



The OECD Productivity Database: Key measurement issues and challenges

*Launching Seminar LA-KLEMS
“Growth, labor, capital, and sectorial heterogeneity
in Latin America”*

Washington, 12-13 December, 2016

**María Belén Zinni
Statistics Directorate
OECD**



Outline

- The OECD Productivity Database
- Key measurement issues
- Future challenges
- Concluding remarks



The OECD Productivity Database



The *OECD Productivity Database*

- Primarily based in **national accounts** (2008 SNA)
- **Value added-based** productivity measures
 - Total economy: labour input, labour productivity, capital services, MFP, Unit labour costs (ULCs)
 - Main economic activities (ISIC Rev. 4): labour input, labour productivity, ULCs
- OECD countries, accession countries and OECD key partner economies (including BRIICS)
- Meets **OECD data quality principles**: coherence, timeliness, accessibility, interpretability
- Adherence to *OECD Productivity Manual* ([OECD, 2001](#))

The OECD Productivity Database



Key measurement issues



i) Introduction of new standards

Revisions in international standards help to account for new and emerging products and industries and organisational changes in production:

- From 1993 SNA to 2008 SNA
- From ISIC Rev. 3 to ISIC Rev. 4

However...

- Timing for implementation differ across countries
- Break in time series may be hard to mend



ii) Measuring labour input

- Most widely used measures:
 - **Total hours worked** → less readily available, especially at industry level, more difficult to compare internationally, but conceptually preferred
 - **Total employment (head-counts or persons)** → more broadly available, more reliable but conceptually less appealing
- Preferred source: **national accounts**
 - Consistency with output and compensation measures
 - Consistency between hours and employment measures
- Still...
 - National-accounts estimates of labour input are missing for some OECD countries and, in particular, for key partner economies
 - When available, differences in primary data sources require different adjustments that may affect cross-country comparability



Total employment and total hours worked measures in the *OECD Productivity Database*

Key issues:

- Persons vs jobs →
- Coverage of employee and self-employed →
- Industry coverage
- Domestic vs. national concept →
- Lack of data availability, particularly, on hours worked at industry level
- Other issues: e.g. changes in the primary data sources



These measurement issues reflect the use of different primary data sources (1)

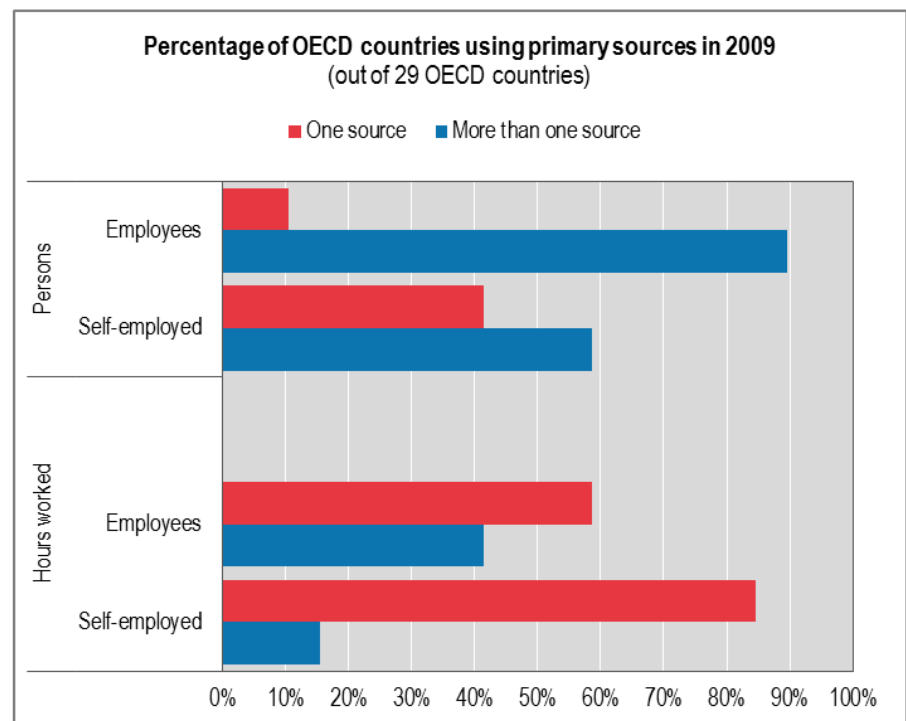
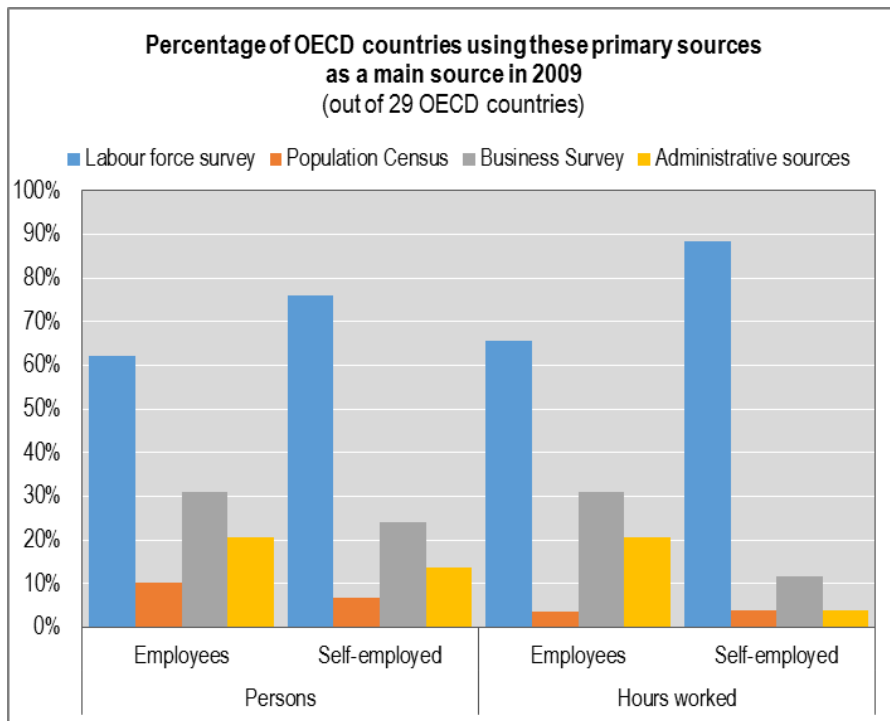
Primary data source	Pros	Cons
Labour force survey	<ul style="list-style-type: none"> • Information on employees, self-employed, unpaid family workers, government and NPISHs workers • Information on the characteristics of employment: age, gender, education, industry, occupation • Provides information on hours actually worked • Harmonised concepts across countries (ILO concepts) • It counts jobholders (persons) 	<ul style="list-style-type: none"> • It is a household survey: could have limited consistency with output and value added measures, especially at industry level • National concept of employment • Suspect of over-reporting hours worked compared to work hours reported in time use surveys • It excludes people living in collective households
Business survey	<ul style="list-style-type: none"> • Information consistent with output data • Covers production units operating in the territory: domestic concept of employment 	<ul style="list-style-type: none"> • Typically excludes information on agriculture and government sector • May not include small enterprises (below a certain employment threshold) • May leave out the self-employed and count jobholders (jobs) • Hours paid or contractual hours, which excludes absences and unpaid overtime • Not necessarily harmonised across countries
Population census	<ul style="list-style-type: none"> • Can be used as a benchmark 	<ul style="list-style-type: none"> • Low frequency of data collection (typically every 10 years)
Administrative sources (e.g. social security registers, tax registers)	<ul style="list-style-type: none"> • To complement data on employment and labour income/compensation 	<ul style="list-style-type: none"> • Very often there is restricted access to these micro data • No information on the informal economy



