Economic growth

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Spring 2018

Broadly speaking the EU has two main aims

1. Ensure political stability
2. Improve living standards

Within EU framework number of factors that affect economic growth

1. International factors
   - Exchange rate regimes; terms of trade; capital flows
2. Policy
   - Promoting competitiveness; full employment; work quality; social cohesion; innovation

Cobb-Douglas function

Useful to examine factors that contribute to growth

$$Y_t = A_t K_t^{\alpha} L_t^{\beta} \tag{1}$$

K is capital

L labour

A accounts for technology.

Technology is an important source of growth

- Increase in A_t results in higher output without having to raise inputs
- Measure of productive efficiency
- Can fluctuate for various reasons, e.g. new technology, government regulation, management style

Since an increase in A_t increases productiveness of other factors it is also known as **Total Factor Productivity** (TFP).

Productivity

Often interested in output per worker; can re-write (1)

$$\frac{Y_t}{L_t} = A_t \left(\frac{K_t}{L_t}\right)^{\alpha} L_t^{\alpha+\beta-1} \tag{2}$$

Shows three potential ways to increase productivity

1. Increase in number of workers
2. Capital deepening
3. Technological progress

More workers will only add to growth when

$$\alpha + \beta > 1 \tag{3}$$

Most growth theories assume constant returns to scale

$$\beta = 1 - \alpha \tag{4}$$

Production function becomes

$$\frac{Y_t}{L_t} = A_t \left(\frac{K_t}{L_t} \right)^{\alpha} \tag{5}$$

Swan-Solow model links output to capital, labour and technological efficieny parameter

$$Y_t = AF(K_t, L_t) \tag{6}$$

Key feature is diminishing marginal return to capital accumulation

- Increase in K will give progressively smaller increase in Y

$$\frac{\delta^2 Y_t}{\delta K_t} < 0 \tag{7}$$

- Assuming constant labour supply

Model assumes closed economy and no government sector

- No international trade or public spending

All output takes form of consumption or investment

$$Y_t = C_t + I_t \tag{8}$$
$$S_t = Y_t - C_t = I_t \tag{9}$$

Capital depreciates

$$\frac{\partial K_t}{\partial t} = I_t - \gamma K_t$$

Capital stock depends on

- Investments (+)
- Depreciation rate (-)

Consumers save constant share of income: investments will be constant fraction of output

$$S_t = sY_t = I_t \tag{10}$$

Investment level is given by

$$I_t = sY_t = sAF(K_t, L_t) \tag{11}$$

NB- One off increase in technology level A has the same effect as a one off increase in s

- Capital and output gradually increase to a new level

K vs. A

Important difference between two determinants of growth

- Savings rate s is subject to a limit
- A does not face constraints.

Implication: for long-term sustainable growth TFP increases matter

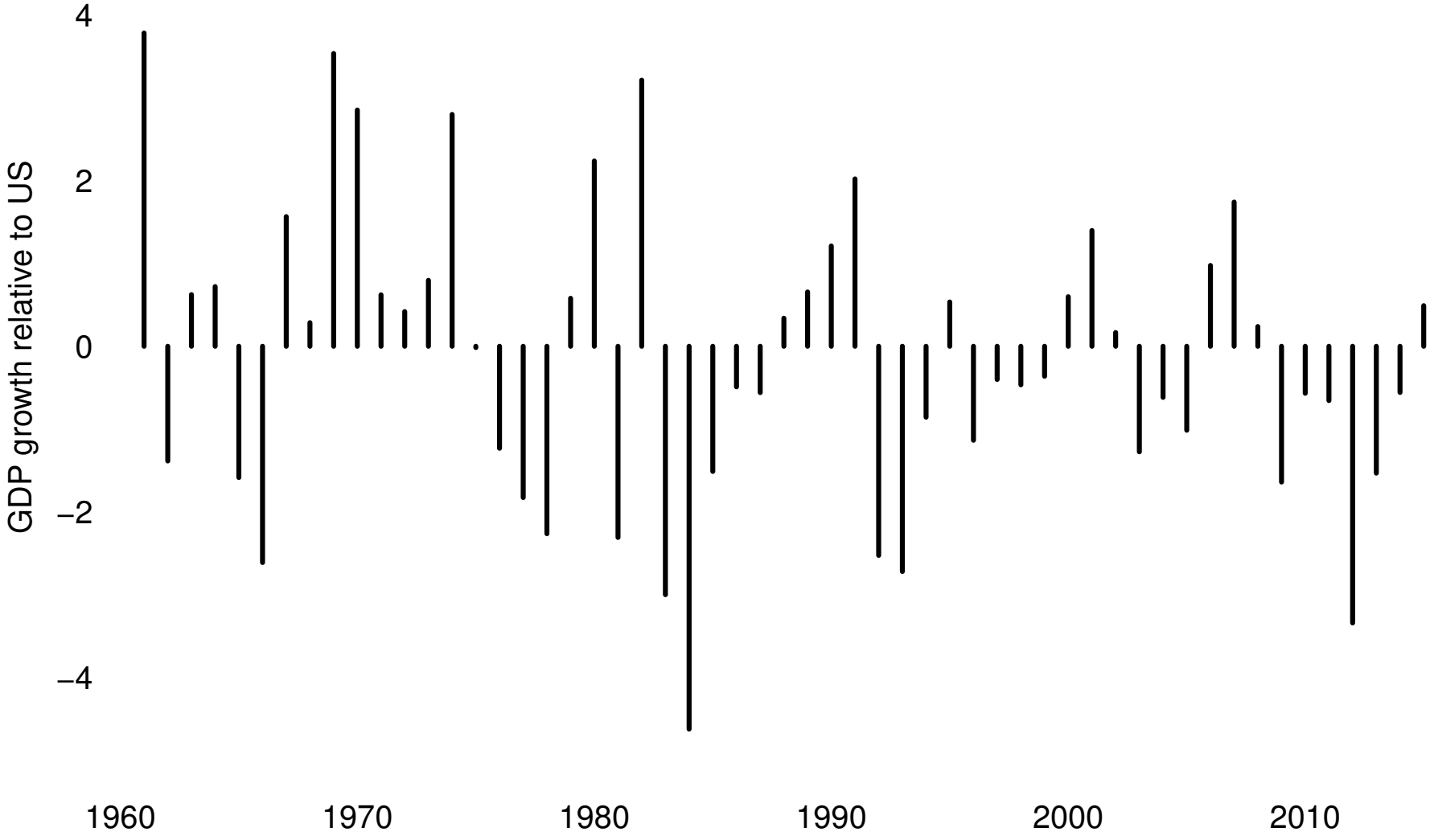
- Growth through capital accumulation will taper off over time producing a one-off increase in output per worker whereas TFP growth can lead to sustained higher growth rates of output per worker

