



# Trade in Value Added and Labor Productivity

**25<sup>th</sup> INFORUM World Conference**  
**Riga Technical University**  
**Riga, Latvia**  
**August 28th – September 2<sup>nd</sup> 2017**

Toshiaki Hasegawa

CHERP

Faculty of Economics

Chuo University

Tokyo, JAPAN

[vinomac@tamacc.chuo-u.ac.jp](mailto:vinomac@tamacc.chuo-u.ac.jp)

1

## Background of Japanese low productivity

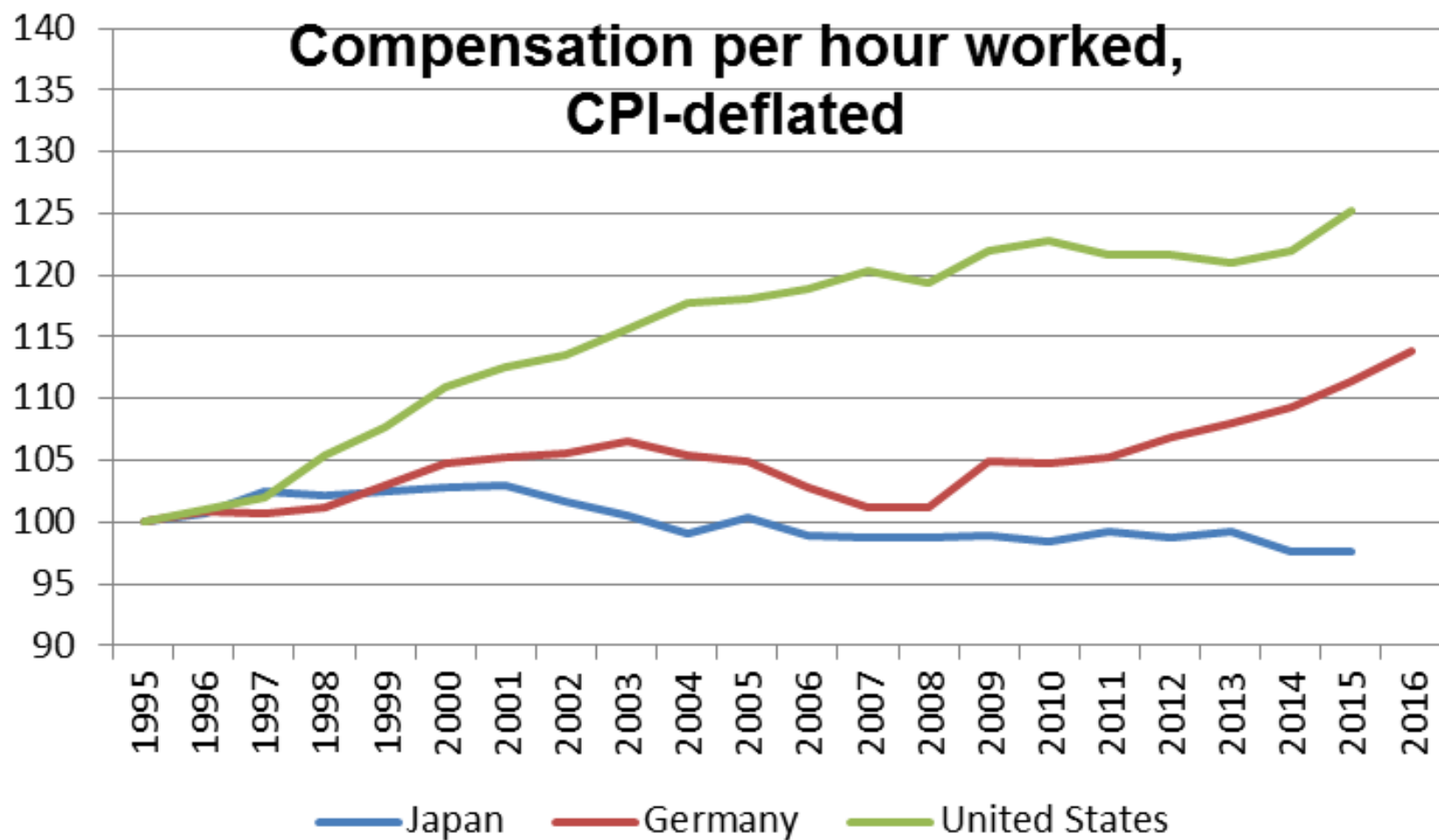
- Industry`s productivity of Japan is related to International Competitiveness.
- We examine how the data of Trade in Value-Added is preferable much more than the data in gross trade data.
- Japanese industries are totally cautious to introduce foreign value added.

