Productivity in Western and Eastern Germany after the Unification: What can we learn?

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at ERI, Hitotsubashi University
28 February 2015

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Motivation
Differences
Labor and Capital
Productivity gap
Outlook
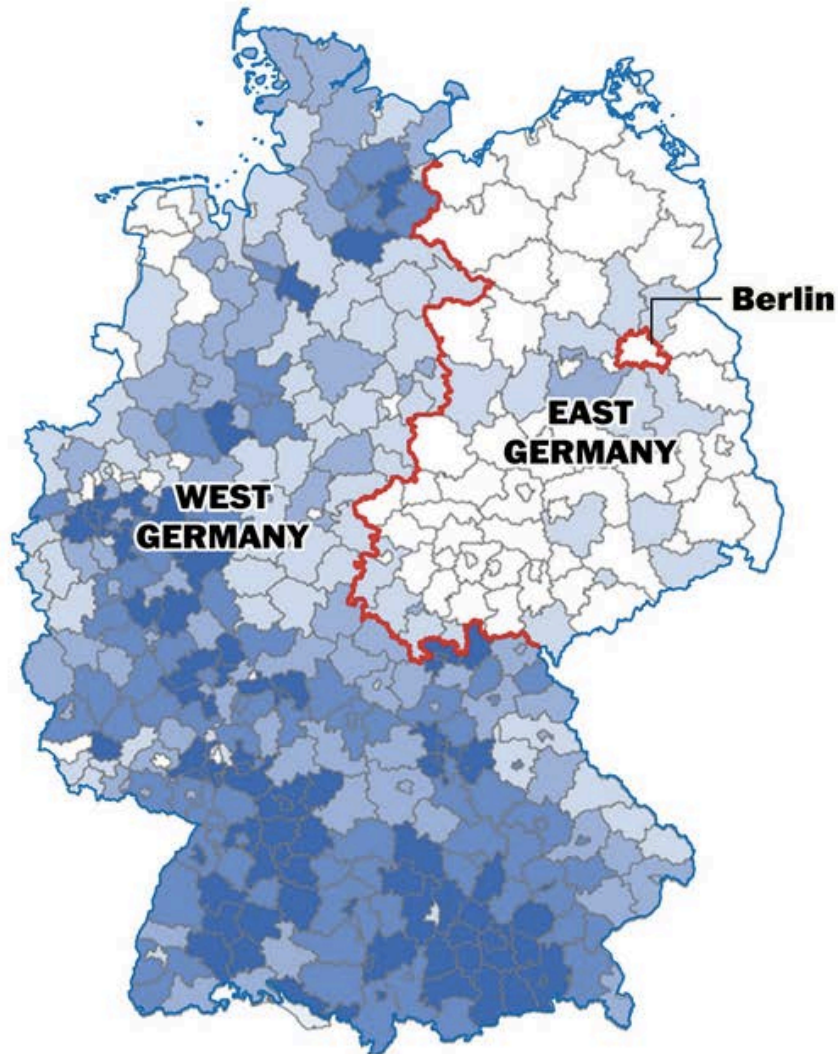
Motivation

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Motivation

- 25 years after the reunification, there is still distinct differences in the patterns of economic development in the western and eastern Germany.
- In particular, the productivity differs in the two regions.
- It is enigmatic why the difference still exists, because:
  - the same culture and language, law, institutions, and other non-physical infrastructure,
  - the almost same conditions of physical infrastructure,
  - the better human capital in Eastern Germany, if formally measure it,
  - the same or better per worker capital stock in the production sector of Eastern Germany,
  - most old managers were replaced with new managers.

2

Motivation **Income**
Differences Unemployment
Labor and Capital Demographics
Productivity gap Farm size
Outlook Child care

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Differences between WG and EG

Disposable **Income**

Data: 2011

More   Less

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Income
Unemployment
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Farm size
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Differences between WG and EG

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Differences
Labor and Capital
Productivity gap
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Income
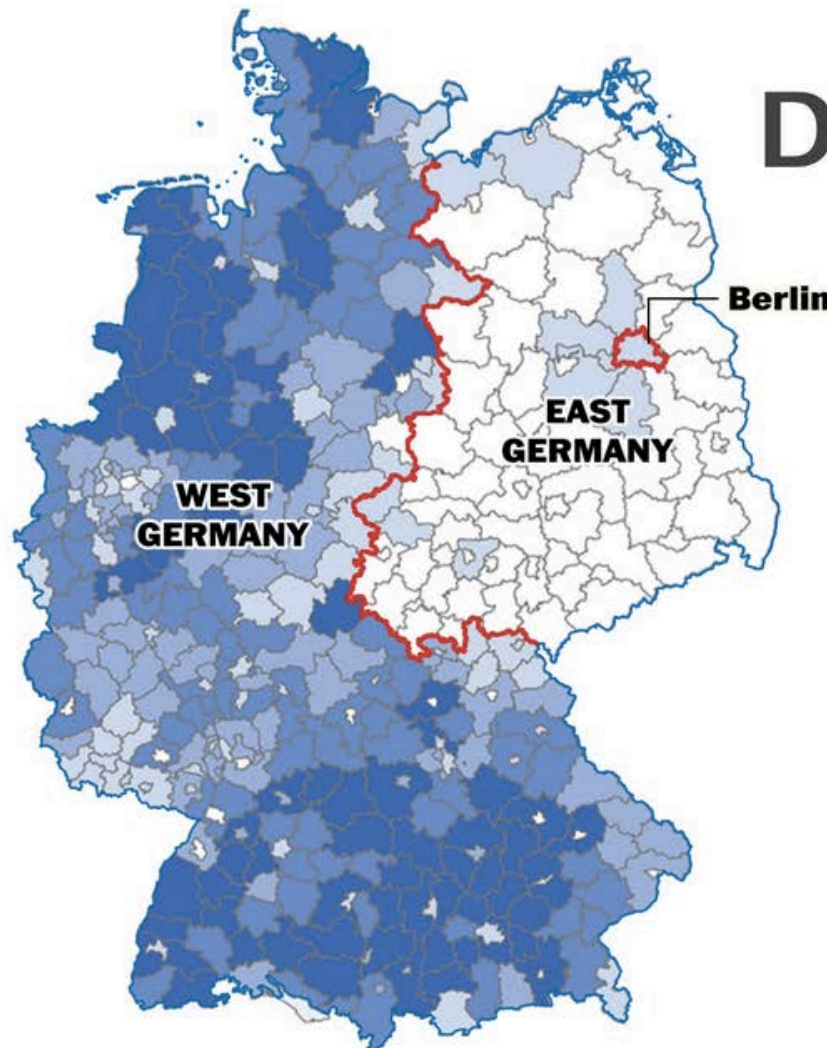Unemployment
Demographics
Farm size
Child care

