

The Role of Labor Market Changes in the Slowdown of European Productivity Growth

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Employment, Productivity, and Policy

- EU labor productivity catches up to US level up to 1995 then falls back
- Hours worked moves in the opposite direction
 - Did one cause the other?
- Major increase in heterogeneity
- Understanding these issues will help us understand the effects of gov't policy

Our Basic Accounting Identity

- Output = Y
- Hours Worked = H
- Employees = E
- Population = N

- $Y/N = Y/H \times H/N$
 = $Y/H \times H/E \times E/N$

- We largely neglect hours per employee because there has been no major turnaround
- Focus is on labor productivity and the employment rate
 - We say their sum is output per capita
- We're concerned with *growth rates*

Our Main Contribution is to the Policy Debate

- For 20 years, Europe had low employment and hours, high unemployment
- Slowdown in productivity post-1995
 - Especially embarrassing compared to US
- EU wants to change it all with reforms – some to raise employment, others to raise productivity
- **They Can't Have It Both Ways**

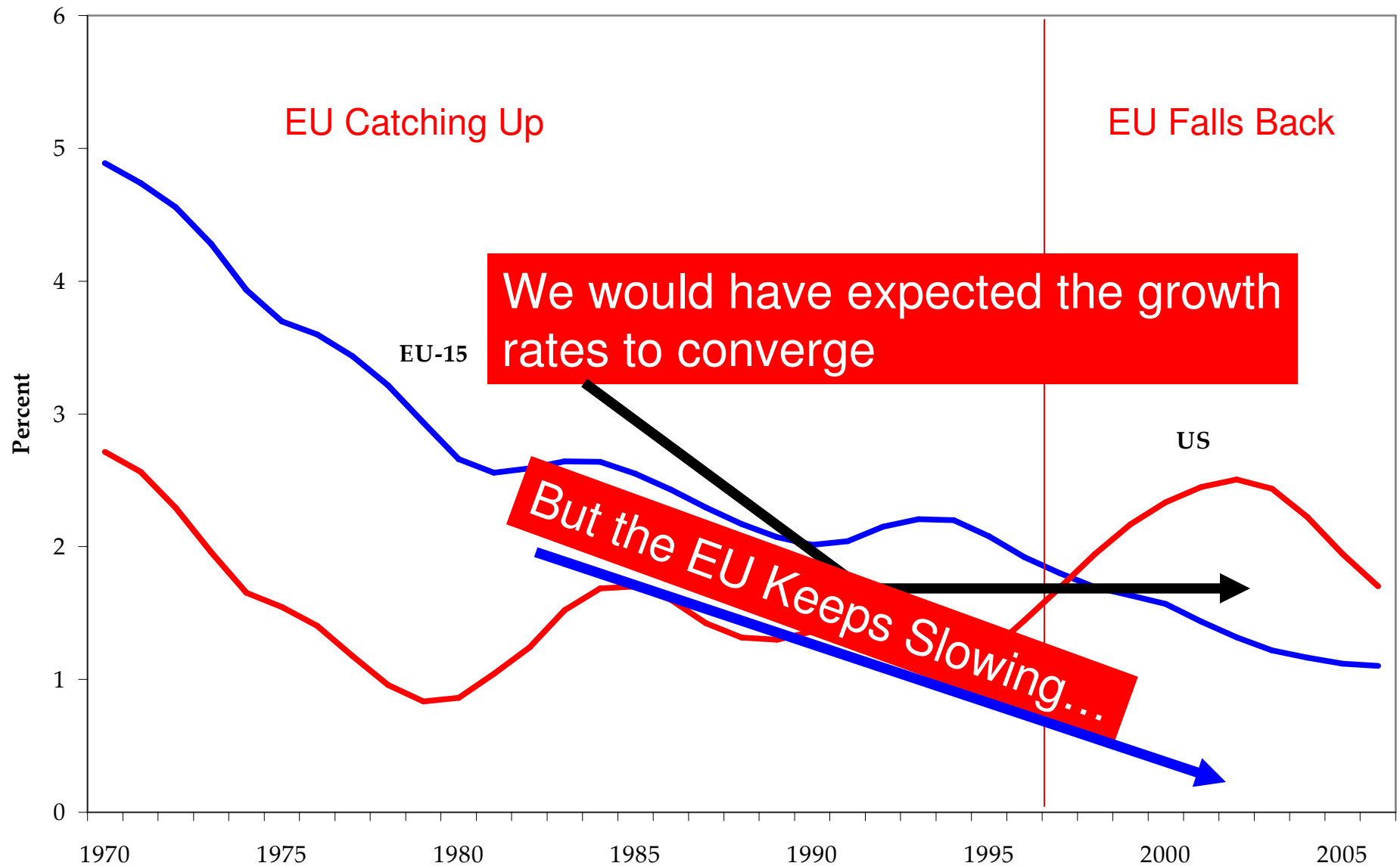
The Employment-Productivity Tradeoff

- Take any CRS production $F(K,L)$
 - Intensive form, $L \cdot F(K/L, 1) = L \cdot f(K/L)$
 - $Y/L = f(K/L)$
- As long as capital is fixed, an increase in employment lowers labor productivity
- We don't know how fast capital adjusts though; the tradeoff may be quantitatively small (maybe Europe is a small open economy?)
- A major goal of this paper is to quantify the tradeoff

