

EU KLEMS Growth and Productivity Accounts

2013 release¹

Description of methodology and country notes for the Finland

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Introduction

The EU KLEMS rolling updates from 2012 onwards follow up from the previous release in 2009 which showed detailed growth accounts up to 2007. These new updates are similar in concepts and methodologies to calculate the various growth and productivity variables as its predecessors, but it also has a number of new features;

- It provides updates to the most recent available year and revisions of longer time-series in case national statistical institutes (NSIs) provided these.
- New investment data has been provided by the EU KLEMS consortium partners.
- Most importantly, a new industrial classification is used.

Since last year many European NSIs started to produce data based on the new NACE 2 industry classification, which is consistent with the international standardized ISIC Revision 4 (Rev. 4) industry classification. Accordingly, we adjusted the industrial classification used in EU KLEMS. We distinguish between 35 industries covering the total economy. Many of the industries are a near perfect match with previous ISIC Revision 3 (Rev. 3) industries, but the definition of various other industries has changed and some new industries have been introduced (see below).

The next section of this document describes the issues involved in constructing the new output files for Finland based on the most recent data available in the ISIC Revision 4 industry classification. A brief overview is provided of the most important changes compared to earlier releases of the EU KLEMS database. The appendix shows the industry mapping tables that are used for the estimation of the output, capital and employment variables. The appendix shows the mapping tables that have been used to map the Finnish capital asset types to the EU KLEMS assets for the calculation of the initial 1975 capital stocks, and the mapping of broad EU KLEMS Rev. 3 sectors to broad Rev. 4 sectors for the allocation of labour services growth per hour worked (LAB_QPH) prior to 1998.

¹ For comments and suggestions please send an email to euklems@rug.nl.

Sources and methods for the 2013i release

This section details the sources and methods used in this EU KLEMS release to arrive at estimates of total factor productivity in the new ISIC Rev. 4 industry classification. Additionally this section covers the incorporation of revised investment series and the updating procedure of labour services. For more detailed information on the general growth accounting methodology and construction of the database, see O'Mahony, Mary and Marcel P. Timmer (2009)². A sheet with additional aggregates, such as Market Economy and Non Market Services, has been added to the output file.

Synopsis of the main points

- Output, labour, investment and labour composition data supplied by STATFI in the ISIC Rev. 4 EU KLEMS industry list.
- Capital stocks are taken directly from the STATFI website.
- Changes in TFP growth rates compared to earlier EU KLEMS releases are mostly due to changes in Value Added growth.

Output and labour

Statistics Finland (STATFI) supplied data on output, labour input data for the period 1975-2012 in the ISIC Rev. 4 industry classification. The industry list is a perfect match with the list used in EU KLEMS. No adjustments have been made to this data. Volume indices have been aggregated using a Tornqvist³ weighting procedure.

Labour services

The growth of labour services per hour worked (LAB_QPH) is based detailed employment and wage series by industry, gender, age and educational attainment, supplied by STATFI for the period 1998-2012. As in the previous EU KLEMS releases, growth rates in labour services are calculated through a Tornqvist aggregation of growth rates of 18 detailed types of workers (classified by gender, 3 types of educational attainment and 3 age classes). Wages for each type are used as weights. In the labour input file the employment and wage shares are presented. Prior to 1998 the growth rates from the labour services per hour worked index (LAB_QPH) from the November 2009 (09i) EU KLEMS release has been used to cast back the series. **Appendix table 1** shows the concordance table by broad sectors used to map the ISIC Revision 3 industries to the new ISIC Revision 4 EU KLEMS industry list. Growth rates of hours worked have been added to the LAB_QPH growth rates to arrive at the growth of the labour services index (LAB_QI).

Investment series and capital services

Investment data for the eight EU KLEMS asset types have been supplied by STATFI for the period 1975-2012 for the EU KLEMS industry list in the ISIC Rev. 4 industry classification. Total asset deflator have been used to calculate the investment volumes. Volumes of investment are denoted in 2005 prices instead of an index where 2005 is set to 100, since 2005 investment is zero in some cases.

