

Was Marx Right?

Evidence from 43 Countries, 2000-2014

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Objectives

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Main questions:

Does the **OCC** rise or fall as countries develop?

Does the **rate of exploitation** rise or fall as countries develop?

Does the average **profit rate** rise or fall as countries develop?

Does the share of **unproductive activities** rise or fall as countries develop?

We estimate 'Kuznets curves' for Marxist variables across countries

We plot **Marxist variables** against **development levels** (real GDP per capita in dollars)

Objectives

Analyze structural transformations in the **global economy** from a **Marxist** perspective

Develop a **methodology** and a **software** to compute Marxist variables at the global level for **43** developed and developing countries using multi-country input-output data from 2000 to 2014

Deliver a comprehensive dataset in **panel** format at the **country level**

Estimate a wide range of Marxist variables at the global level, within and across countries

Methodology

Methodology

Transform the **entire** World Input-Output Database (**WIOD**) into Marxist variables

WIOD = global input-output matrices + socio-economic accounts for each country

Create a panel of **217** Marxist variables

for **43** countries from **2000** to **2014**

using industry-level data for **57** industries in each country

Methodology

Decompose the **entire WIOD** into **productive** and **unproductive** activities (PA and UA)

PA = productive activities = activities that **directly** create value added

UA = unproductive activities = activities that do not create value added

Decompose each global IO matrix into PA and UA:

classify the **intermediate inputs** within each global IO matrix into PA and UA

calculate the (Marxist) **value added** of PA in each global IO matrix

across the 57 industries in each of the 43 countries, for each year from 2000 to 2014

Methodology

For PA and UA in each year, we compute:

1. flows of gross income, net income, surplus income
2. stocks of fixed assets
3. employment and wages
4. profit rates (surplus value over fixed assets)
5. exploitation rates (surplus value over labor compensation in PA)
6. compositions of capital: OCC and UCC (fixed assets over labor compensation in PA)
7. MELT (value added of PA over total labor hours of PA)
8. knowledge rents
9. shares of each sub-category of UA
10. shares of every country in the global aggregates of each Marxist variable

Methodology

Develop a **fully automated R program** that:

1. Implements our methodology (6,000 lines of code)
2. Classifies into **PA** and **UA** each of the 57 industries in both the **global IO matrices** and in the **socio-economic accounts**, for each of the 43 countries in each year from 2000 to 2014
3. Constructs the global Marxist dataset with 217 variables in **panel** format

The full **R code** and the **Excel file** with the entire panel dataset will be available online if the paper is accepted for publication

Relevance

Relevance

First paper to estimate **PA** and **UA** at the global level

Check how **Marxist variables** relate to the **development level** of a country
(development level = real GDP per capita in year-average US dollars)

Analyze the **global reallocation** of **PA** and **UA** across countries and over time

Check if Marx's hypotheses from 160 years ago hold true **at the global level today**

Create a **panel dataset** that can be used in further empirical and econometric studies

Next Steps

Next steps

Employ the global Marxist dataset in panel econometrics

Estimate how the **evolution of PA and UA** explains:

1. **real GDP per capita** across countries
2. **labor productivity** across countries
3. **income and wealth inequality** across countries

Main challenge: find appropriate IVs

Create another global panel dataset at the **industry level**, rather than **country level**

Results

Results

We estimate:

Marxist variables across countries **over time**

Marxist variables across countries **for different levels of development**

Results

Hypothesis:

If there is a tendency for the **OCC** to rise over time then there should also be a tendency for the **rate of exploitation** to rise, otherwise the average **profit rate** will tend to decrease

Evidence at the global level from 2000 to 2014:

OCC and the **exploitation rate** rise over time, but the average **profit rate** falls

The 2007-2008 crisis had a major negative impact on profits

OCC, **exploitation rate**, and **profit rate** all fall with the **level of development**

Results

Variables that **decrease** with the level of development (real GDP per capita in US dollars):

1. **profit rate** (surplus value in PA over total fixed assets in both PA and UA)
2. **exploitation rate** (surplus value in PA over labor compensation in PA)
3. **OCC** (total fixed assets in PA and UA over labor compensation in PA)

Variables that **increase** with the level of development:

1. **UA over PA** (both in terms of flows of income and stocks of fixed assets)
2. **knowledge rents** as a share of total UA

Results

USA, Germany, and Japan:

Shares of global PA rapidly decreasing (in flows and in stocks of PA)

USA has the highest global share of knowledge rents

USA has the highest global share of UA (in flows and in stocks of UA)

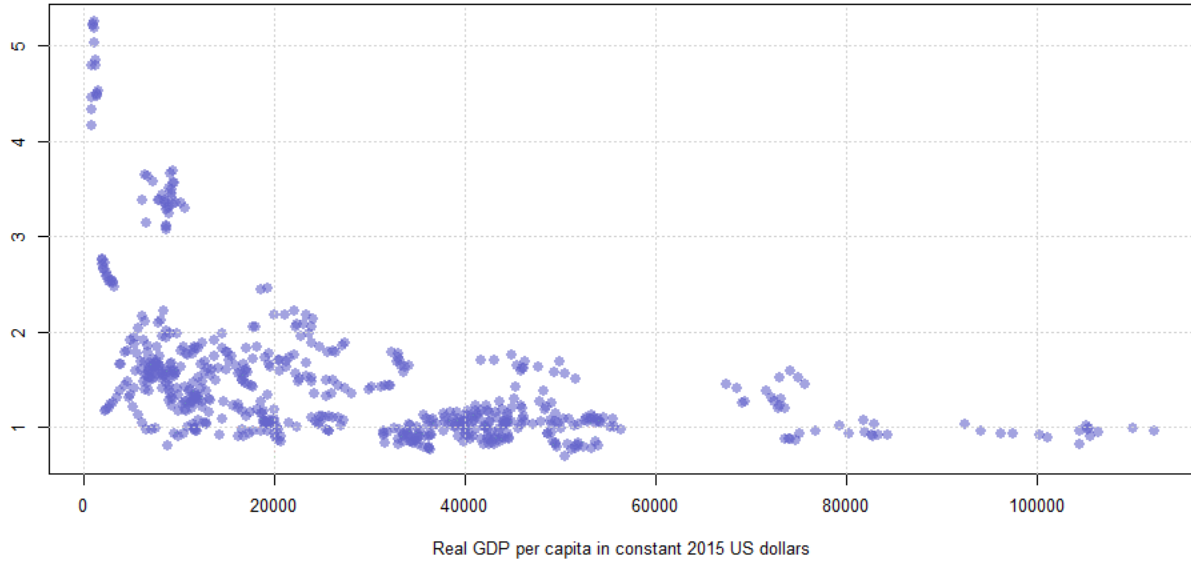
China:

Share of global PA rapidly increasing (in flows and in stocks of PA)

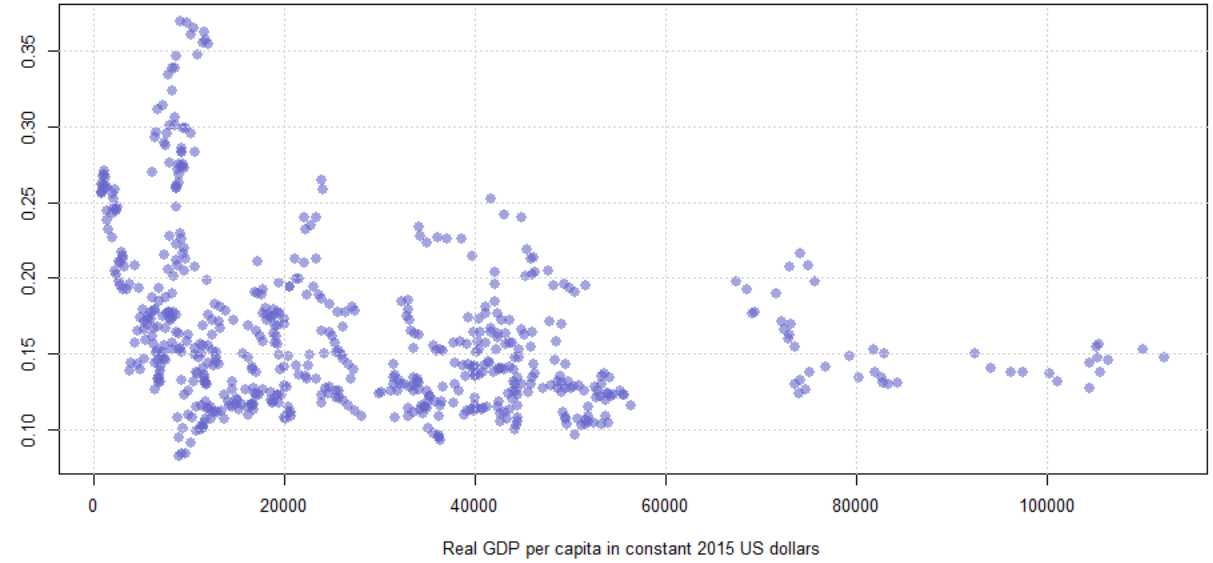
PA has moved rapidly towards China and away from the rest of the world economy