These measurement issues reflect the use of different primary data sources (2)

Primary sources for employment and hours worked in OECD National Accounts

The 2009 survey



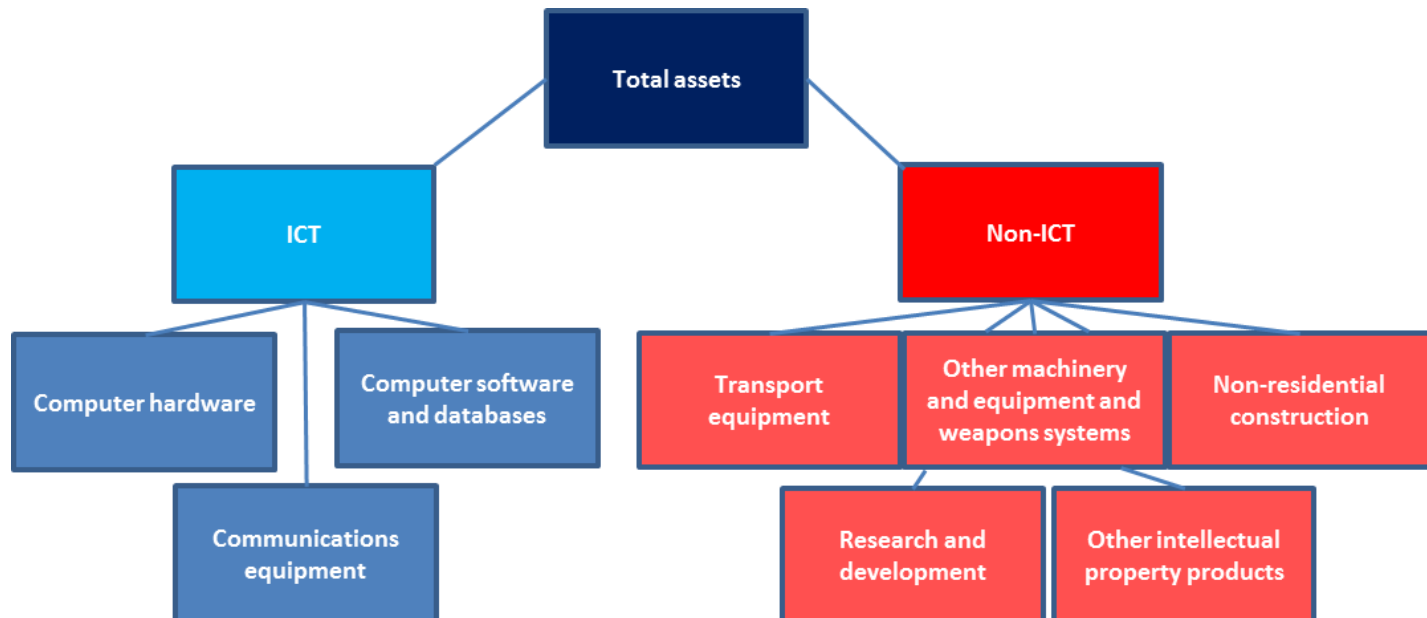
Source: Brunet and Hong, *Comparability of labour input measure for productivity analysis, Working Party in National Accounts, October 2009*, STD/CSTAT/WPNA(2009)11.



