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PÉCSI TUDOMÁNYEGYETEM
KÖZGAZDASÁGTUDOMÁNYI KAR

Do we need manufacturing?

History

- Before 1980: Inventory management
- 1980-1995: Production management
- 1990- : Operations management
- 2015- : Process management

What is process management

- Process management: is about designing, managing, and improving the set of activities that create products and services and deliver them to customers

Criterias of efficiency are not the same for each industry

Product type:	Innovative	Functional
Product variety	high	low
Average error in the forecast at the time production is completed	40-100%	10%
Average stockout rate	10-40%	1-2%
Lead time required for make-to-order products	1 day – 2 weeks	6 months to 1 year
Contribution marging	20-60%	5-20%

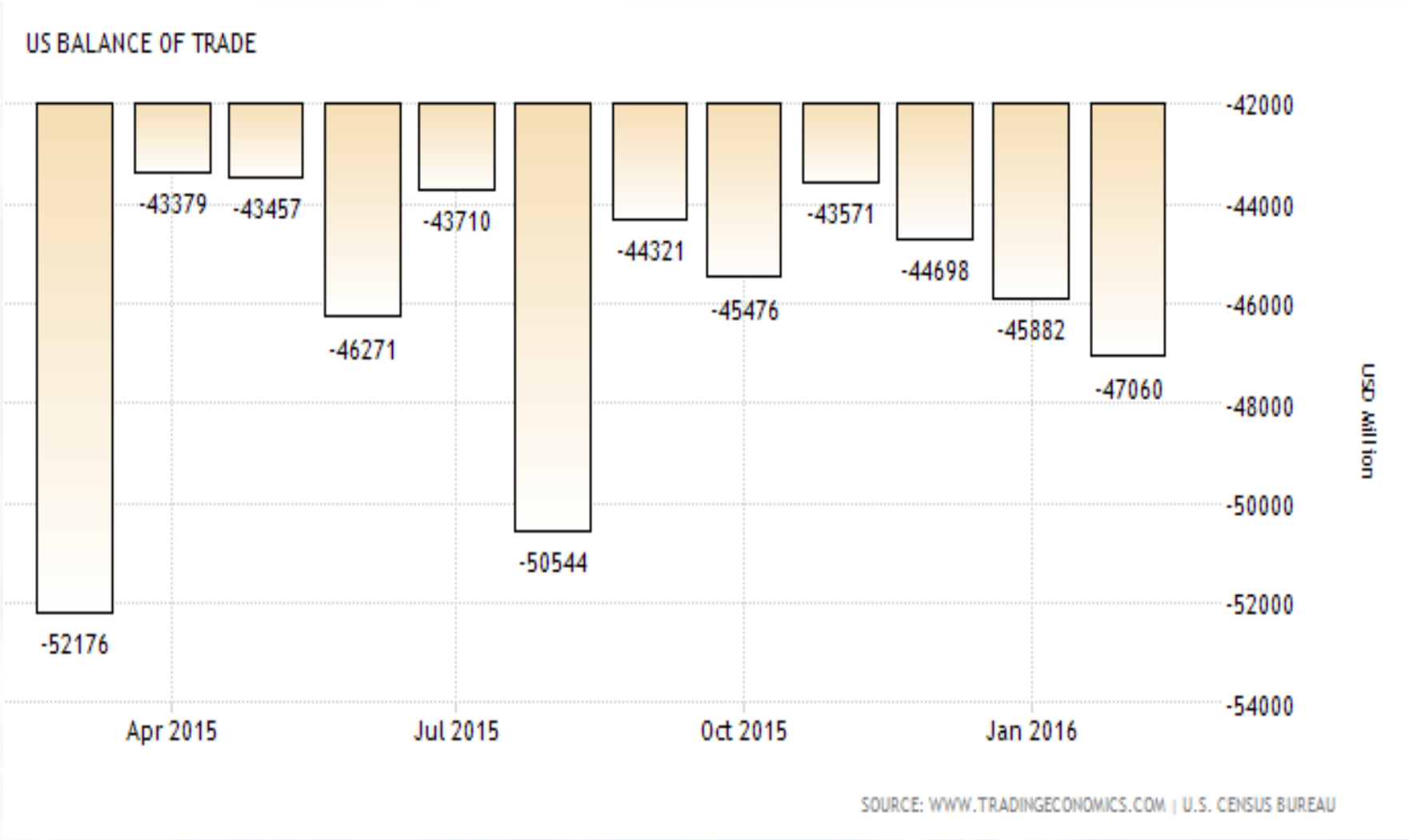
Driving forces of globalization

- The decrease of transportation costs
- The decrease of communications cost
- The development of the financial sector
- The disappearance of trade barriers