Plots

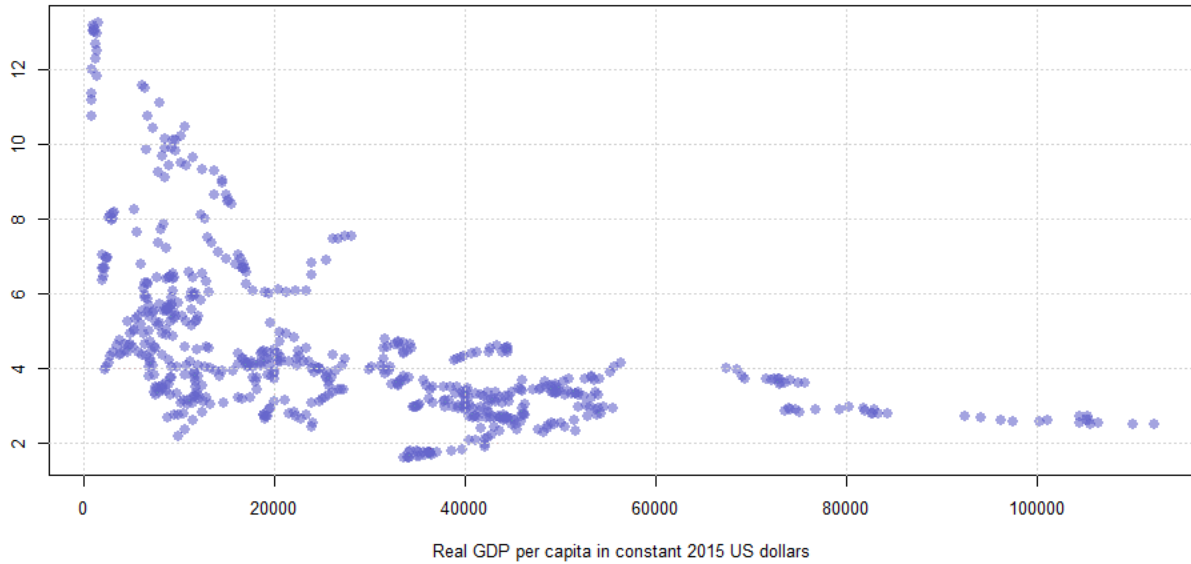
A
Rate of surplus value (rate of exploitation in productive activities)



