

# EU KLEMS Growth and Productivity Accounts

## 2013 update<sup>1</sup>

### Description of methodology and country notes for Sweden

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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.
- 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 industry classification (ISIC Rev. 4). 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 Rev. 3 industries, but the definition of various other industries has changed and some new industries have been introduced (see below). The National Accounts (NA) data in the new classification is provided for shorter time series than were previously available in the ISIC Rev. 3 classification.

The next section gives a brief comparison of the new ISIC Rev. 4 classification and the old ISIC Rev. 3 classification. The last section covers the country specific notes on construction issues and revisions of the source data. 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.

#### Industry Classification changes

In this section the main differences between the classifications are briefly highlighted. For many industries the ISIC Rev. 3 and ISIC Rev. 4 industry classifications are a close or even one to one match. However, the revised classification also features a number of industries which are completely new and are comprised of multiple activities at the 4-digit level spread across many ISIC Rev. 3 2-digit industry aggregates. The short list below indicates the most problematic industries:

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<sup>1</sup> For comments and suggestions please send an email to [euklems@rug.nl](mailto:euklems@rug.nl).

- Postal and courier activities are allocated to ISIC Rev. 4 industry 53 whereas in ISIC Rev. 3 these activities were part of Post and Telecommunications, combined in the 2-digit industry 64.
- The ISIC Rev. 4 sector J, Information and communication, consists of Publishing, Audiovisual and broadcasting activities (58-60), Telecommunications (61), and IT and other information services (62-63). These activities consist of multiple ISIC REV. 3 industries belonging to several 2-digit sectors.

### **Construction notes Sweden**

For more detailed information on the general growth accounting methodology and construction of the database, see O'Mahony, Mary and Marcel P. Timmer (2009)<sup>2</sup>.

#### *Synopsis of the main points*

- Official data on output, labour input, labour services, and capital services are taken directly from the website of Statistics Sweden (STATSWE) for the period 1993-2011 in the ISIC Rev. 4 industry classification.<sup>3</sup>
- No split between ICT and non-ICT capital is available in the output file. Growth contributions of ICT and non-ICT capital to output growth are available on the STATSWE website.
- The Swedish industry list only covers data pertaining to the production of private output. Government is not included in these statistics.
- A worksheet with additional industry aggregates has been added in order to facilitate comparisons with other EU KLEMS countries for the market economy.
- TFP estimates in this EU KLEMS release are identical the results published on the STATSWE website for industries at the lowest comparable level. For aggregate industries the results deviate due to differences in the methods of aggregation.
- Comparisons with earlier vintages of EU KLEMS reveal that STATSWE has lowered its capital services estimates considerably which has consequences for the estimated values of TFP.

#### *General Approach*

Official data on output, labour input, labour services, and capital services have been downloaded directly from the STATSWE website. Shares of labour and capital compensation in Value Added are available as well, however, no split of the returns to ICT and non-ICT capital is presented. We use the version of the database published by STATSWE on 13-09-2013.

Data for all variables is available for the 1993-2011 period. The data published by STATSWE in their growth accounting database excludes all non-private output. Their measure of labour input, consistent with private output, is presented as a quantity index of hours worked (H\_EMP\_QI). Appendix table 1 shows private output as a percentage of total output for STATSWE sectors that include non-private output. A sheet with an alternative industry list has been added to the output file, which includes a split between Market Economy and Non-Market Services. Values for labour and capital compensation are derived by multiplying the reported compensation shares by Value Added.

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<sup>2</sup> 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

<sup>3</sup> [Statistics Sweden](#)

STATSWE presents data at a detailed 52 industry level and a total (market) economy aggregate. Appendix table 2 shows the concordance table used to map the STATSWE industries to EU KLEMS sectors in the ISIC Rev. 4 industry classification. As can be observed from the appendix table, the EU KLEMS sector 'Postal and courier activities' (53) includes 'warehousing and support activities for transport' (H52). 'Activities of households as employers' (T) has been clubbed with S and is present in the aggregate sector 'Arts, entertainment, recreation and other service activities' (R-S).

Nominal data has been aggregated by simple summation. Volume indices are aggregated using the Tornqvist<sup>4</sup> aggregation method. For the volume of total hours worked (H\_EMP\_QI) total labour compensation (LAB) is used as weights to Tornqvist aggregate the data.

### Growth Accounting

Apart from the missing split in ICT and non-ICT capital services we employ the standard EU KLEMS growth accounting methodology. Data for aggregate sectors is calculated from the bottom up by aggregating underlying industries.

### Comparison of the data

At the lowest industry levels where EU KLEMS industries match the STATSWE industries, the results from growth accounting are a perfect match. The only aggregate available in the STATSWE industry list is the total (market) economy. STATSWE calculates the growth contributions and TFP results at the total economy level, whereas in EU KLEMS the results are calculated from the bottom up. Therefore a difference in the results can be observed, due to reallocation effects.

Comparisons with the November 2009 Release, Updated in March 2011 (09ii release) reveal that STATSWE has revised their data considerably. It should be noted however that the results in the 09ii release do include non-private production. Even so, estimates of the contributions of capital to output growth have been reduced considerably. Market economy output remains comparable with earlier vintages of the data, as does the contribution of labour to output growth. The result is a higher TFP growth on average for the market economy in the new EU KLEMS data.