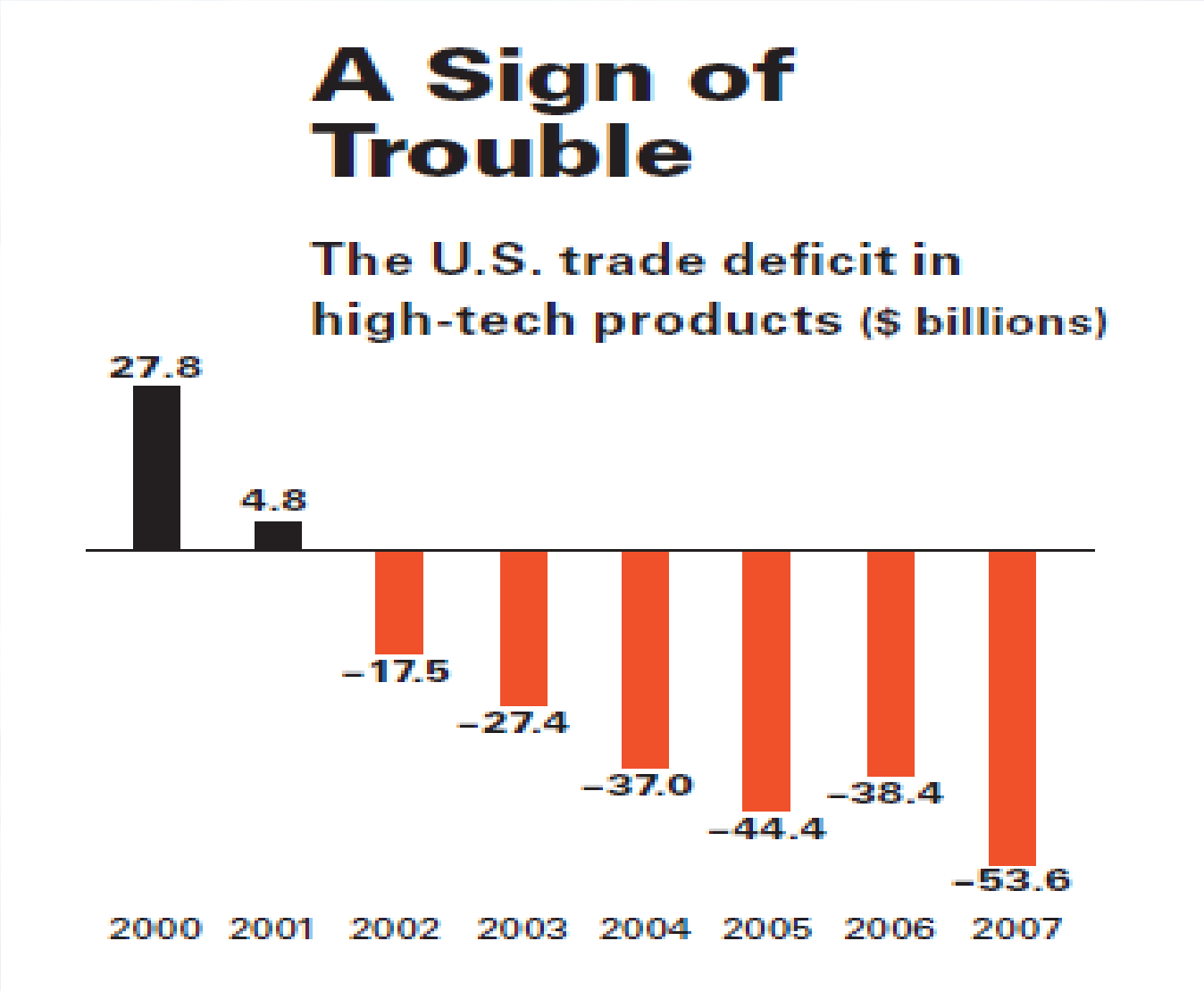
Some consequences of globalization

- Primarily: it intensifies the competition facing a worker. Consider the additional supply of global labor created by four populous countries:
- China: 780 million
- India: 478 million
- Brazil: 95 million
- Russia: 75 million

US balance of trade, latest months



The high tech sector



Lost industries

Going…Going…Gone

Many high-tech products can no longer be manufactured in the United States because critical knowledge, skills, and suppliers of advanced materials, tools, production equipment, and components have been lost through outsourcing. Many other products are on the verge of the same fate.

Semiconductors

ALREADY LOST

"Fabless" chips

AT RISK

DRAMs

Flash memory chips

Lighting

ALREADY LOST

Compact fluorescent lighting

AT RISK

LEDs for solid-state lighting, signs, indicators, and backlights

Electronic displays

ALREADY LOST

LCDs for monitors, TVs, and handheld devices like mobile phones

Electrophoretic displays for Amazon's Kindle e-reader and electronic signs

AT RISK

Next-generation "electronic paper" displays for portable devices like e-readers, retail signs, and advertising displays

Energy storage and green energy production

ALREADY LOST

Lithium-ion, lithium polymer, and NiMH batteries for cell phones, portable consumer electronics, laptops, and power tools

Advanced rechargeable batteries (NiMH, Li-ion) for hybrid vehicles

Crystalline and polycrystalline silicon solar cells, inverters, and power semiconductors for solar panels

Computing and communications

ALREADY LOST

Desktop, notebook, and netbook PCs

Low-end servers

Hard disk drives

Consumer-networking gear such as routers, access points, and home set-top boxes

AT RISK

Blade servers, midrange servers

Mobile handsets

Optical-communication components

Advanced materials

ALREADY LOST

Advanced composites used in sporting goods and other consumer gear

Advanced ceramics

Integrated circuit packaging

AT RISK

Carbon composite components for aerospace and wind energy applications

The effect of outsourcing on innovation

- When a country loses the capability to manufacturing, it loses the ability to innovate
  (Pisano & Shih: Producing Prosperity, HBR Press, 2012)

