

Work and Taxes

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Background/Motivation

Hours Worked Relative to US in 2004

$H < .75$	$.75 < H < .85$	$.85 < H < .95$	$H > .95$
Belgium France Germany Italy	Austria Finland Ireland Netherlands Norway Spain	Denmark Greece Portugal Sweden UK	Australia Canada Japan New Zealand Switzerland

Accounting for Differences in Hours of Work

Differences in hours worked may arise due to differences in various factors:

Primitives

e.g., preferences

Policies

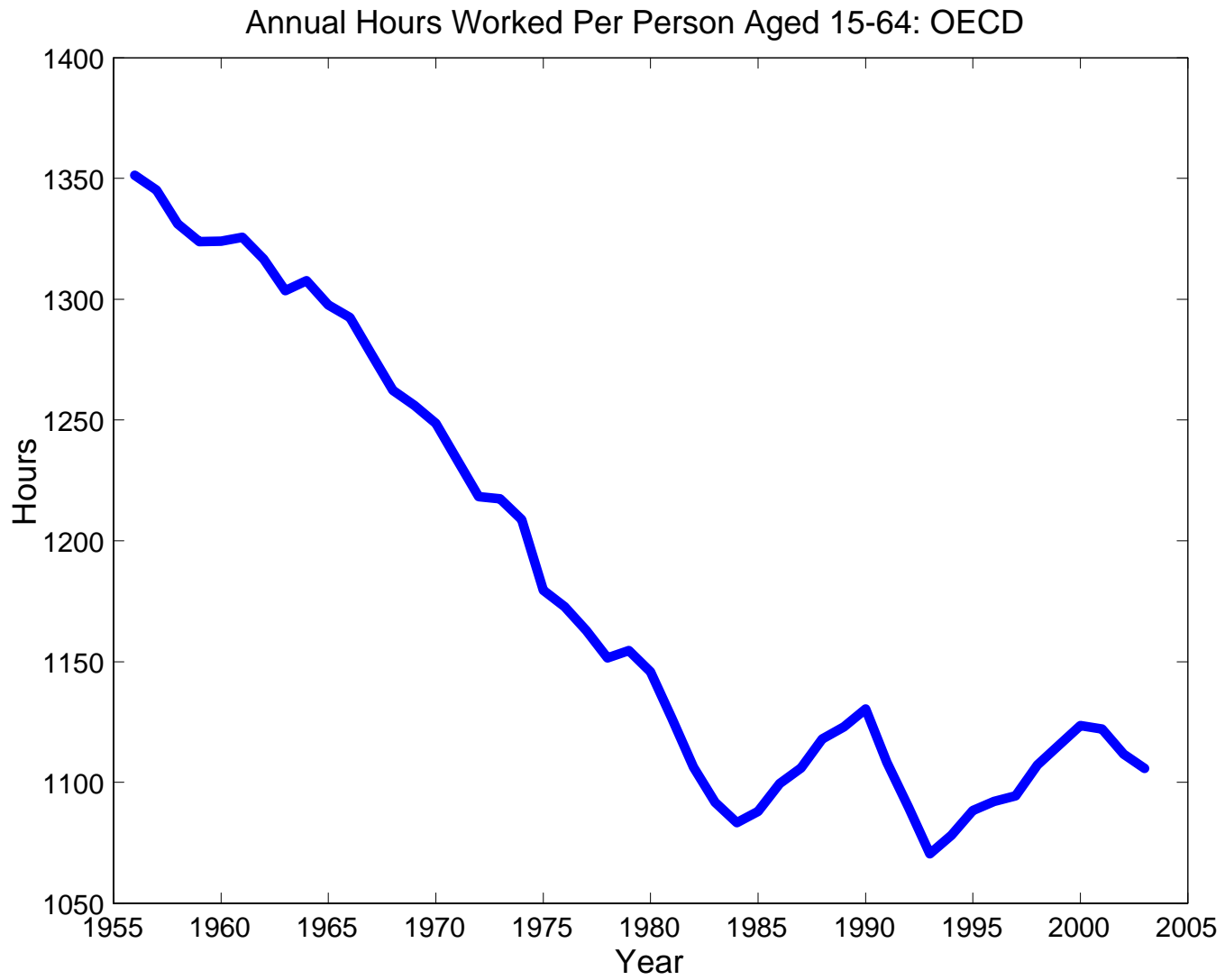
e.g., various tax and transfer programs,
labor and product market regulation

Institutions

e.g., unions

Some additional aspects of differences in hours of work that may prove helpful in assessing the relative importance of various factors:

1. Time series evolution
2. Sectoral Patterns
3. Age Patterns
4. Intensive and Extensive Margins
5. Productivity
6. Uses of Nonmarket time