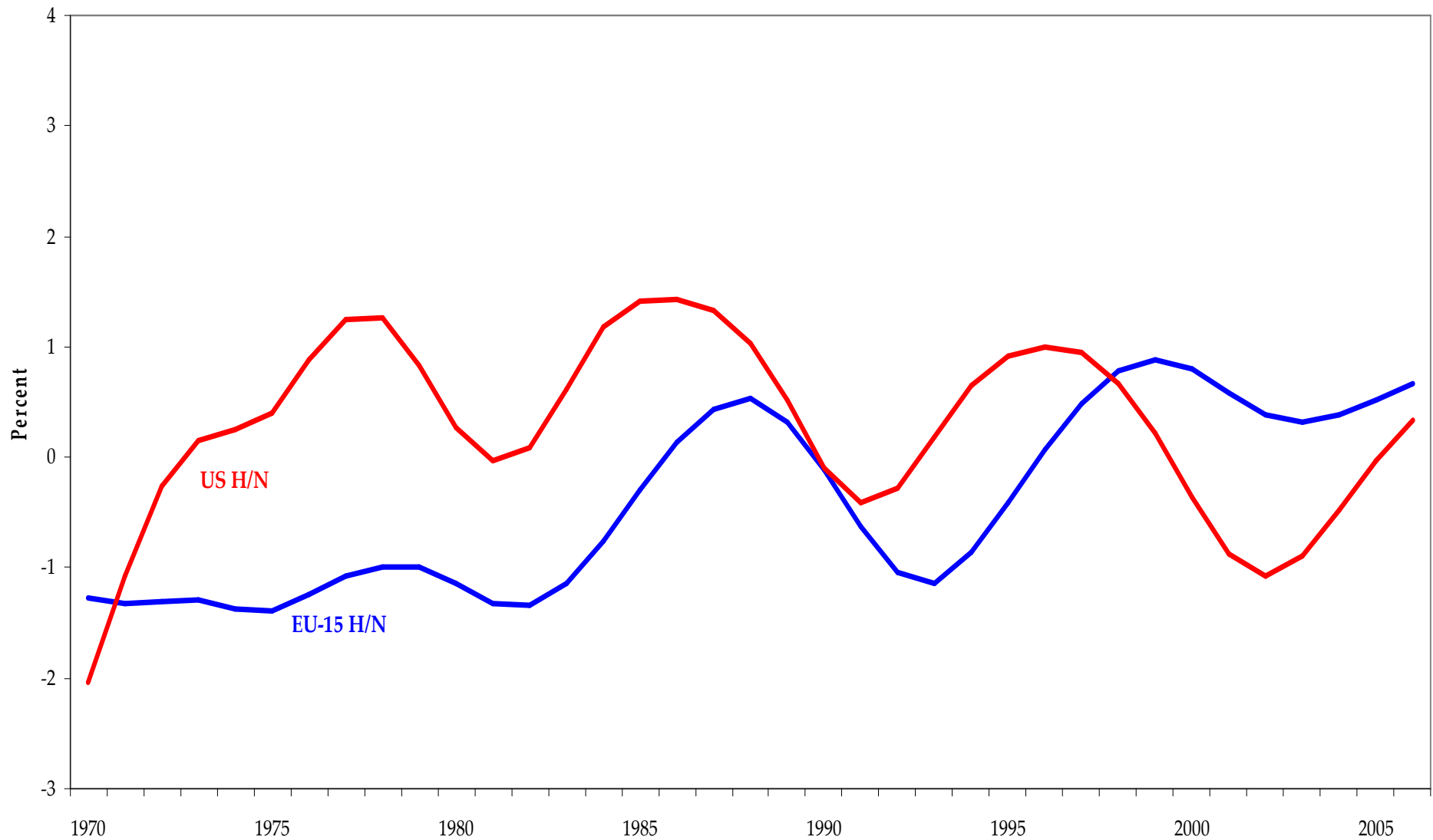
Outline

1. Basic Data
2. Explaining Employment
3. Employment and Productivity
4. Effects of Government Policies
5. Conclusion

Labor Productivity Growth



Adding Hours per Capita



Adding Hours per Capita

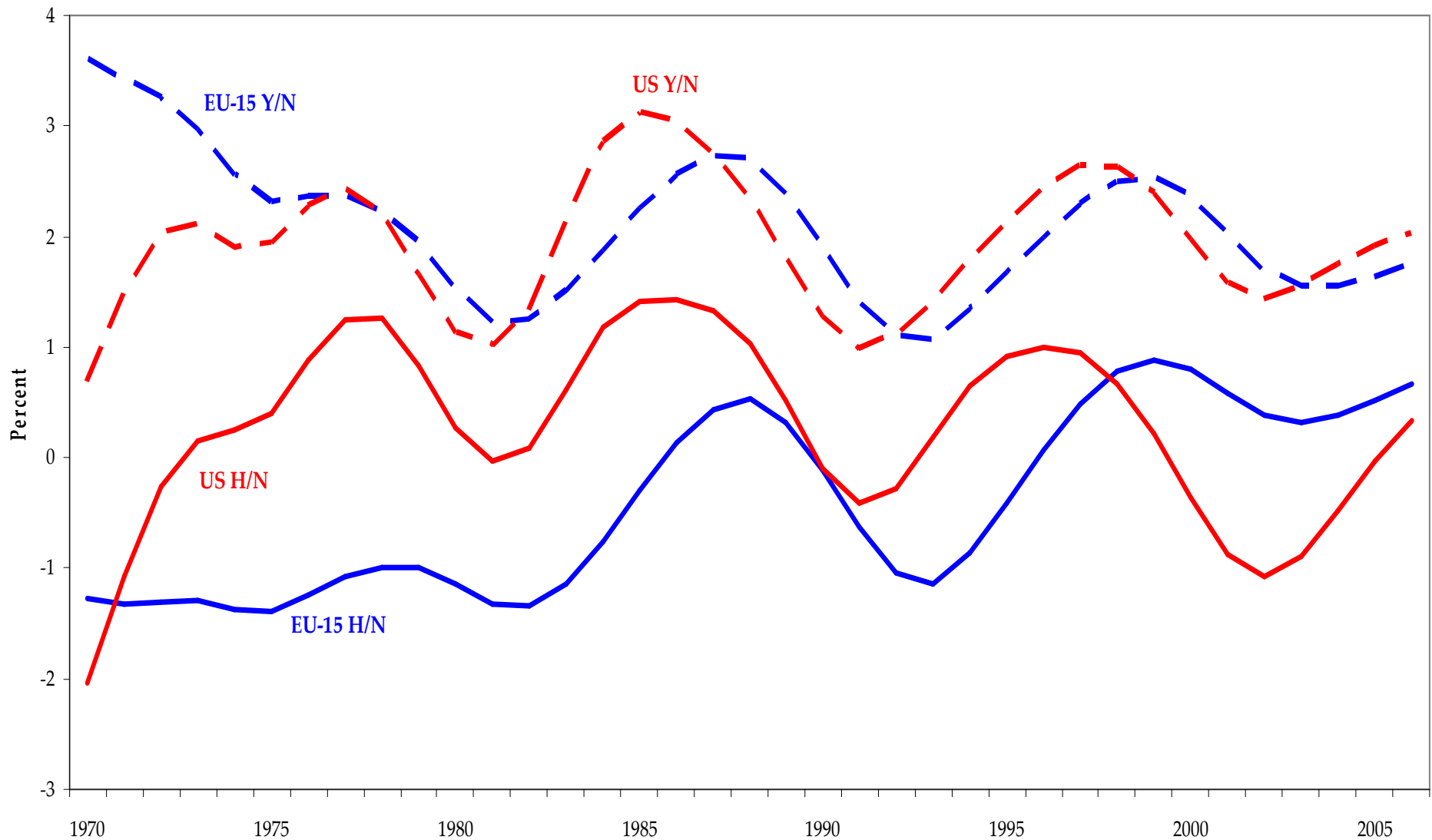
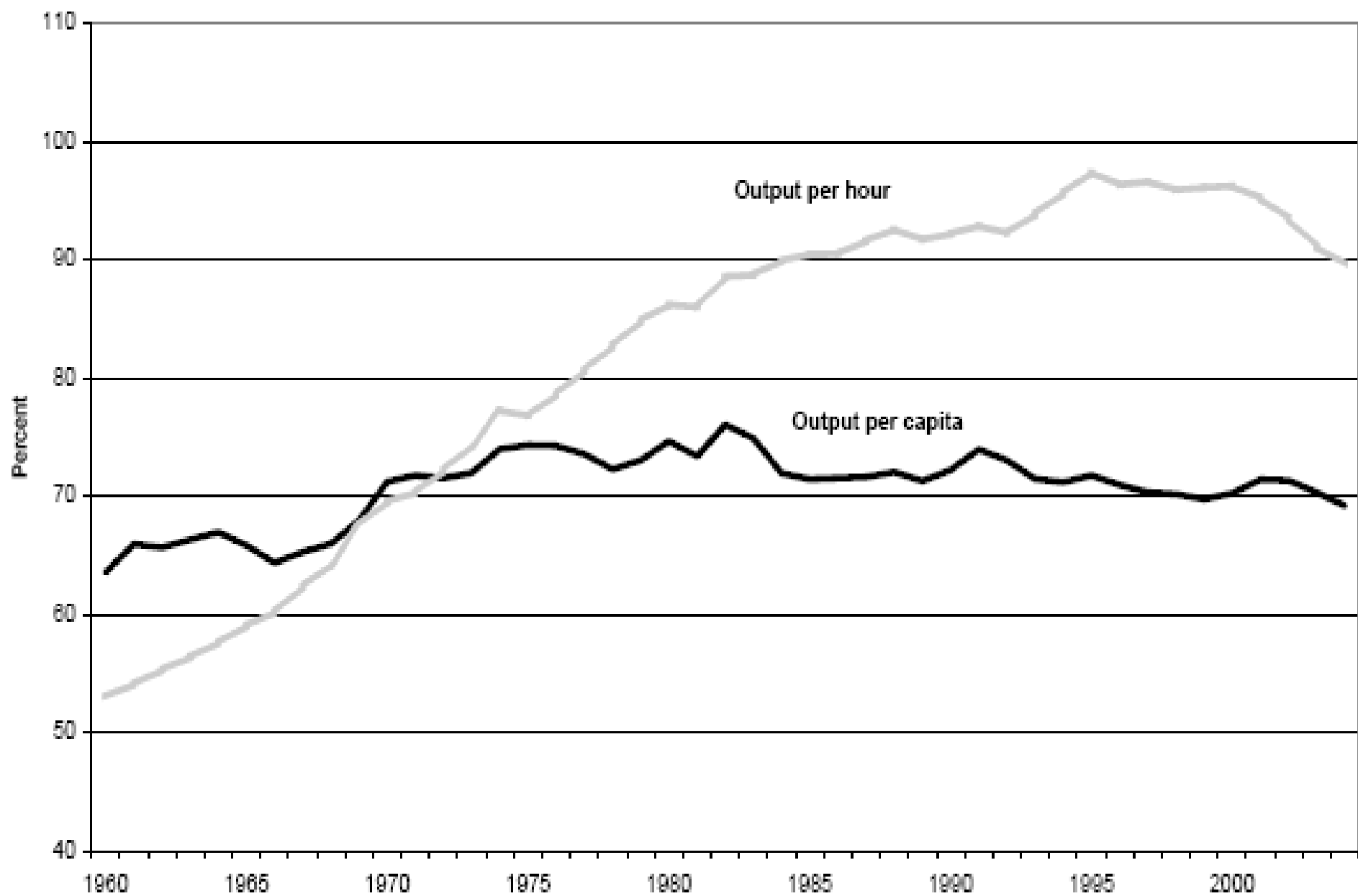