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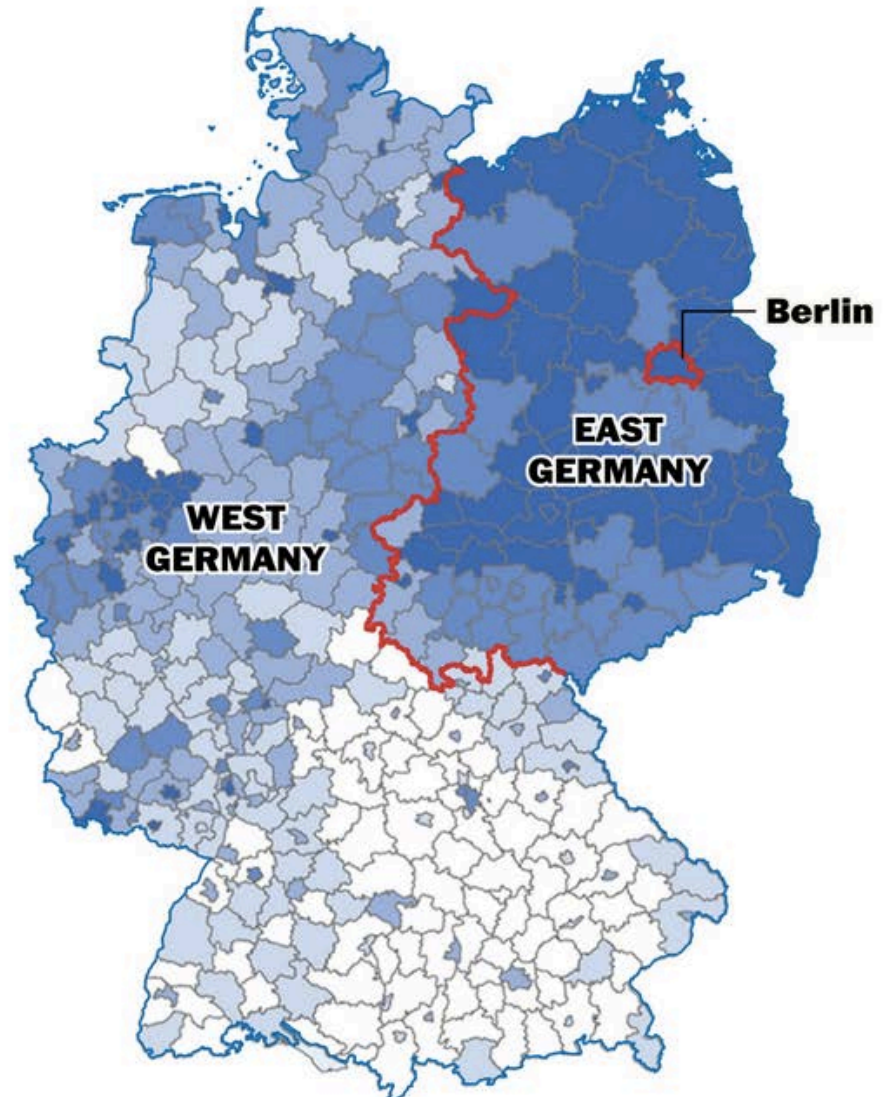
Differences between WG and EG

Demographics

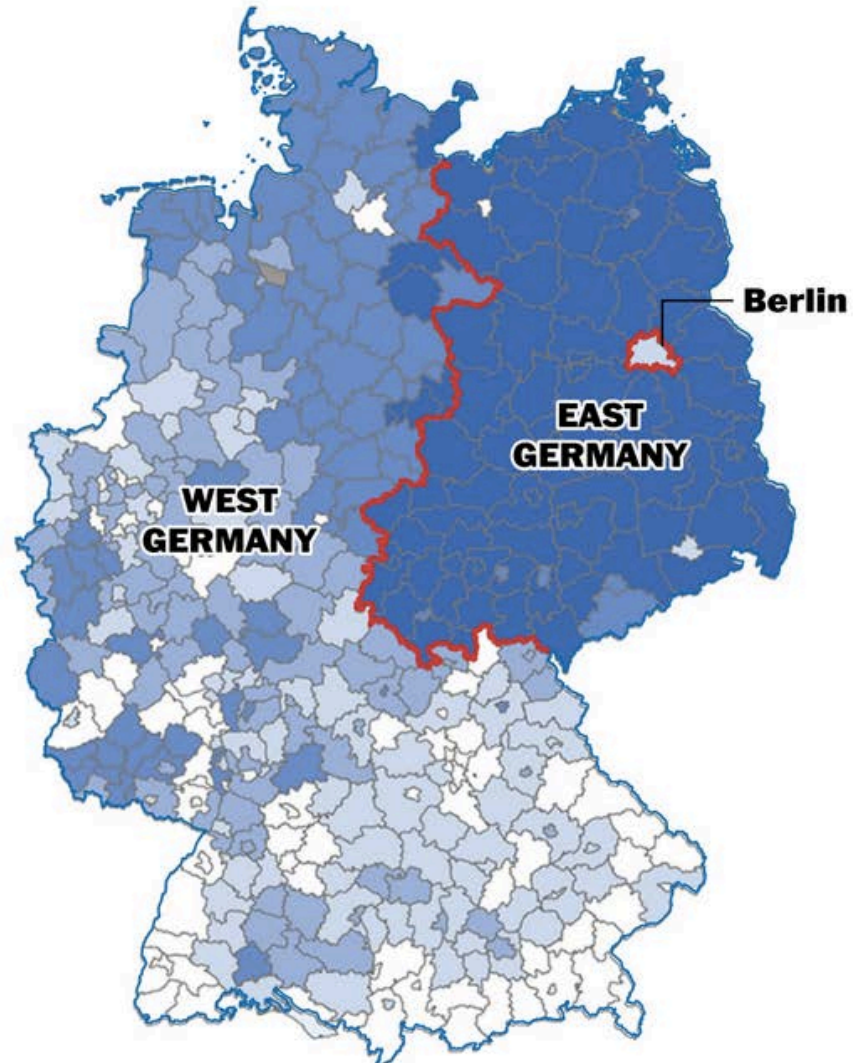Percentage of young people among total population

Data: 2011

Higher   Lower

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Differences between WG and EG

Size of
farms

Data: 2010

Bigger   Smaller

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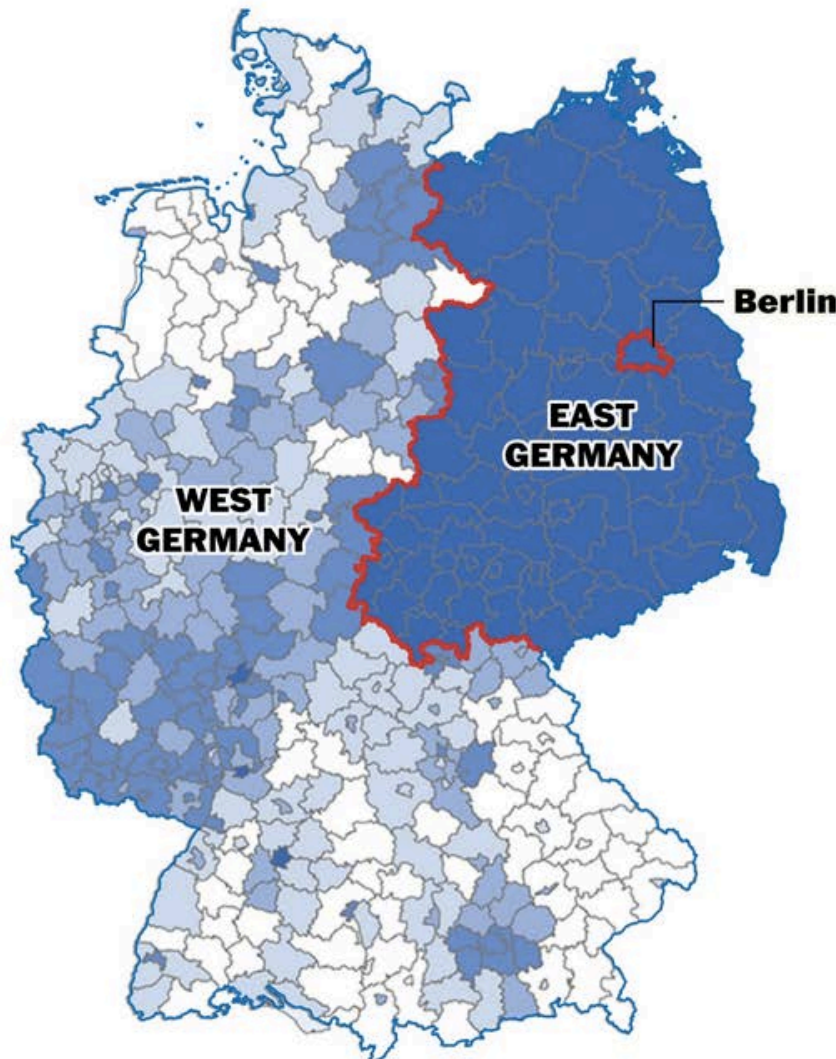Unemployment
Demographics
Farm size
Child care

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Differences between WG and EG

Percentage of
0 – 2 year olds
in full-time
child care

Data: 2013

More care   Less care

Purpose: Let's look at it more in detail!