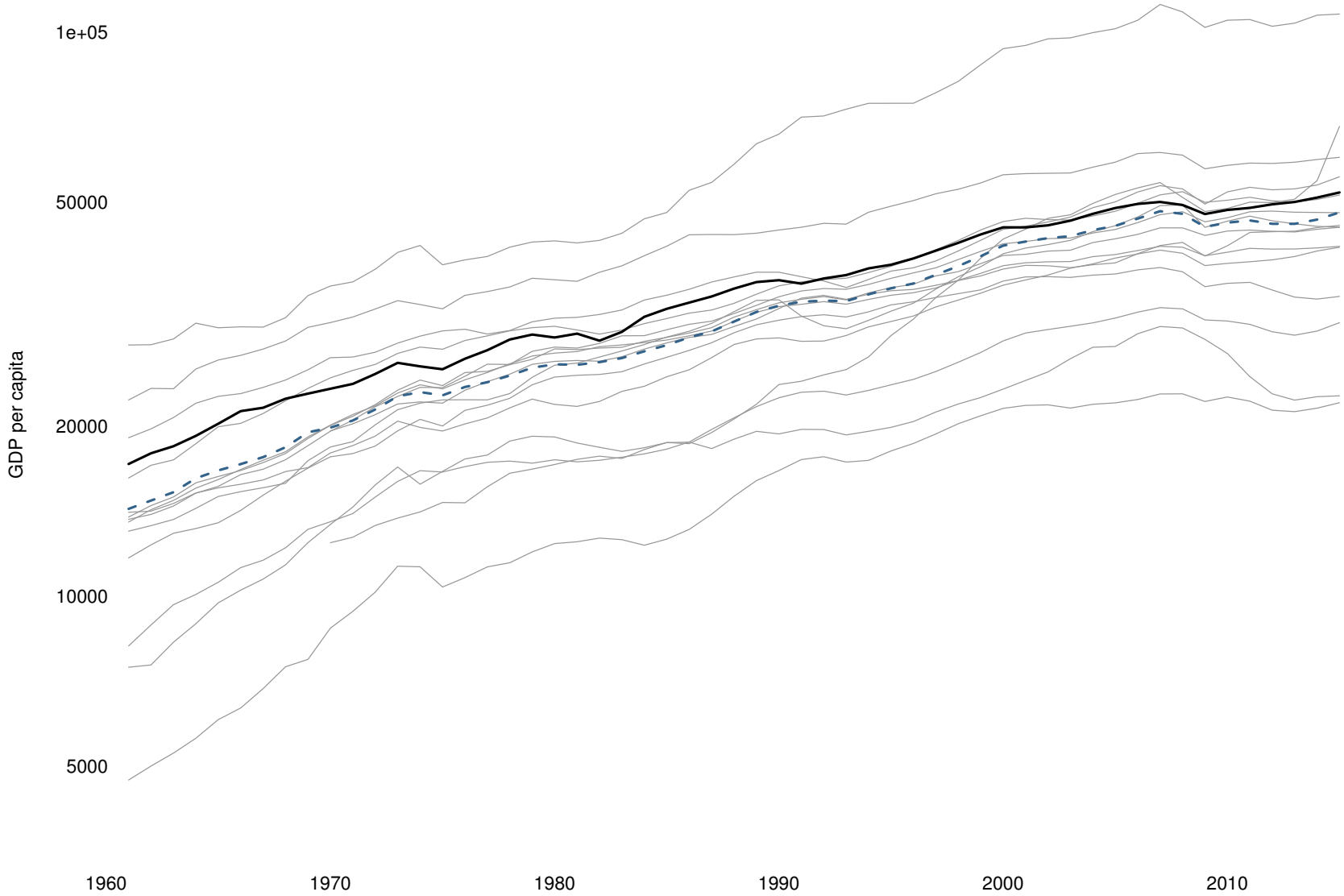
How well are EU countries doing in terms of economic growth?