Figure 3. Ratio of Europe-15 to the United States, Output per Capita and Output per Hour, 1960-2004



Turnarounds in Hours and Output

- Turnarounds are 1995-2006 minus 1980-1995 growth
- The relative turnarounds (EU minus US) cancel each other out

$$Y/H + H/N = Y/N$$

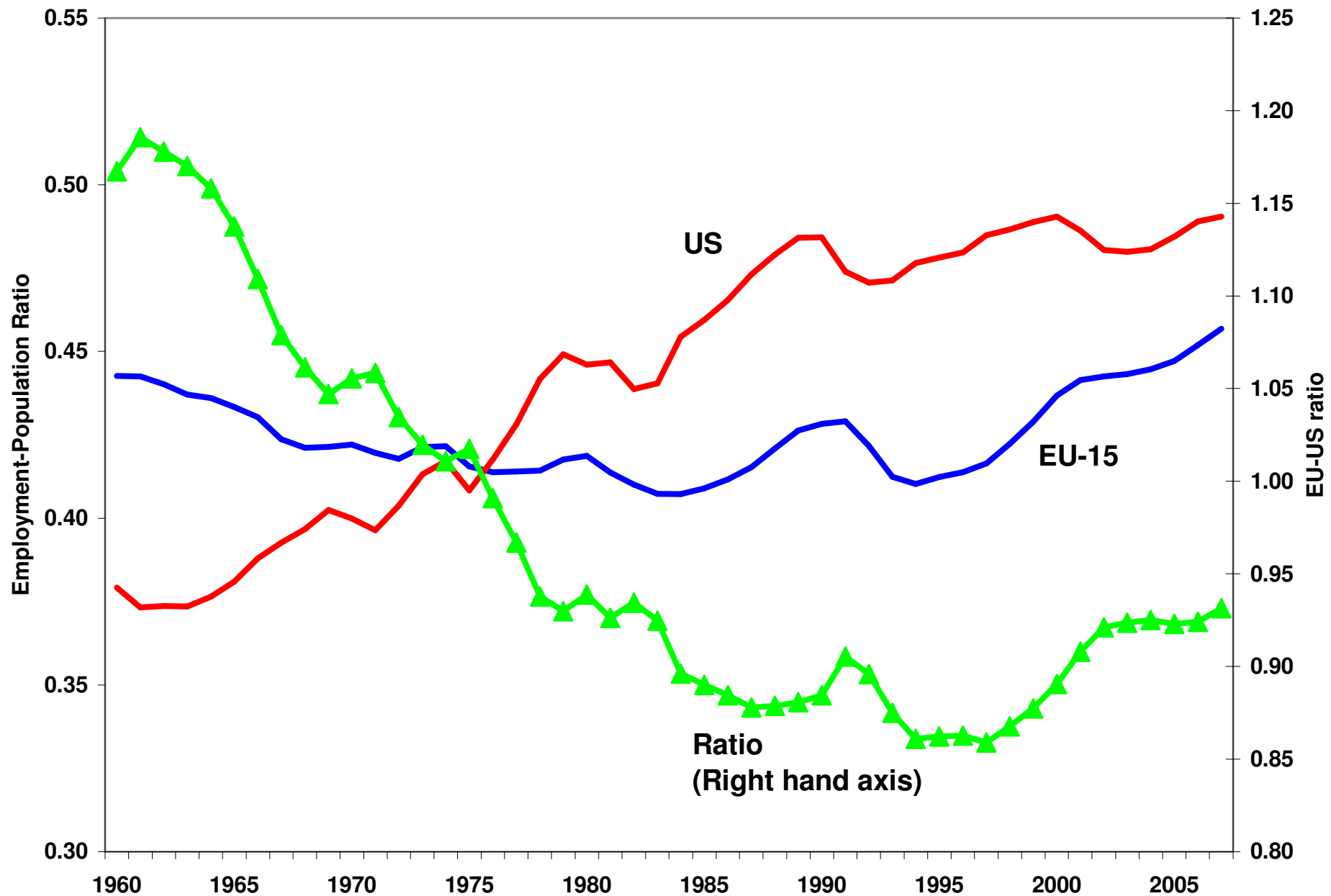
$$-2.20 \quad 1.99 \quad -0.21$$

- 1980-2005 Y/N growth is identical
- But the EU is not catching up

Labor Turnarounds

- Most of the action is in E/N
- This fits with the focus of the previous literature
- Studying employment gives us more data, i.e. by age and sex

US vs EU E/N



Employment Explanations

- Prescott – taxes explain everything
 - Uses a labor supply elasticity of -0.9
 - This is probably too large
- Alesina, Glaeser, Sacerdote – unions
 - There's a coordination problem
- Blanchard – taste for leisure
- Others simply throw it all into a regression
 - That's where we fit in

