



Employment and Compensation in the WIOD Socio-Economic Accounts (SEA): Revisions for 2008/2009 and new data for 2010/2011

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Introduction

This document describes the sources and methods used for the update of employment and compensation in the WIOD Socio-Economic Accounts (SEAs). Data relating to various variables described below have been updated for the years 2010 and 2011 and in many cases data for 2008 and/or 2009 have been revised. This is indicated in the country specific notes. Table 1 lists the variables updated in this version of the SEAs. The sources used for industry output and value added at current prices is described in more detail in “[Changes in the November 2013 update](#)”, Marcel Timmer, Abdul A. Erumban, Reitze Gouma, and Gaaitzen J. de Vries, November 2013, available at www.wiod.org.

Table 1 Variables updated in the WIOD Socio-economic Accounts (SEA)

Values	Description
COMP*	Compensation of employees (in millions of national currency)
LAB*	Labour compensation (in millions of national currency)
CAP*	Capital compensation (in millions of national currency)
EMP	Number of persons engaged (thousands)
H_EMP*	Total hours worked by persons engaged (millions)

*European countries only

European countries

For all 27 European countries the data is revised for 2008 and 2009 and new data for 2010/2011 has been added. Calculation of COMP is based on trends in share of COMP in value added from EUROSTAT National Accounts data. To update LAB, the growth of this share is also applied. CAP is derived as VA-LAB as usual.

Update of EMP and H_EMP is based on growth trends in EUROSTAT National Accounts data

Data for trends for 2008-2011 is given in the NACE 2 industry classification, while WIOD is based in NACE rev 1. A NACE 2 to NACE 1 one-to-one industry mapping is applied, depending on the level of detail at which data is available in the external sources, shown in table 2.

Romania 2008 and 2009 data was not revised due to lack of new data.

Table 2 External sources used for update

Country	External source, industry classification and level of detail
Austria	EUROSTAT NACE 2 A64 level
Belgium	EU KLEMS NACE 2
Bulgaria	EUROSTAT NACE 2 A10 level
Cyprus	EUROSTAT NACE 2 A64 level
Czech Republic	EUROSTAT NACE 2 A64 level
Denmark	EUROSTAT NACE 2 A64 level
Estonia	EUROSTAT NACE 2 A38 level
Finland	EUROSTAT NACE 2
France	EU KLEMS NACE 2 up to 2010, extended with EUROSTAT NACE 2 A21 level
Germany	EU KLEMS NACE 2 up to 2010, extended with EUROSTAT NACE 2 A21 level
Greece	EUROSTAT NACE 2 A64 level
Hungary	EUROSTAT NACE 2 A64 level
Ireland	EUROSTAT NACE 2 A38 level
Italy	EUROSTAT NACE 2 A38 level
Latvia	EUROSTAT NACE 2 A21 level
Lithuania	EUROSTAT NACE 2 A38 level
Luxembourg	EUROSTAT NACE 2 A21 level
Malta	EUROSTAT NACE 2 A10 level
Netherlands	EUROSTAT NACE 2 A64 level
Poland	EUROSTAT NACE 2 A21 level
Portugal	EUROSTAT NACE 2 A10 level
Romania	EUROSTAT NACE 2 A10 level
Slovakia	EUROSTAT NACE 2 A64 level
Slovenia	EUROSTAT NACE 2 A64 level
Spain	EU KLEMS NACE 2 up to 2010, extended with EUROSTAT NACE2 A38 level
Sweden	EUROSTAT NACE 2 A38 level
United Kingdom	No new data is available. Fixed 2009 shares and ratios are applied

Non-European countries

Below the sources and methods for updating the employment series of total persons engaged (EMP) are discussed for the non-European countries included in WIOD, namely Australia, Brazil, Canada, China, India, Indonesia, Japan, South Korea, Mexico, Taiwan, Russia, Turkey, and the United States.

Australia

Main sources	Data
ABS Detailed, Quarterly labour Force statistics, catalogue number 6291.0.55.003	Quarterly employment data for 106 industries in the ANZSIC06 industry classification

Methods

The ANZSIC industries are mapped to the WIOD industries and aggregated. Annual averages of the quarterly data are calculated. This results in time series of employment at the WIOD level of 35 industries. The SEA data for total persons engaged is extrapolated using the industry growth rates for the period 2008-2011.