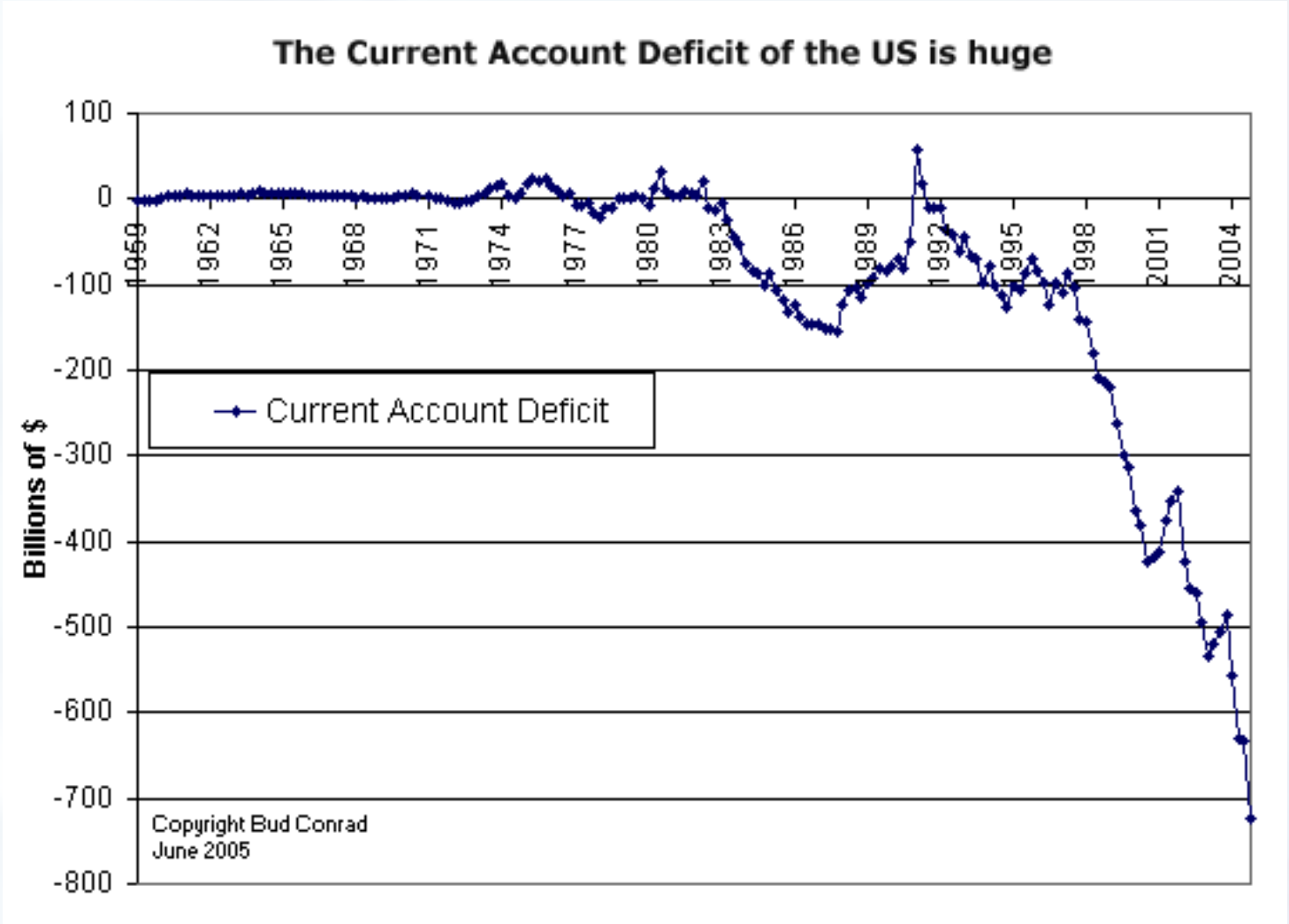
- Rechargeable batteries: the market is dominated by South Korean, Japanese and Chinese manufacturers. Reason: their expertise in consumer solutions for lithium ion batteries.

- The Asian Pacific region is a ***manufacturing hub*** for all electronic components and has all the supporting infrastructure required for large scale production of batteries for hybrid electric vehicles