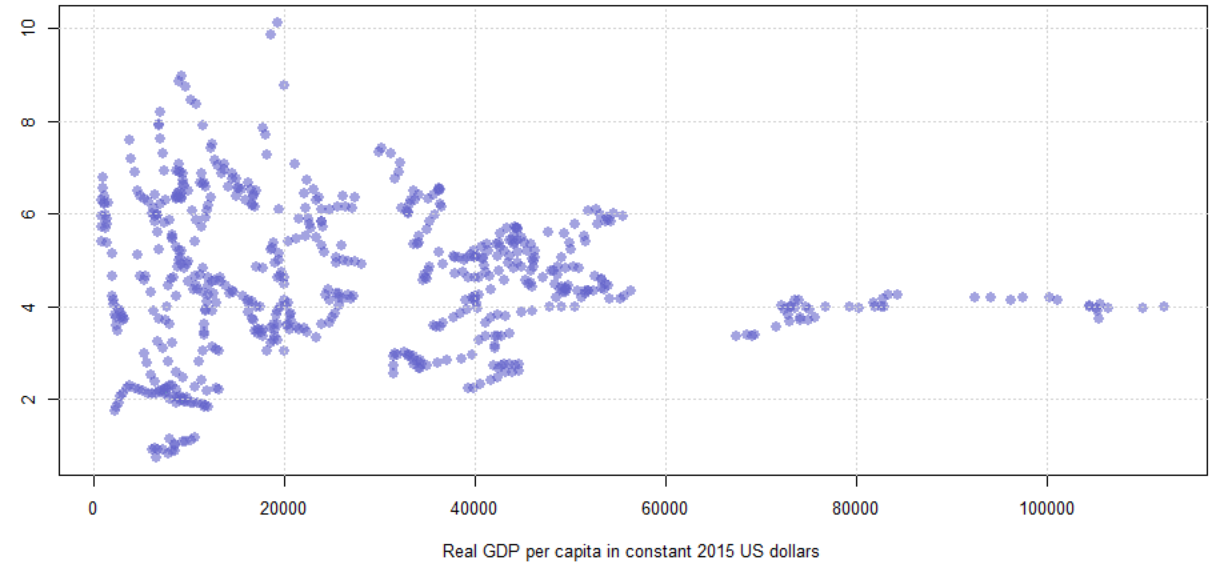
B
Average rate of profit



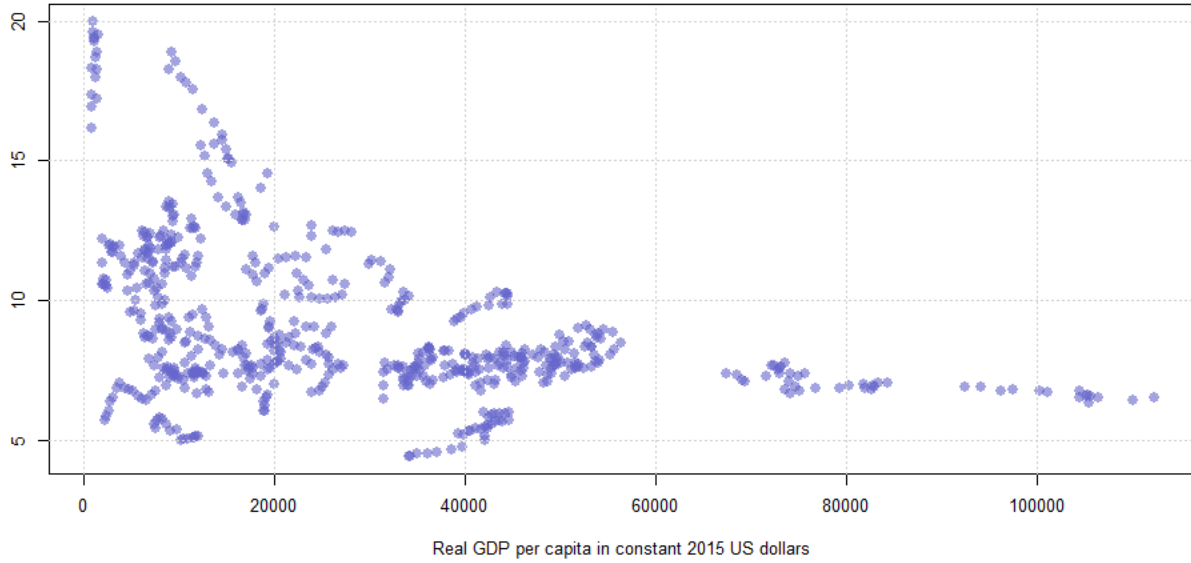
C
Organic composition of capital



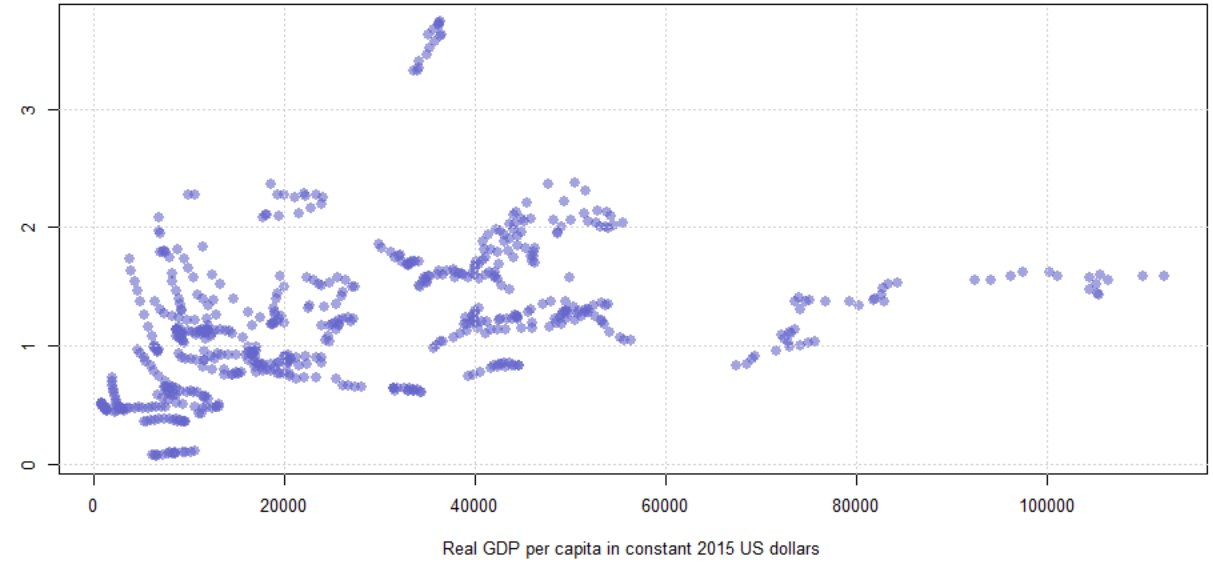
D
Unproductive composition of capital



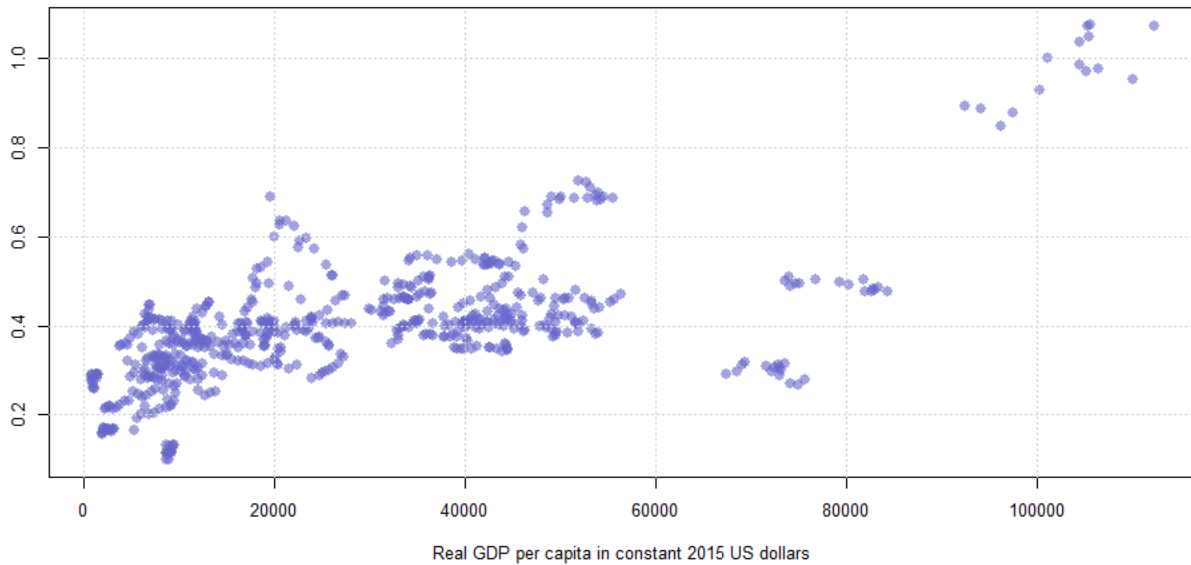
A
Overall organic composition of capital



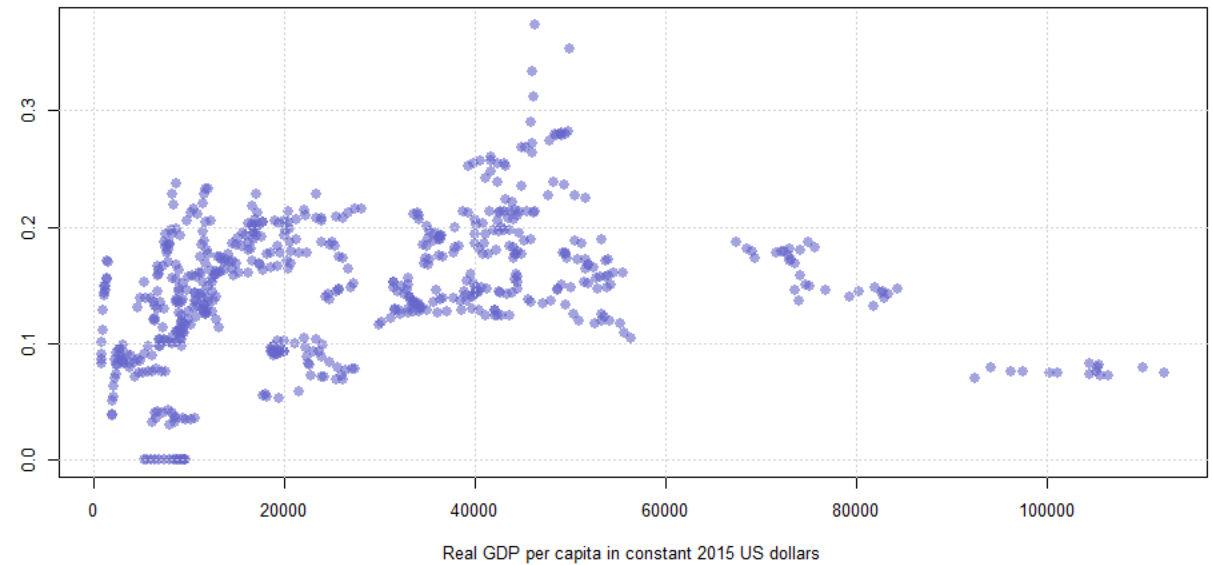
B
Unproductive to productive capital stock ratio



C
Net income of unproductive activity over the value added of productive activity



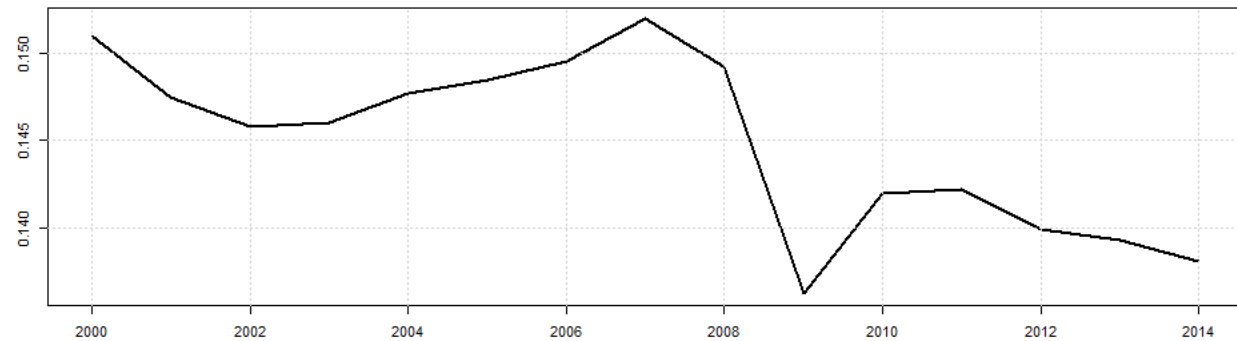
D
Share of knowledge rents in the net income of unproductive activity



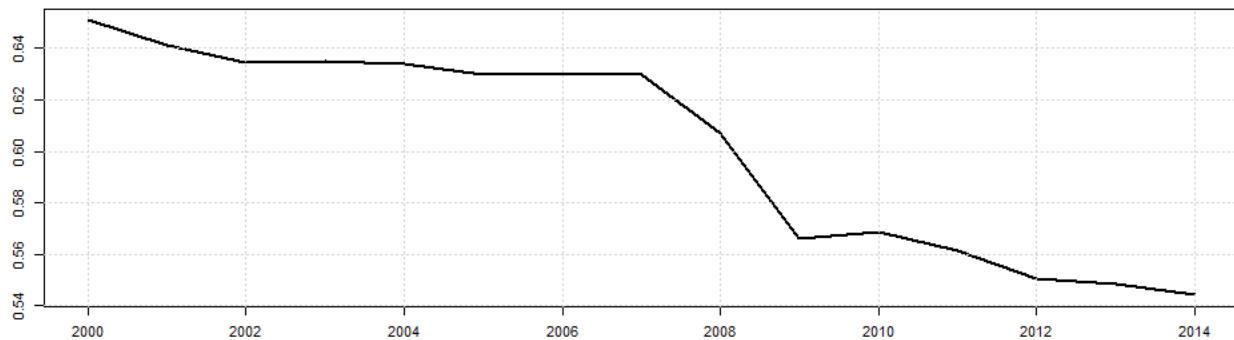
A
Rate of surplus value: rate of exploitation of productive employees (Surplus Value/COMP.pa)



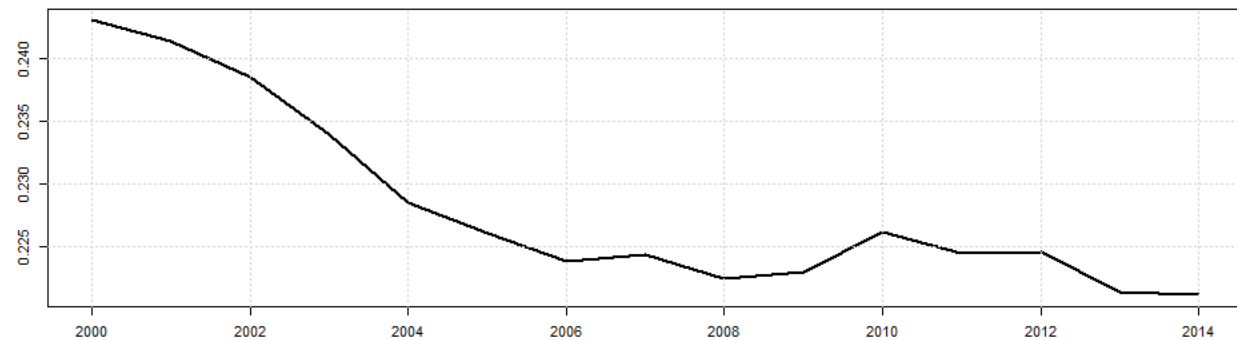
B
Average profit rate relative to the total productive and unproductive capital stock (Surplus Value / K)