- I do not have any definite explanation for the productivity gap yet.
- If it is indeed difficult to find the causes, then it would suggest we need to be more carful about the determinants of productivity: per worker capital stock and formally counted education years can not sufficiently account for the productivity level.

Motivation
Differences
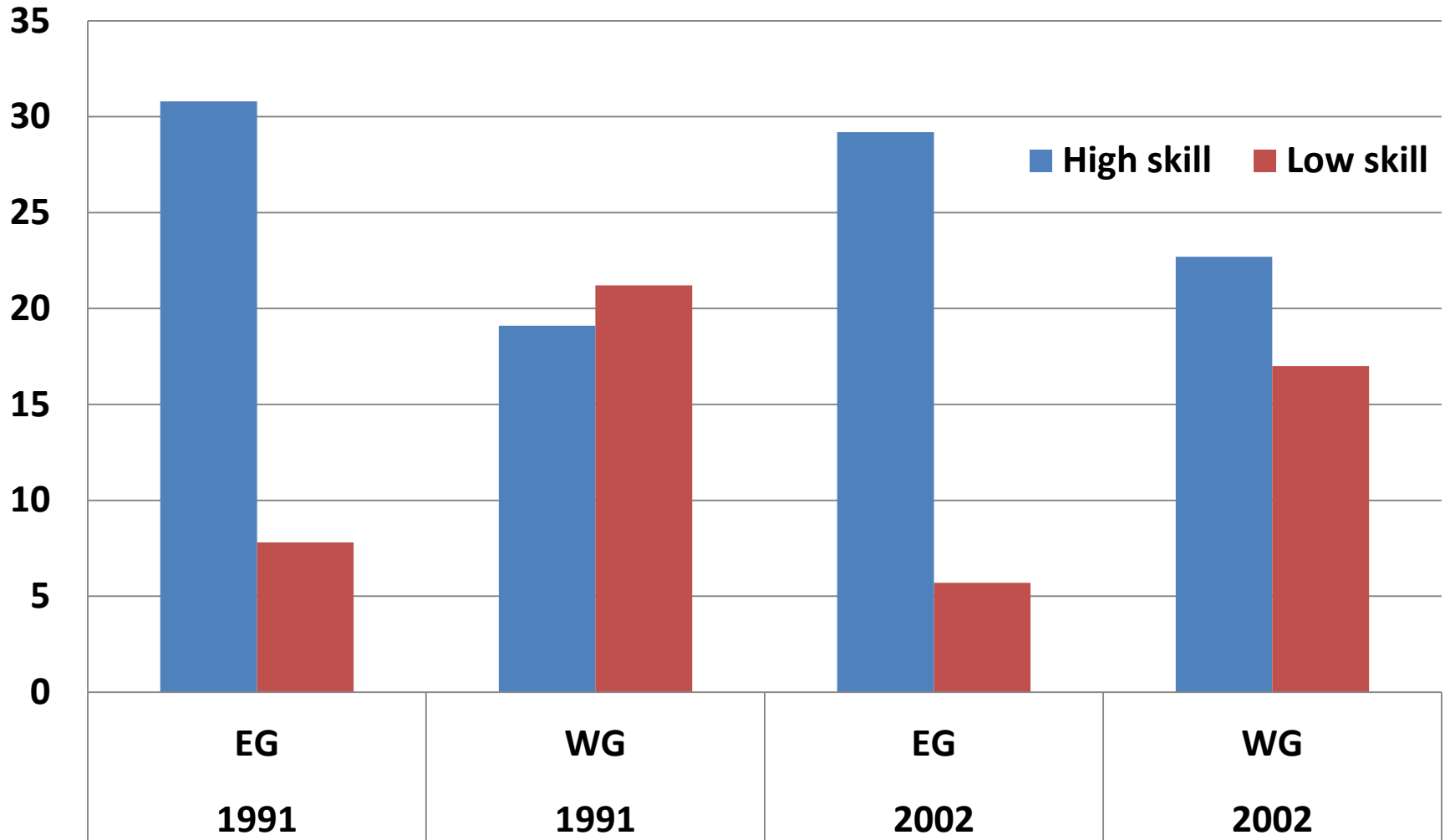**Labor and Capital**
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Purpose
Human capital
Labor productivity
Capital
Capital productivity

Purpose: Fact?

- Take a look at labor.
- Take a look at capital stock.
- Calculate the hypothetical productivity gaps.

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Human capital formally measured

% of the total population of age 25-65 at the year of 2002

Ragnitz(2007)

Legend: ■ High skill ■ Low skill

	EG 1991	WG 1991	EG 2002	WG 2002

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Labor productivity (Overall)

Value added per worker
2005 Euro(Left), % Ratio(Bar, Right)

Legend: EG/WG · WGwoB · EGoB

Data: SBA

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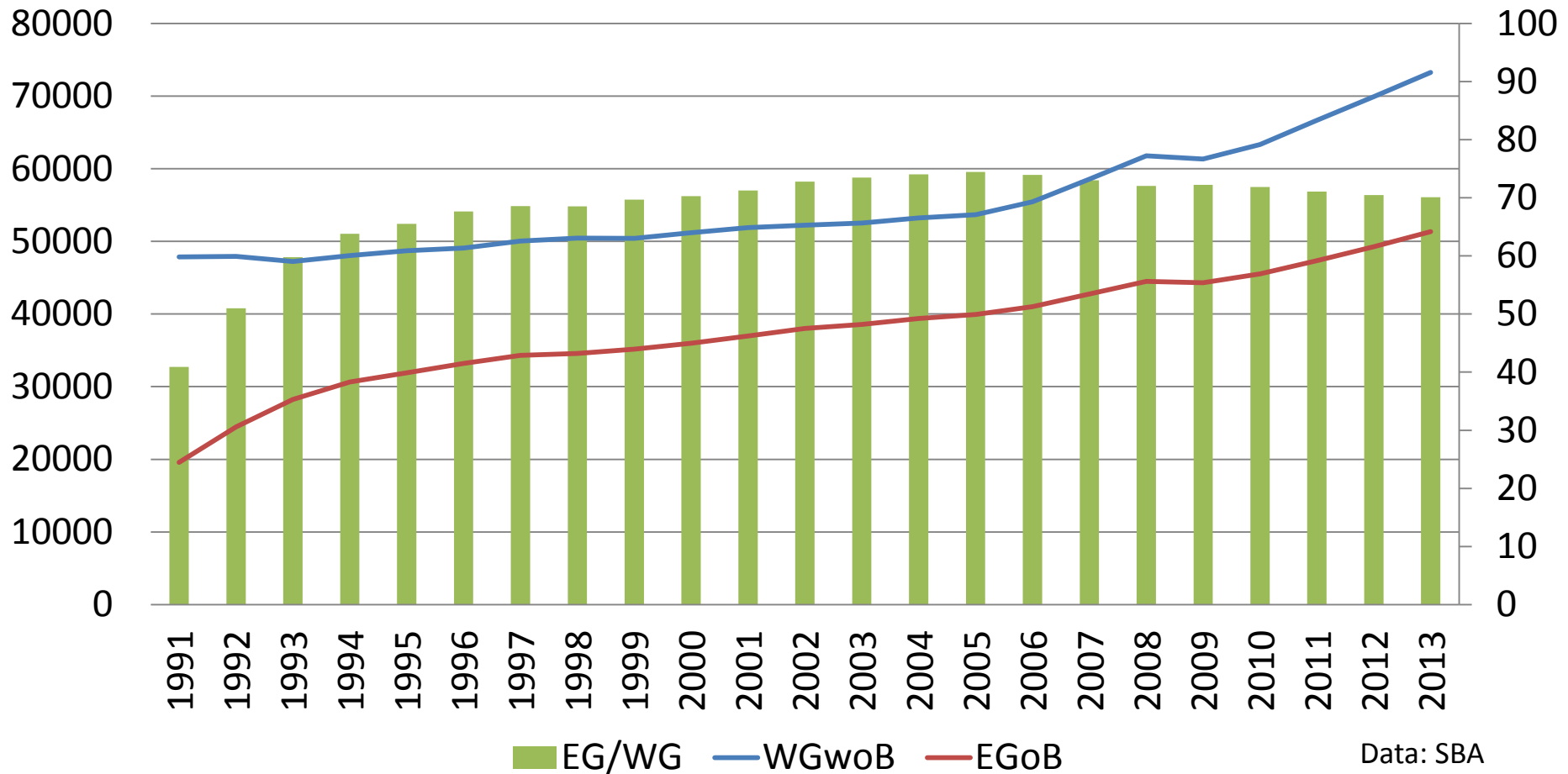
Labor productivity (Production exc. services)