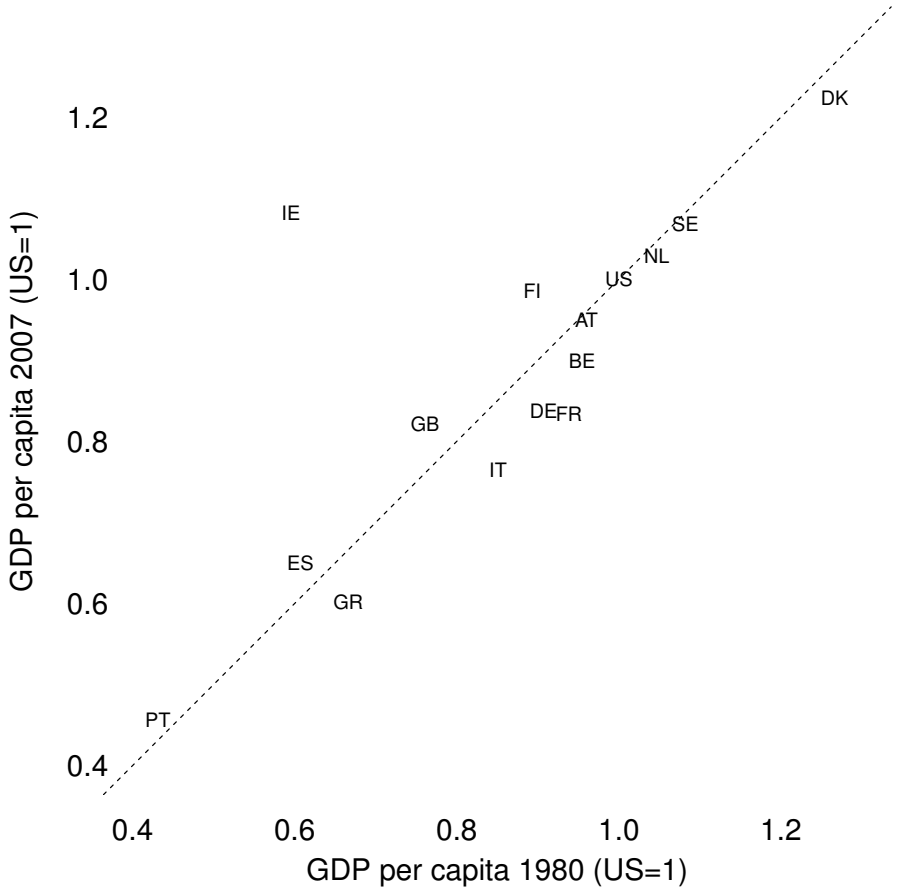
- Recall situation was pretty bleak following WW2

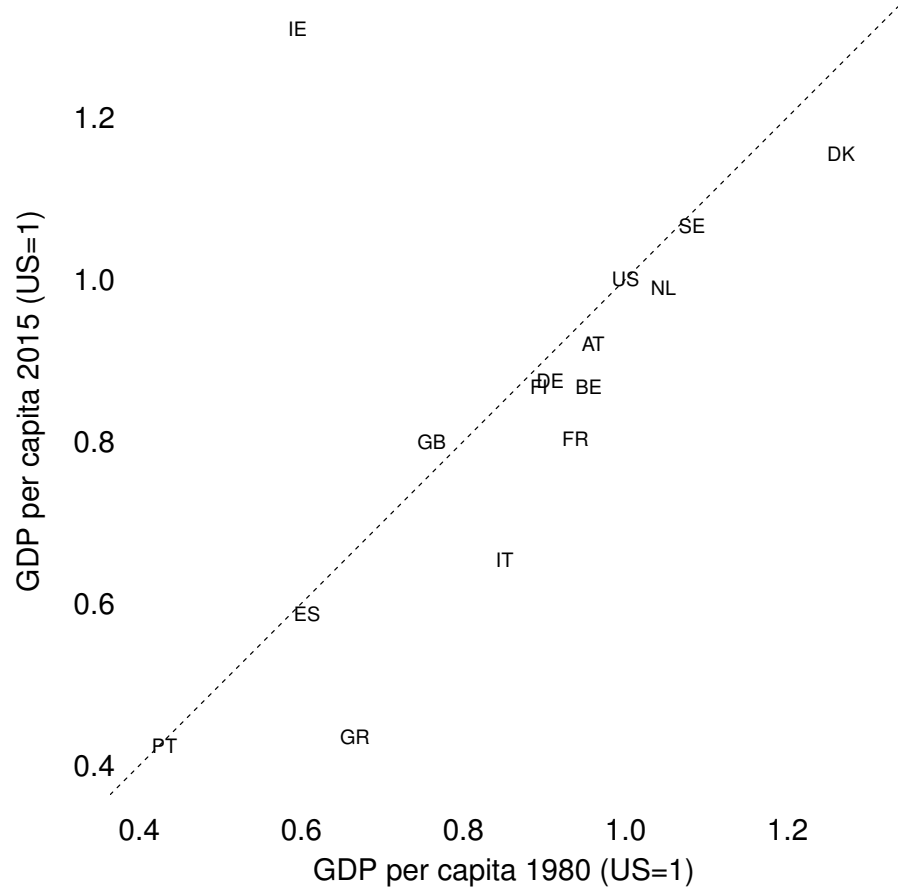
Answering this question can take two approaches

1. US comparison
2. Development of new EU member states


GDP growth relative to US
4
2
0
−2
−4
1960
1970
1980
1990
2000
2010


1e+05
50000
20000
10000
5000
GDP per capita
1960
1970
1980
1990
2000
2010


GDP per capita 2007 (US=1)
GDP per capita 1980 (US=1)
0.4
0.6
0.8
1.0
1.2
IE
DK
SE
NL
US
FI
AT
BE
DE
FR
GB
IT
ES
GR
PT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IE
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DE
FI
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GB
IT
ES
GR
PT

Americans attribute Europe's reduction in productivity to number of factors

1. Taxation level
2. Regulations
3. Level of competition

On the other hand, quality of living probably better in Europe (and lower inequality)

Two main issues in context of growth

1. Lack of competitiveness
   - Difficult to measure but can proxy with relative unit labour costs
   - Will increase when nominal wage growth rate out paces labour productivity
2. Low employment rate
   - EU GDP per capita 35% below US
   - European works less as output-per-hour is comparable