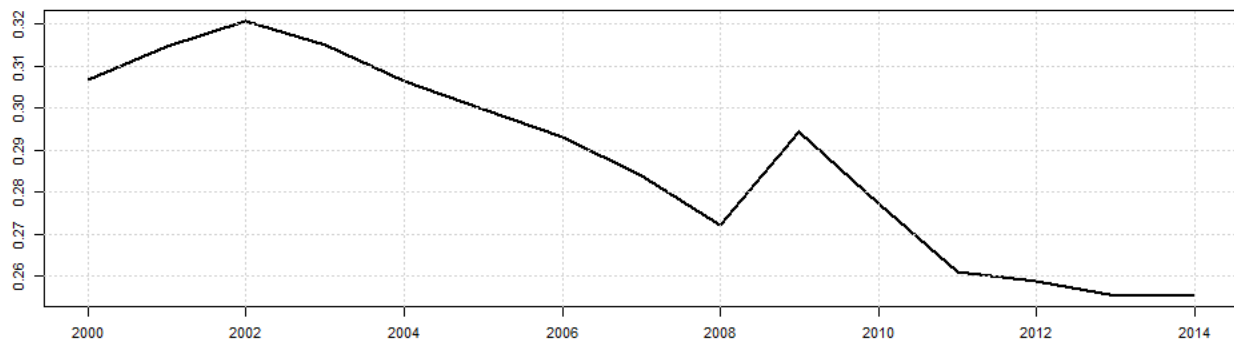
C
Value-added to capital stock ratio in productive activities (VApa/Kpa)



D
Net income to capital stock ratio in unproductive activities (NIua/Kua)



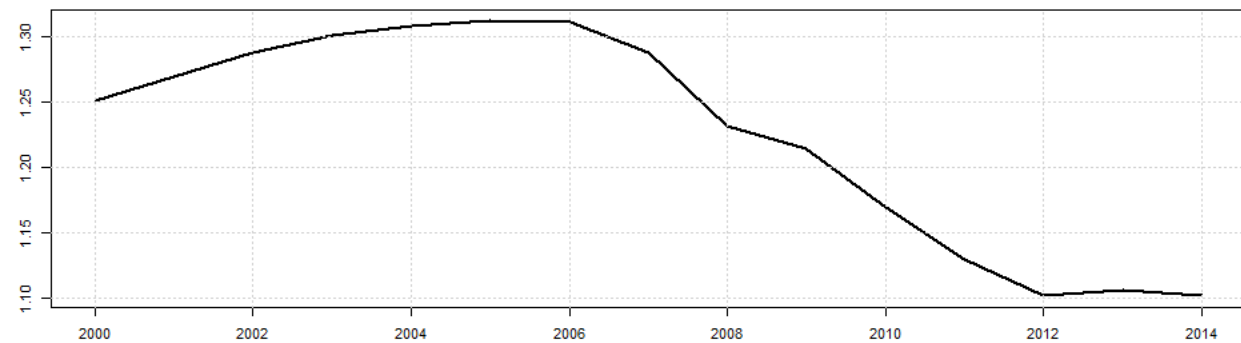
E
Gross income of unproductive activities over the total value of productive activities (GIua/TVpa)



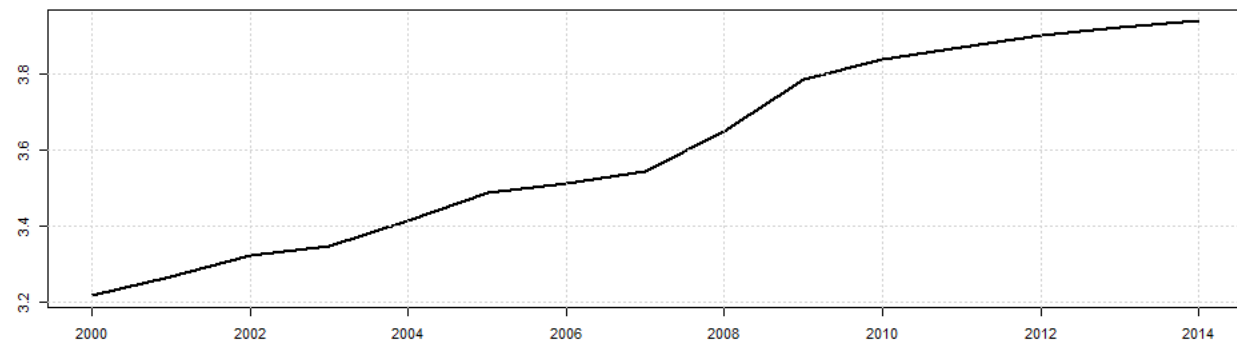
F
Net income of unproductive activities over the value-added of productive activities (NIua/VApa)



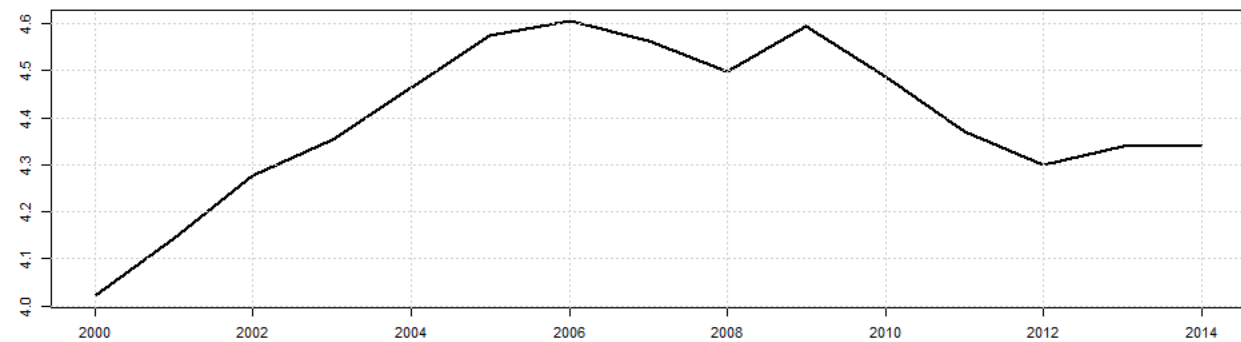
A
Unproductive to productive capital
stock ratio (K_{ua}/K_{pa})



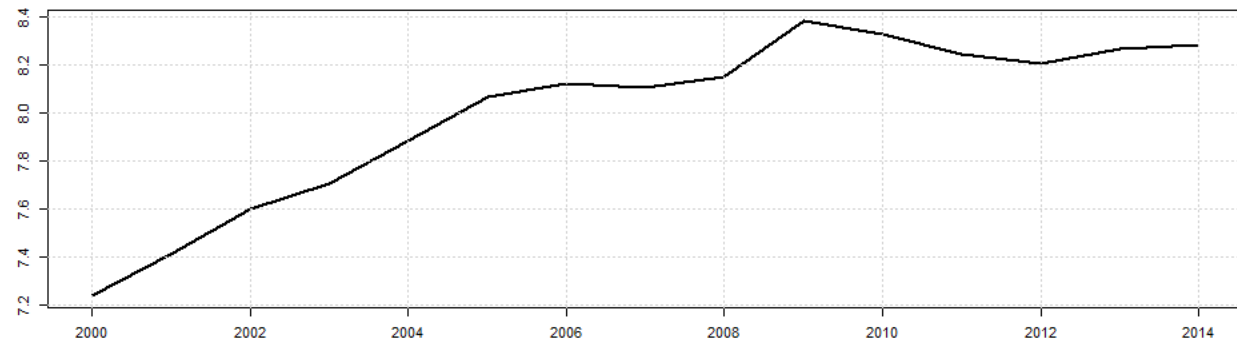
B
Organic composition of capital
($K_{pa}/COMPP_a$)



C
Unproductive composition of capital
($K_{ua}/COMPP_a$)