Value added per worker
2005 Euro(Left), % Ratio(Bar, Right)

Legend: EG/WG, WGwoB, EGoB

Data: SBA

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Differences
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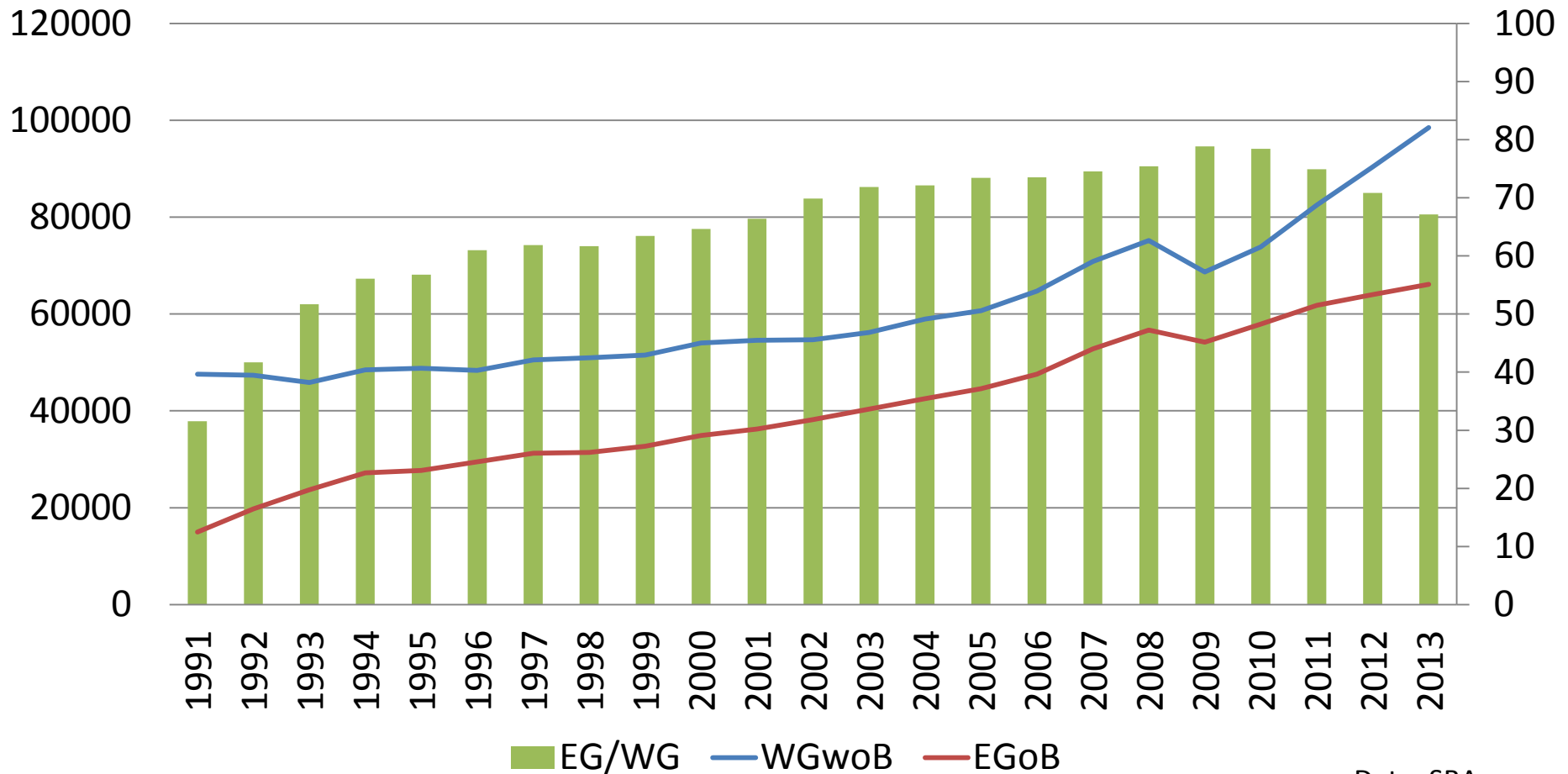
Labor productivity (Services)

Value added per worker
2005 Euro(Left), % Ratio(Bar, Right)

Legend: EG/WG · WGwoB · EGoB

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Differences
Labor and Capital
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Outlook

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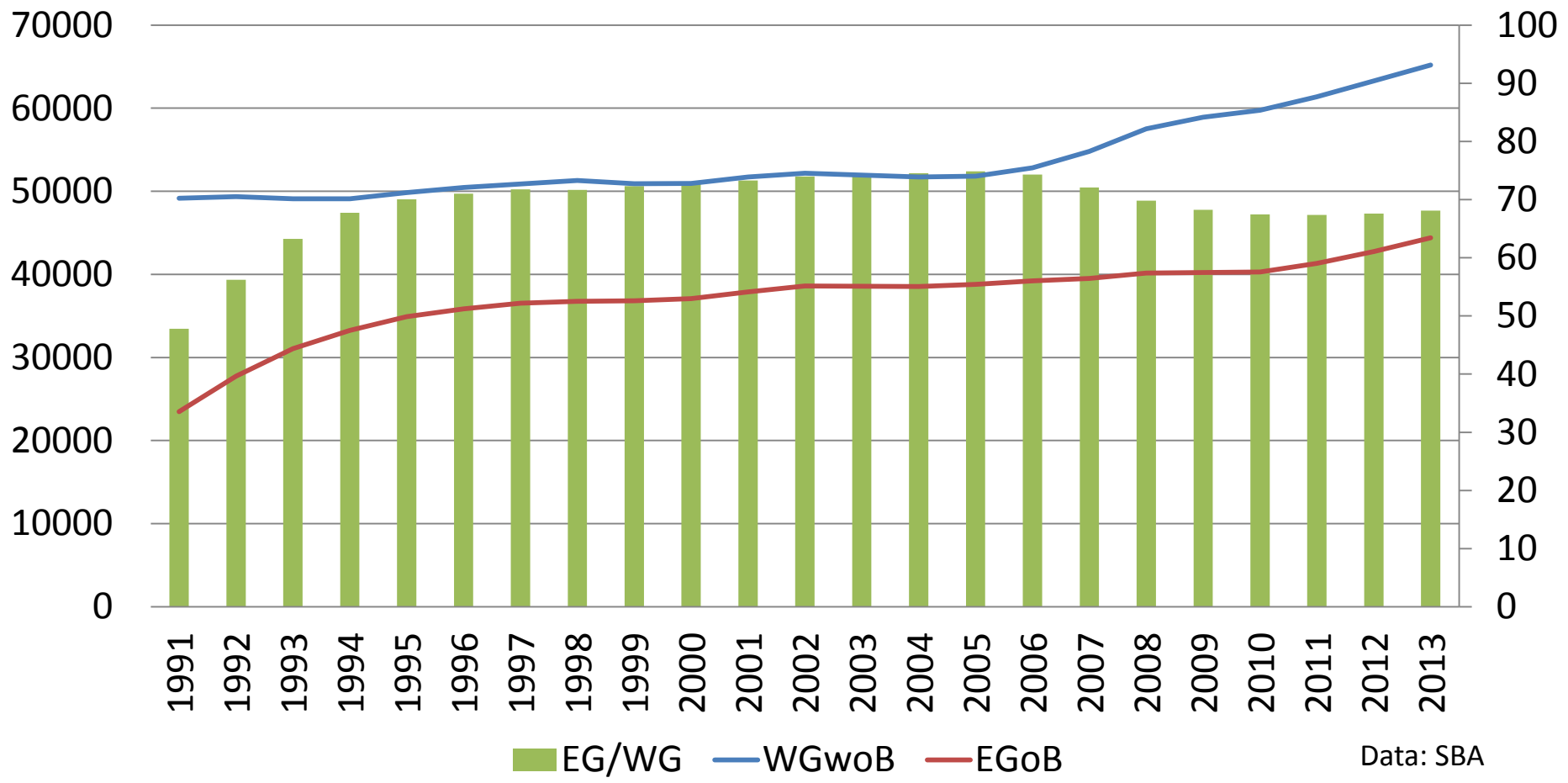
Capital stock (Overall)