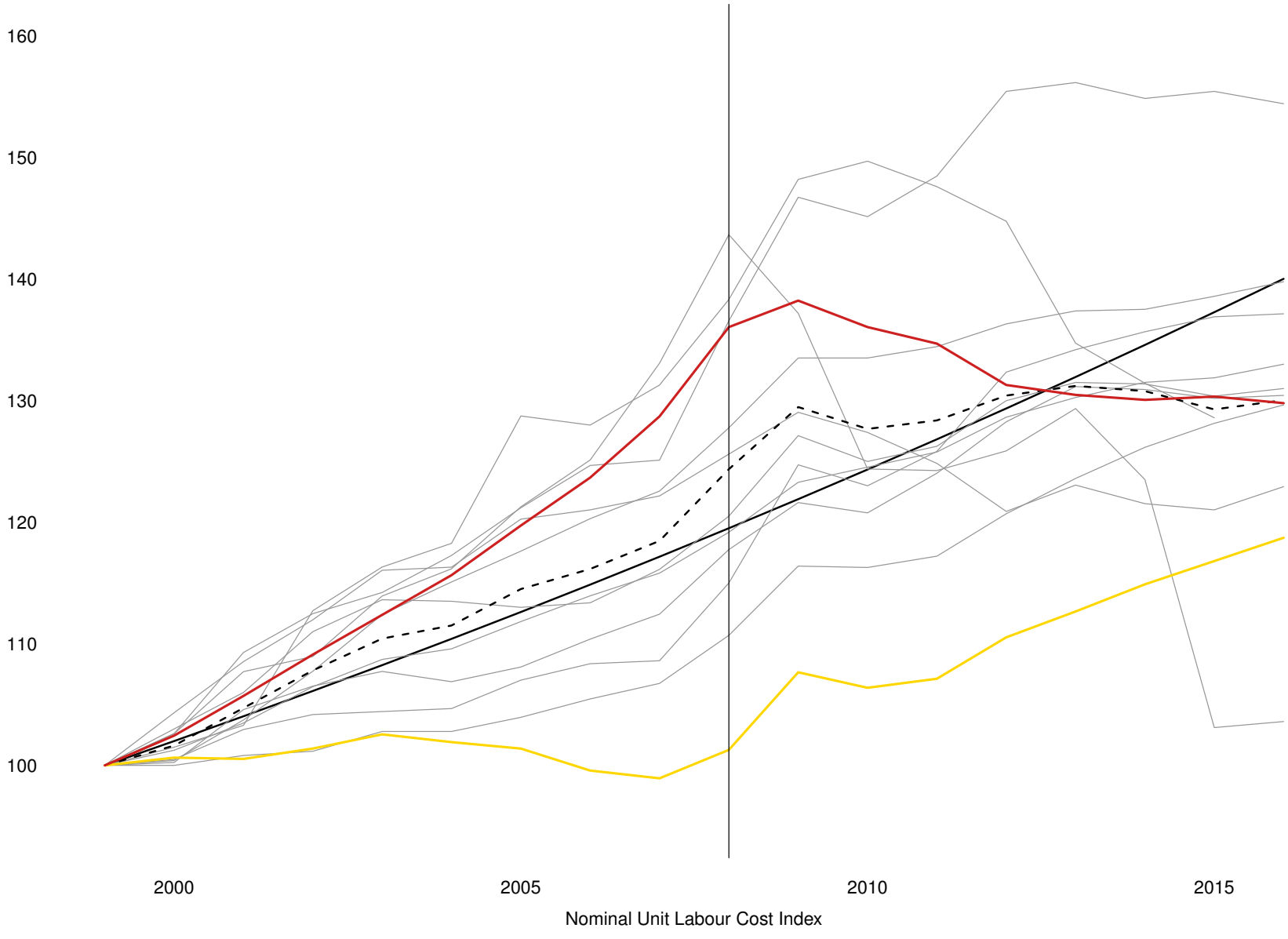
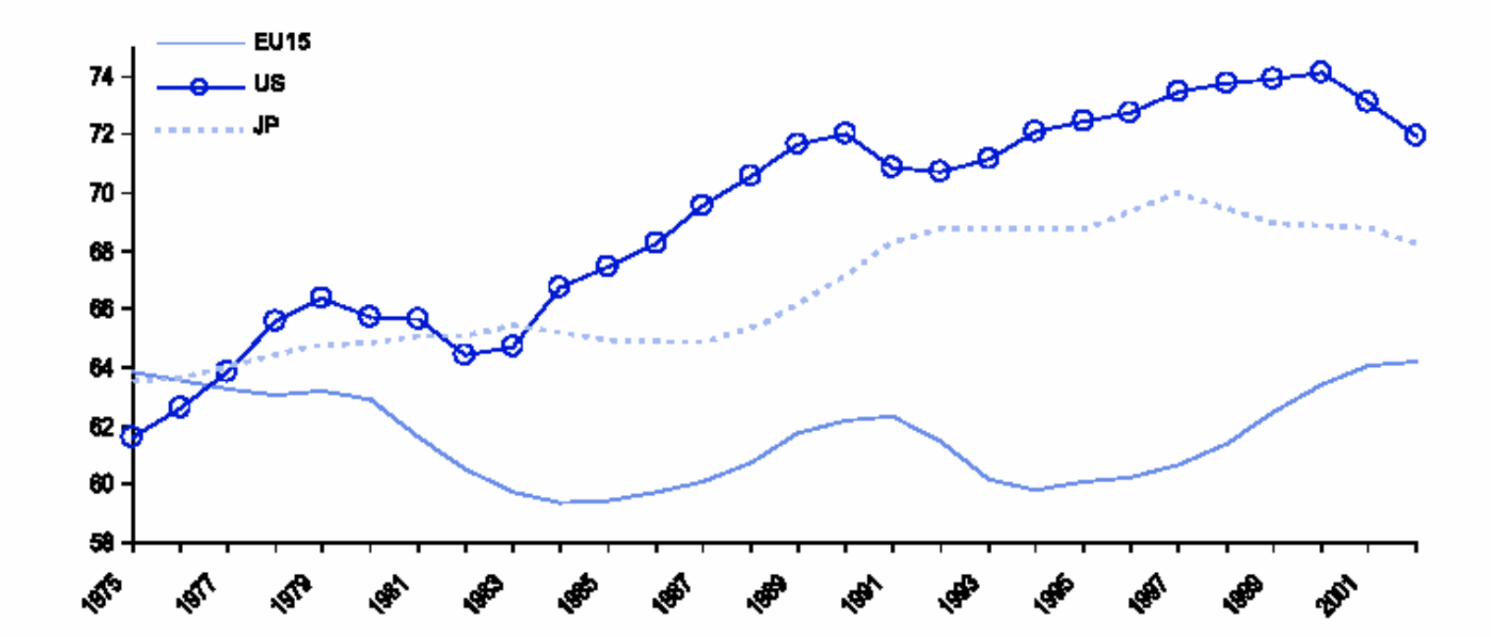