Time Series for Individual Countries

I will look at dynamics for countries from each of the four groups identified earlier:

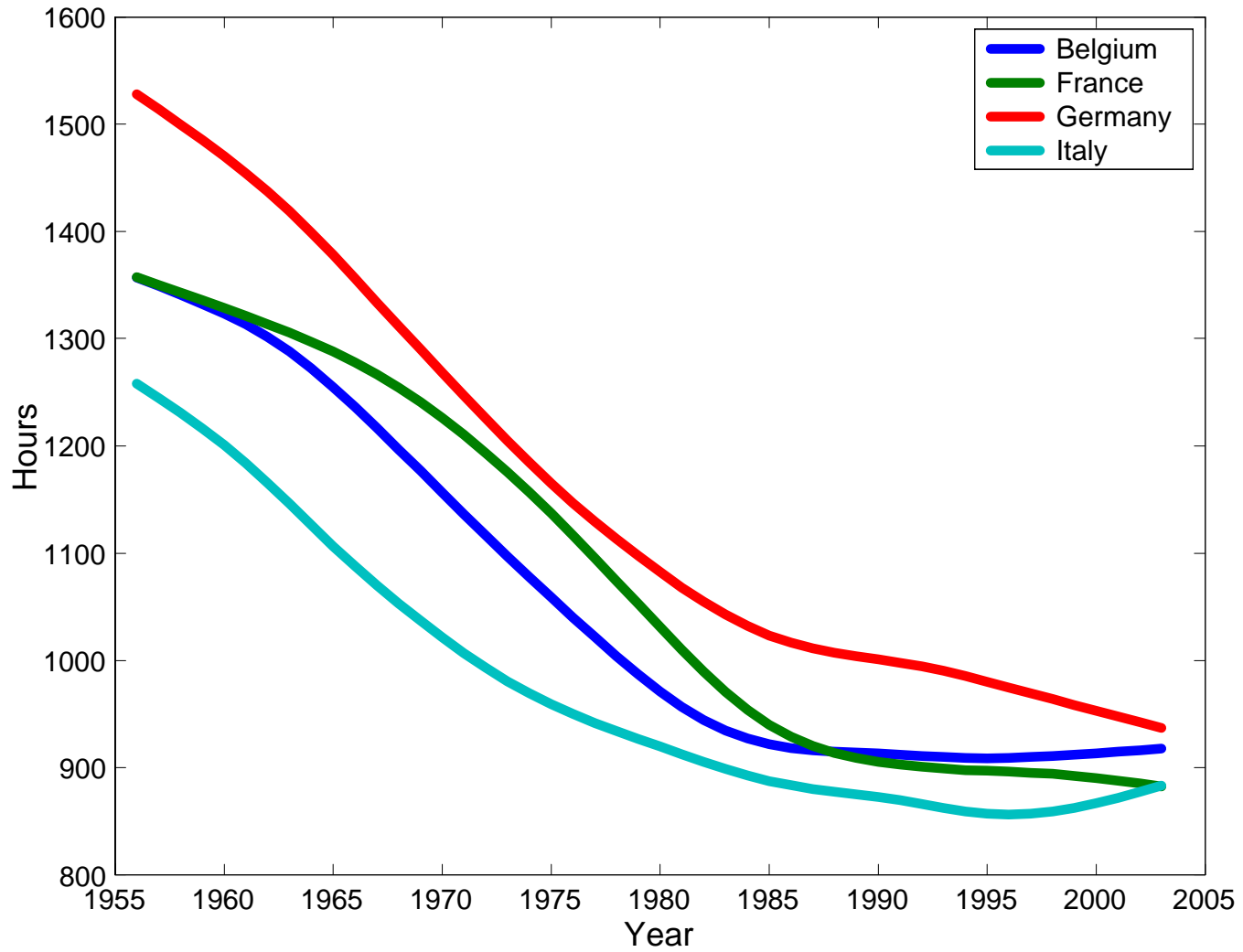
Group 1 ($> .95$ US): Aus Can NZ US

Group 2 ($[\.85, .95]$ US): Den Por Swe UK