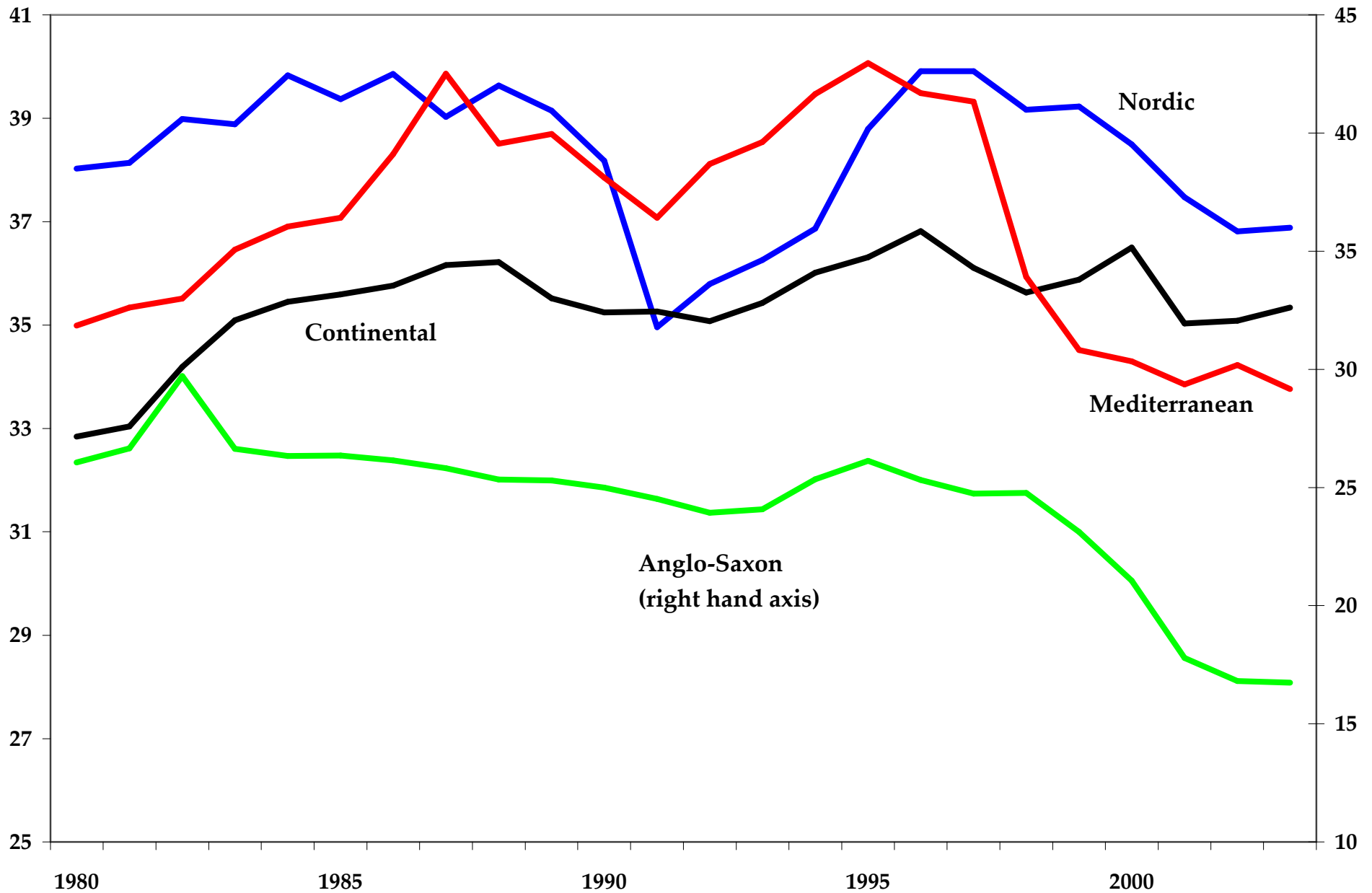
Employment Explanations

- Everybody misses the post-1995 turnaround
- What caused it?
 - Changes in regulations, taxes?
 - Decline in unions?
 - Shift in preferences?
 - Whose preferences?
- Note H/E hasn't started rising

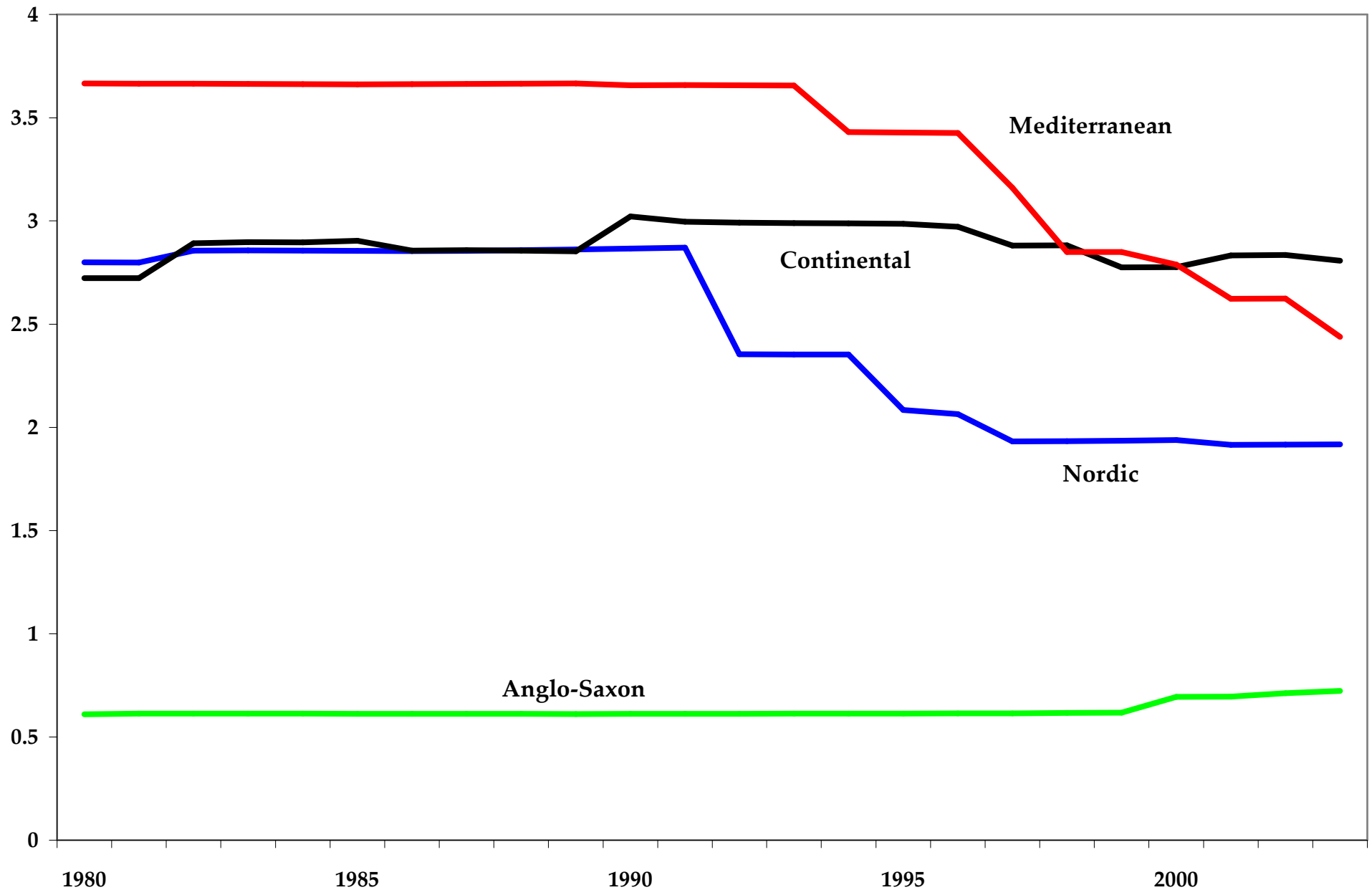
Employment Regressions

- Cover 1980-2003 EU-15, N=320, population weighted
- **Explanatory Variables:**
 - Output Gap
 - Average Replacement Rate (ARR)
 - Employment Protection Legislation (EPL)
 - Product Market Regulation (PMR)
 - Union Density
 - Tax wedge
 - Various dummies
- These are common across this literature