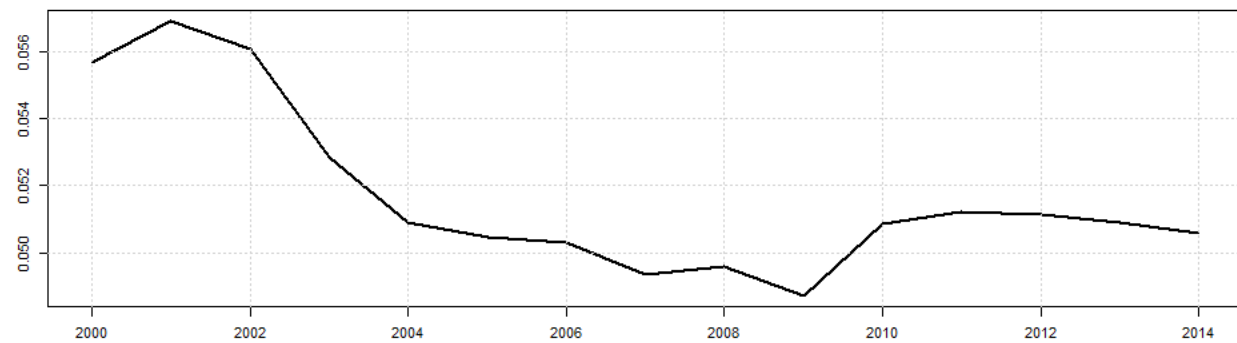
D
Overall organic composition of capital
($K/COMPP_a$)



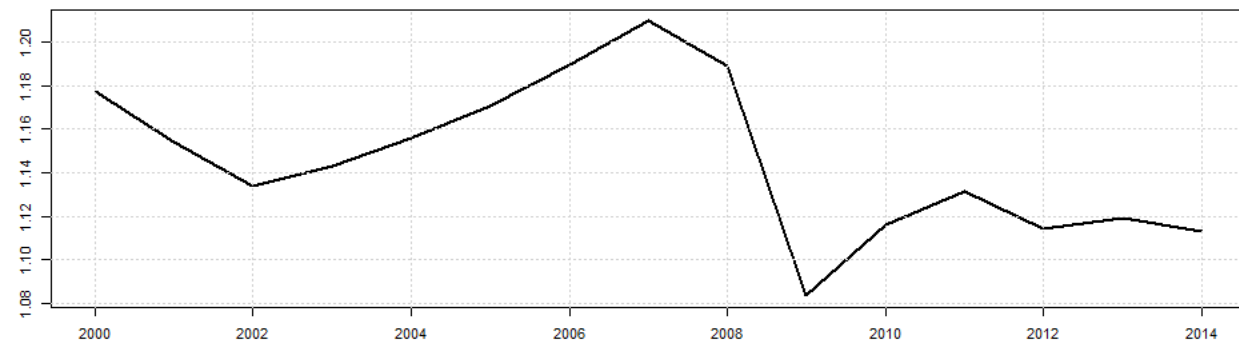
E
Share of knowledge rents in the net income
of unproductive activities



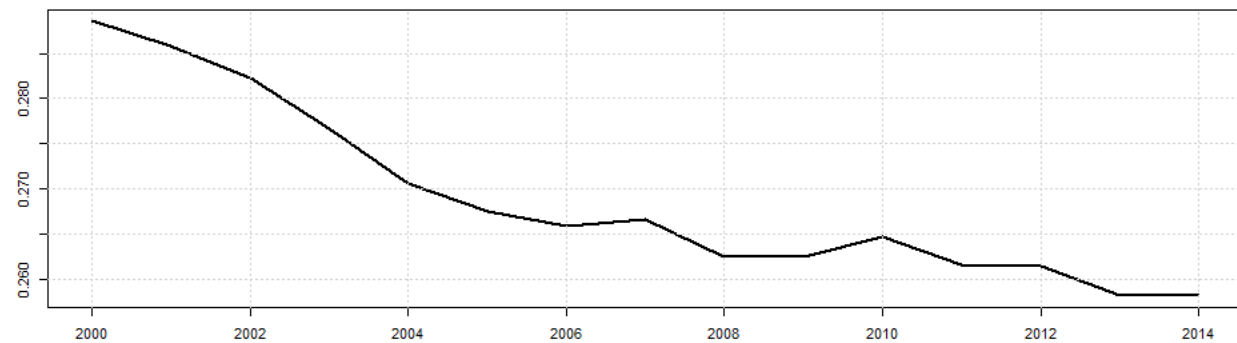
F
Share of the unproductive capital stock in unproductive
activities whose main source of revenue are knowledge rents



A
Total value to capital stock ratio in
productive activities (TV_{pa}/K_{pa})



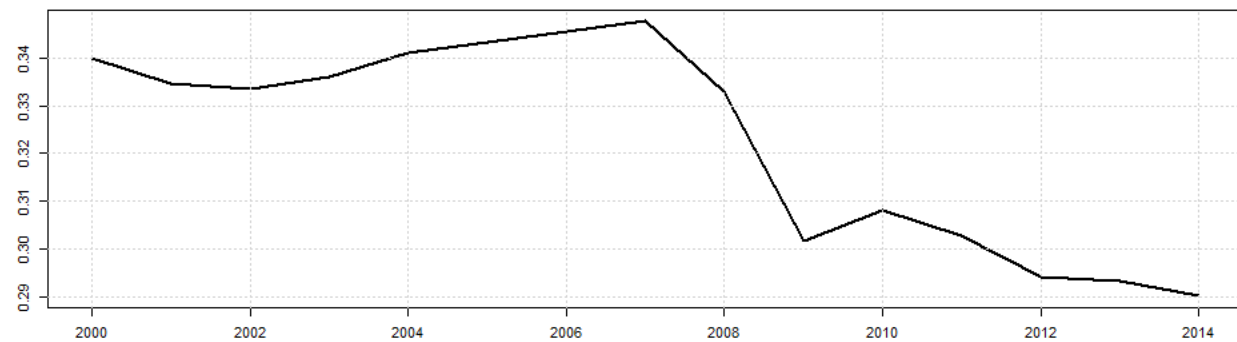
B
Gross income to capital stock ratio in
unproductive activities (GI_{ua}/K_{ua})



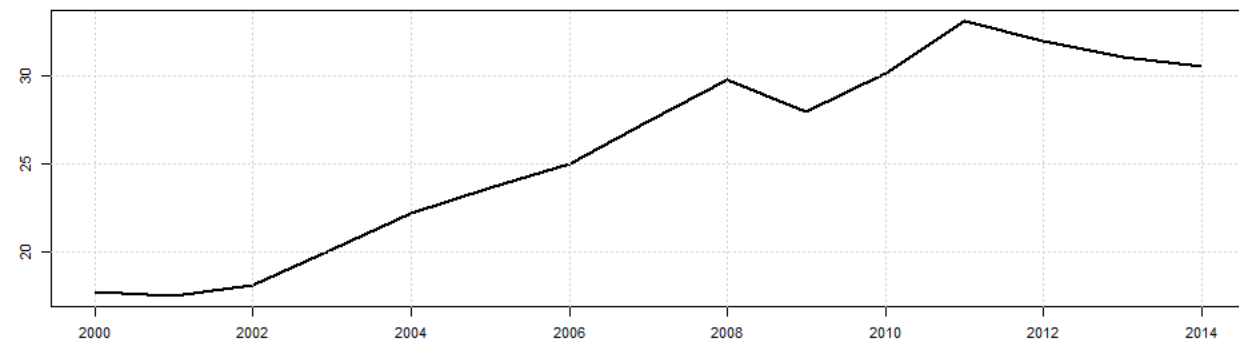
C
Ratio of employee compensation in unproductive and
productive activities ($COMP_{ua}/COMP_{pa}$)



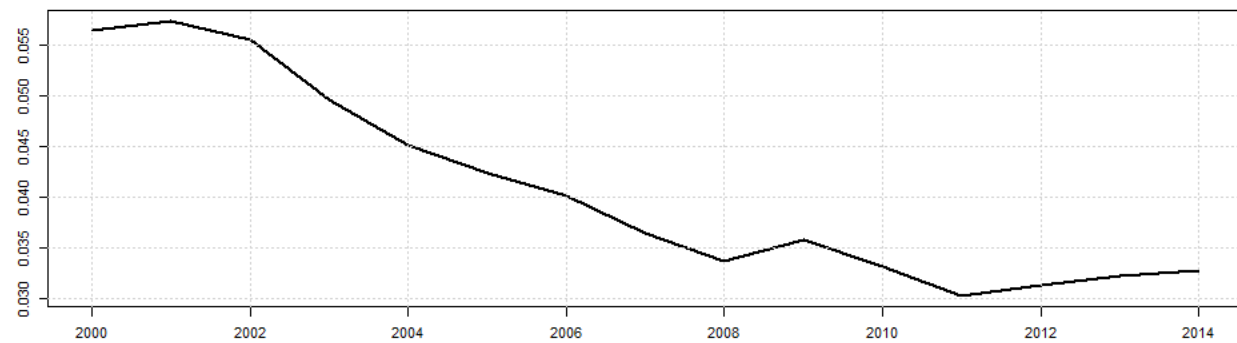
D
Average profit rate relative to the productive
capital stock ($Surplus\ Value / K_{pa}$)