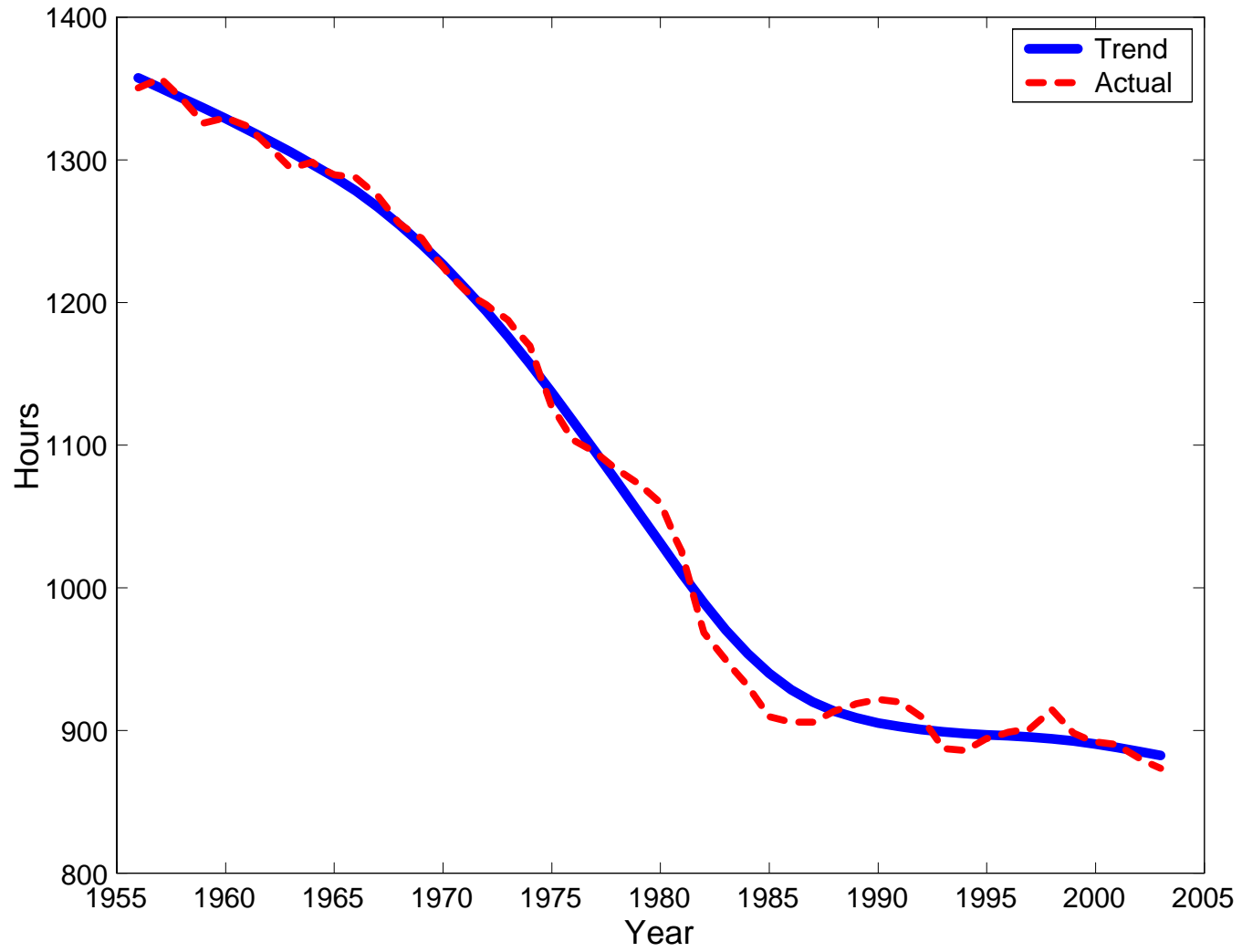
Group 3 ($[\.75, .85]$ US): Aut Fin Nor

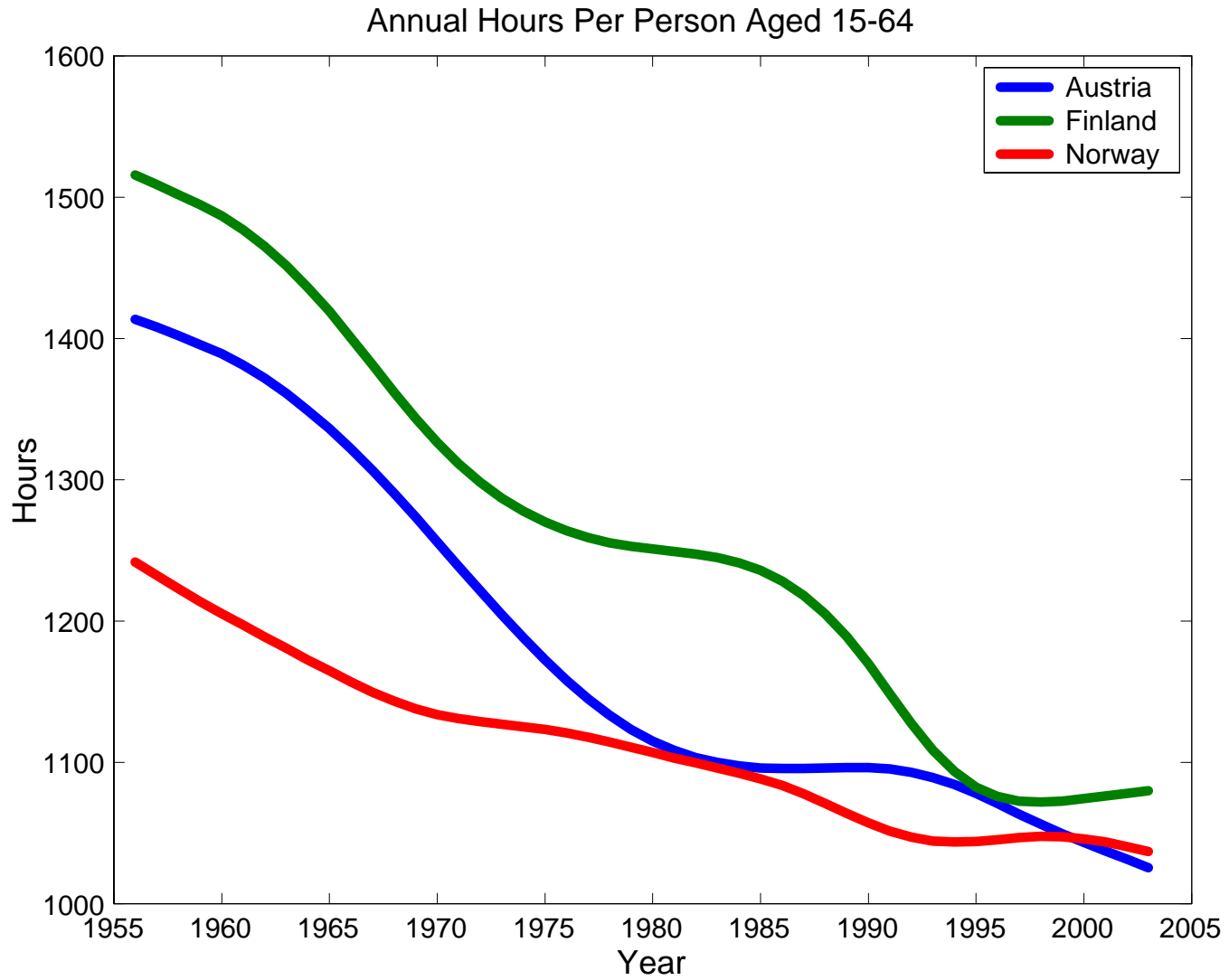
Group 4 ($< .75$ US): Bel Fra Ger Ita

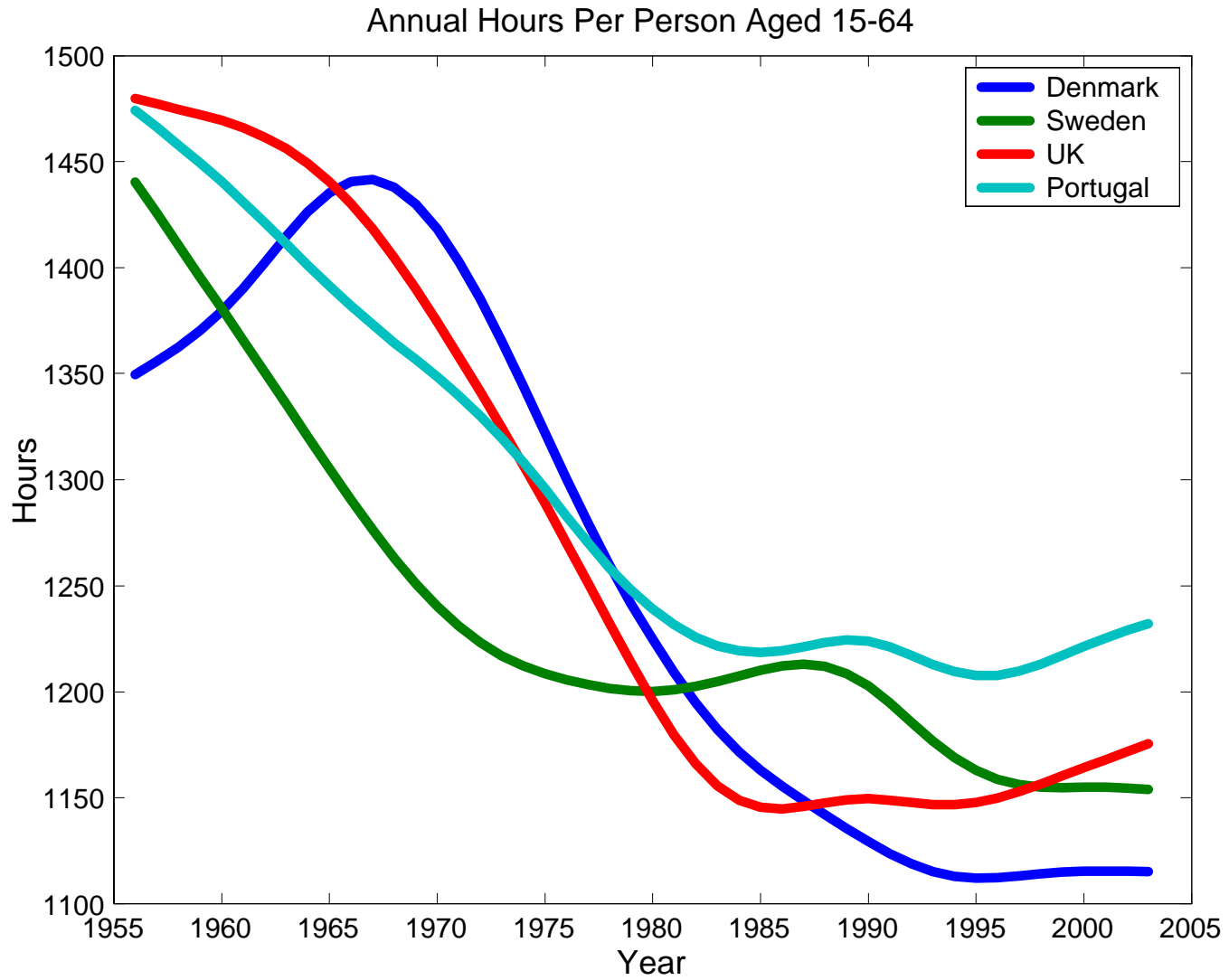
Annual Hours Per Person Aged 15-64