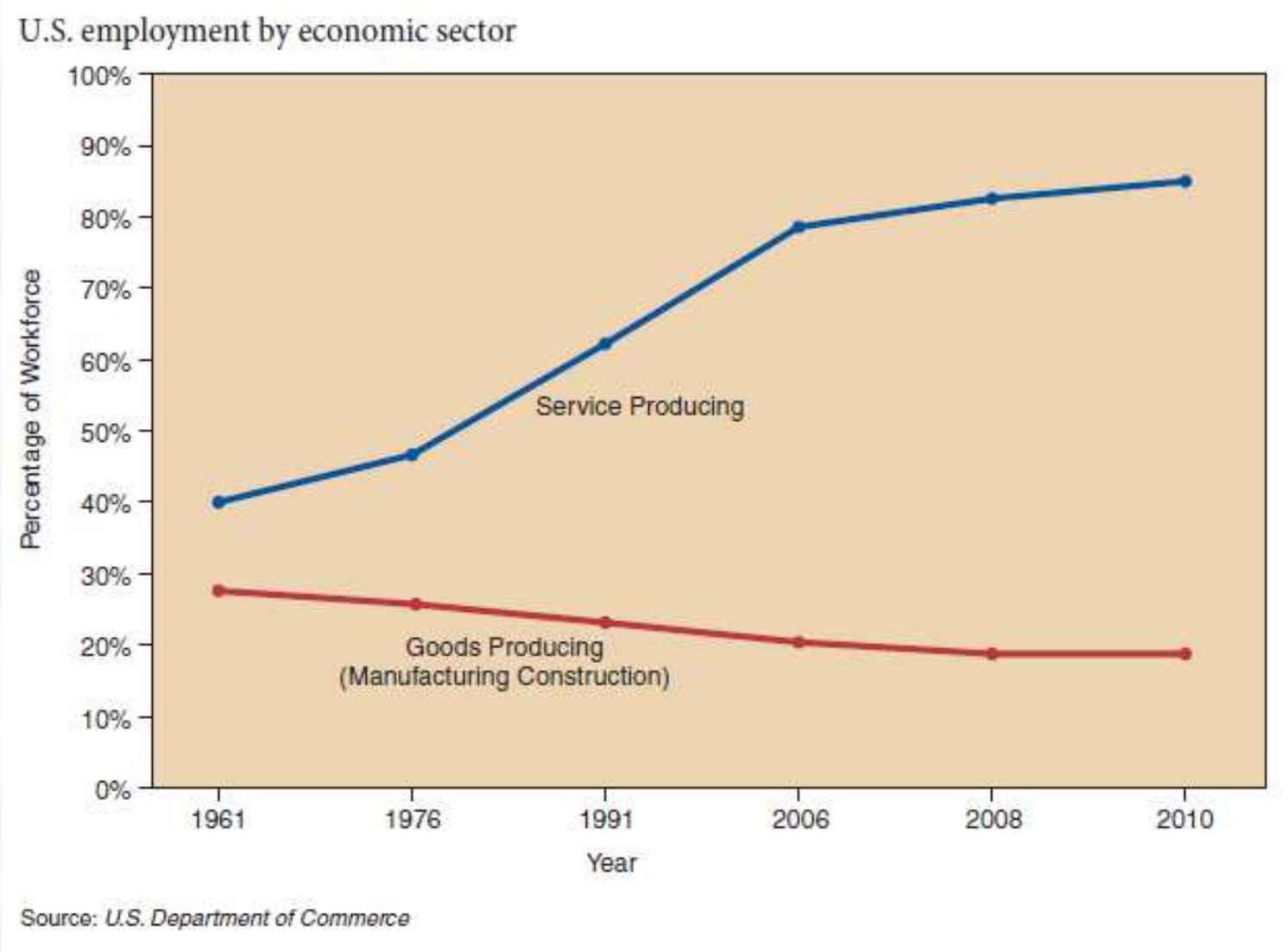
The Industrial Commons

- The industrial commons is a platform for growth
- A decline of competitiveness of firms in one sector can have implications for the competitiveness of firms in another
- Industries and suppliers of capabilities to the industries need each other. Kill a critical industry, and the suppliers will not survive for long

The Current Account



Do we have tradeable goods?



Process driven innovation

- Even minor changes in the process can have a huge impact on the product
- The value of closely integrating R&D and manufacturing is extremely high, and the risk of separating them are enormous
- Outsourcing processes to lower-cost locations far away from R&D you lose the ability to create new commercially viable products

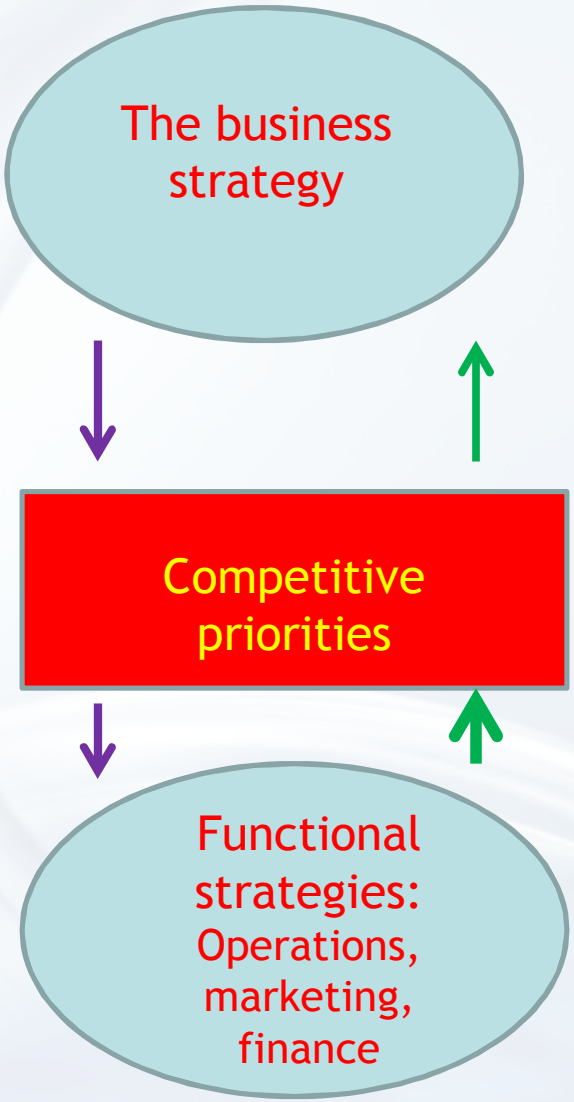
The source of competitiveness: productivity