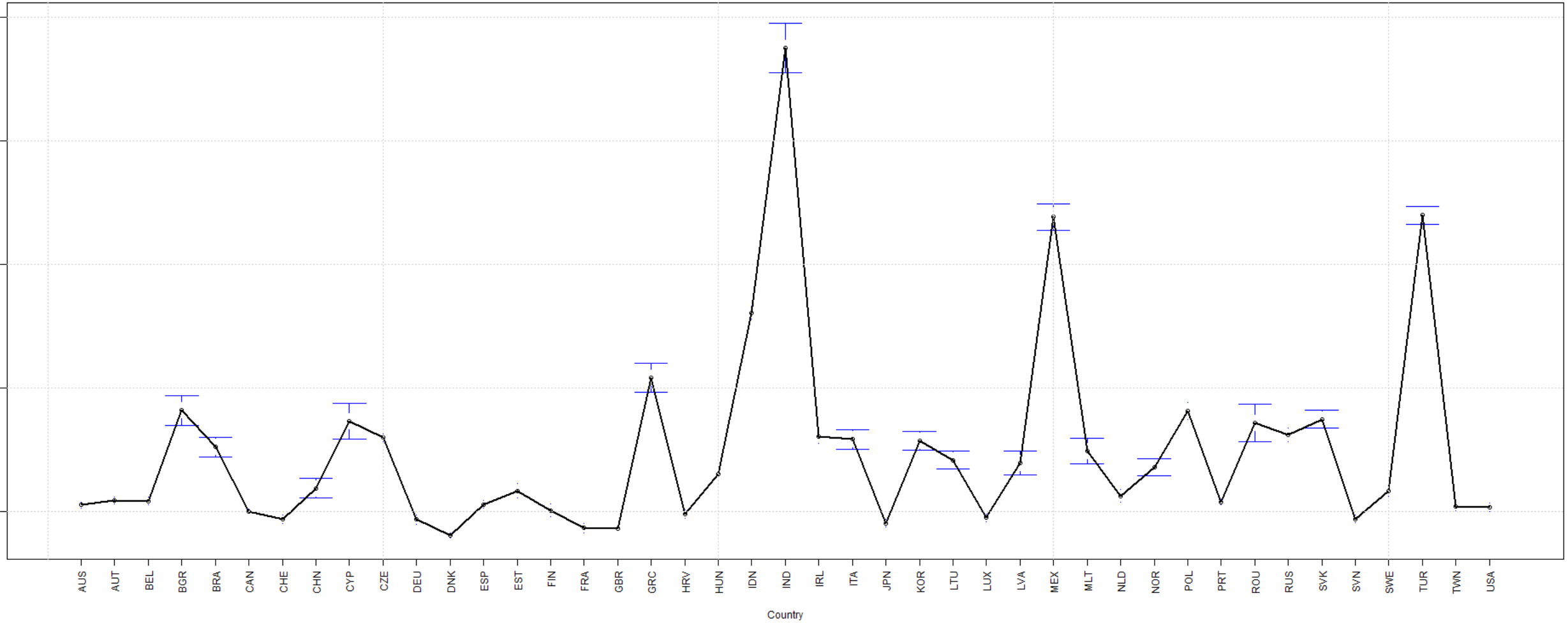
E
Monetary expression of labor time
(MELT)



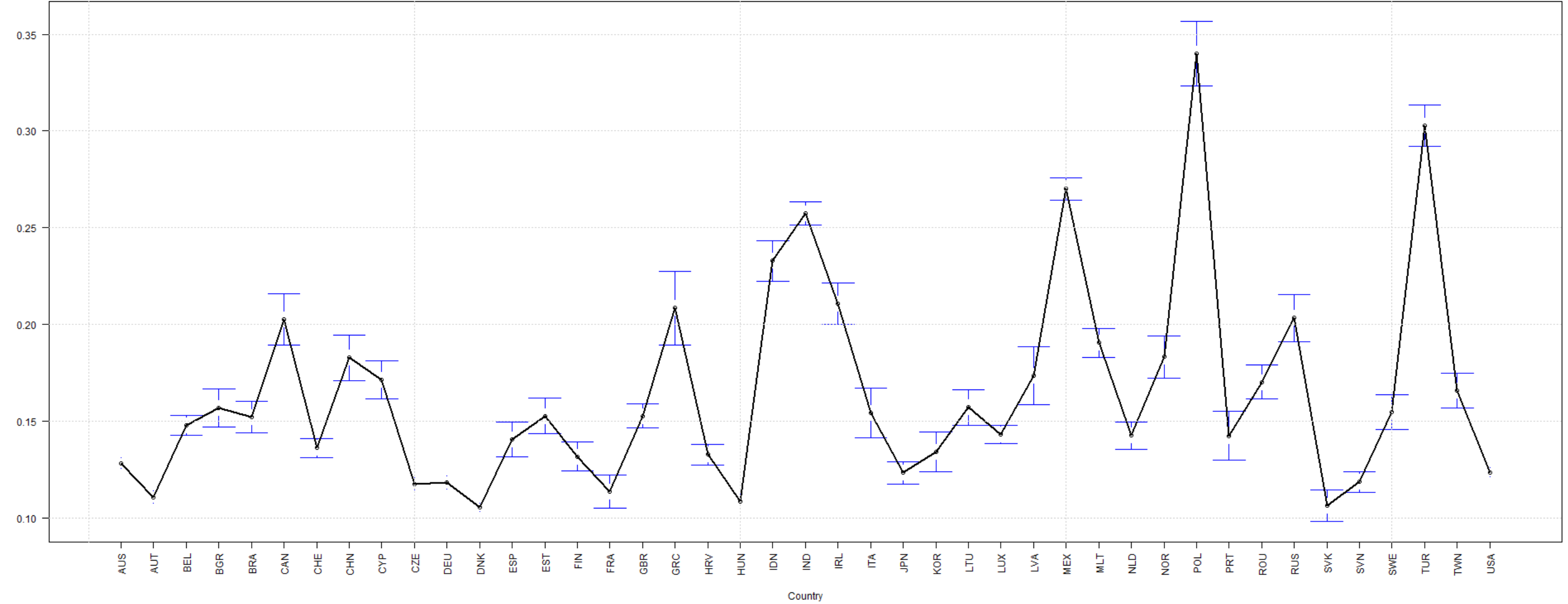
F
Value of money
($1/MELT$)



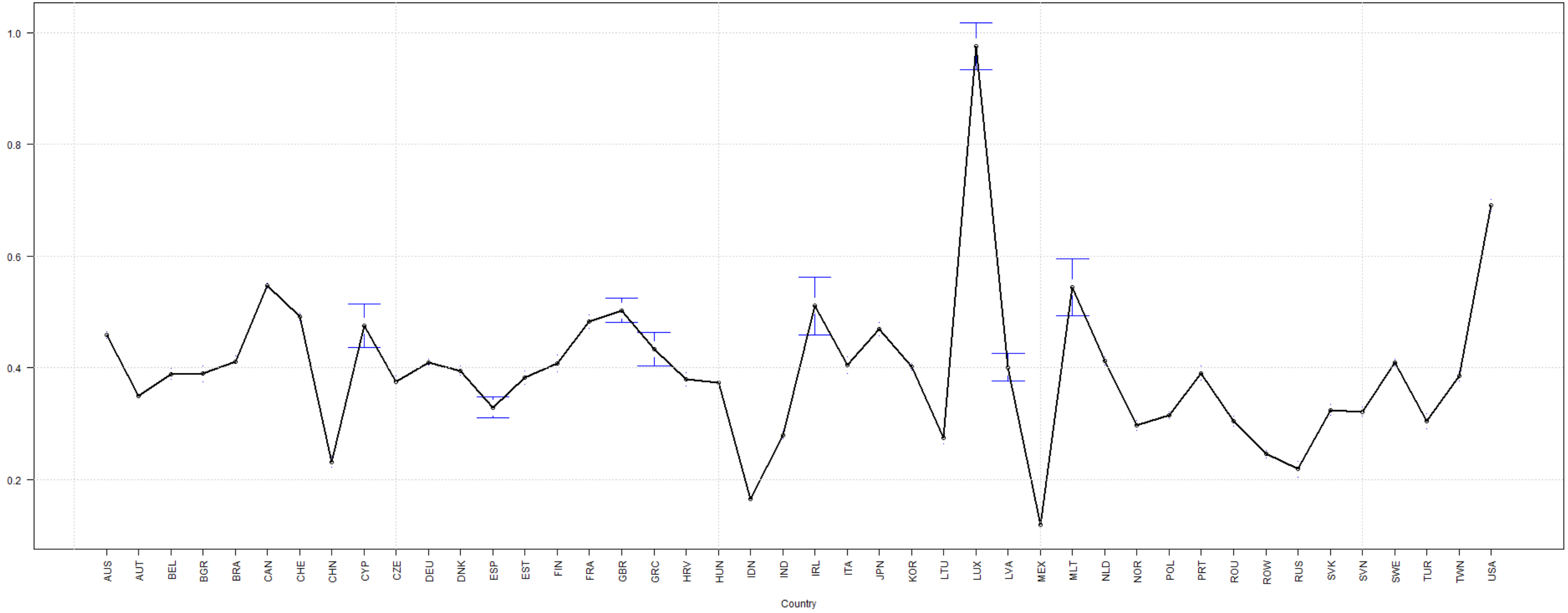
Rate of surplus value: rate of exploitation in productive activities
Averages within countries (2000-2014)