Capital Stock per worker
2005 Euro(Left), % Ratio(Bar, Right)

Repurchase prices, excluding buildings and infrastructure) EG/WG ─── WG ─── EG/oB

Data: SBA

14

Motivation
Differences
Labor and Capital
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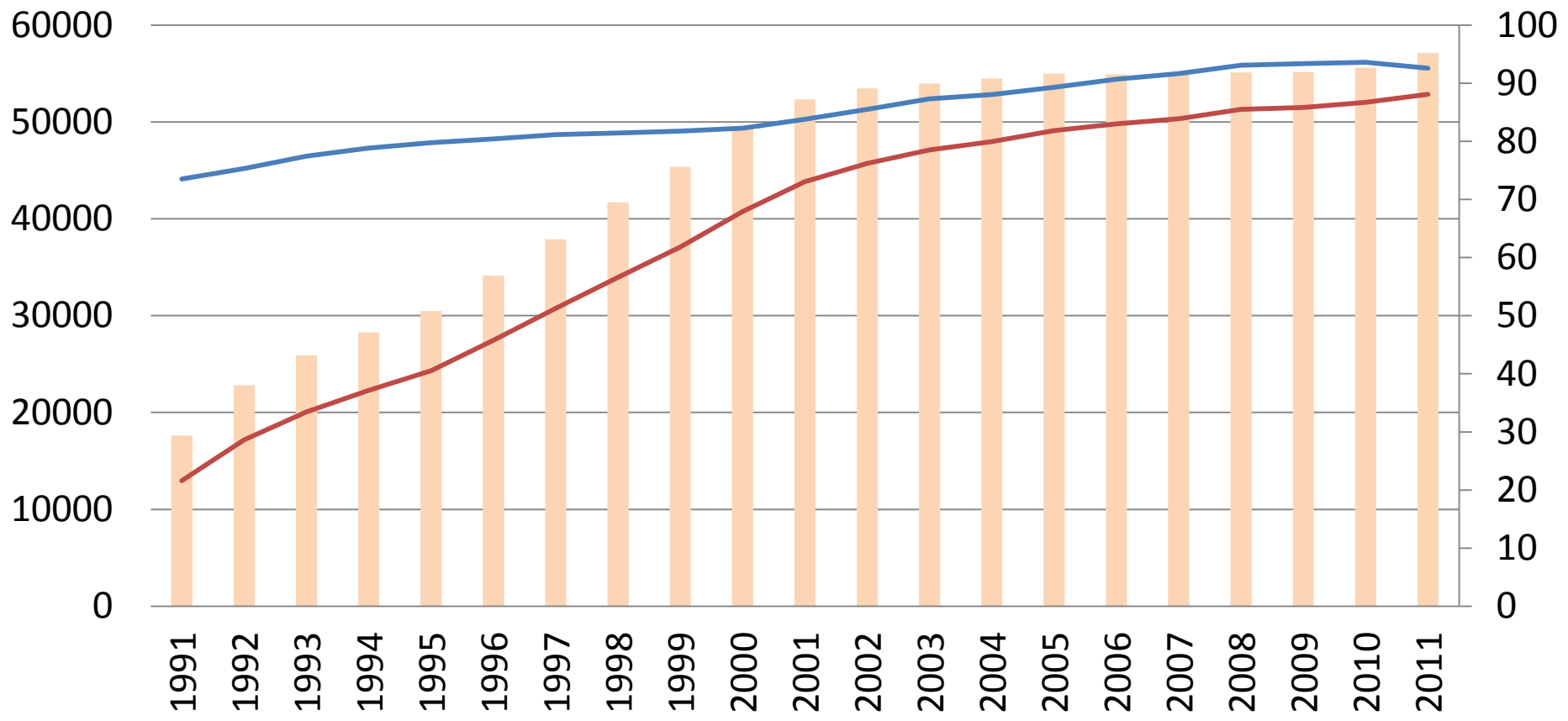
Capital stock (Production exc. services)

Capital Stock per worker
2005 Euro(Left), % Ratio(Bar, Right)

Repurchase prices, excluding buildings and infrastructure)

EG/WG   WGweR   EGoB

Data: SBA

Motivation   Purpose
Differences   Human capital
Labor and Capital   Labor productivity
Productivity gap   **Capital**
Outlook   Capital productivity

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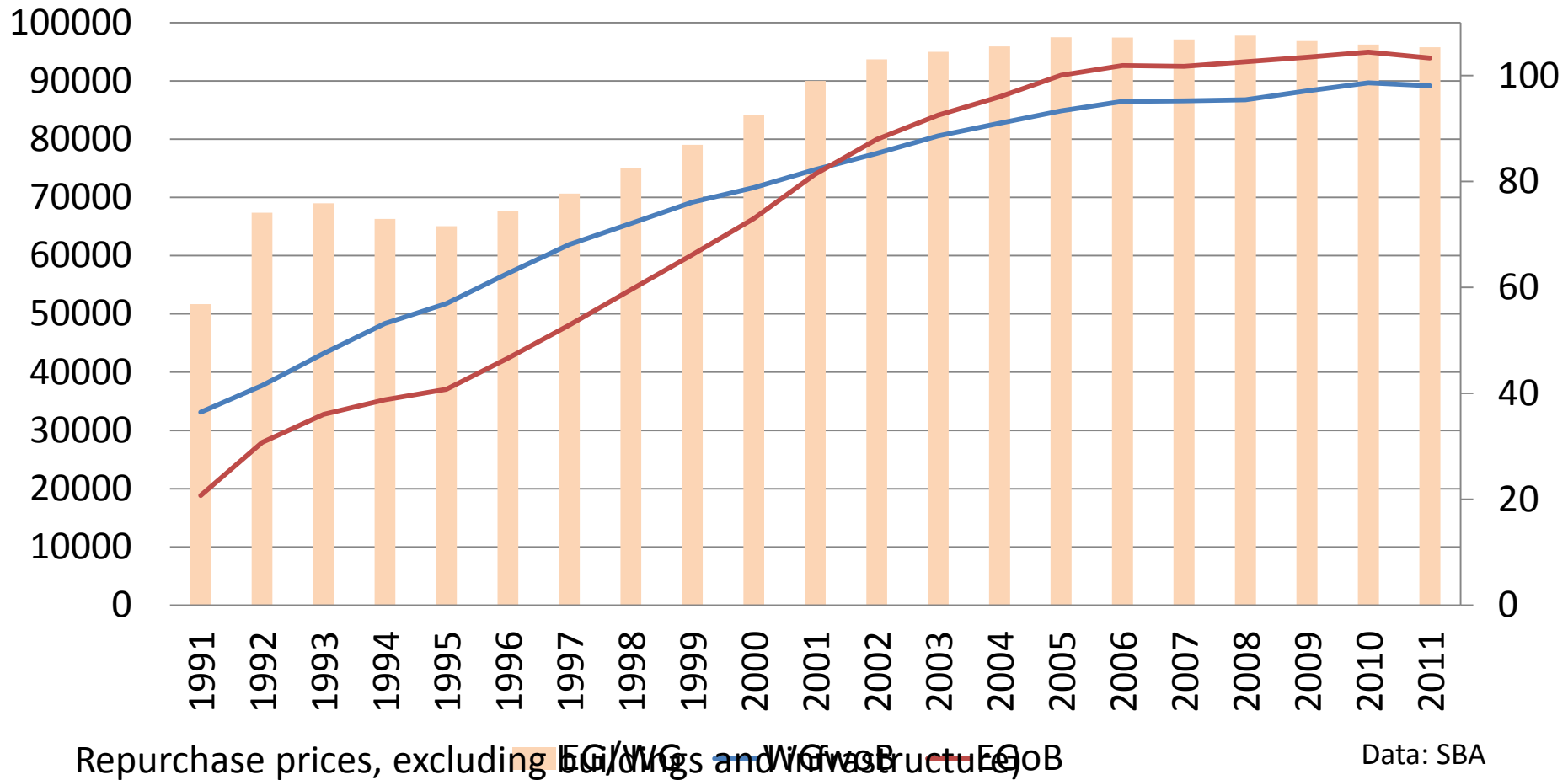
Capital stock (Services)