160
150
140
130
120
110
100
2000
2005
2010
2015
Nominal Unit Labour Cost Index

Figure 1.Employment rates in the EU, US and Japan 1975-2002

(% of working population)



Source: European Commission (2003)

Employment rate is lower because

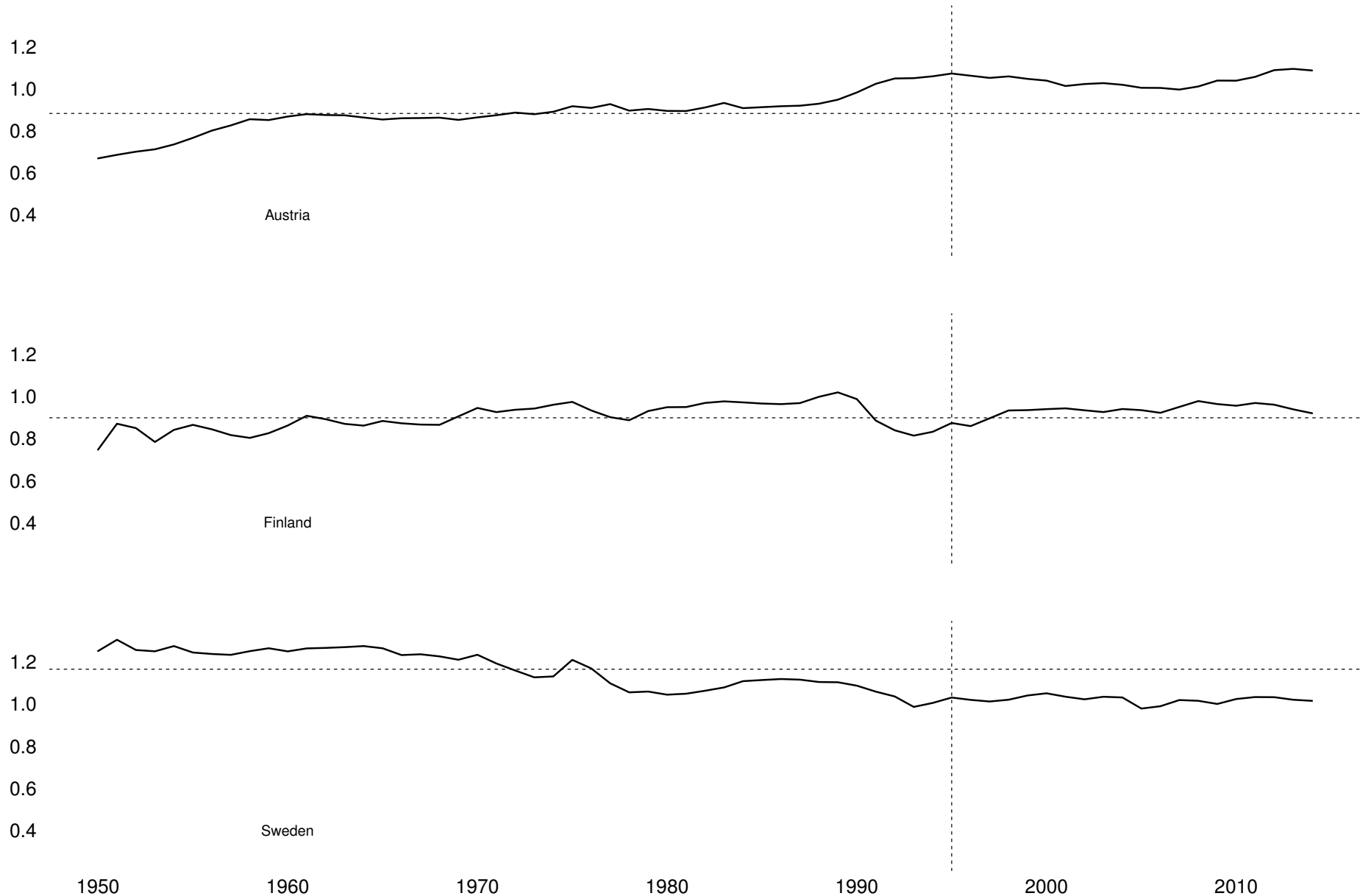
1. Relatively few new jobs are created
2. Unemployed Europeans spend more time searching for employment