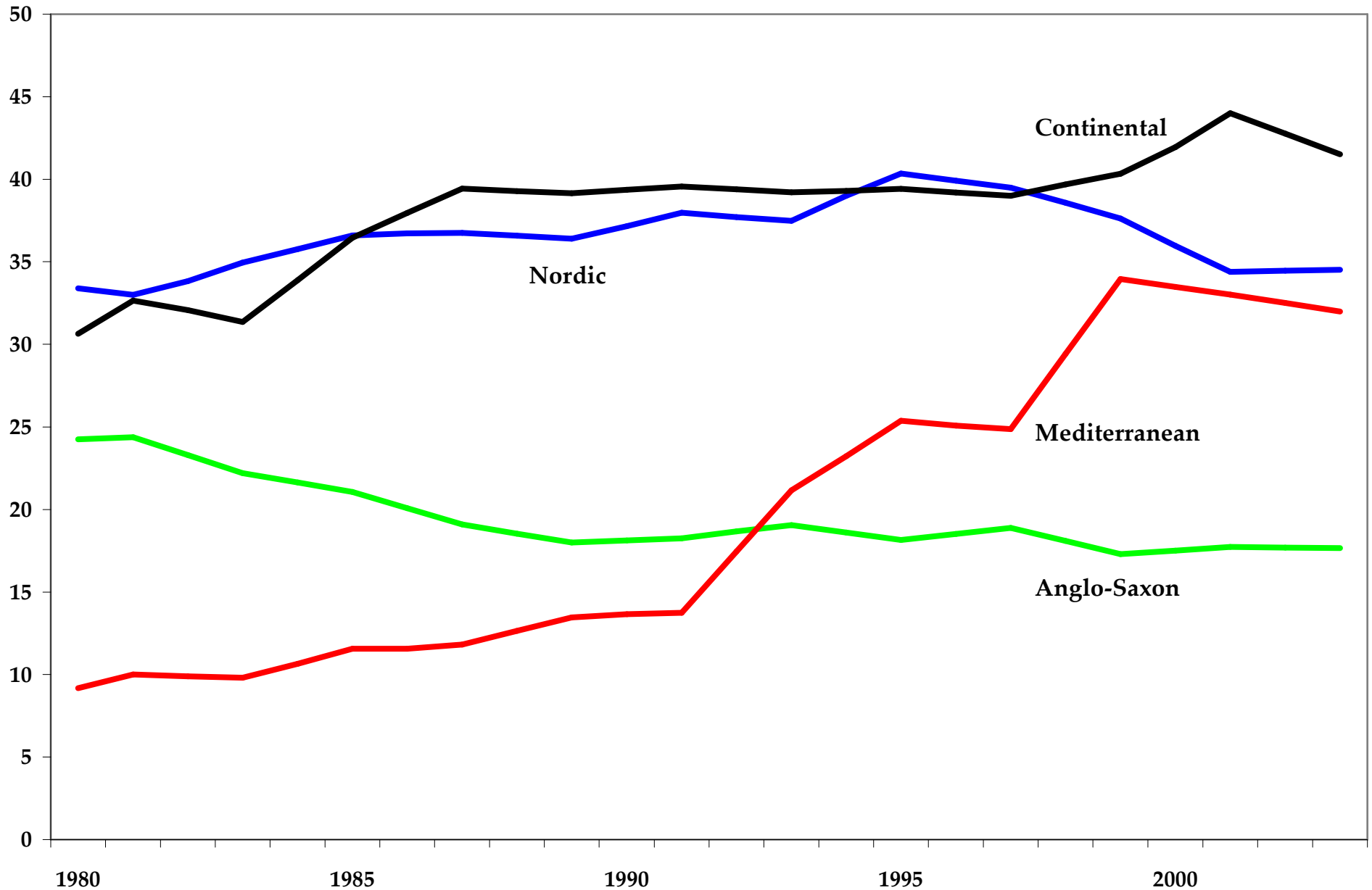
Taxes in Europe



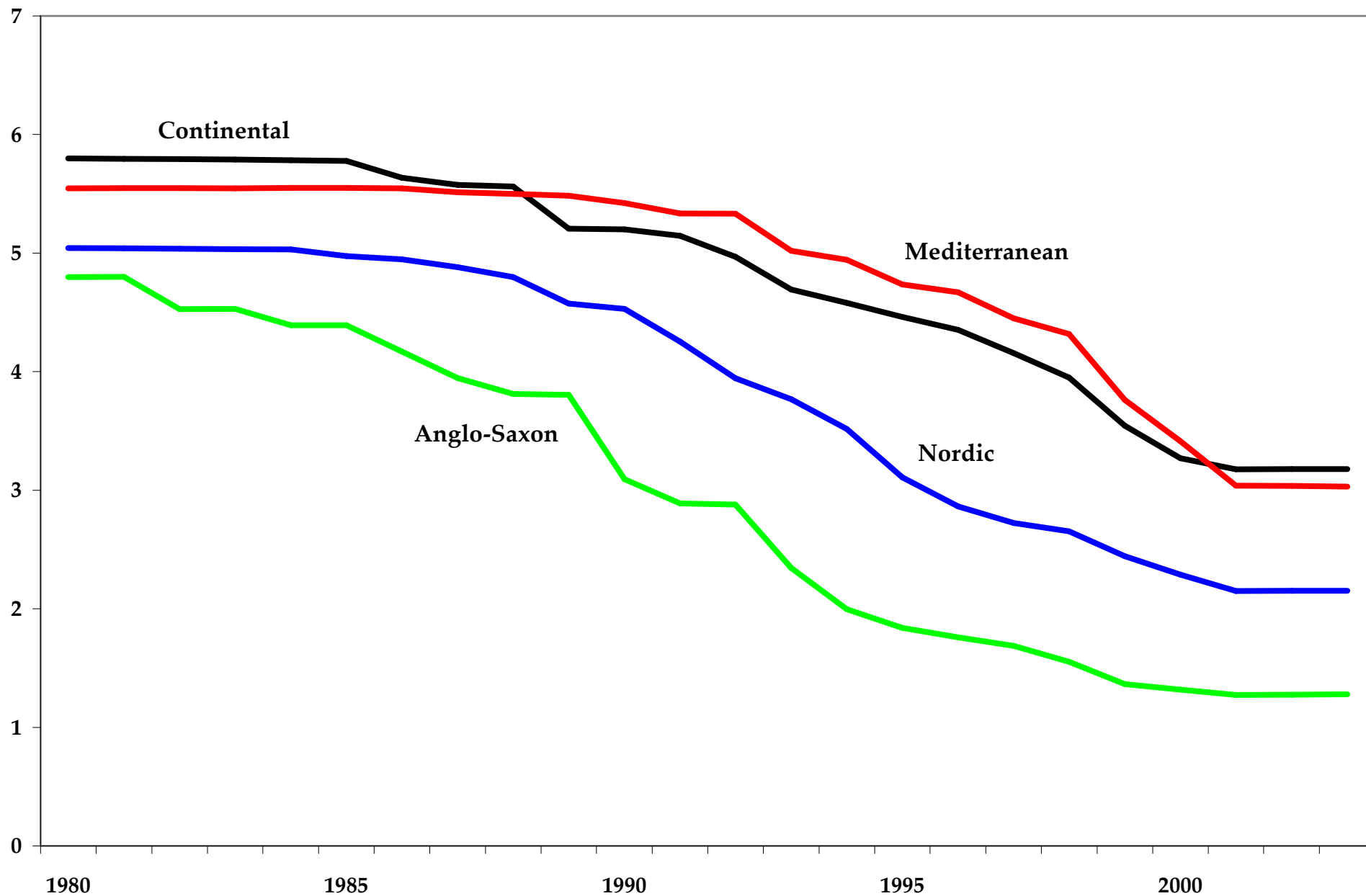
Employment Protection Legislation



Unemployment Benefits



OECD Product Market Regulation Index



Employment Regression Results

<u>Output Gap</u>	0.52 *** (0.05)
<u>Product Market Regulation</u>	-0.44 (0.55)
<u>Union Density</u>	-0.46 *** (0.10)
<u>Employment Protection Legislation</u>	0.86 (0.79)
<u>Unemployment Benefits (ARR)</u>	-0.18 *** (0.05)
<u>High Corpratism Dummy</u>	-2.04 ** (0.98)
<u>Tax Wedge</u>	-0.28 *** (0.07)
<u>Post-1995 Dummy</u>	0.94 *** (0.15)
<u>R²</u>	0.52