iii) Measuring capital input

Methodology ([Schreyer et al. 2003](#))

1. Capital as a source of productive services → **capital services**
≠ capital as a storage of wealth → **net capital stocks**
2. Collection of investment series, current prices and volumes, by asset type, from national accounts:





iii) Measuring capital input (II)

3. **Harmonised ICT deflators** → US ICT deflators adjusted for domestic inflation

$$\Delta \ln p_t^{SOFT,COU} - \Delta \ln p_t^{NICT,COU} = f(\Delta \ln p_t^{SOFT,US} - \Delta \ln p_t^{NICT,US})$$

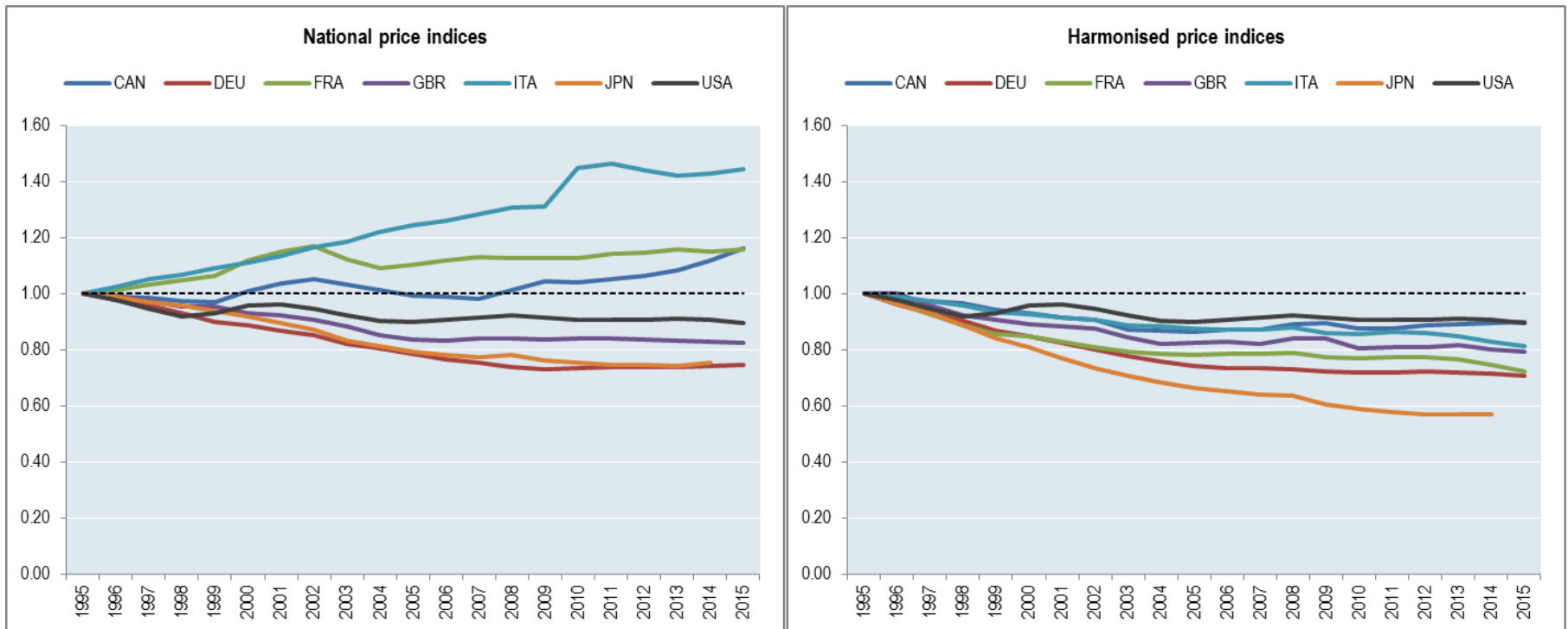
4. PIM → productive capital stocks of each asset type
- Common assumptions across countries: average services lives, retirement function, age-efficiency profile
4. Capital services by asset type proportional to the productive capital stock at the end of the previous period
5. In equilibrium, user costs reflect the marginal productivity of the different assets → **user cost shares** are used as weights to aggregate capital services across different asset types

Capital services in the *OECD Productivity Database* are currently available for **20 OECD countries** → need for *long GFCF series by asset (for all assets!)*



International comparisons of volume changes in ICT investment are still challenging → *harmonised ICT deflators*

Price indices for investment in computer software, 1995=1



Source: OECD Productivity Database, December 2016.



v) Cross country comparisons of productivity levels at the OECD

OECD-Eurostat PPP programme:

- PPP for cross-country comparisons of GDP, private consumption and actual individual consumption
- Comparisons made from the *expenditure side* (using purchasers' prices)
- These PPPs cannot be used to compare productivity levels across industries in different countries
- Computing PPP by industry would require:
 - Data on producer prices (**production side**) → available for a restrictive set of products or industries; data on output but not necessarily on intermediate inputs; and/or
 - A perfect **mapping between expenditure categories and industrial sectors** → price data might not be representative of each industry; plus need for adjustments for trade margins, international trade, indirect taxes and subsidies

OECD Productivity Database → comparisons of productivity growth rates across industries



Future challenges



Future challenges for the *OECD Productivity Database ...*

- Increase country coverage and have longer time series of labour input and **labour productivity at industry level**
- Increase country coverage of **capital services** (and MFP) at the total economy level
- Adjusting labour input: accounting for **labour composition**
- Development of **capital services measures by industry**
- **Intellectual property products** → ownership and location
- To further explore the links between **productivity and globalisation** ➔



... how?

- OECD is working closely with **NSOs** → improving timeliness, length of the series and granularity of national accounts
- OECD data collection of **Supply-Use Tables (SUT)**:
 - Additional tables and employment series
 - Additional details for industries (ISIC Rev. 4) and products (in line with European CPA)
 - Additional series broken down by products
- Use of labour force surveys



Concluding remarks



Lessons from our experience and more

- Productivity measurement starts with national accounts → working closely with NSOs is very important
- Step-by-step approach → with an action plan and deliverables for each step
 - Keeping in mind future challenges for the countries involved and their production transformation strategy
- OECD will be happy to get involved and advise as and when needed



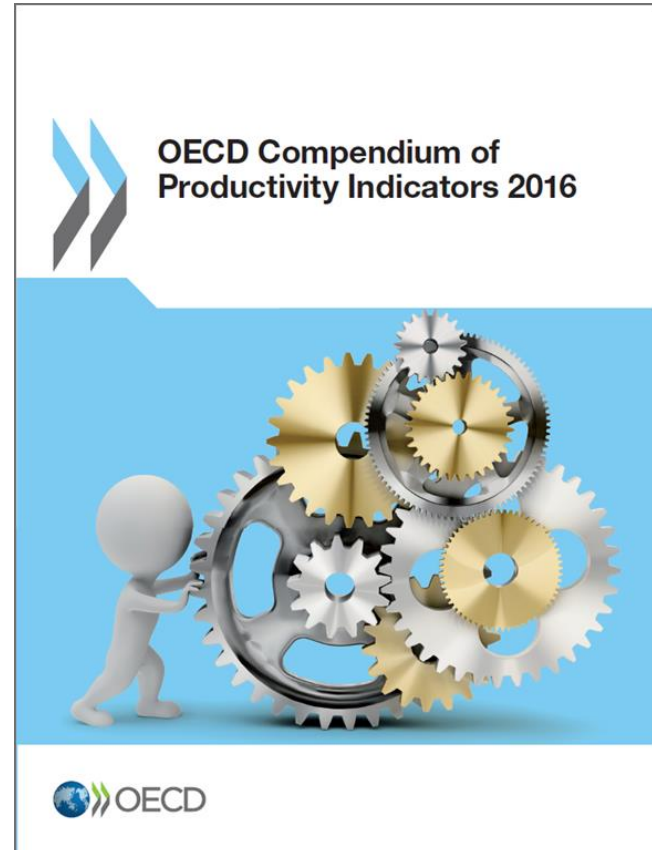
Further reading



More on productivity developments and key measurement issues...

What is new in 2016?

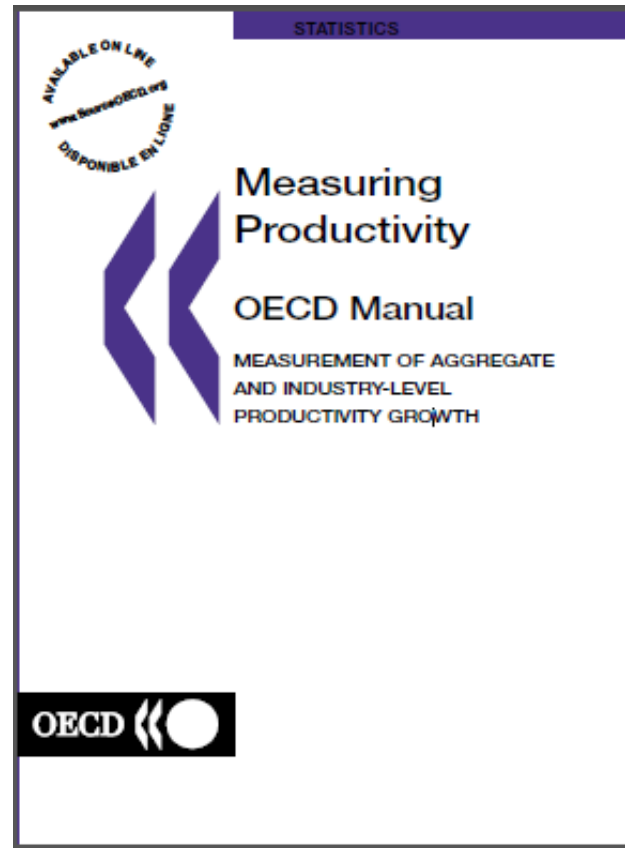
- The productivity paradox
- Productivity in emerging economies
- The role of business dynamism
- Productivity by firm size
- Current challenges in measuring productivity