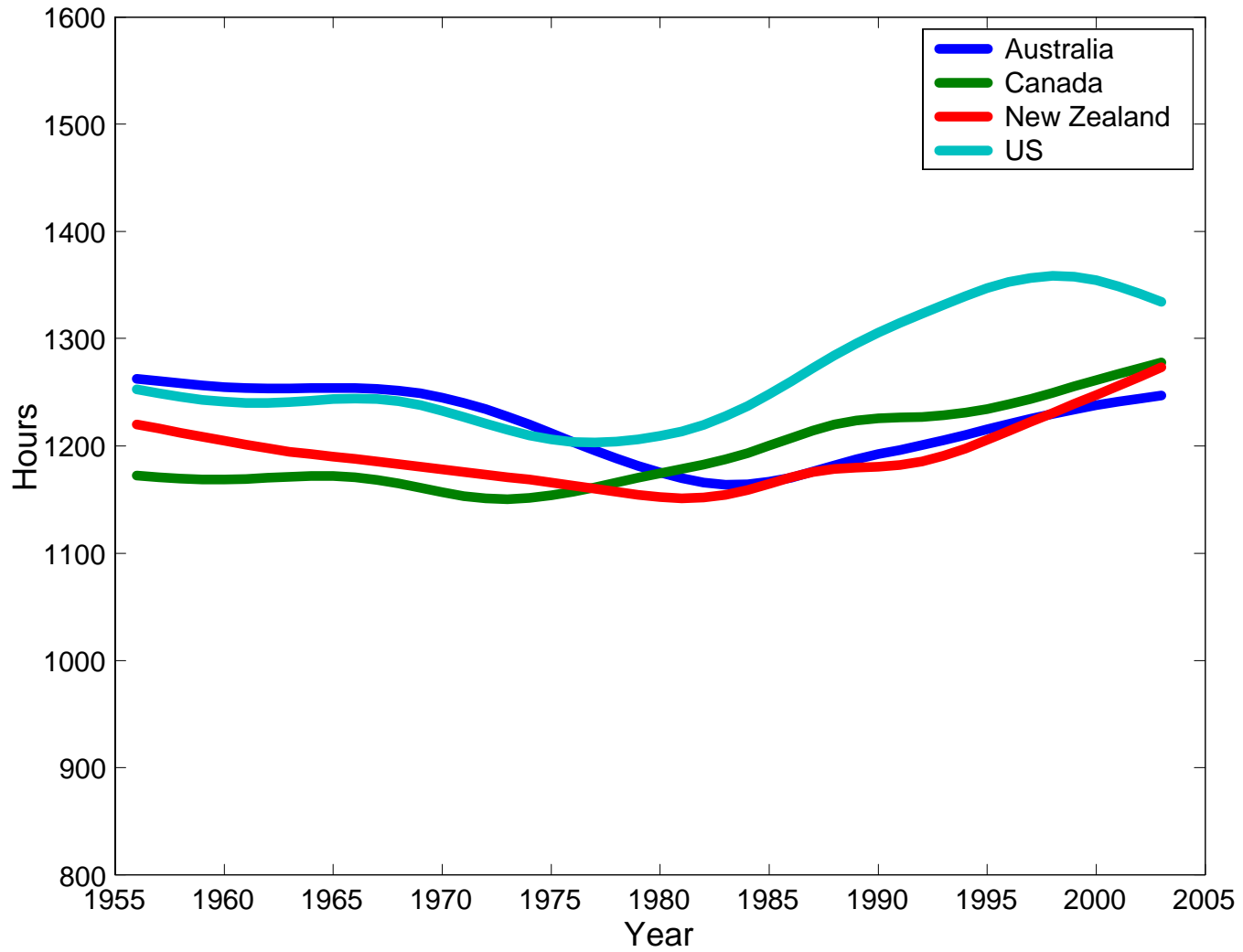
Total Hours, Actual and Trend: France

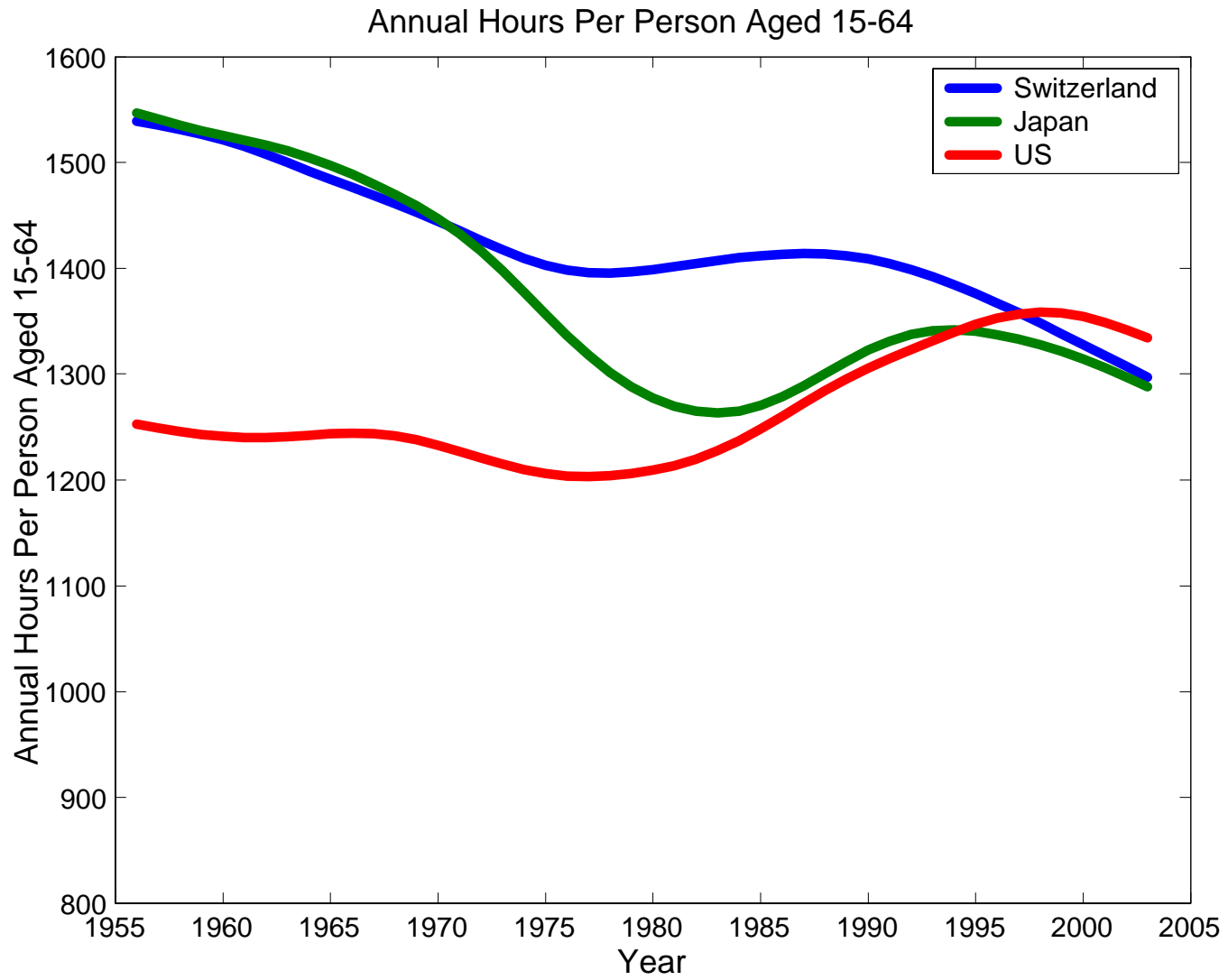






Annual Hours Per Person Aged 15-64





Hours Worked in 2004 Relative to 1956