<u>RMSE</u>	1.18
<u>N</u>	320

- Our tax wedge coefficient is consistent with what others have found
- EPL and PMR seem to have no effects
- Everything else has the correct sign – regulations and taxes reduce employment
- The post-1995 dummy is substantial
 - Growth in the employment *rate* rose by 1% after '95

Employment Regression Results

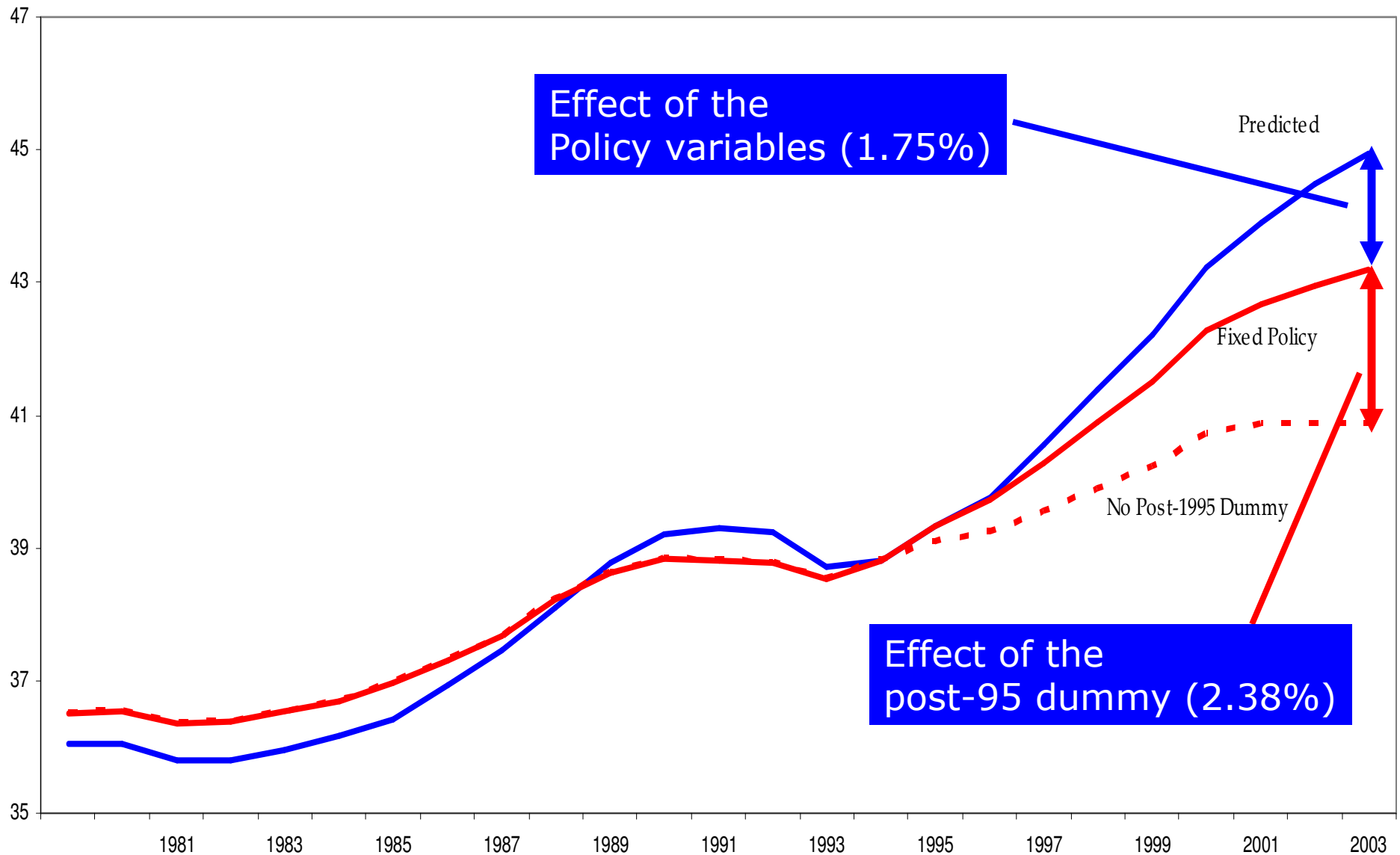
Robustness

- Results are the same if population weights are dropped or year dummies are added
- Dropping the Mediterranean countries or Spain does not affect the size of the post-1995 dummy