# Labour Productivity Indicators

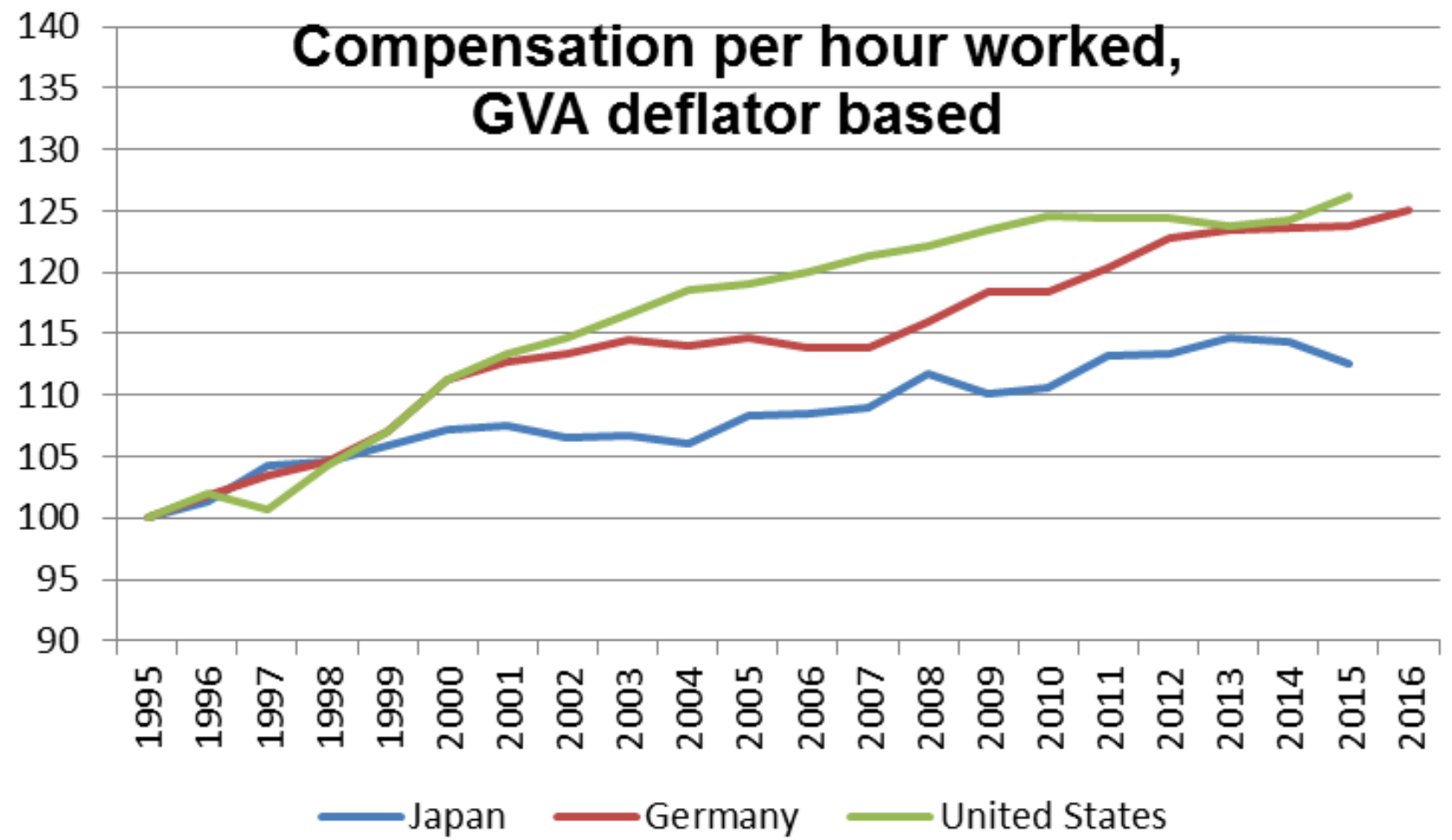
- OECD.STAT
- This dataset is an archived version of STAN Indicators in ISIC Rev.3 SNA93.
- Other data characteristics of Labour productivity index
- Labour productivity is here calculated as the ratio of value added volumes to number engaged. Labour productivity represents the amount of output per unit of input, output being here defined as value added while the input measure used is total employment.
- Although hours worked would be preferable as a measure of labour input, at the present time consistent hours worked data at the industry level are not available in STAN Database for all OECD countries.
- Series for this indicator are presented as indices, having data for the reference year of each country = 100 (most countries use 2000 as ref. year). This indicator is not calculated for zones (i.e. country groups).
- Concepts & Classifications
- This indicator is calculated as follows:
  - $100 * (\text{VALK}_i / \text{EMPN}_i) / (\text{VALK}_{i\_2000} / \text{EMPN}_{i\_2000})$
  - 1999-2009 for Japan,
  - **VALK**: Value added, volumes
  - **EMPN**: Number of persons engaged (total employment)