- The country needs to be competitive in producing tradable goods

- A country is competitive if its companies are able to compete successfully in the global economy while supporting high and rising living standards for an average citizen of the nation (Porter-Rivkin-Vietor, HBR, 2015)

- Competitiveness hinges on productivity: ***the value of goods and services produced per unit of human, capital and natural resources***

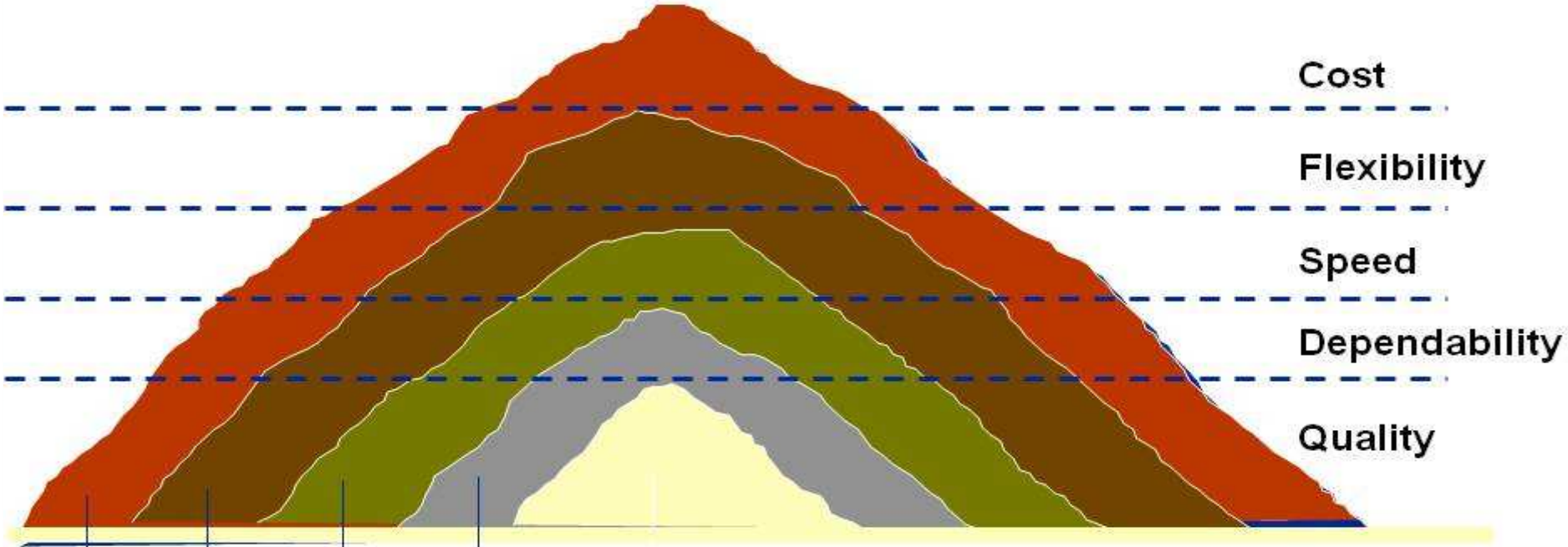
The indicators of competitiveness



- Price/cost
- Performance quality
- Conformance quality
- Volume flexibility
- Variety flexibility
- In time delivery
- Short leadtime
- Distribution system
- Promotion
- After sales service

Miller, J. G. and A. V. Roth, 1994, A Taxonomy of Manufacturing Strategies, *Management Science*, 40(30), 285-304

The 'Sand Cone' Model



Quality

Quality+ dependability

Quality+ dependability + speed

Quality+ dependability + speed + flexibility

Quality+ dependability + speed + flexibility + cost

Developing advantage in one dimension helps building it in an other one (Ferdows, K. and A. De Meyer, 1990, Lasting improvements in Manufacturing Performance, *Journal of Operations Management, 9, 168-184)*

The deeper routes of success

Watanabe: a The Toyota Way rests on two pillars: the continuous improvement, and respecting people.