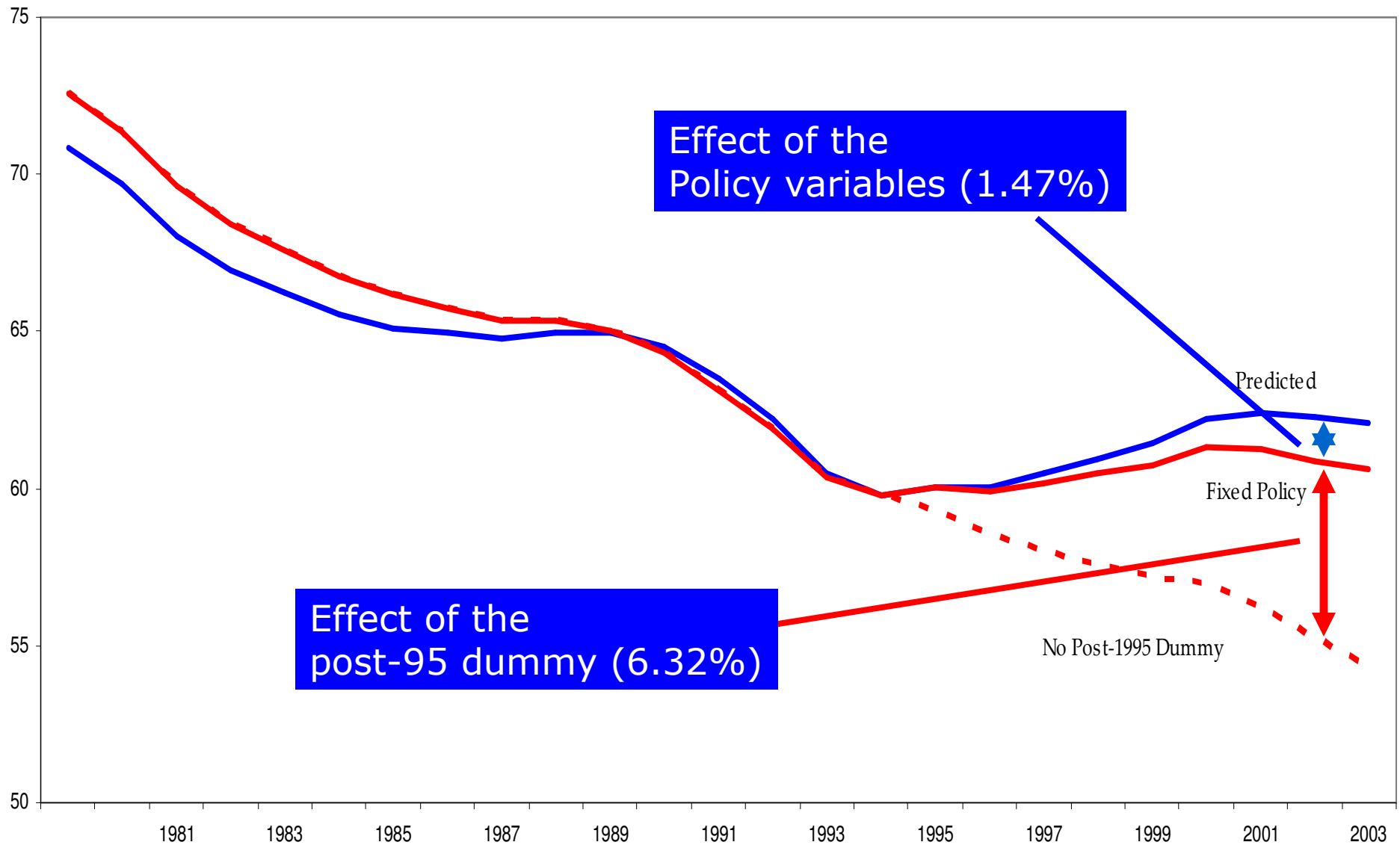
Employment Regression Results

- With all of our dummies, it is not clear from the regressions what effects policy choices had
- So we plot predicted values with policy fixed at its 1995 level
- The output gap and dummies are still allowed to vary

Female Employment



Male Employment



Productivity Regressions

- Suppose we are in a Cobb-Douglas world. What coefficient would we expect on employment?

$$y = .33*k + .67*l$$

$$(y-l) = .33*(k/l)$$

- If capital is fixed, the coefficient will be -.33
- If capital adjusts it will be smaller
- If labor is not homogenous it could be larger
 - The last people to enter the labor force are likely the least skilled and experienced

Productivity Regressions

- We can't simply regress productivity on employment
- A shock to productivity affects wages and hence employment

Productivity Regressions

Identification

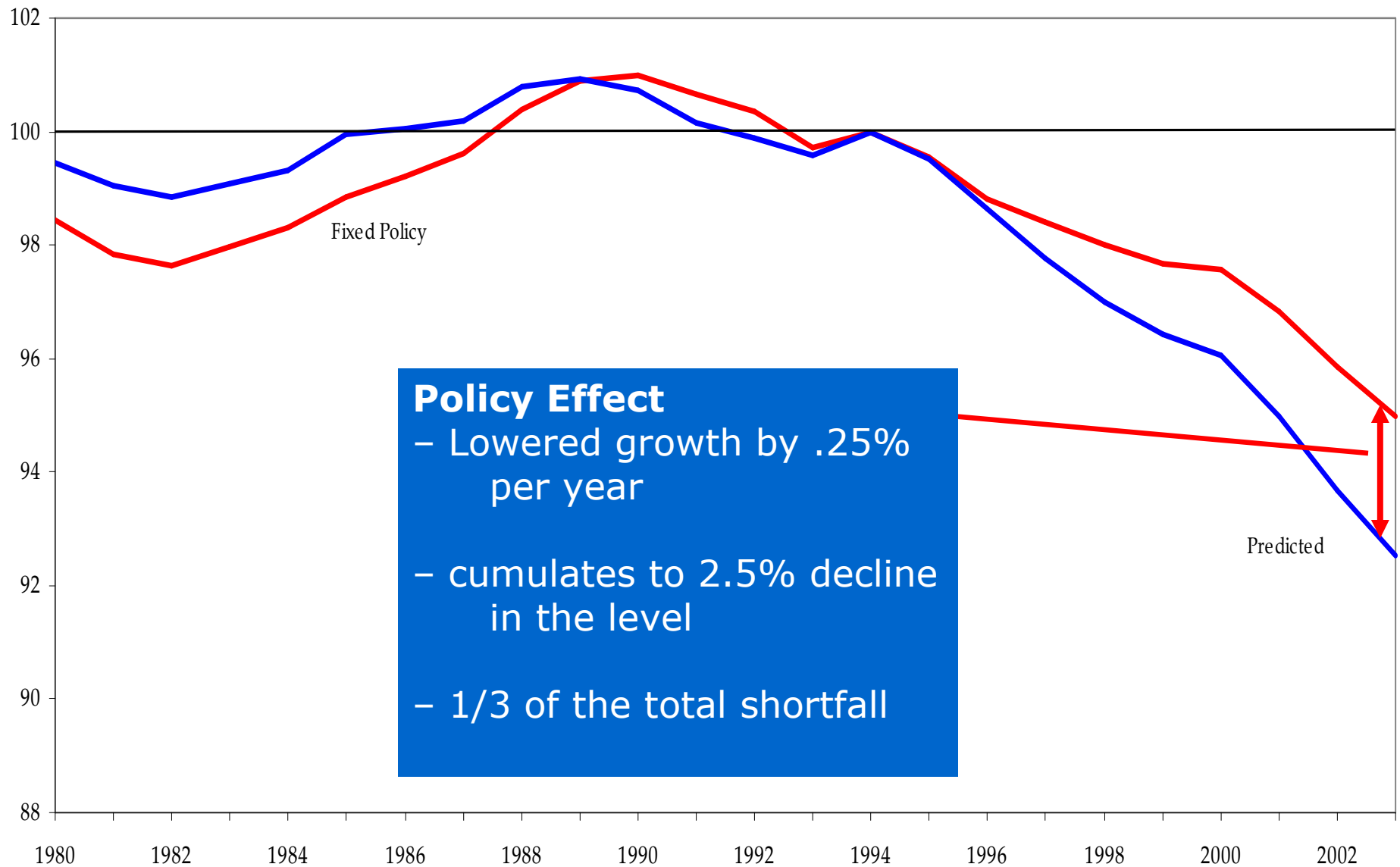
- We want variables that affect employment but not productivity
- The tax wedge is our best candidate
- We also consider using the post-1995 dummy and union density
 - Pragmatism
 - This gives more power, passes identification tests, but seems somewhat questionable