Capital Stock per worker
2005 Euro(Left), % Ratio(Bar, Right)

Repurchase prices, excluding buildings and infrastructure)

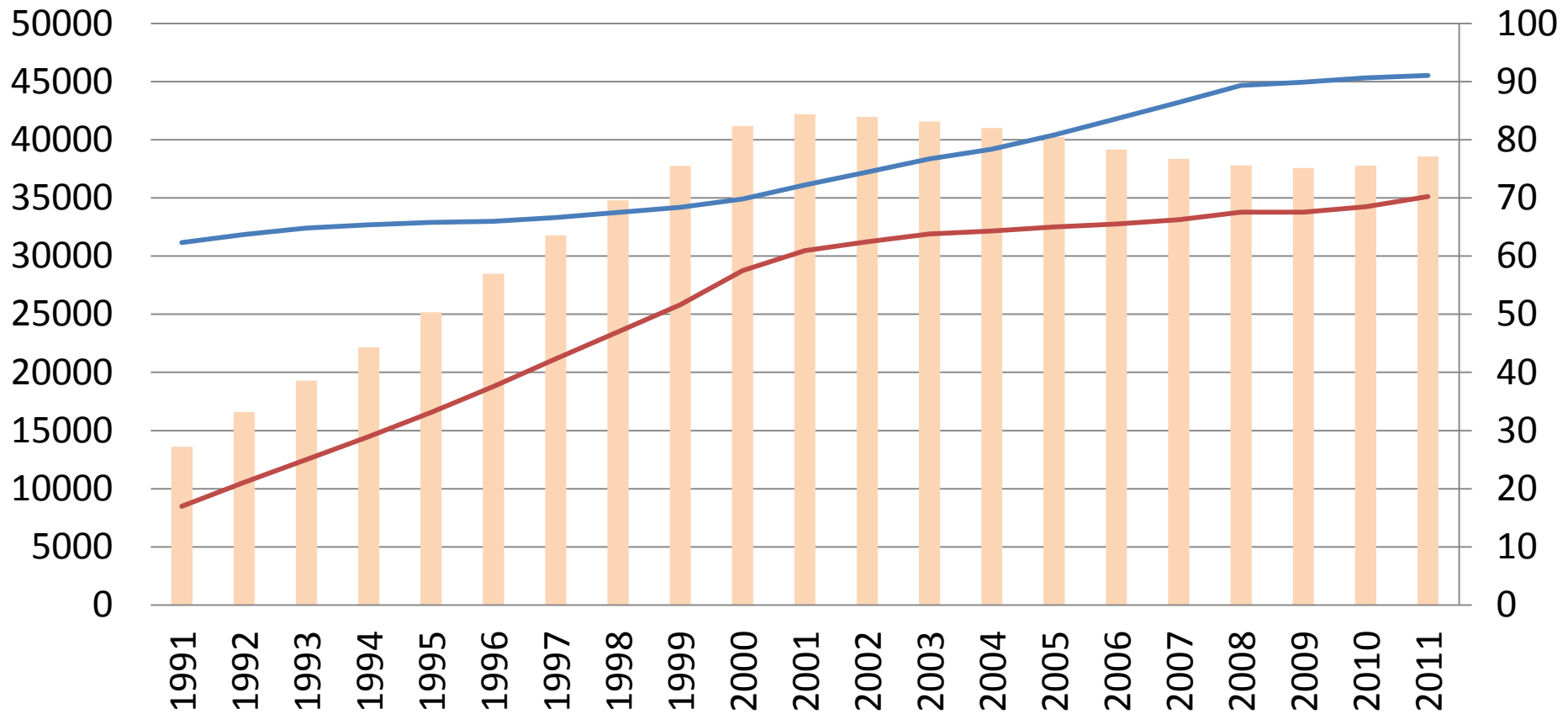EG/WG   WG   EG/GoB   WG/GoB

Data: SBA

Motivation
Differences
Labor and Capital
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Outlook

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Capital productivity (Overall)

Capital productivity
2005 Euro(Left), % Ratio(Bar, Right)
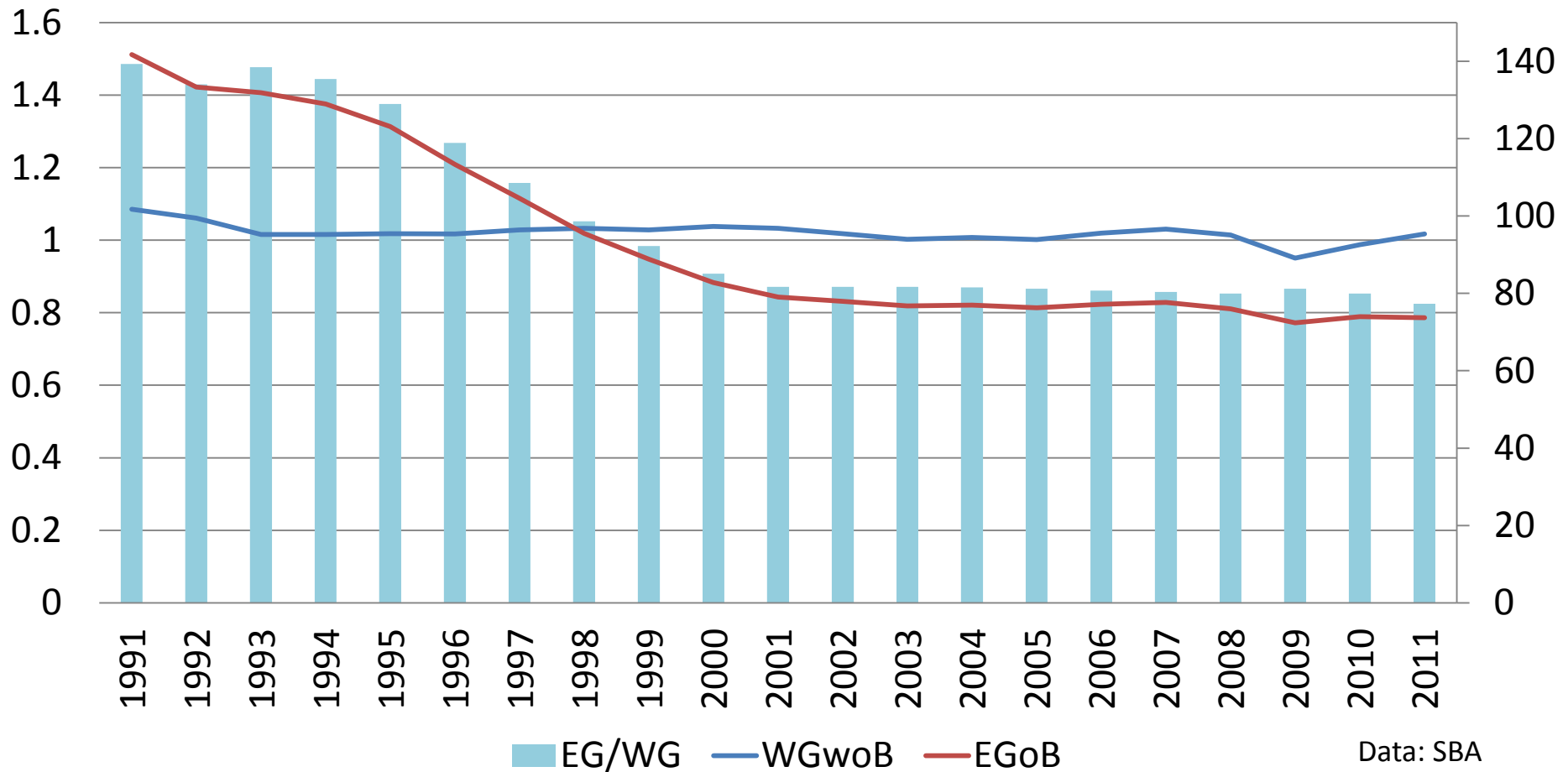
EG/WG   WGwoB   EGoB