² O'Mahony, Mary and Marcel P. Timmer (2009), '[Output, Input and Productivity Measures at the Industry Level: the EU KLEMS Database](#)', *Economic Journal*, 119(538), pp. F374-F403

³ The Tornqvist aggregation approach uses annual moving weights based on averages of adjacent points in time. For more information on this procedure see the general EU KLEMS methodology [document](#).

Initial capital stocks for the year 1975 are taken directly from the STATFI website. The STATFI asset types are mapped to the EU KLEMS asset types using the concordance table in **appendix table 2**. The data is aggregated in current prices and deflated at the KLEMS asset type level using the asset investment deflators. Time series of capital stocks are calculated using the Perpetual Inventory Method (PIM)⁴. Industry depreciation rates are included in the new capital input files. Capital compensation by asset type and capital services are calculated using the standard EU KLEMS methodology.

The distribution of investment over the asset types has changed compared to earlier releases of the EU KLEMS database. According to STATFI new estimates of investment in ICT assets have been calculated in 2008-2009. The distribution is based on national accounts investments series according to Structural Business Statistics and it is still our source for the calculation, whereas the original distribution that was created for EU KLEMS was based on supply and use tables which gave an incorrect measure of ICT investments.

In the prior EU KLEMS releases adjustments were made to allocate investments to ICT asset types. Therefore the asset distribution, most notably in the early years, prior to 1995, is now very different from earlier EU KLEMS versions. Hence prior to 1995 no split of total capital services into ICT and non-ICT is possible. For the same reason, investments, capital stocks and capital compensation by asset type prior to 1995 are also not available.

Growth Accounting Variables

Comparing the growth accounting results reveals that TFP growth estimates remain in line with the results in earlier KLEMS releases for period averages of 10 years. For individual years and industries discrepancies can be observed, most notably for the most recent years 2004-2007. Most of the changes can be attributed to revisions in the growth rates of Value Added.

⁴ For a detailed description see the general EU KLEMS methodology [document](#).

Appendix table 1

Industry concordance for labour composition by broad sectors		
ISIC Rev. 3	ISIC Rev. 4	ISIC Rev. 3 Description
A,B	A	AGRICULTURE, FORESTRY AND FISHING
C	B	MINING AND QUARRYING
D	C	TOTAL MANUFACTURING
E	D-E	ELECTRICITY, GAS AND WATER SUPPLY
F	F	CONSTRUCTION
G	G	WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES
I	H	TRANSPORTATION AND STORAGE
H	I	ACCOMMODATION AND FOOD SERVICE ACTIVITIES
K	J, L, M-N	INFORMATION AND COMMUNICATION, REAL ESTATE, PROFESSIONAL, SCIENTIFIC, TECHNICAL, ADMINISTRATIVE AND SUPPORT SERVICE ACTIVITIES
J	K	FINANCIAL AND INSURANCE ACTIVITIES
L	O	REAL ESTATE ACTIVITIES
M	P	EDUCATION
N	Q	HEALTH AND SOCIAL WORK
O,P,Q	R-U	OTHER SERVICE ACTIVITIES

Appendix table 2

Asset type concordance for initial capital stocks		
STATFI asset	EUKLEMS asset	EU KLEMS Asset Description
Dwellings	RStruc	Residential structures
Non-residential buildings	OCon	Total Non-residential investment
Civil engineering and other structures	OCon	Total Non-residential investment
Transport equipment	TraEq	Transport Equipment
Computers and peripherals	IT	Computing equipment
Other communication equipment	CT	Communications equipment
Other machinery and equipment	OMach	Other Machinery and Equipment
Mineral exploration	Other	Other assets
Computer software	Soft	Software
Entertainment, literary or artistic originals	Other	Other assets
Major improvements to land, etc.	Other	Other assets
Costs of ownership transfer for land, etc.	Other	Other assets