(Watanabe: Lessons form Toyota's Long Drive, *Harvard Business Review*, 2007, July-Aug, 74-83

IKEA mugs

Today, there are 2024 mugs on a pallet, the first trial had only 864, which means a 60% reduction in transportation and production costs. Annual production: 25 million

IKEA- Pöang chair

120$

50$

Compying and imitating of success

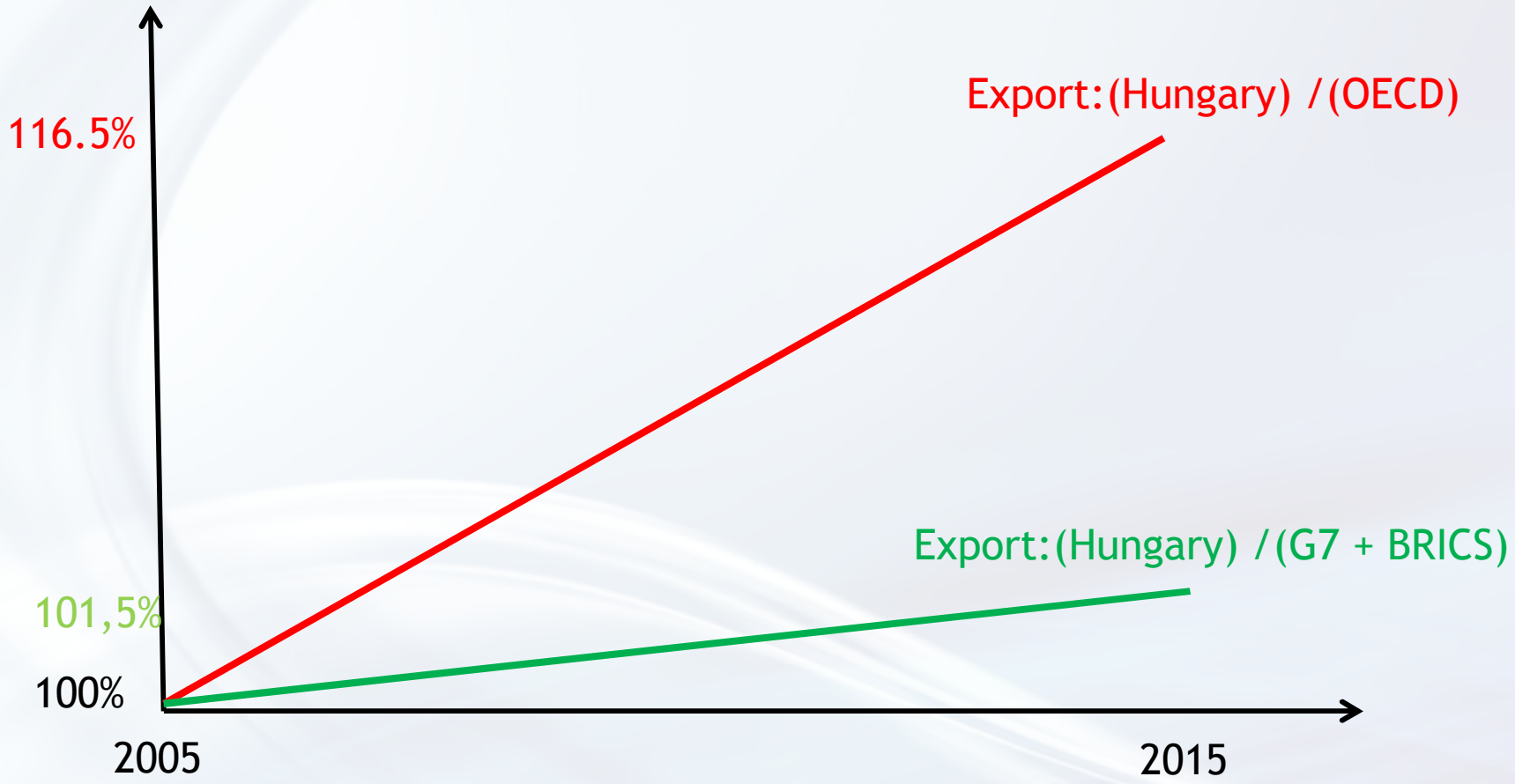
- The practice of implementing the principles of continuous improvement and respecting people requires a long development path and dedicated labor force
- Development paths and attitude towards work may not be purchased on the market

