income and current transfers to and from abroad together with consumption of fixed capital.

Real value of changes in terms of trade is supposed to reflect changes in purchasing power of external trade of goods and services from the reference year or more precisely the previous year in case of annual chain linking. The formula can be written as follows:

$$T = X/P_m - X/P_x$$

where   T is changes in terms of trade
        X is exports of goods and services
        $P_m$ is import prices
        $P_x$ is export prices

Primary income to and from abroad and current transfers to and from abroad are deflated by using the price index of gross domestic final expenditure.

Consumption of fixed capital at constant prices is to be found in the capital stock model. The capital stocks are derived from the accumulated gross fixed capital formation by using the perpetual inventory method. These stocks exist both at current and constant prices.

**Appendix 1**

# English translation of some concepts and names of institutions mentioned in the Inventory

| English | English abbreviation | Icelandic |
|---|---|---|
| Agricultural Economic Institute | AEI | Hagþjónusta landbúnaðarins |
| Agricultural Production Board | APB | Framleiðsluráð landbúnaðarins |
| Consumer Price index | CPI | Vísitala neysluverðs |
| Directorate of Fisheries | | Fiskistofa |
| Enterprise Accounts Register | EAR | Ársreikningar fyrirtækja á samræmdu formi |
| Farmers Association of Iceland | FAI | Bændasamtök Íslands |
| Financial Management Authority | | Fjársýsla ríkisins |
| Financial Supervisory Authority | | Fjármálaeftirlitið |
| Fisheries Association of Iceland | | Fiskifélag Íslands |
| Household Expenditure Survey | HES | Rannsókn á útgjöldum heimila (Neyslukönnun) |
| Icelandic Tourist Board | | Ferðamálastofa |
| Land Registry of Iceland | LRI | Fasteignamat ríkisins |
| National Energy Authority | | Orkustofnun |
| Producer Price Index | PPI | Vísitala framleiðsluverðs |
| Statistics Iceland | SI | Hagstofa Íslands |
| Wage Index | | Launavísitala |