## Change of Productivity & VA in Export in Japan, Germany and U.S.A.

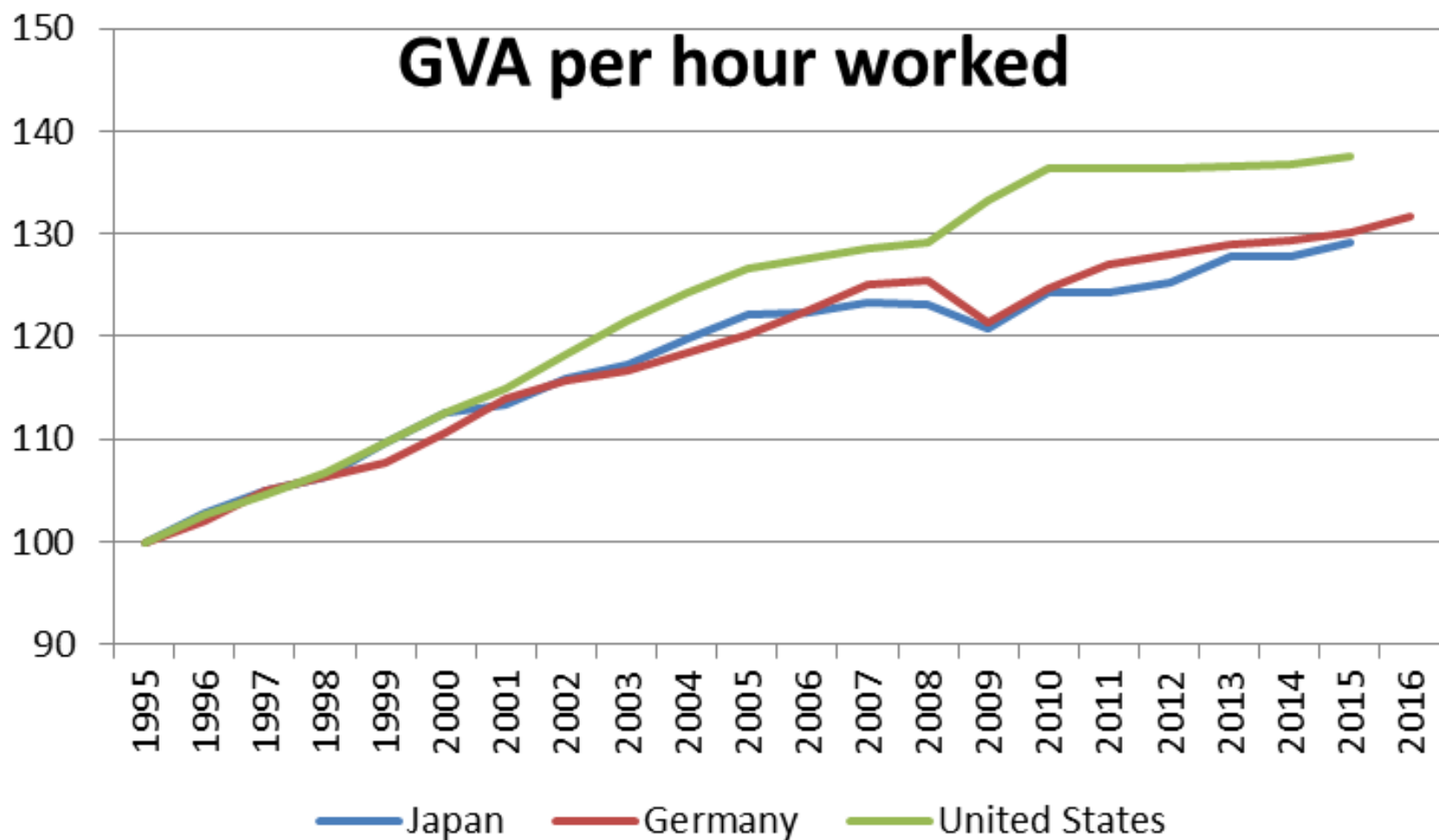
- Selected OECD countries, GVA per hour worked and average hourly labour compensation, indices 1995=100
- Notes:
  - Gross value added (GVA) at basic prices per hour worked (by total persons employed) is deflated using the GVA deflator.
  - Average labour compensation per hour worked (by employees) is deflated using country's GVA deflator and the CPI (all items).
- Sources:
  - OECD Compendium of Productivity Indicators 2017 - © OECD 2017
  - OECD National Accounts Statistics (database), April 2017.
  - OECD Productivity Statistics (database), April 2017.
  - OECD Main Economic Indicators (database), April 2017.