Reshoring Project in Fort Worth

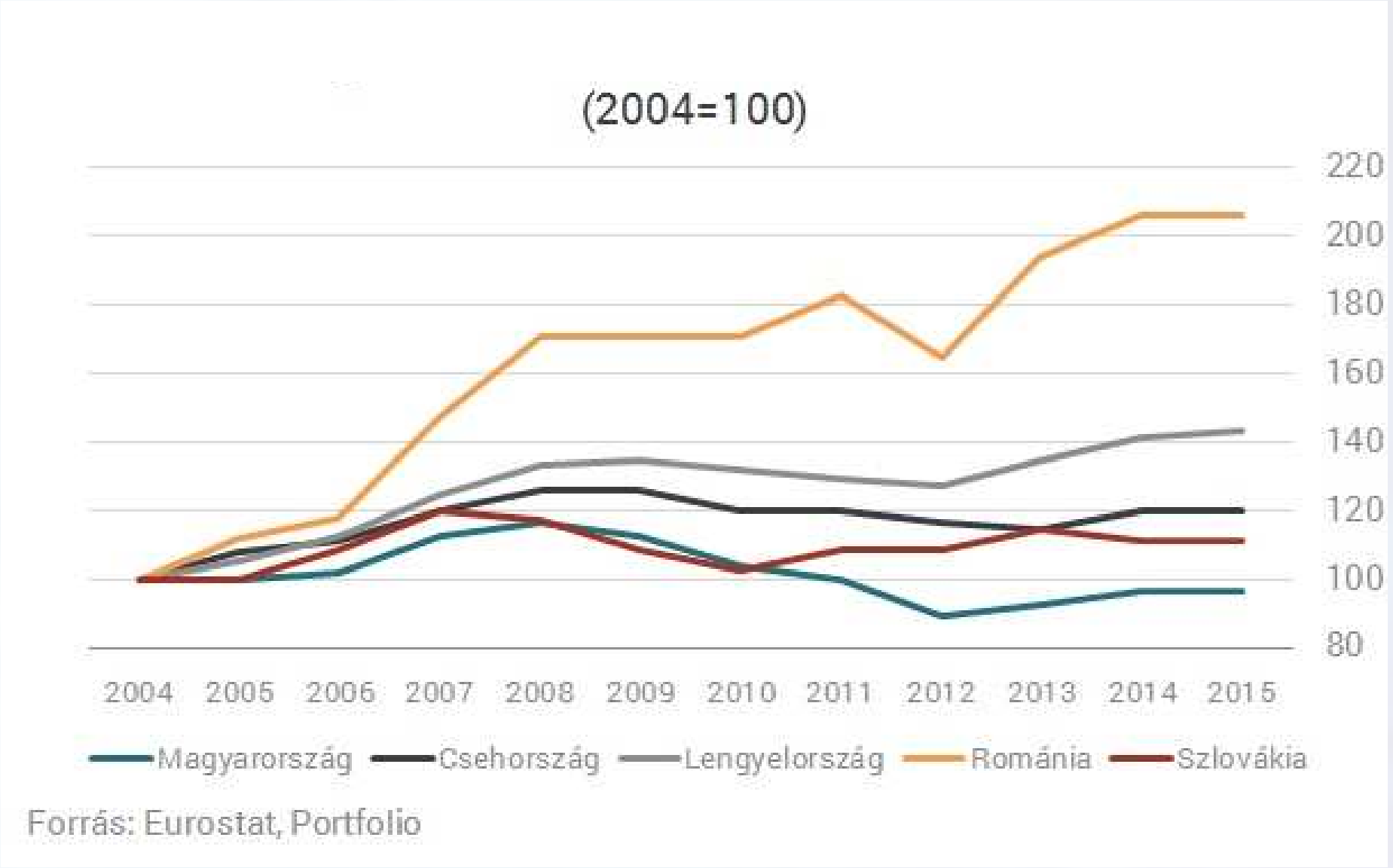
- Appliance Park had a goal of hiring 2500 people
- Started with 10 000 applicants in August, 2012
- 6142 passed the initial screening
- 730 were hired
- 228 terminated at the end of the first year
- (Shih, W. C., What It Takes to Reshore Manufacturing Successfully, Sloan Man. Rev., 2014