OECD (2016), *OECD Compendium of Productivity Indicators 2016*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/pdty-2016-en>



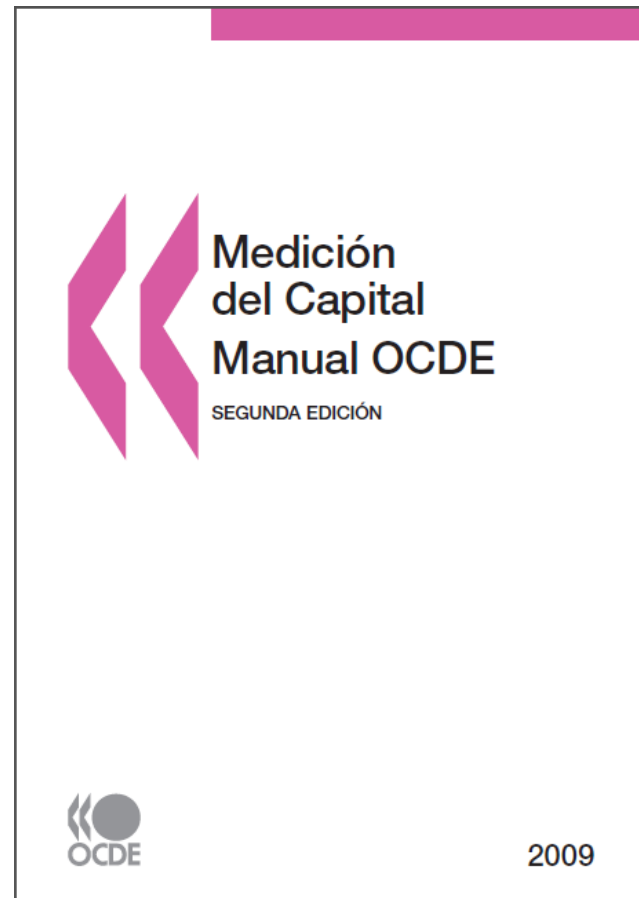
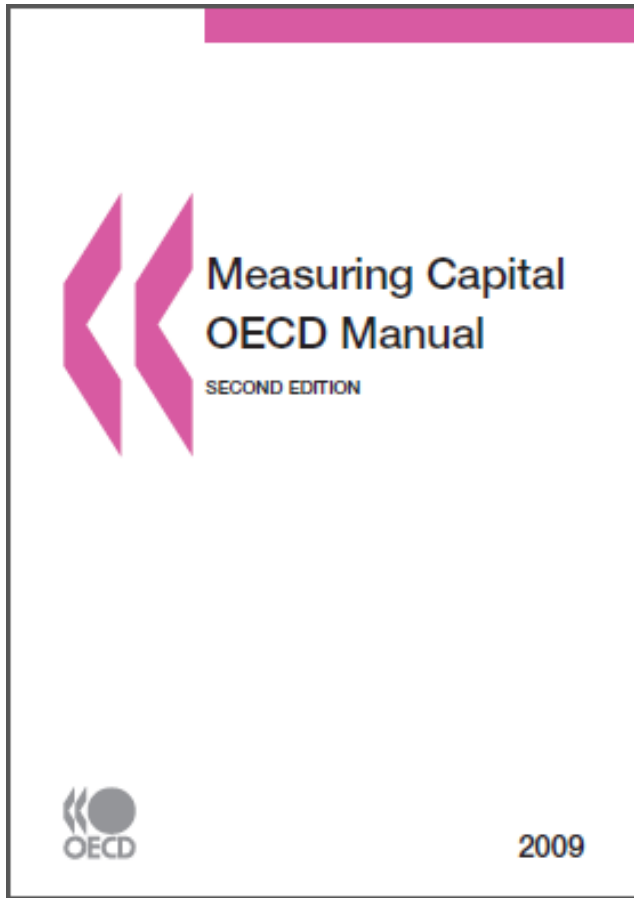
A guide to productivity measurement



OECD. (2001), *Measuring Productivity - OECD Manual: Measurement of Aggregate and Industry-level Productivity Growth*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264194519-en>



A guide to capital measurement... also in Spanish!



OECD. (2009), Measuring Capital - OECD Manual 2009: Second edition, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264068476-en>