Data: SBA

Motivation
Differences
Labor and Capital
Productivity gap
Outlook

Purpose
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Capital productivity (Production exc. services)

Capital productivity
2005 Euro(Left), % Ratio(Bar, Right)

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18

Motivation
Differences
Labor and Capital
Productivity gap
Outlook

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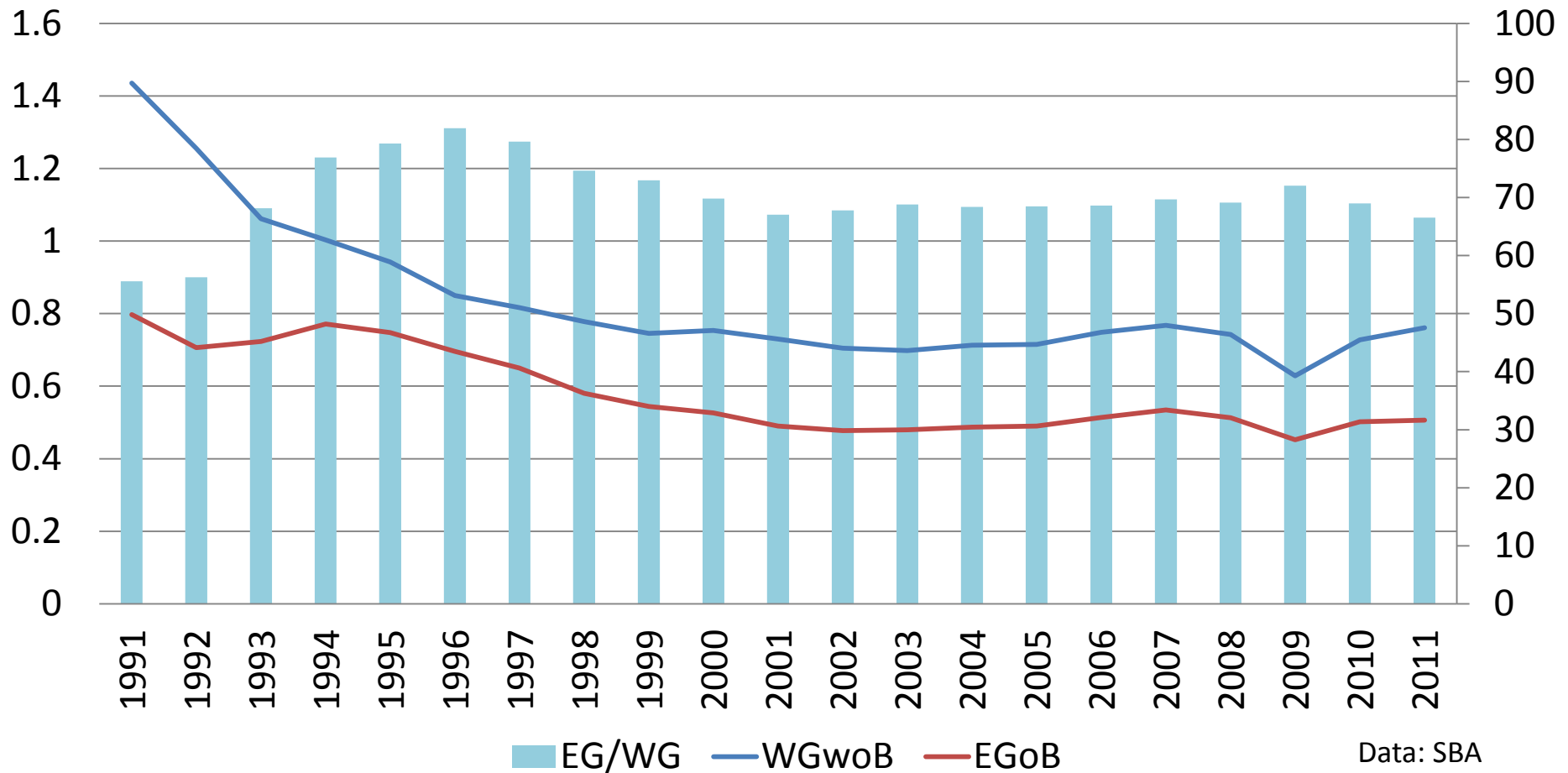
Capital productivity (Services)

Capital productivity
2005 Euro(Left), % Ratio(Bar, Right)

EG/WG   WGwoB   EGoB

Data: SBA

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Differences
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Method
Result
Some observations

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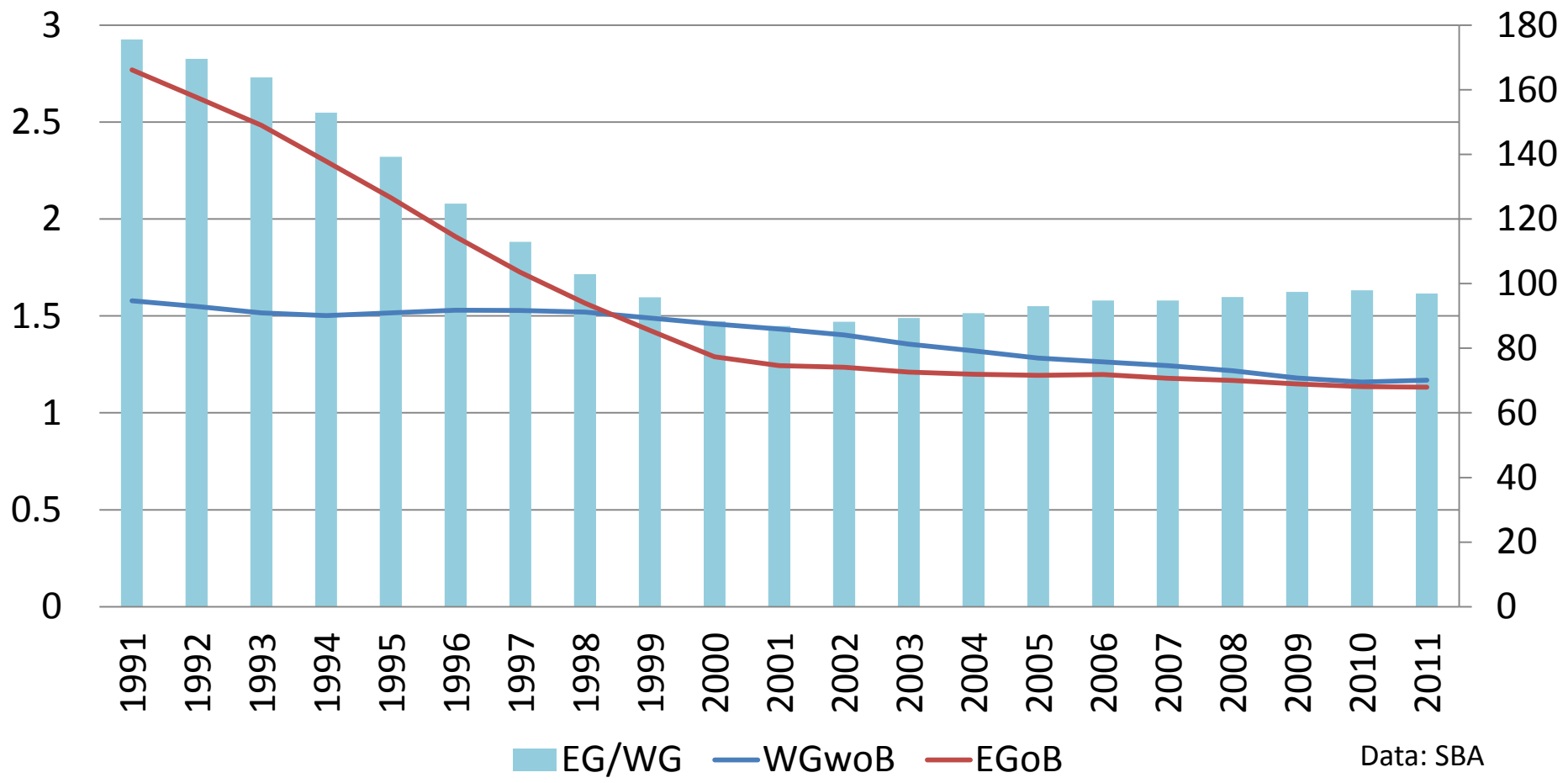
Productivity gap : method