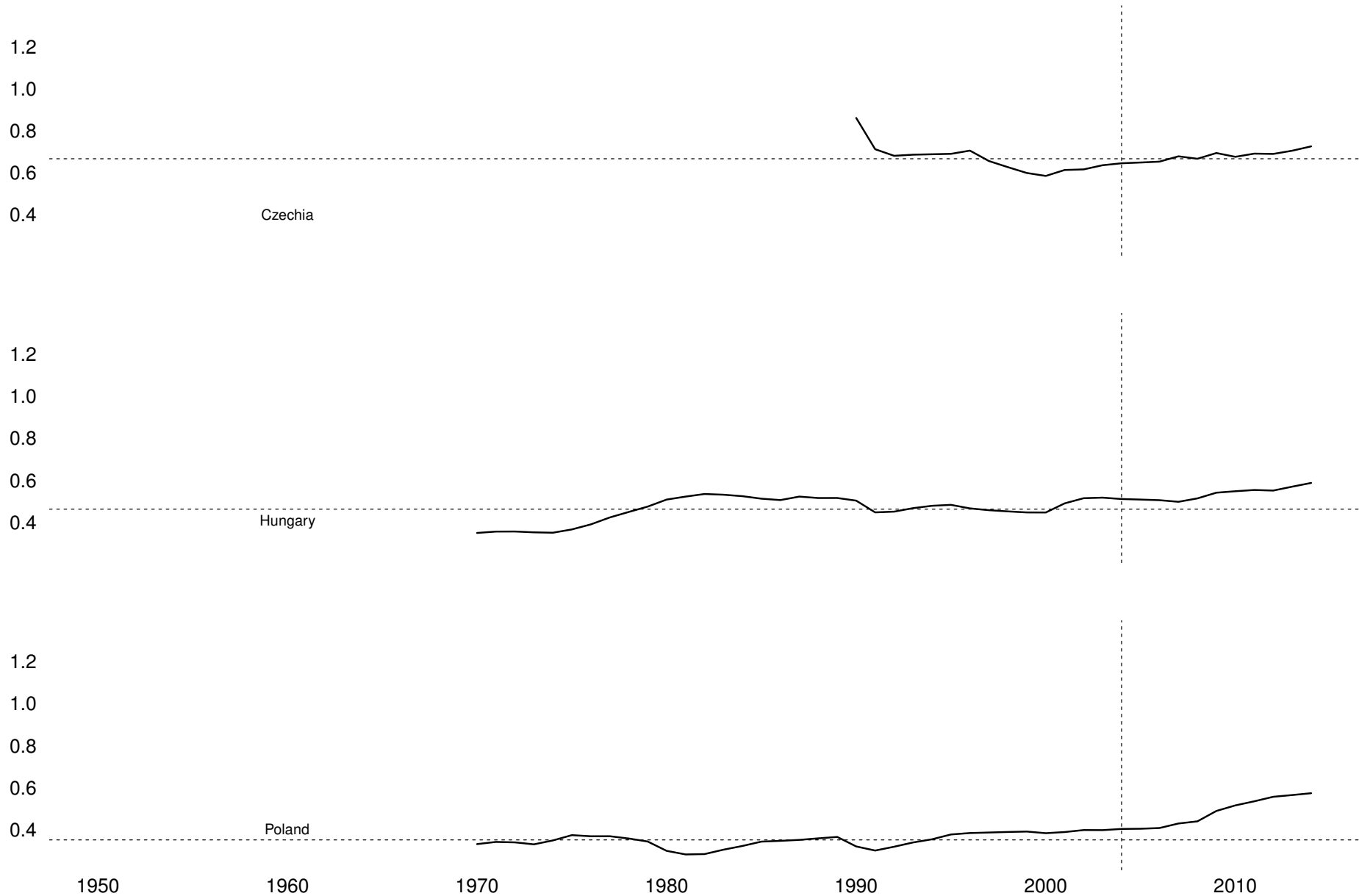
Besides using US as counterfactual can look at new member states

1. 1970s: Denmark, the United Kingdom, and Ireland
2. 1980s: Inclusion of former military regimes; Greece, Portugal, and Spain
3. 1995: Joining of non-aligned countries after the end of the Cold War in 1995; Austria, Finland, and Sweden
4. 2000s: Former East Bloc countries joined the EU.


1.2
1.0
0.8
0.6
0.4
Denmark
1.2
1.0
0.8
0.6
0.4
Ireland
1.2
1.0
0.8
0.6
0.4
Great Britain
1950
1960
1970
1980
1990
2000
2010


1.2
1.0
0.8
0.6
0.4
Greece
1.2
1.0
0.8
0.6
0.4
Spain
1.2
1.0
0.8
0.6
0.4
Portugal
1950
1960
1970
1980
1990
2000
2010


1.2
1.0
0.8
0.6
0.4
Austria
1.2
1.0
0.8
0.6
0.4
Finland
1.2
1.0
0.8
0.6
0.4
Sweden
1950
1960
1970
1980
1990
2000
2010


1.2
1.0
0.8
0.6
0.4
Czechia
1.2
1.0
0.8
0.6
0.4
Hungary
1.2
1.0
0.8
0.6
0.4
Poland
1950
1960
1970
1980
1990
2000
2010

In 2005 evaluation was made on performance of countries that joined in 1995

Austria

- Lower prices resulting in 2% welfare effect
- Additional 0.5% GDP growth annually

Finland

- Increase in trade and investment
- Lower consumer prices
- Large overall impact on economy

Sweden

- Estimated 0.4% increase in trend growth
- Increase in competition and FDI
- Improvement in fiscal and monetary policy

In general evaluation showed that joining the EU had been beneficial.