Hungary’s competetiveness

Hungary's competitiveness

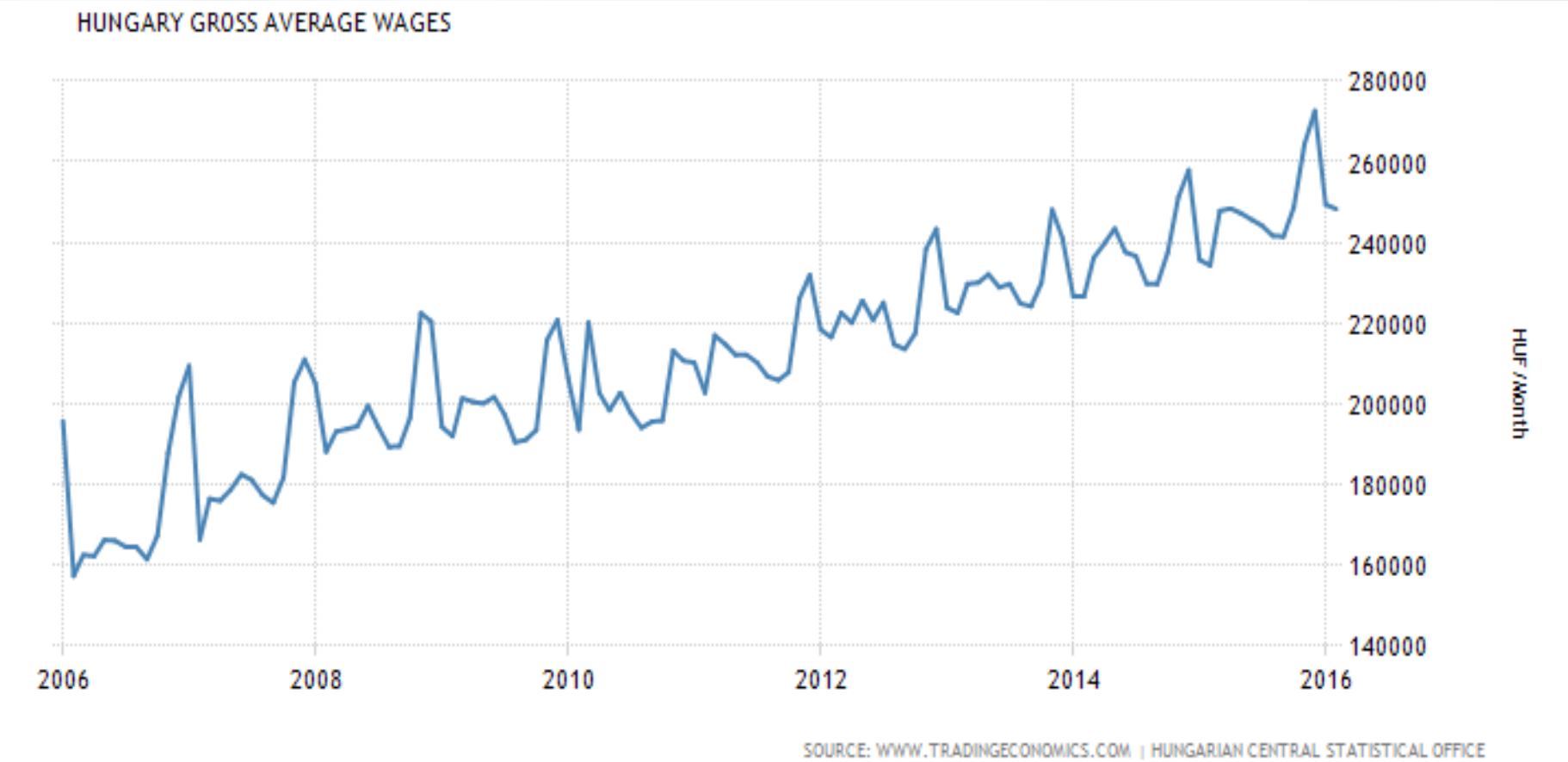


The dynamics of export share of CEEC



Forrás: Eurostat, Portfolio

Hungary, gross average wages

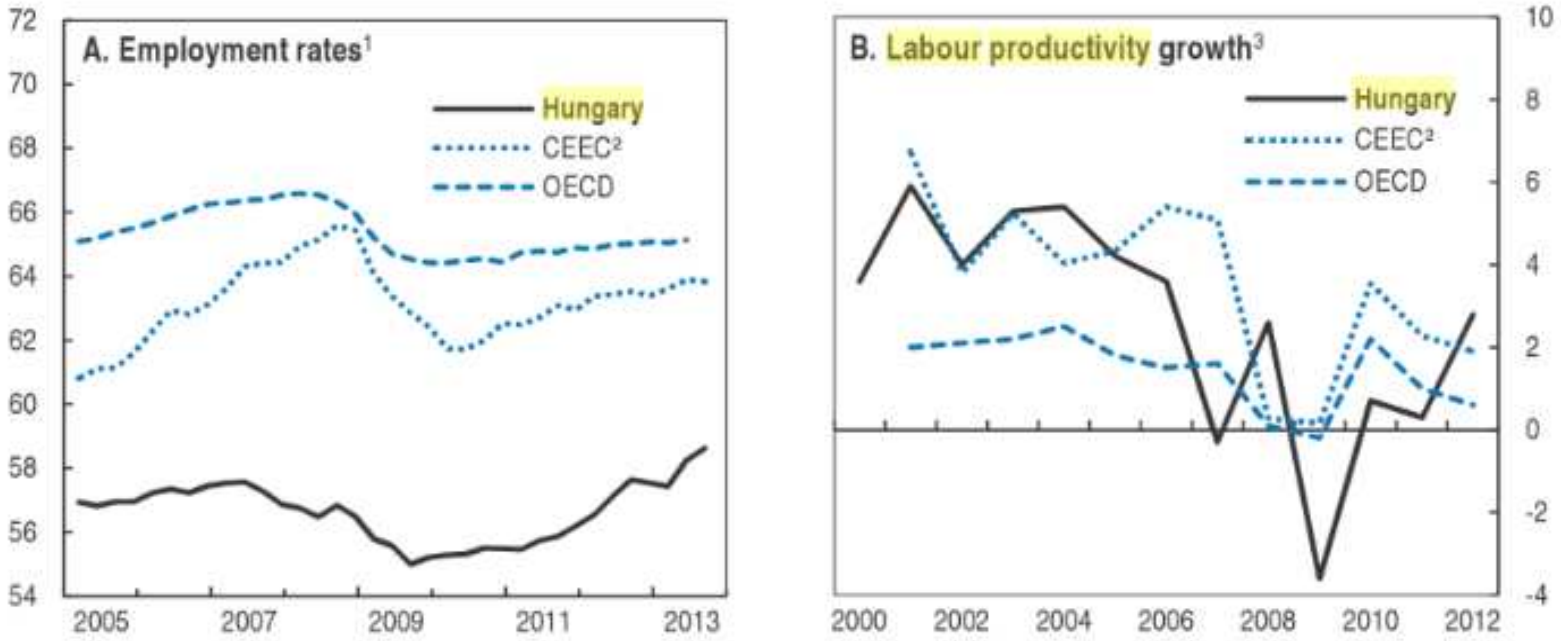


Hungary, current account

Is this sustainable?

Figure 2.1. **Employment and labour productivity growth have been low**

Per cent



1. Age 15-64.
2. Unweighted average of other Central and Eastern European countries (Czech Republic, Estonia, Poland, Slovak Republic and Slovenia).
3. GDP in constant prices per hour worked, total economy.

Source: OECD (2013), *OECD Main Economic Indicators* and *OECD Productivity Statistics* (databases), December.

StatLink http://dx.doi.org/10.1787/888932983357

- Thanks for your kind attention