Brazil

Main sources	Data
UN ECLAC statistical database	Employment by ten broad sectors from 2009-2011
Pesquisa Industrial Anual	Employment by detailed manufacturing industries, 2009-2011

Methods

Value added by economic activity is given in the World Input-Output Tables until 2011. We have used labour productivity growth rates by sector to update employment data in WIOD. Labour productivity growth by broad sectors is obtained from the UN ECLAC statistical database, whereas productivity trends by detailed industry are derived from the annual industrial surveys (we have used the reports of employment and value added for firms with 1 or more employees). Employment data by economic activity for 2010 and 2011 was obtained by the difference between labour productivity growth and the growth in value added times previous year employment.

Canada

Main sources	Data
STATCAN	Labour statistics by business sector industry and non-commercial activity in the NAICS industry classification for detailed industries

Methods

The new estimation of employment variables for 2008-2011 is based on labour productivity trends for market industries from STATCAN up until 2010.

For 2011 the productivity growth of 2009-2010 was applied. For 'Education' and 'Public Administration and Defense' the total economy productivity growth trend was used.

Productivity is based on hours worked, so hours worked were estimated first. No level data on persons engaged was available, therefore persons engaged are estimated using the EMP/H_EMP ratios from the previous version of the SEA files. Ratios for 2009 were applied to 2010 and 2011.

Note that EMPE and H_EMPE variable for 2008 and 2009 were not revised.

China

Main sources	Data
China Statistical Yearbook (2010, 2011, and 2012 issue)	GDP and Employment by three main sectors from 2009-2011 Employment and gross industrial output by detailed manufacturing industries (and mining, and public utilities) Employment and value added by broad sectors

Methods

Value added by economic activity is given in the World Input-Output Tables until 2011. We have used labour productivity growth rates by sector to update employment data in WIOD. Labour productivity growth for agriculture is presented in the China statistical yearbook. For mining, manufacturing industries and utilities we have used labour productivity growth trends (gross output value per person engaged). Employment for services sectors as well as for construction is obtained from the trend in tertiary productivity growth. For retail and wholesale trade the trend in sales per person engaged is used. All productivity trends were derived using tables presented in the various issues of the China Statistical Yearbook. Employment data by economic activity for 2010 and 2011 was obtained by the difference between labour productivity growth and the growth in value added times previous year employment.

India

Main sources	Data
National Sample Survey Office (NSSO)	Biannual survey data on industry shares of employment in total employment, taken from NSS reports for 2007/2008, 2009/2010 and 2011/2012.
DGET 2012-2013 Economic Survey (appendix table 3.1, Page A-56)	Total economy employment (employment in organized sectors)

Methods

Industry shares of employment from the NSS reports for 2009/2010 are reported according to the NIC-2004 classification, which is consistent with the ISIC Revision 3 classification. In the 2011/2012 report the NIC-2008 classification is used which is consistent with ISIC Revision 4. The industries are mapped to the SEA industries and aggregated. Data for 2009/2010 has been taken as pertaining to the year 2009 and the data from the 2011/2012 report are taken for the year 2011. This gives us the industry distribution of employment for 2009 and 2011. These shares are multiplied by the total economy employment numbers taken from DGET. The growth rates from the resulting employment series by industry are used to extrapolate the SEA data on total persons engaged for the years 2010 and 2011. Some industries have zero percentages in the NSS data, due to rounding, whereas the SEAs do report values. Therefore the

industry shares in total employment have been assumed the same as in 2009. This is the case for: Coke, refined petroleum and nuclear fuel (23), Water transport (61), and Air transport (62).

Indonesia

Main sources	Data
BPS National Labour Force Survey	Employment by ten broad sectors for 2009-2011, semi-annual data

Methods

In the national labour force survey, employment statistics for February and August are given. The annual average of the employment data by 10 broad sectors of the economy is used to extrapolate the SEA employment series for 2010 and 2011.