Growth accounting

$$G_t^Y = G_t^A + \alpha G_t^K + (1 - \alpha) G_t^L \tag{12}$$

Growth in output equals technology growth plus weighted average of capital and labour growth rates

- Weight determined by α

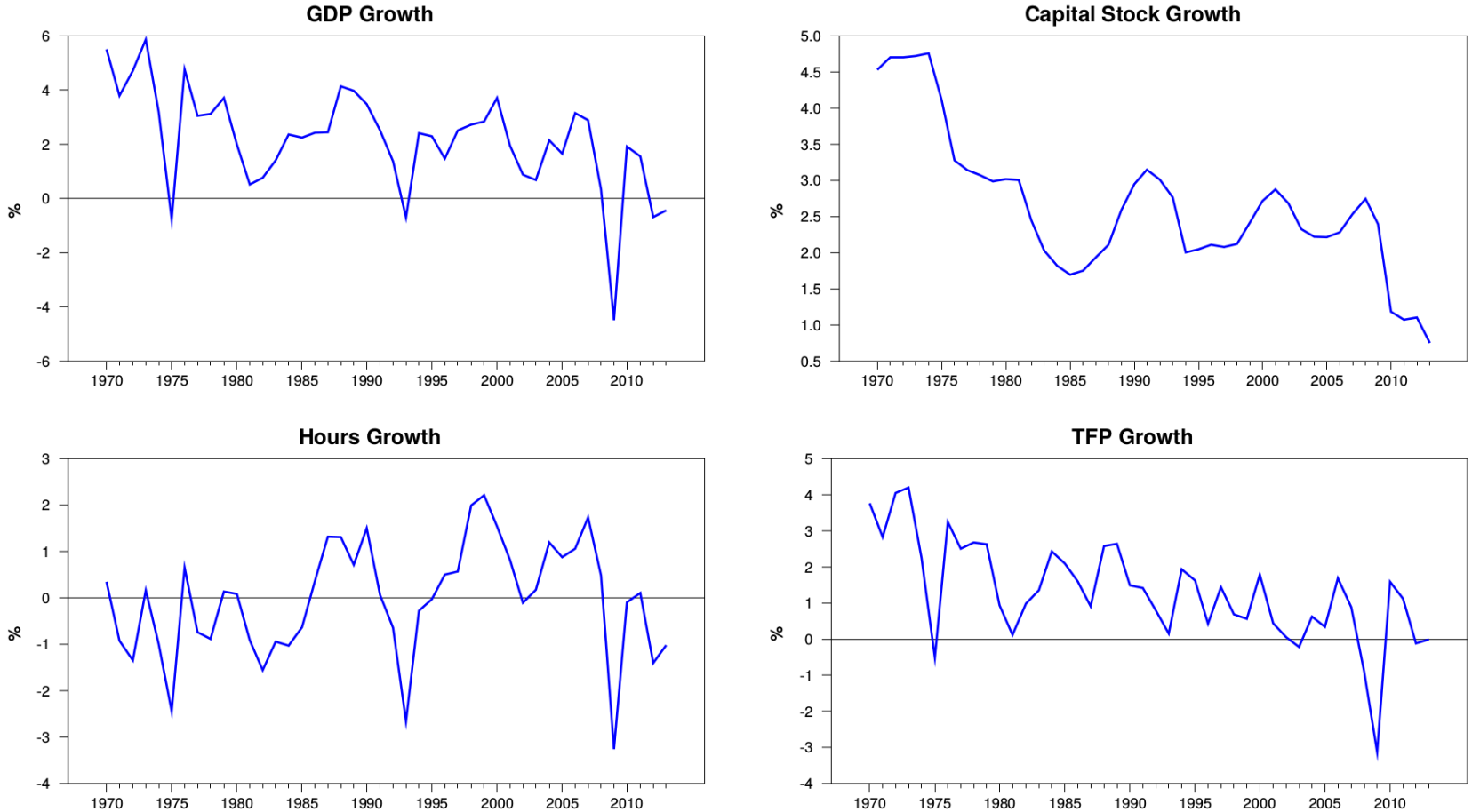
Table 1: Decomposition of Euro Area and US Output Growth Rates (%)

	Euro Area				United States			
Period	$\triangle y$	$\triangle a$	$\triangle k$	$\triangle l$	$\triangle y$	$\triangle a$	$\triangle k$	$\triangle l$
1970-1976	3.6	2.7	1.5	-0.5	3.1	0.9	1.2	1.0
1977-1986	2.1	1.6	0.8	-0.4	3.1	0.7	1.2	1.2
1987-1996	2.3	1.5	0.8	0.0	2.9	0.9	1.1	0.9
1997-2006	2.2	0.7	0.8	0.7	3.1	0.9	1.6	0.7
2007-2013	-0.3	-0.2	0.5	-0.6	1.0	0.5	0.7	-0.2
2000-2013	0.9	0.2	0.7	0.0	1.7	0.5	1.1	0.2
2010-2013	0.1	0.3	0.3	-0.5	2.1	0.7	0.5	0.9

Note: The table shows the contribution of growth in labour inputs, capital inputs and TFP to total output growth.