Increasing number of NSOs computing official productivity statistics

	Country	Institution	MFP measure	Industry
EU	Denmark	Statistics Denmark	Value added based; KLEMS until 2013 (discontinued)	Market sector, non-farm market sector and more than 100 industries
	Finland	Statistics Finland	Value added based; KLEMS	Total economy and more than 80 industries
	France	INSEE (Working Paper in 2013)	Value added based	Total economy
	Italy	ISTAT	Value added based	Total economy and more than 40 industries (NACE Rev 2)
	Netherlands	Statistics Netherlands	Value added based; KLEMS	Market sector and 1 and 2 digit SIC 2008 sectors
	Sweden	Statistics Sweden	Value added based; KLEMS	Total economy and more than 50 industries (NACE Rev 2)
	United Kingdom	Office for National Statistics	Value added based	Market sector and 9 industries
Non-EU OECD	Australia	Australian Bureau of Statistics	Value added based	Market sector and 16 industries (ANZSIC06)
	Canada	Statistics Canada	Value added based; KLEMS	Aggregate business sector, major business sub-sectors and 100 industries (NAICS)
	Korea	Bank of Korea		
	Mexico	INEGI	KLEMS	Total economy and 67 industries (NAICS)
	New Zealand	Statistics New Zealand	Value added based	Measured sector (market sector) and more than 30 industries (ANZSIC06)
	Switzerland	Swiss Federal Statistics Office	Value added based	Total economy
	United States	Bureau of Labour Statistics	Value added based; KLEMS	Private business sector, Non-farm private business sector and 80 industries (NAICS)



More on productivity measurement

OECD Productivity Statistics webpage:

<http://www.oecd.org/std/productivity-stats/>

Contact us:

Belen.Zinni@oecd.org

productivity.contact@oecd.org



**Thank you for
your attention**

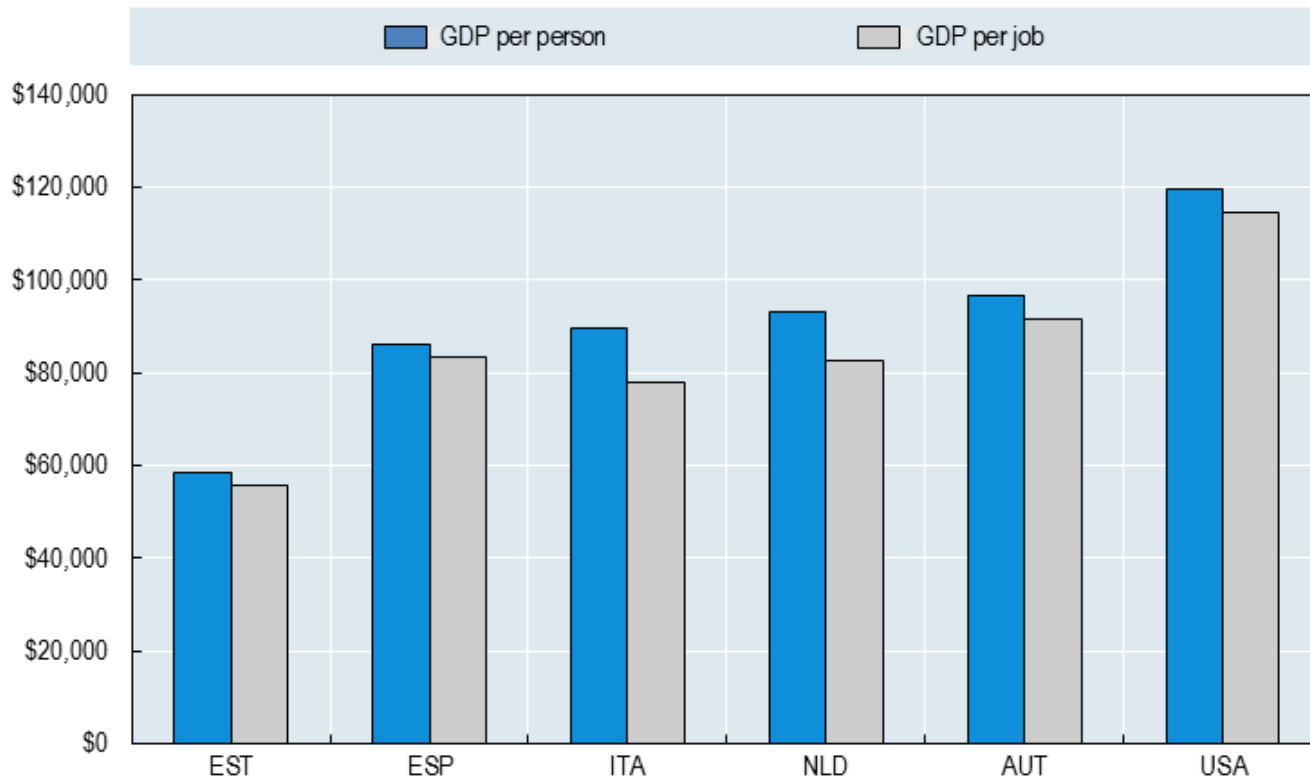


Back up slides



Measuring employment: persons vs jobs

Labour productivity in the total economy US dollars, current PPPs, in 2015



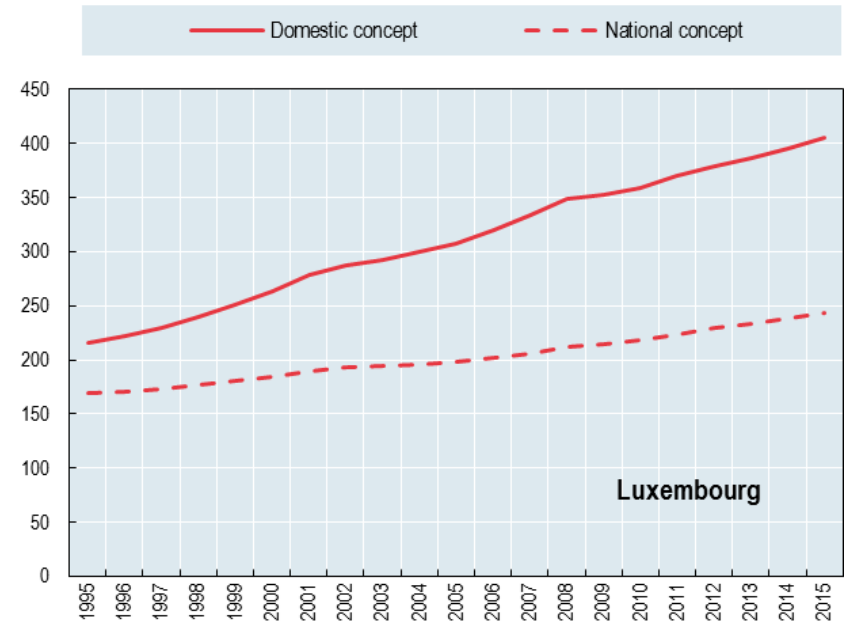
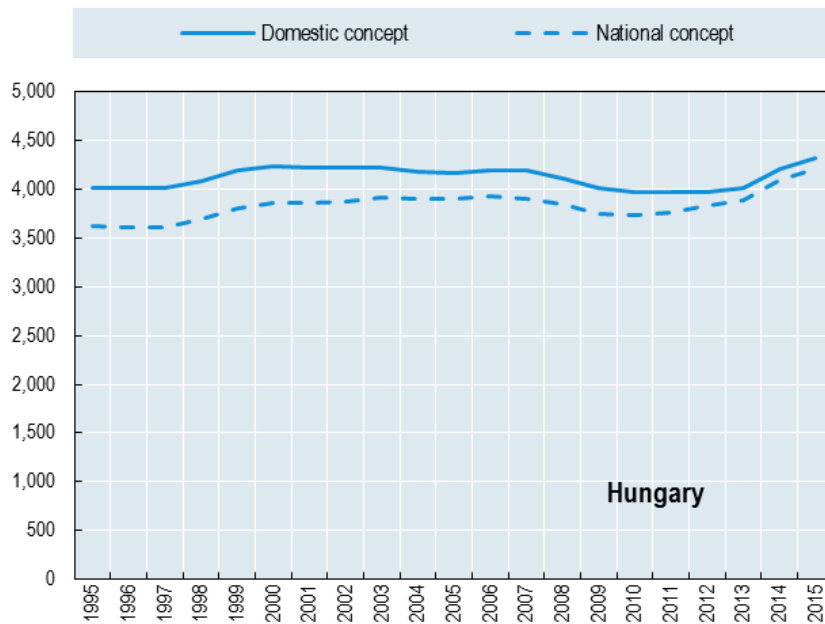
Source: OECD National Accounts Statistics (database), http://stats.oecd.org/Index.aspx?DataSetCode=SNA_TABLE3





Number of persons employed: Domestic vs national concept

Employment in the total economy Thousands of persons



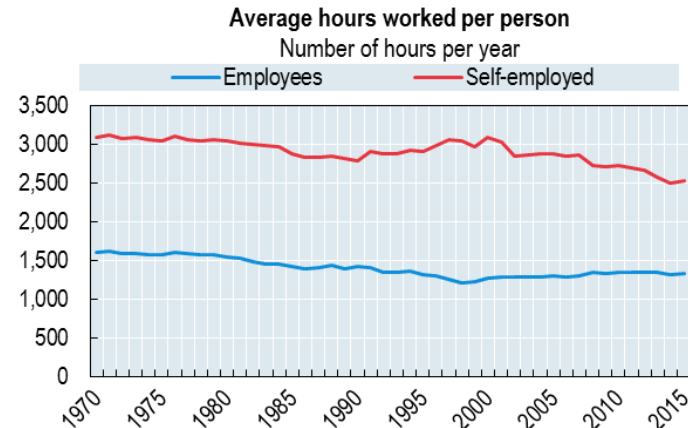
Source: OECD National Accounts Statistics (database), http://stats.oecd.org/Index.aspx?DataSetCode=SNA_TABLE3



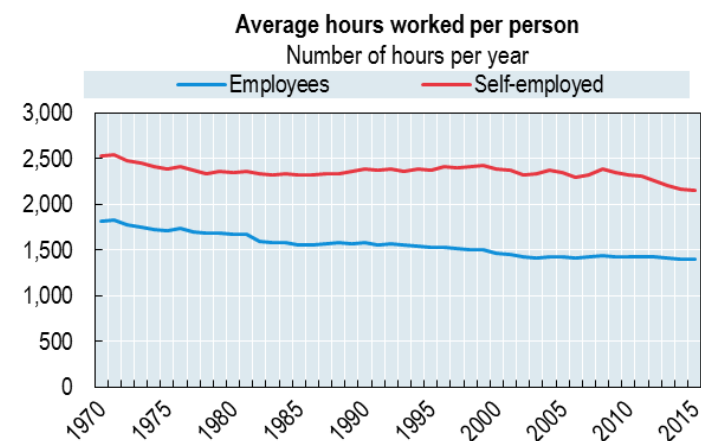
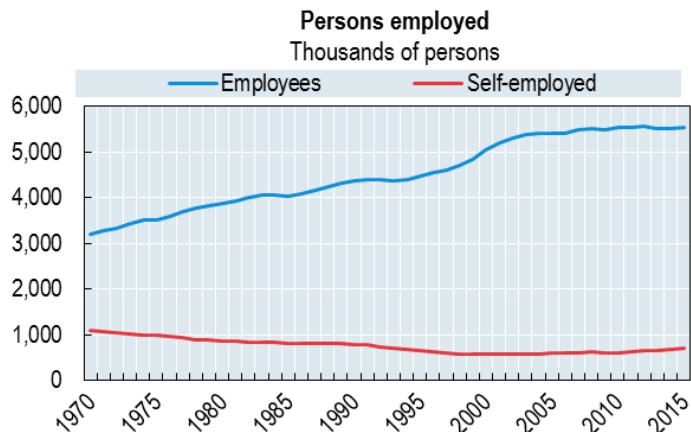