Japan

Main sources	Data
Japan Industry Productivity Database release 2013	GDP and employment by detailed (108) sectors
Labour force surveys	Employment by detailed sectors

Methods

Value added by economic activity is given in the World Input-Output Tables until 2011. We have used the labour productivity growth rates by sector from 2009 to 2010 given in the Japan Industry Productivity (JIP) database to update the employment series to 2010. Employment data for 2011 is based on detailed employment data given in the labour force surveys. Due to the Great East Japan Earthquake, various regions are not reported in the 2011 LFS, which results in biased employment estimates. Instead, we have used the average employment growth rate by detailed sector for the period 2010 to 2012 instead.

South Korea

Main sources	Data
STATISTICS KOREA, Economically Active Population Survey (downloaded from KOSIS website)	Employment by broad sectors in the ISIC Rev. 4 classification (A21 level), monthly data, 2009-2011
Korea Industry Productivity database (KIP)	Hours worked data for detailed industries, ISIC Rev.3 classification, annual for 2009-2010

Methods

Annual averages of the monthly KOSIS employment data by broad sectors are computed. The ISIC Rev. 4 sectors are mapped to broad ISIC Rev. 3 sectors. For 2009 and 2010 the detailed industry data on hours worked from the KIP database is used to calculate shares for detailed industries and multiplied by the broad sector employment data. For 2011 no further industry detail is available so the employment growth by broad sectors is used. The resulting employment figures are used to extrapolate the SEA employment data for the years 2010 and 2011.

Mexico

Main sources	Data
UN System of National Accounts	GDP by six broad sectors
Encuesta Nacional de Ocupación y Empleo (INEGI)	Employment by six broad sectors
INEGI	Nominal labor productivity trends by detailed manufacturing industries

Methods

Value added by economic activity is given in the World Input-Output Tables until 2011. We have used labour productivity growth rates by sector to update employment data in WIOD. Labour productivity growth by broad sectors is obtained from the UN national accounts database divided by employment from ENOE. The seven sectors distinguished are (1) agriculture, forestry, hunting, and fishing; (2) manufacturing; (3) construction; (4) wholesale, retail trade, restaurants and hotels; (5) transport, storage and communication; (6) other activities. Productivity trends by detailed manufacturing industries are derived from tables presented by Mexico's statistical office INEGI. Employment data by economic activity for 2010 and 2011 was obtained by the difference between labour productivity growth and the growth in value added times previous year employment.

Russia

Main sources	Data
WorldKLEMS	Employment for 2010 and 2011.

Methods

For 2010 and 2011 the employment statistics by sector are extrapolated using the data available from WorldKLEMS, pre-release delivered by dr. Ilya Voskoboynikov.¹

Taiwan

Main sources	Data
National Statistics Taiwan	Total employment by broad sectors in the ISIC Rev. 4 industry classification
	Data on employees by 110 detailed industries in the ISIC Rev. 4 industry classification

Methods

The data on total employment by broad ISIC Rev. 4 sectors are mapped to broad ISIC Rev. 3 sectors. In order to provide a further breakdown of industrial employment, shares are derived from the detailed data on employees. The detailed industries in ISIC Rev. 4 are mapped to the 35 SEA industries in ISIC Rev. 3. The detailed data on employees is also used to calculate the share of Remediation services in Water supply and Remediation services in order to split the data for total employment for this broad sector and add Remediation services to Other Community, Social and Personal Services (O). The same method is

¹ More information on construction methods can be found in the following paper: Voskoboynikov, Ilya B. (2012), "New measures of output, labour and capital in industries of the Russian economy", [GGDC Research Memorandum 123](#).

applied to split the data for the broad Rev. 4 Information and Communication sector. The resulting time series of total employment by SEA industries is used to extrapolate the data for 2010 and 2011.

Turkey

Main sources	Data
Turkstat	Total employment by 18 broad sectors in the ISIC Rev. 4 industry classification

Methods

Turkstat provides annual data on persons engaged for 18 broad sectors in the ISIC Rev. 4 industry classification. These broad sectors are mapped to ISIC Rev. 3 sectors. SEA employment data is extrapolated for the years 2010 and 2011 using these broad sector growth rates.

United States

Main sources	Data
BEA NIPA	Total employment figures for detailed NAICS industries

Methods

The NIPA tables provide data on Employees and Self-Employed for 71 industries in the NAICS industry classification. The NAICS industries are mapped to the 35 SEA industries. Summing over the employees and self-employed and aggregating the industries yields total employment series by SEA industries. This data is used to extrapolate the SEA employment data for the years 2010 and 2011.