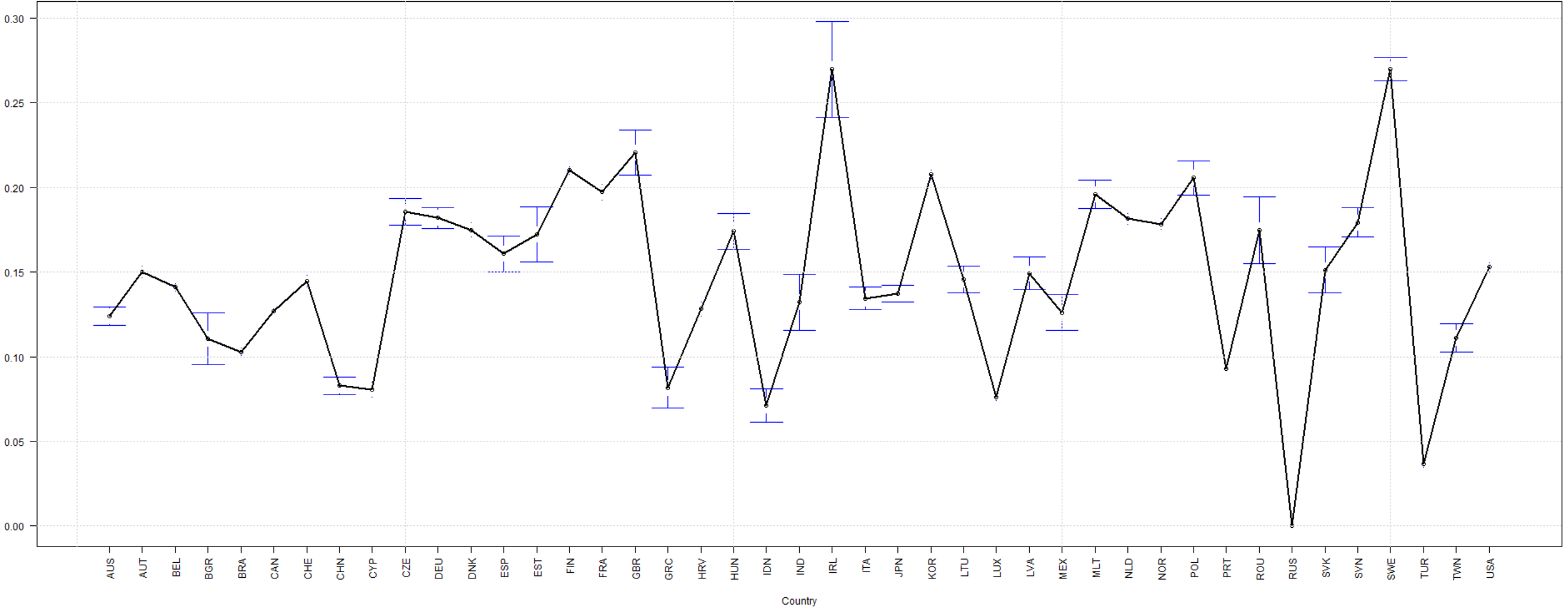
Average profit rate relative to the total productive and unproductive capital stock
Averages within countries (2000-2014)



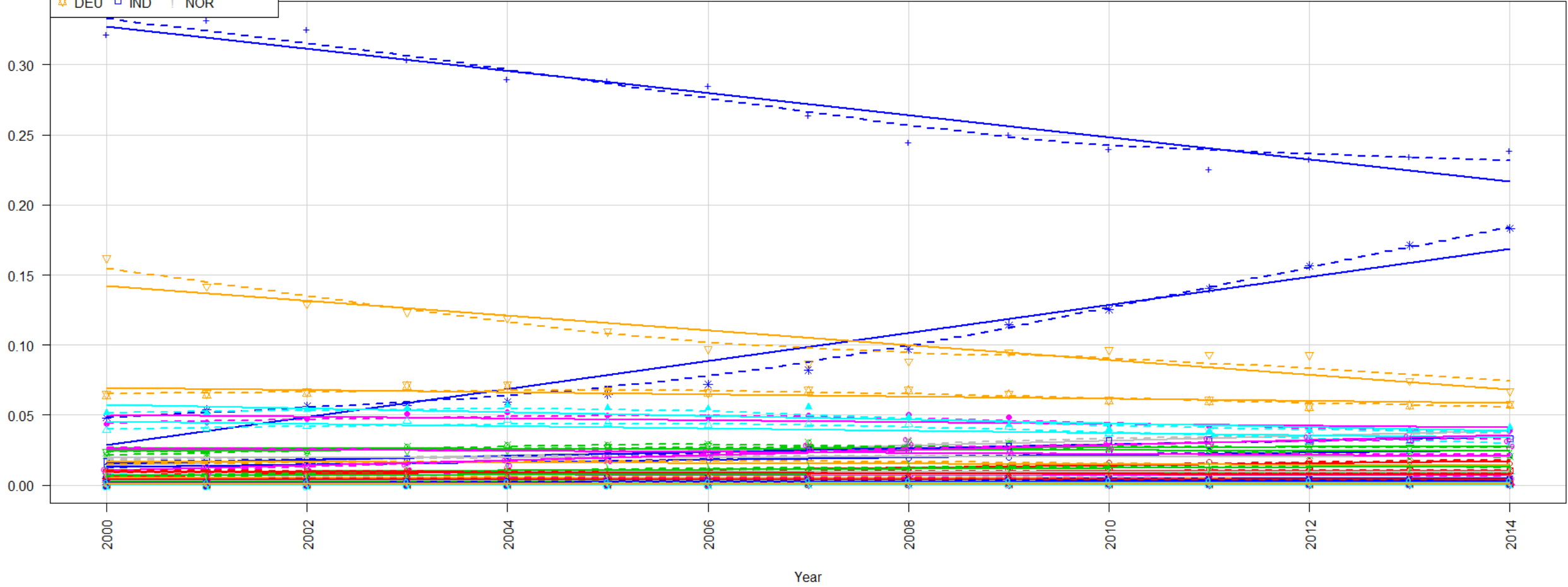
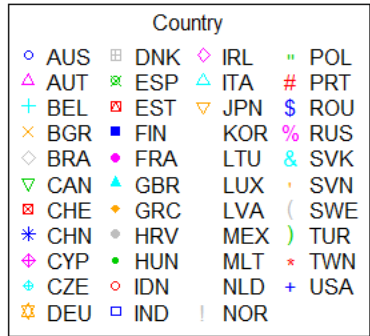
Ratio of net income of unproductive activities over the value added of productive activities
Averages within countries (2000-2014)



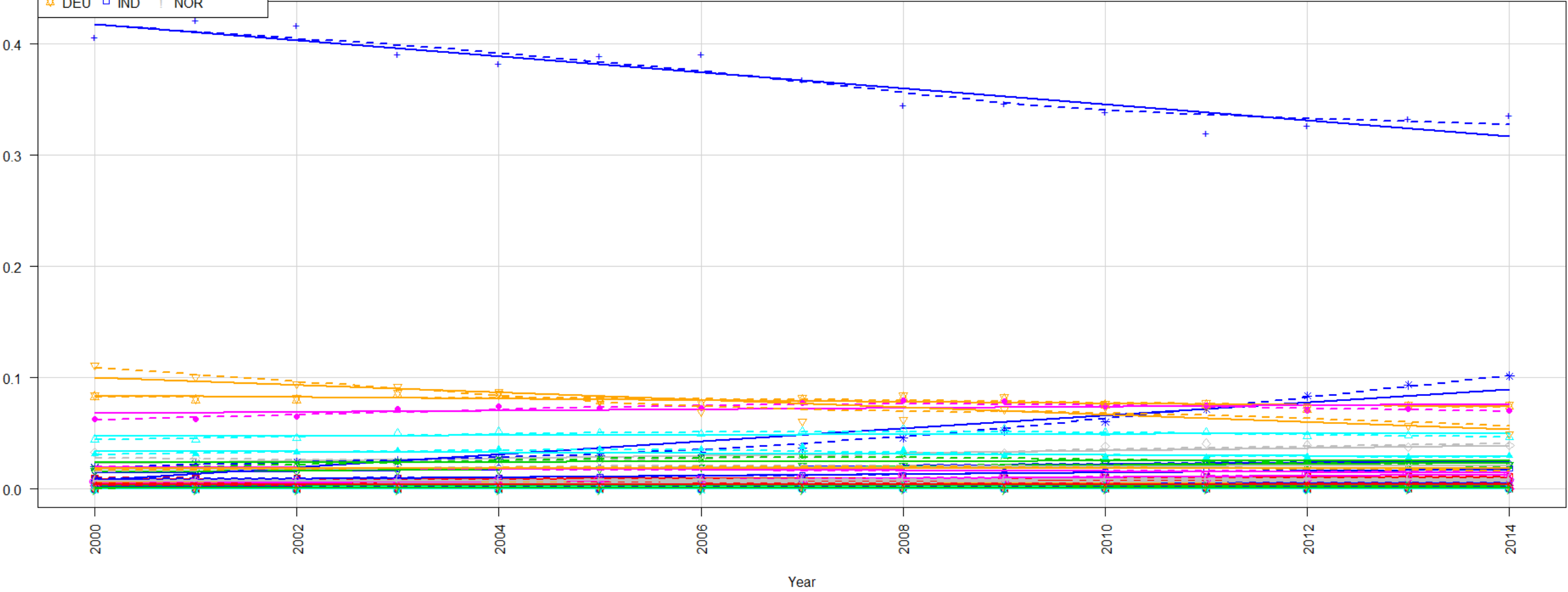
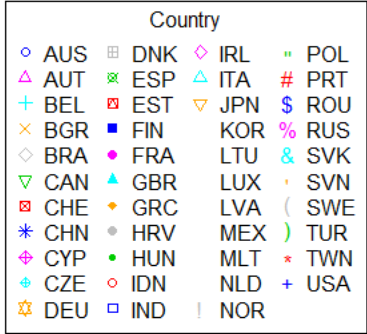
Share of knowledge rents in the net income of unproductive activities
Averages within countries (2000-2014)