Hours worked and persons employed: coverage of employees and self-employed

Agriculture, forestry and fishing, France



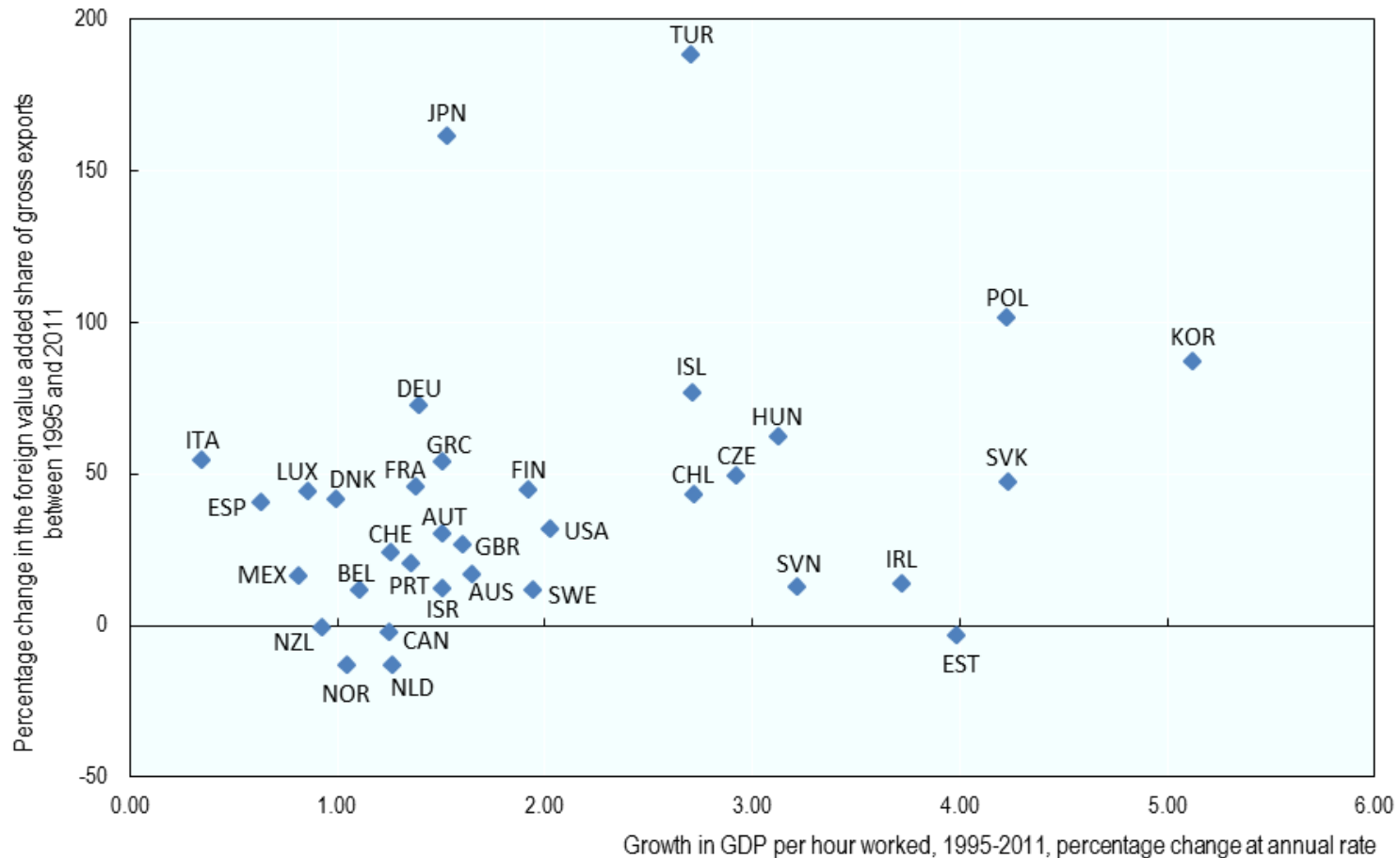
Trade, repairs; transport; accommodation and food serv., France





Integration in GVC and productivity

Integration in GVC and labour productivity, total economy



OECD (2016), OECD Compendium of Productivity Indicators 2016, OECD Publishing, Paris, <http://dx.doi.org/10.1787/pdtvy-2016-en>