### Compensation per hour worked, GVA deflator based

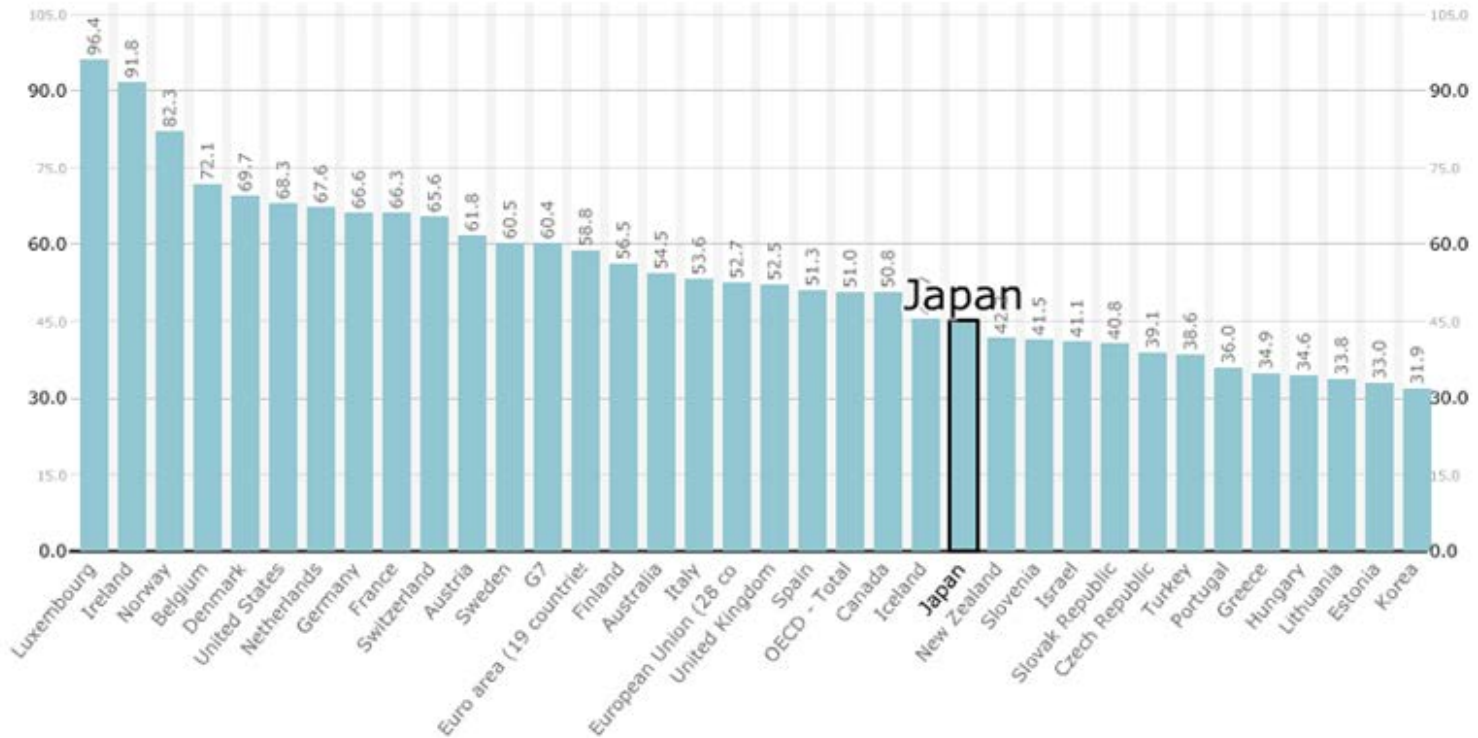


## GVA per hour worked



GDP per hour worked, USD, current prices