Appendix table 1

Private Output as a percentage of Total Output																					
Industry Description	Code	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	
warehousing and support activities for transportation, postal and courier activities	H52-H53	72%	72%	74%	72%	73%	73%	72%	68%	66%	65%	65%	65%	66%	65%	65%	64%	63%	63%	63%	
management of real estate	L68B	53%	55%	53%	52%	52%	52%	53%	53%	54%	54%	54%	55%	55%	58%	57%	58%	55%	56%	57%	
architectural and engineering activities, technical testing and analysis, R&D	M71-M72	86%	86%	85%	83%	86%	87%	86%	80%	78%	76%	75%	76%	79%	82%	81%	78%	75%	77%	76%	
travel agency, tour operator and other reservation service and related activities	N79	94%	95%	95%	96%	96%	96%	96%	96%	96%	95%	95%	95%	96%	96%	95%	95%	96%	96%	96%	
education	P85	6%	6%	7%	7%	6%	7%	9%	9%	9%	9%	11%	12%	12%	14%	14%	15%	16%	17%	18%	
human health activities	Q86	14%	15%	16%	16%	16%	18%	18%	24%	23%	26%	26%	24%	24%	24%	24%	25%	26%	27%	27%	
residential care activities and social work activities	Q87-Q88	5%	6%	8%	8%	8%	10%	11%	12%	13%	14%	12%	13%	14%	15%	15%	16%	19%	21%	23%	
arts, entertainment and recreation	R90-R93	36%	39%	41%	40%	44%	47%	51%	55%	55%	56%	57%	57%	57%	57%	59%	60%	58%	59%	59%	
other service activities and activities of households as employers	S94-T98	23%	24%	25%	24%	24%	25%	27%	29%	30%	30%	30%	31%	32%	33%	34%	36%	35%	37%	38%	

<sup>4</sup> 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](#).

**Appendix Table 2**

Industry concordance		
STATSWE ISIC Rev. 4 industry list (many to 1 mapping)	EU KLEMS ISIC Rev. 4 list	STATSWE Description
A01	A	crop and animal production, hunting and related service activities
A02	A	forestry and logging
A03	A	fishing and aquaculture
B05-B09	B	mineral extract
C10-C12	10-12	food
C13-C15	13-15	manufacturing of textiles, clothing and leather products manufacture of wood and of products of wood and cork, except furniture,
C16	16-18	manufacture of articles of straw and plaiting materials
C17	16-18	manufacture of paper and paper products
C18	16-18	printing and reproduction of recorded media
C19	19	manufacture of coke and refined petroleum products
C20-C21	20-21	coke, refined petroleum, chemicals and basic pharmaceutical products
C22	22-23	manufacture of rubber and plastic products
C23	22-23	manufacture of other non-metallic mineral products
C24	24-25	manufacture of basic metals
C25	24-25	manufacture of fabricated metal products, except machinery and equipment
C26	26-27	manufacture of computer, electronic and optical products
C27	26-27	manufacture of electrical equipment
C28	28	manufacture of machinery and equipment n.e.c.
C29	29-30	manufacture of motor vehicles, trailers and semi-trailers
C30	29-30	manufacture of other transport equipment
C31-C32	31-33	manufacture of furniture and other manufacturing
C33	31-33	repair and installation of machinery and equipment
D35	D-E	electricity, gas, steam and air conditioning supply
E36-E37	D-E	water supply and sewerage
E38-E39	D-E	waste collection, materials recovery and other waste management services
F41-F43	F	construction
G45	45	wholesale and retail trade and repair of motor vehicles and motorcycles
G46	46	wholesale trade, except of motor vehicles and motorcycles
G47	47	retail trade, except of motor vehicles and motorcycles
H49	49-52	land transport and transport via pipelines
H50	49-52	water transport
H51	49-52	air transport
H52-H53	53	warehousing and support activities for transportation, postal and courier activities
I55-I56	I	hotels and restaurants
J58	58-60	publishing activities motion picture, video and TV-programme, sound recording, programming and
J59-J60	58-60	broadcasting
J61	61	telecommunications computer programming, consultancy and related activities and information
J62-J63	62-63	services
K64	K	financial service activities, except insurance and pension funding
K65	K	insurance, reinsurance and pension funding, except compulsory social security
K66	K	activities auxiliary to financial services and insurance activities
L68B	L	management of real estate legal, accounting and activities of head offices, management consultancy
M69-M70	M-N	activities
M71-M72	M-N	architectural and engineering activities, technical testing and analysis, R&D
M73-M75*	M-N	advertising and market research, veterinary activities
N77	M-N	rental and leasing activities
N78-N82*	M-N	administrative and supportservice activities
P85	P	education
Q86	Q	human health activities
Q87-Q88	Q	residential care activities and social work activities
R90-R93	R	arts, entertainment and recreation
S94-T98	S	other service activities and activities of households as employers

\*Additional splits for these industries are available for National Accounts variables.