Figure 1

Determinants of Euro Area Output Growth: 1970-2013



Europe vs. US

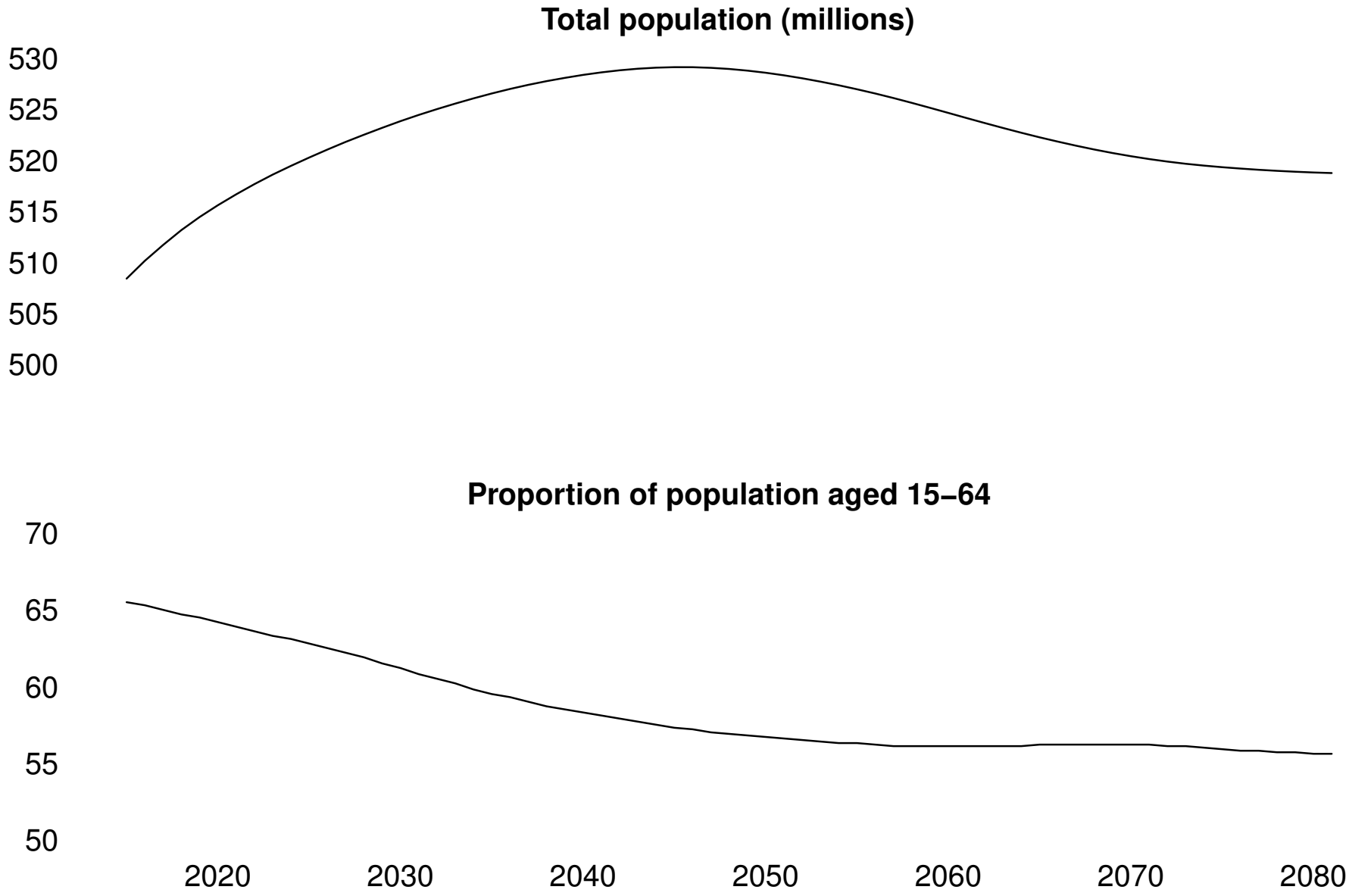
Growth has been similar but since 1990s US growth has been 1.3 percentage points higher

- Output per worker has declined in Europe
- Reduction in TFP growth

Past output growth relied mainly on increases in

- Capital
- Labour

Less on improvements in TFP: problematic as capital is endogenous.


Total population (millions)
530
525
520
515
510
505
500
Proportion of population aged 15–64
70
65
60
55
50
2020
2030
2040
2050
2060
2070
2080

Besides TFP slump aging of population is another serious issue

- Population growth is slowing down; expected to peak middle of century
- Working population (15-64 years) already peaked

Probably leads to further reduction in number of hours worked, reducing output growth

- Assuming that the employment rate returns to pre-crisis levels

Europe's macroeconomic problems are twofold

1. Short term
   - Weak aggregate demand
   - High levels of public and private debt
2. Long term
   - Demographic challenges

Structural reforms are required to boost productivity, in areas such as

1. Labour market
   - Reducing long-run unemployment rates
   - e.g. protection against dismissals, regulation of part-time work
2. Pension
   - Workers can work to a later age
   - Similar to Switzerland where there is a relatively high rate of labour participation among older workers
3. Broader regulatory reforms
   - e.g. taxes, education policies, etc.

2000 **Lisbon strategy** aimed to address some of these issues by deregulation of

- Labour markets
- Product markets

Aim was to create

> *the most dynamic, knowledge based economy in the world by 2010*

Failed

Lisbon strategy focused specifically on

- Problems posed by the public sector
  - Risk-taking was discouraged by large bureaucracies
  - Public services that are often inefficient
  - Policies that protect jobs rather than people
- Salience of national interests
  - Protectionist measures that inhibit competition in the services sector
  - Absence of unified research space

Europe 2020

New 10-year strategy rolled out in 2010

- Strategy identified that the responsibility for structural reforms lies with the national governments
- But should rely on the European single market and the common trade policy

Europe 2020 key issues

Employment

- Target of 75% employment rate of 20-64-year-olds

Innovation

- Invest 3% of EU's GDP in R and D

Climate/energy

- Limit greenhouse gasses by 20-30% compared to 1990 levels
- 20% of energy requirements coming from renewable energy
- Increasing energy efficiency by 20%

Education

- Reduce school dropout rate below 10%
- 40% of 30-34 years old completing tertiary education

Social inclusion

- Reduce people at risk of poverty or social exclusion with 20 million