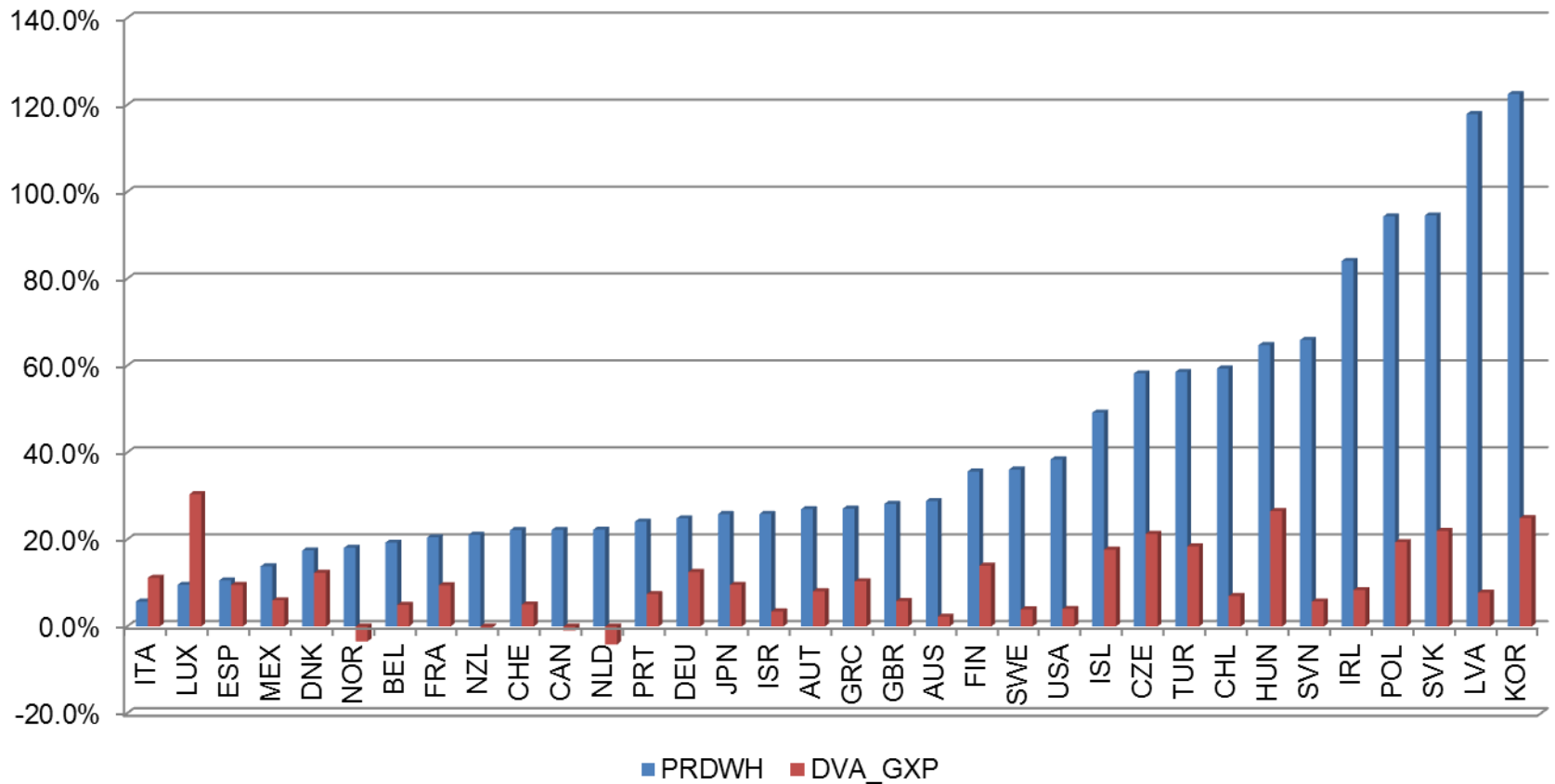
## GDP per hour worked, USD, current prices, current PPPs



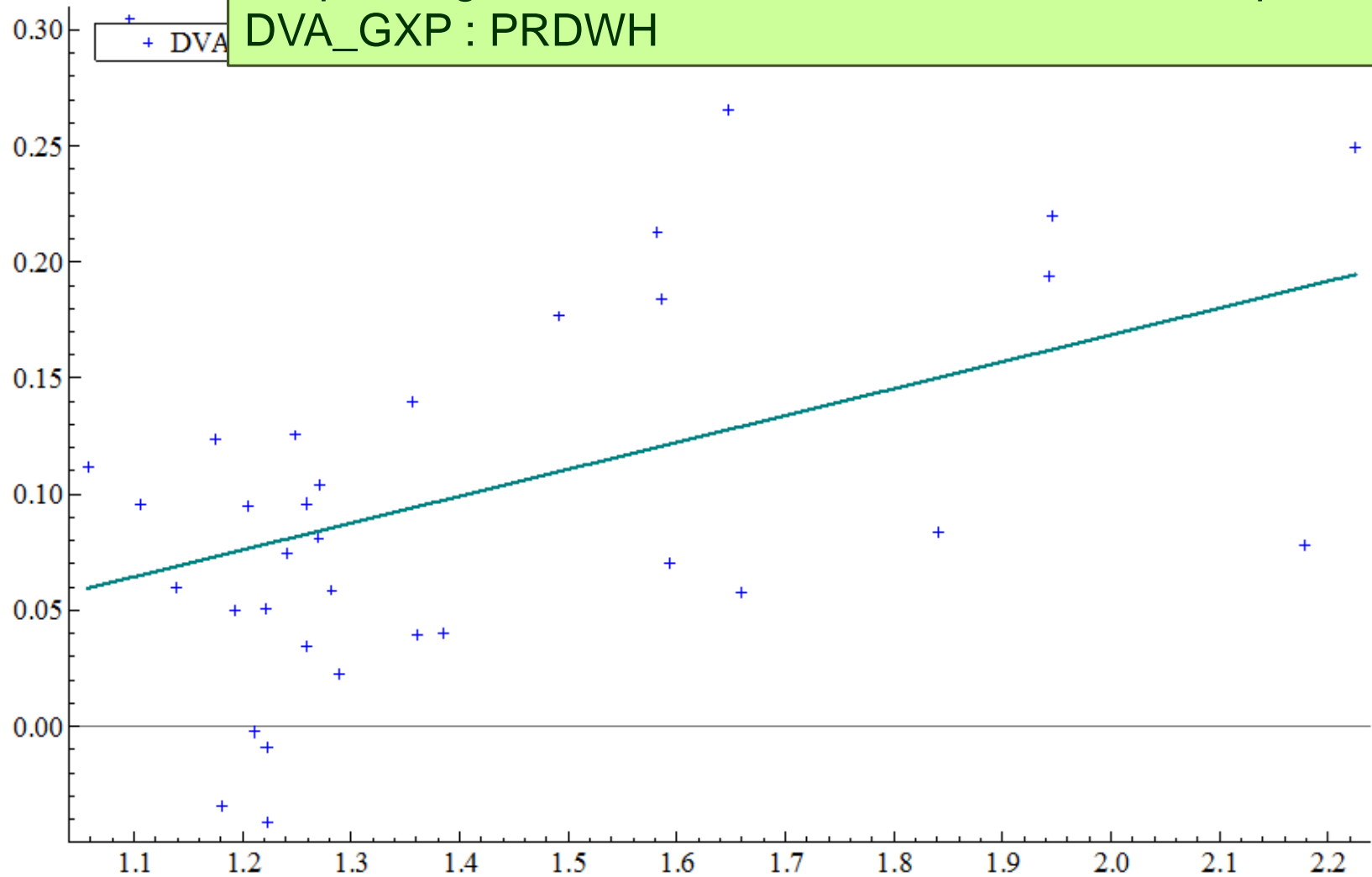
Source: OECD, Level of GDP per capita and productivity