Australia	.97	Germany	.62	Norway	.81
Austria	.74	Greece	1.00	Portugal	.83
Belgium	.68	Ireland	.69	Spain	.86
Canada	1.07	Italy	.73	Sweden	.79
Denmark	.80	Japan	.86	Switzerland	.81
Finland	.72	Netherlands	.80	United Kingdom	.79
France	.65	New Zealand	1.04	United States	1.00

Importance of Trend Differences

Consider the regression:

$$\log h_{it} = a + b_{it} + \varepsilon_{it}$$

The R-squared from this regression is .76.

Without country specific trends it is .26

With country specific intercept it is .89

Digression on Unemployment Rate Evolutions

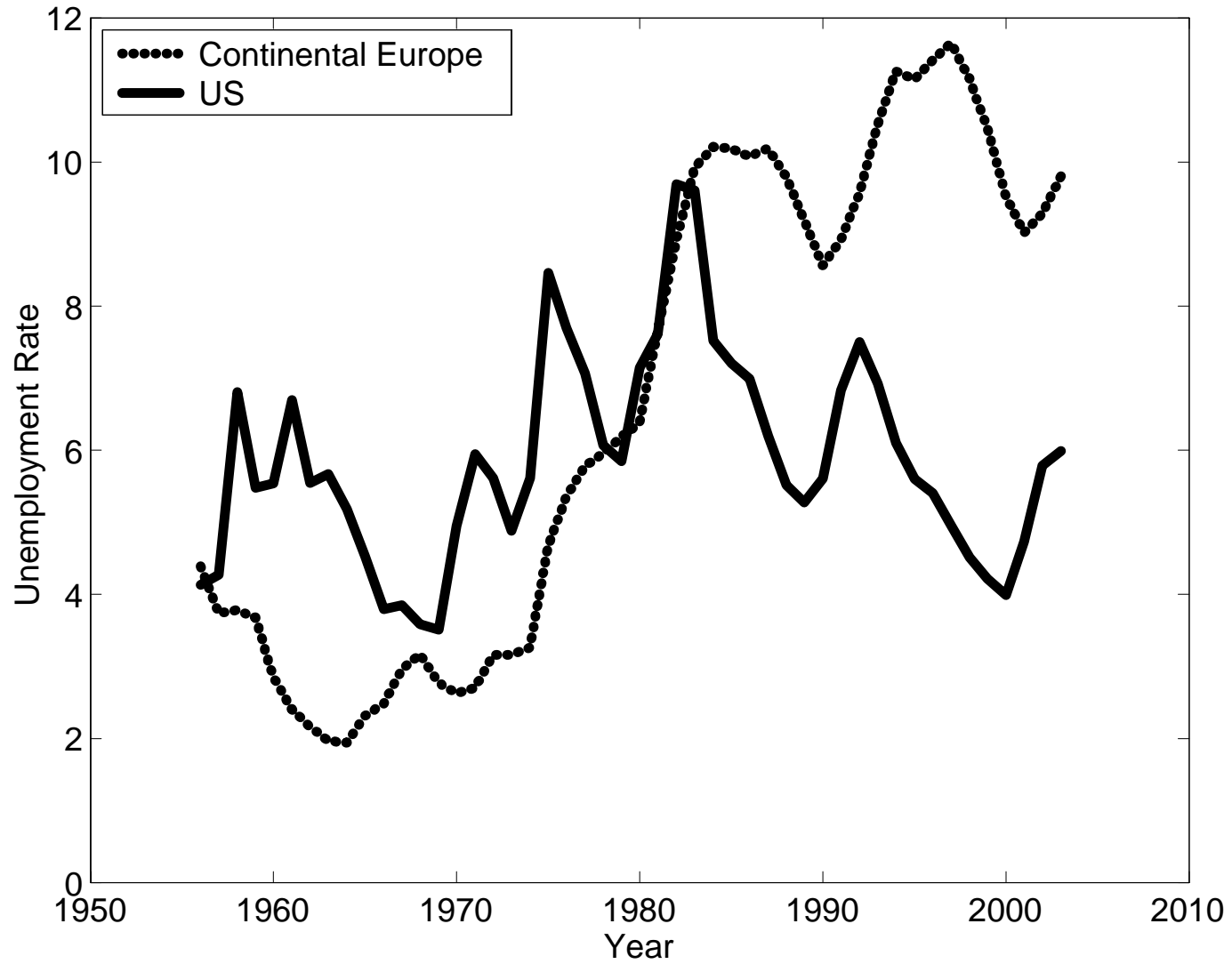
There is a large literature that summarizes and seeks to understand the differing evolutions of unemployment rates across countries