- Method: Growth accounting based on normalized CES production function
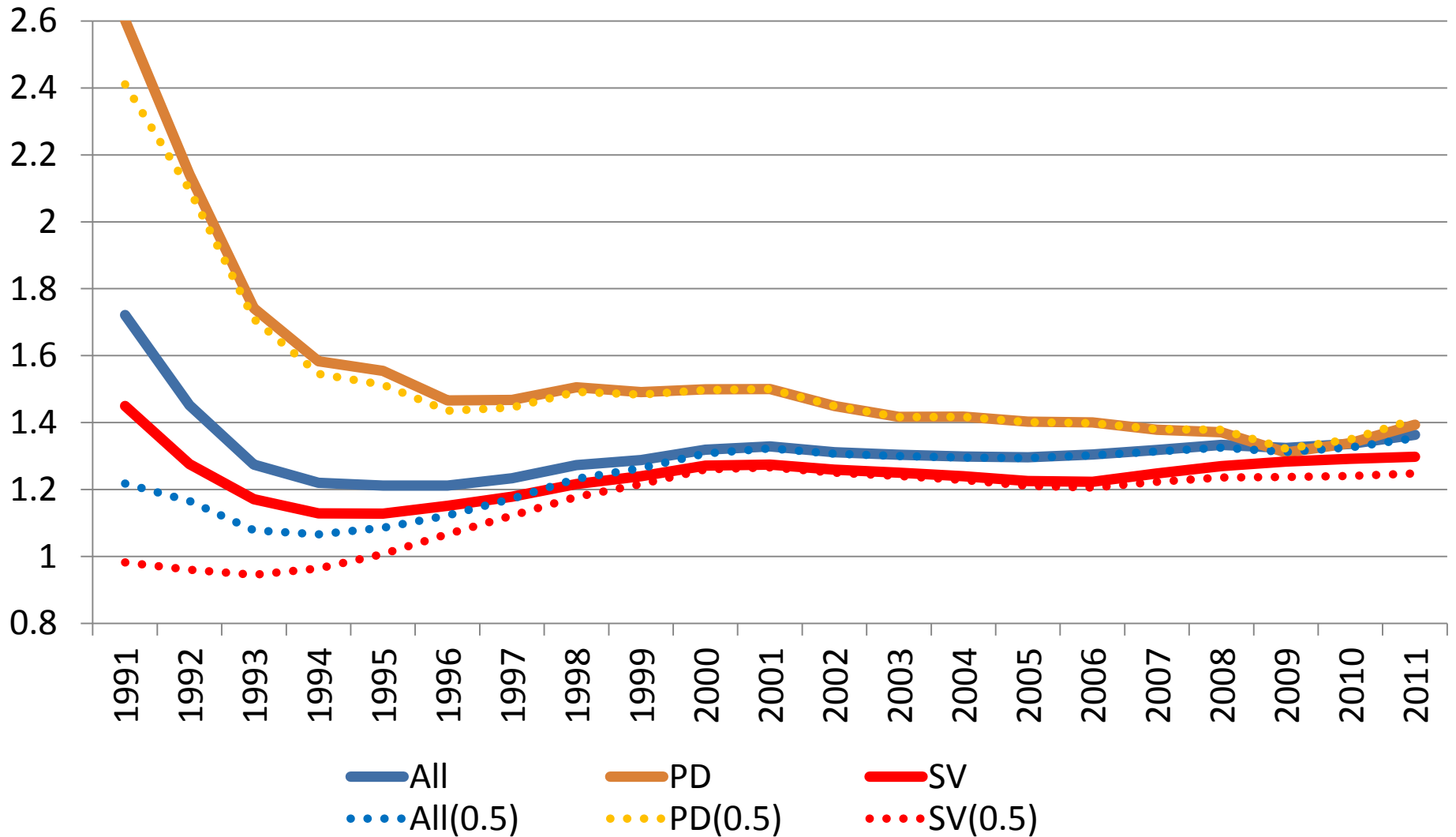
$$Y_t = Y_0 \left[\pi_0 \left(K_t G_K^t \right)^s + \left(1 - \pi_0 \right) \left(L_t G_L^t \right)^s \right]^{\frac{1}{s}}$$

$$s = \frac{\sigma - 1}{\sigma} \ or \ \sigma = \frac{1}{1-s}$$

- *Y*, *K*, *L* and *G* are indexed to the base period.
- The share parameter π_0 for WG from 2005 all German IOT, π_0 for EG from 2005 Regional Accounting data of the federal state, Sachsen-Anhalt.
- Approximate G_K^t with Y^t/K^t and G_L^t with Y^t/L^t.
- Calculate hypothetical Y^t-*hat*, replacing G_*^t for EG with G_*^t for WG.
- The difference between Y^t and Y^t-*hat* indicates the difference in the TFPs of WG and EG.

Motivation
Differences
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Productivity gap (WG=1, σ=1 and 0.5)

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Some observations on the productivity gap

- The gap decreased rapidly until the middle of the 1990s.
- The catching-up slowed in the last-half of the 1990s because the EG productivity in services did not improved. The EG productivity in production continued to improved, very slowly though.
- The catching-up was slightly accelerated in the first half of the 2000s, because the EG productivity was slightly improving both in production and services.
- The tendency was reversed after the Lehman Shock.
- Nevertheless, the gap was not significantly closed in the 2000s. There has been a gap the size of which was in the range from 20 to 40% of the WG level.

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Enigma, again
Outlook

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Again, the enigma.

- Some explanations exist.
- The EG production structure was biased in favor of the low-value added sectors. Thus, under-usage of human capital occurs.
  - However, why the bias exists?
  - Old- and new-historical factors?
  - People move faster than business entities?
- Maybe the gap is within normal variations of regional productivity differences in other countries.
  - Old- and new-historical and geographical factors?
  - The high-productivity big companies think global.
  - Still, the question remains. Why is it uniformly low in EG?

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Enigma, again
Outlook

Outlook

- It is not easy to clearly explain why the productivity gap still exist between WG and EG.
- This suggests that we are not very successful to understand the determinants of productivity.