Productivity Regressions

<u>Employment Rate</u>	-0.64 *** (0.20)
<u>Output Gap</u>	0.68 *** (0.11)
<u>Product Market Regulation</u>	0.56 (0.45)
<u>Union Density</u>	0.03 (0.12)
<u>Employment Protection Legislation</u>	1.66 *** (0.65)
<u>Unemployment Benefits (ARR)</u>	0.14 *** (0.05)
<u>High Corpratism Dummy</u>	-0.49 (0.94)
<u>Post-1995 Dummy</u>	-0.14 (0.24)
R2	0.63
RMSE	0.95
N	320

- Tax wedge is the only instrument in this version
- Coefficient on employment is twice what we would expect
- EPL and ARR have independent positive effects on productivity
- We can drive the SE on employment down to 0.10, but the result remains the same
- Not dependent on Med.

Level of Labor Productivity



Effects of Government Policy

- Assuming hours per employee is stable,
 $E/N + Y/H = Y/N$
- Policy has effects on both employment and productivity
- We just add these effects up

Effects of Government Policy

	Shock Size	Employment	Productivity	Output Per Capita
<u>Product Market Regulation</u>	0.9	-0.14 (0.24)	0.35 (0.25)	0.21 (0.22)
<u>Union Density</u>	23.32	-7.93 (1.17)	5.07 (1.23)	-2.85 (1.07)
<u>Unemployment Benefits (ARR)</u>	11.31	-0.90 (0.34)	1.37 (0.31)	0.47 (0.25)
<u>Employment Protection Legislation</u>	0.87	0.74 (0.36)	0.23 (0.37)	0.97 (0.31)
<u>High Corpratism Dummy</u>	1	-1.02 (0.48)	0.65 (0.33)	-0.37 (0.21)
<u>Tax Wedge</u>	9.21	-2.67 (0.64)	1.71 (0.53)	-0.96 (0.4)

- Tax wedge and union density lower Y/N
- ARR and EPL have *positive* effects
 - Driven by their direct effects on productivity

Effects of Government Policy

- Why would ARR and EPL *raise* productivity and output?
 - Acemoglu and Shimer on reservation wages and matching
 - Match quality may improve
 - More incentive to create job-specific human capital

Conclusion

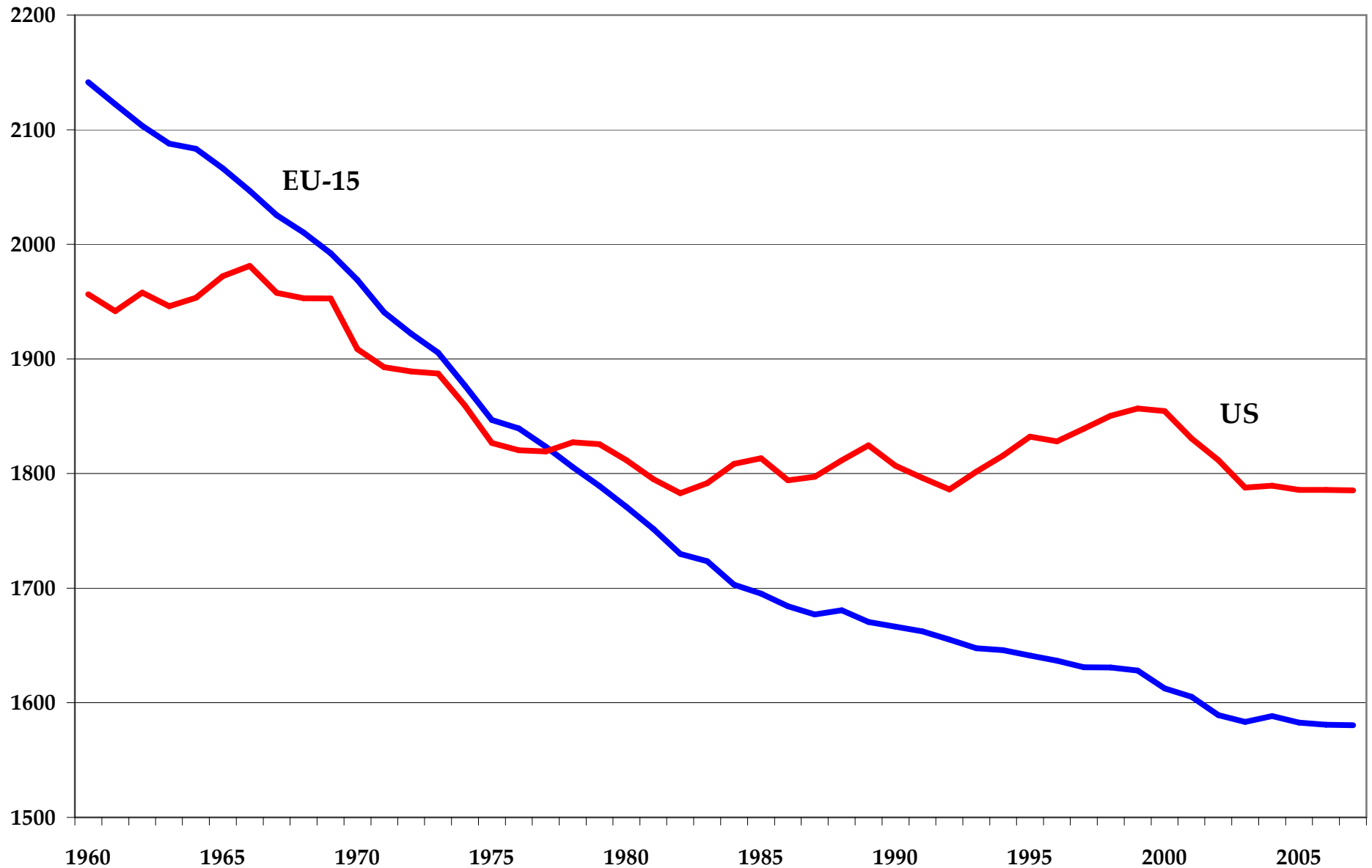
- A good deal of the changes in employment and productivity are unexplained
 - But this paper is not about R^2 's
- There is a strong tradeoff between LP and employment
- A 1% increase in employment only raises output by .36% in the short-run
- The effects of gov't policy are ambiguous
 - Some regulations may increase output

Conclusion

What will happen in the future?

- EU productivity speeds up, US slows down
 - This may already be happening
- What happens to female employment?
- Will investment pick up in the EU?

Raw Data for Hours Per Employee



A short detour to age groups

- Unemployment explains maybe 4%
- LFPR gives 10%
- The age distribution actually goes the other direction

age distribution	unemployment	LFPR	E/N ratio
EU	EU	EU	87.14
US	EU	EU	86.19
EU	US	EU	91.23
EU	EU	US	97.11
US	US	EU	90.77
EU	US	US	102.1

Breaking Down Employment