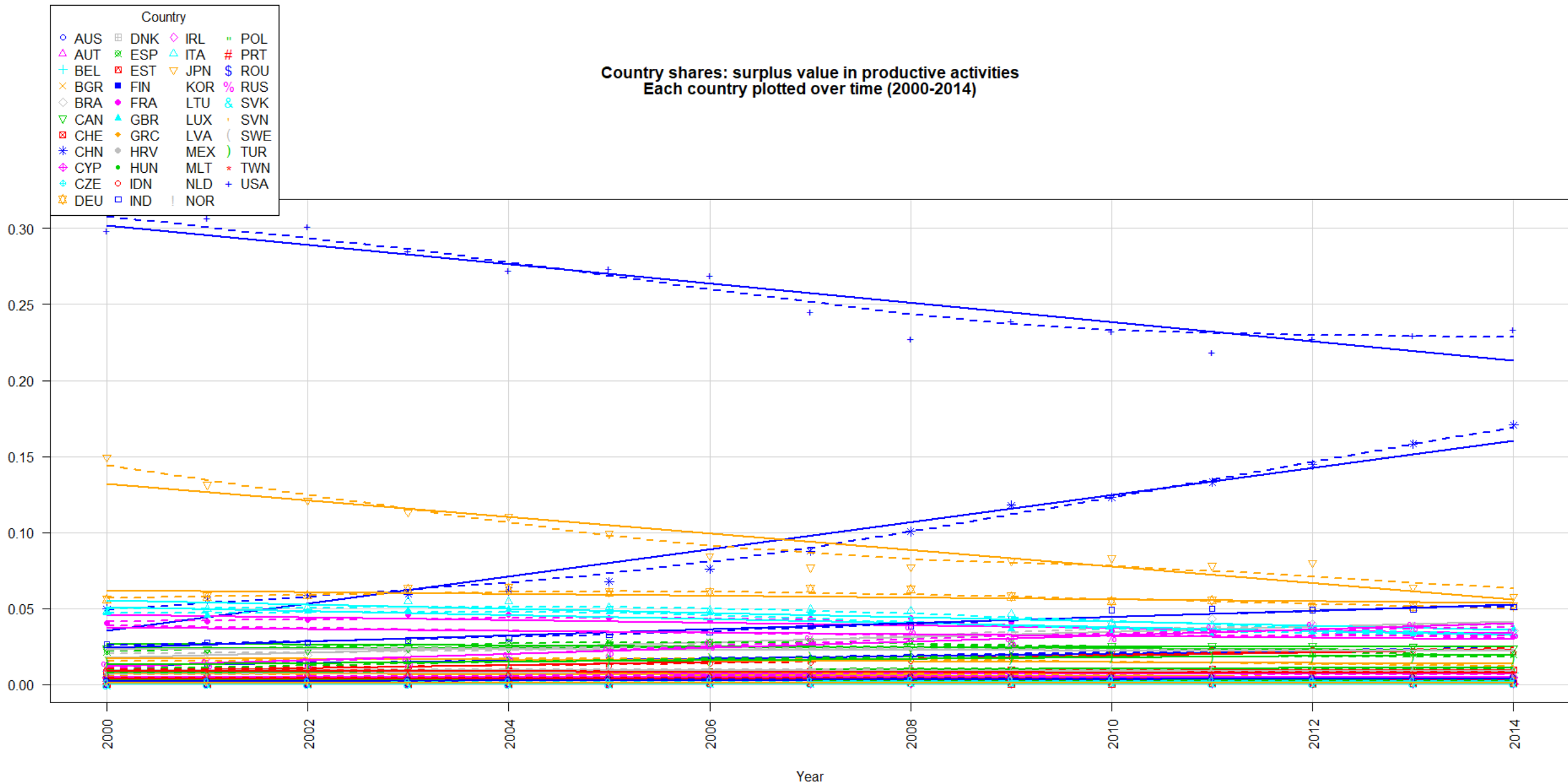
Country shares: value added in productive activities
Each country plotted over time (2000-2014)



Country shares: capital stock in unproductive activities
 Each country plotted over time (2000-2014)



Country shares: surplus value in productive activities
Each country plotted over time (2000-2014)



Tables

Table 1: List of Countries

AUS	Australia	ITA	Italy
AUT	Austria	JPN	Japan
BEL	Belgium	KOR	South Korea
BGR	Bulgaria	LTU	Lithuania
BRA	Brazil	LUX	Luxembourg
CAN	Canada	LVA	Latvia
CHE	Switzerland	MEX	Mexico
CHN	China	MLT	Malta
CYP	Cyprus	NLD	Netherlands
CZE	Czech Republic	NOR	Norway
DEU	Germany	POL	Poland
DNK	Denmark	PRT	Portugal
ESP	Spain	ROU	Romania
EST	Estonia	RUS	Russia
FIN	Finland	SVK	Slovakia
FRA	France	SVN	Slovenia
GBR	UK	SWE	Sweden
GRC	Greece	TUR	Turkey
HRV	Croatia	TWN	Taiwan
HUN	Hungary	USA	USA
IDN	Indonesia	ROW	Rest of the
IND	India		world
IRL	Ireland		combined

Table 3: Classification of Productive and Unproductive Activities

Productive Activities

Crop and animal production, hunting and related service activities
Forestry and logging
Fishing and aquaculture
Mining and quarrying
Manufacture of food products, beverages and tobacco products
Manufacture of textiles, wearing apparel and leather products
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
Manufacture of paper and paper products
Manufacture of coke and refined petroleum products
Manufacture of chemicals and chemical products
Manufacture of basic pharmaceutical products and pharmaceutical preparations
Manufacture of rubber and plastic products
Manufacture of other non-metallic mineral products
Manufacture of basic metals
Manufacture of fabricated metal products, except machinery and equipment
Manufacture of computer, electronic and optical products
Manufacture of electrical equipment
Manufacture of machinery and equipment n.e.c.
Manufacture of motor vehicles, trailers and semi-trailers
Manufacture of other transport equipment
Manufacture of furniture; other manufacturing
Repair and installation of machinery and equipment
Electricity, gas, steam and air conditioning supply
Water collection, treatment and supply
Sewerage; waste collection, treatment and disposal activities; materials recovery; remediation activities and other waste management services

Construction
Wholesale and retail trade and repair of motor vehicles and motorcycles
Wholesale trade, except of motor vehicles and motorcycles
Retail trade, except of motor vehicles and motorcycles
Land transport and transport via pipelines
Water transport
Air transport
Warehousing and support activities for transportation
Postal and courier activities
Accommodation and food service activities
Telecommunications
Legal and accounting activities; activities of head offices; management consultancy activities
Architectural and engineering activities; technical testing and analysis
Other professional, scientific and technical activities; veterinary activities
Administrative and support service activities
Education
Human health and social work activities
Other service activities
Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
Activities of extraterritorial organizations and bodies

Unproductive Activities (Finance)

Financial service activities, except insurance and pension funding
Insurance, reinsurance and pension funding, except compulsory social security
Activities auxiliary to financial services and insurance activities

Unproductive Activities (Real Estate)

Real estate activities

Unproductive Activities (Knowledge Rents)

Printing and reproduction of recorded media
Publishing activities
Motion picture, video and television programme production, sound recording and music publishing activities; programming and broadcasting activities
Computer programming, consultancy and related activities; information service activities
Scientific research and development
Advertising and market research

Unproductive Activities (Government)

Public administration and defence; compulsory social security

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