## GDP per hour worked and Domestic Value-Added to Gross Exort unit: change of 2011 to 1995



Economies with Higher Productivity have not necessarily adopted higher Domestic Value-Added to Gross Export  
DVA\_GXP : PRDWH



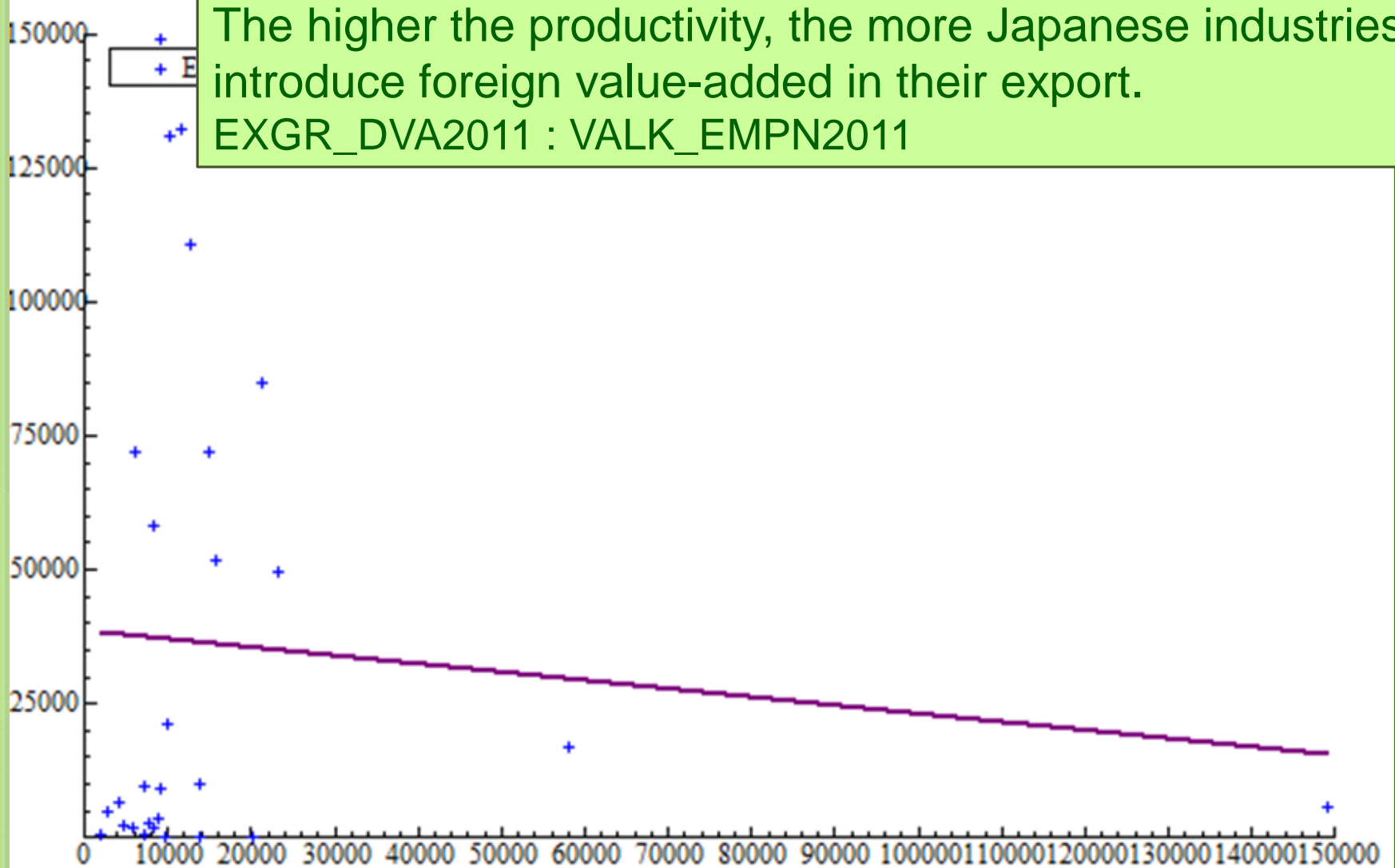
## Compared between countries, Productivity is not necessarily correlated to domestic value-added.

Method of estimation = Ordinary Least Squares

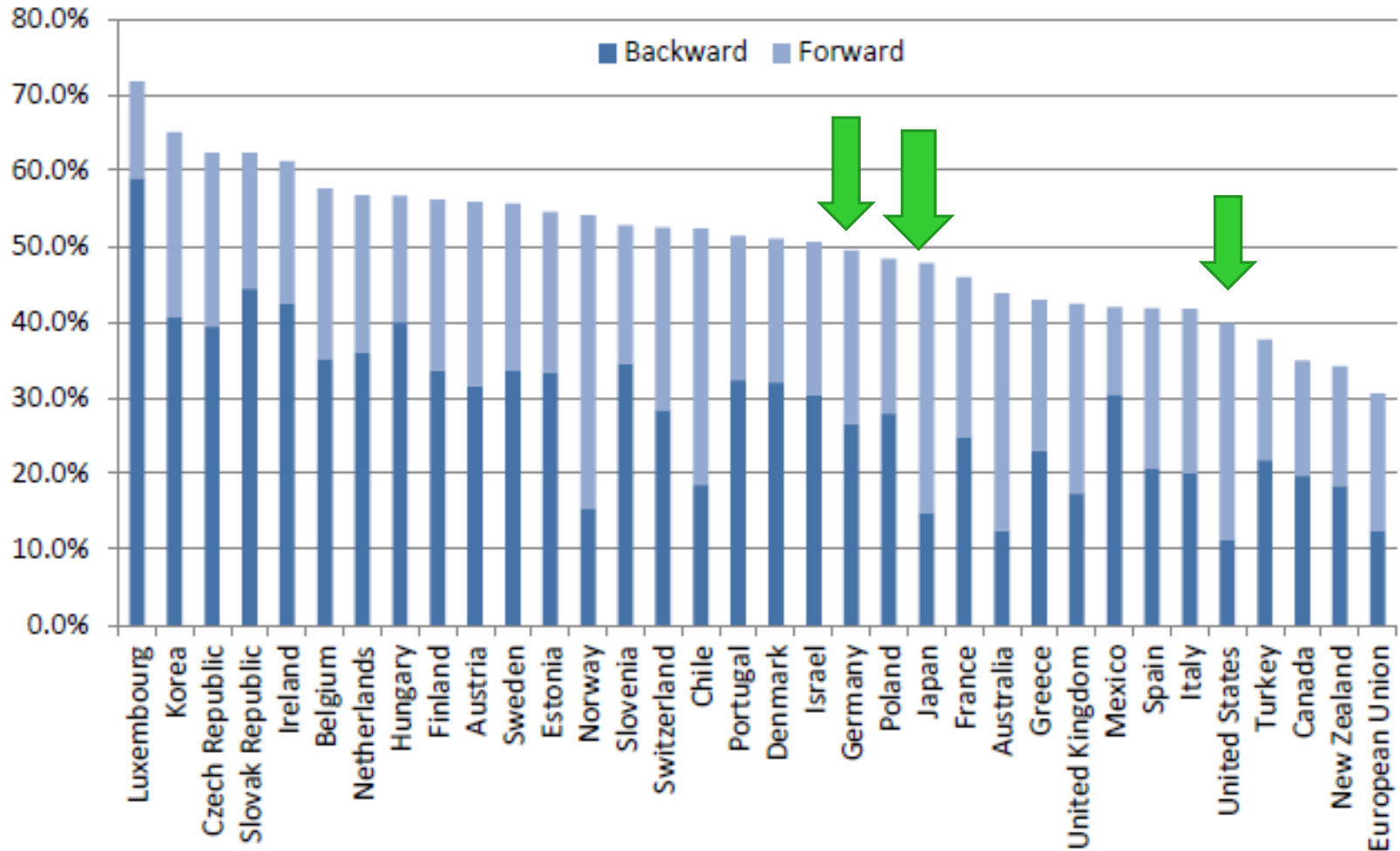
Dependent variable: PRDWH      Number of observations: 34

Mean of dep. var. = 1.41017      LM het. test = 4.40486 [.036]  
 Std. dev. of dep. var. = .308473      Durbin-Watson = 1.95361 [<.492]  
 Sum of squared residuals = 2.57624      Jarque-Bera test = 5.77631 [.056]  
 Variance of residuals = .080508      Ramsey's RESET2 = .180940 [.674]  
 Std. error of regression = .283739      F (zero slopes) = 7.00429 [.013]  
    R-squared = .179578      Schwarz B.I.C. = 7.90979  
    Adjusted R-squared = .153939      Log likelihood = -4.38343

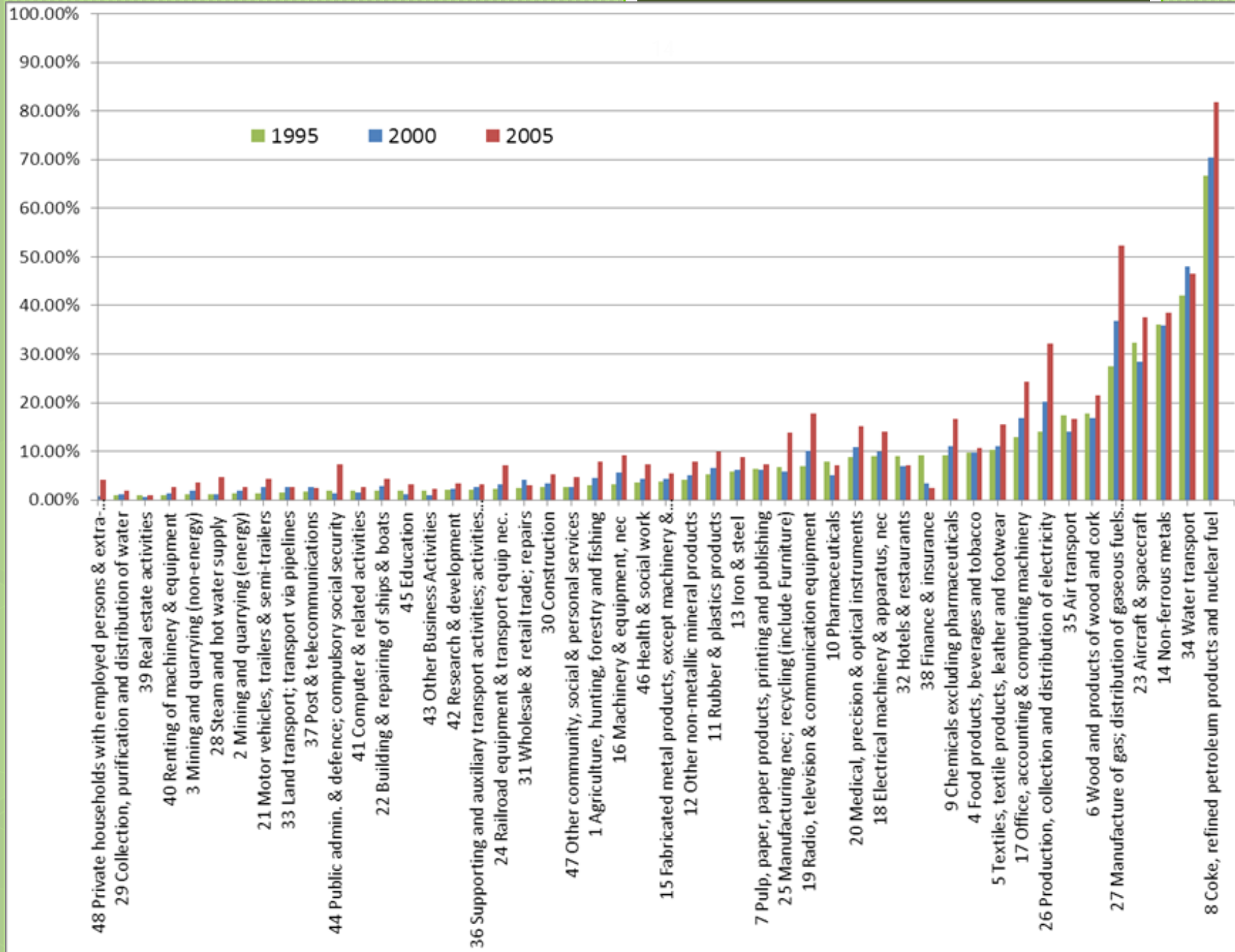
Variable	Estimated Coefficient	Standard Error	t-statistic	P-value
C	1.25435	.076385	16.4214	[.000]
DVA_GXP	1.55227	.586521	2.64656	[.013]



Foreign inputs (backward participation) and domestically-produced inputs used in their countries' exports (forward participation), as a share of gross exports (%).



Source: Authors' calculations using the OECD ICIO model, May 2013 release.



Thank you for listening