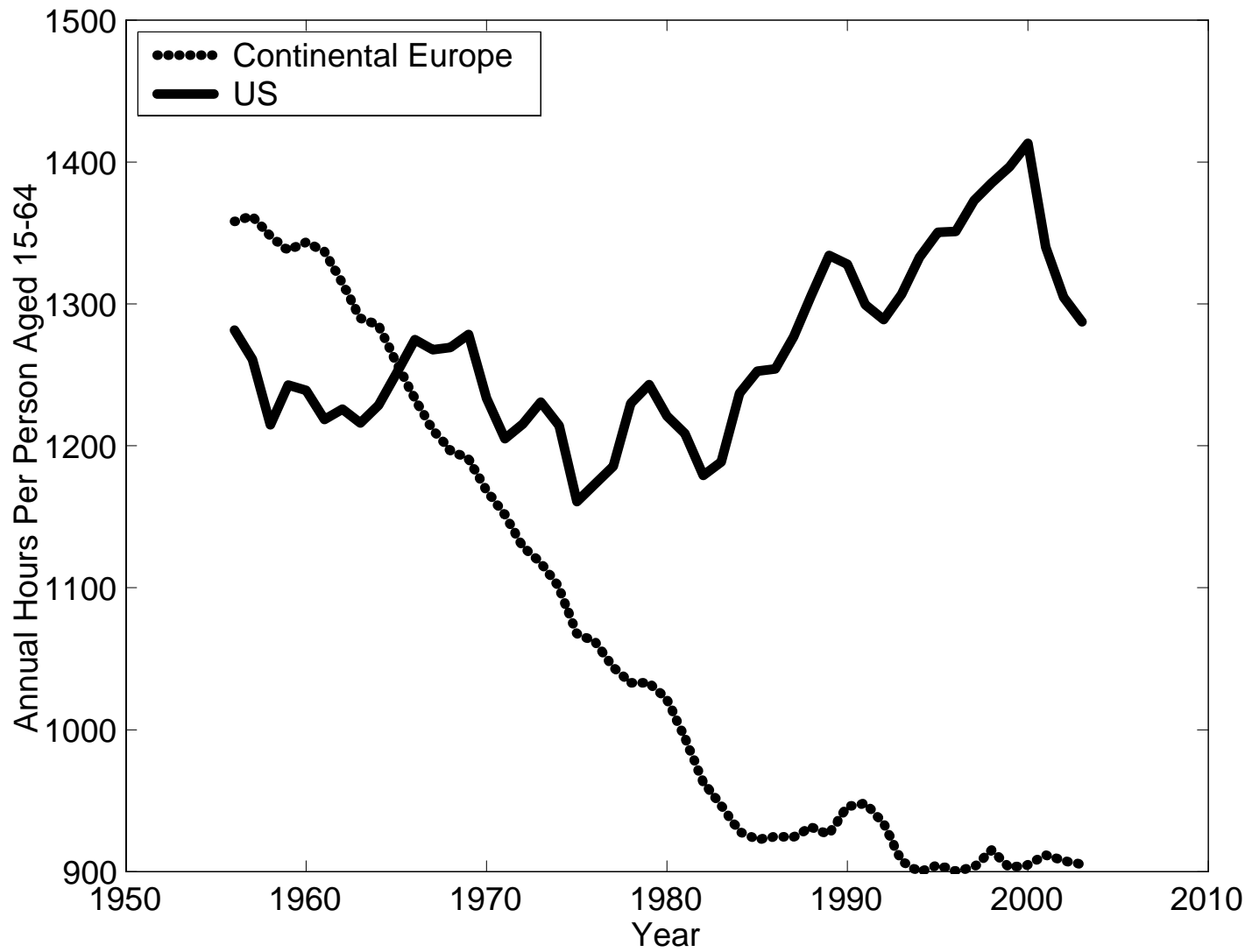
One prominent pattern is that unemployment in the US has changed relatively little since 1960 whereas unemployment in several European countries has increased dramatically

Question: Are the changes in unemployment and hours worked just two different ways of describing the same underlying phenomenon?

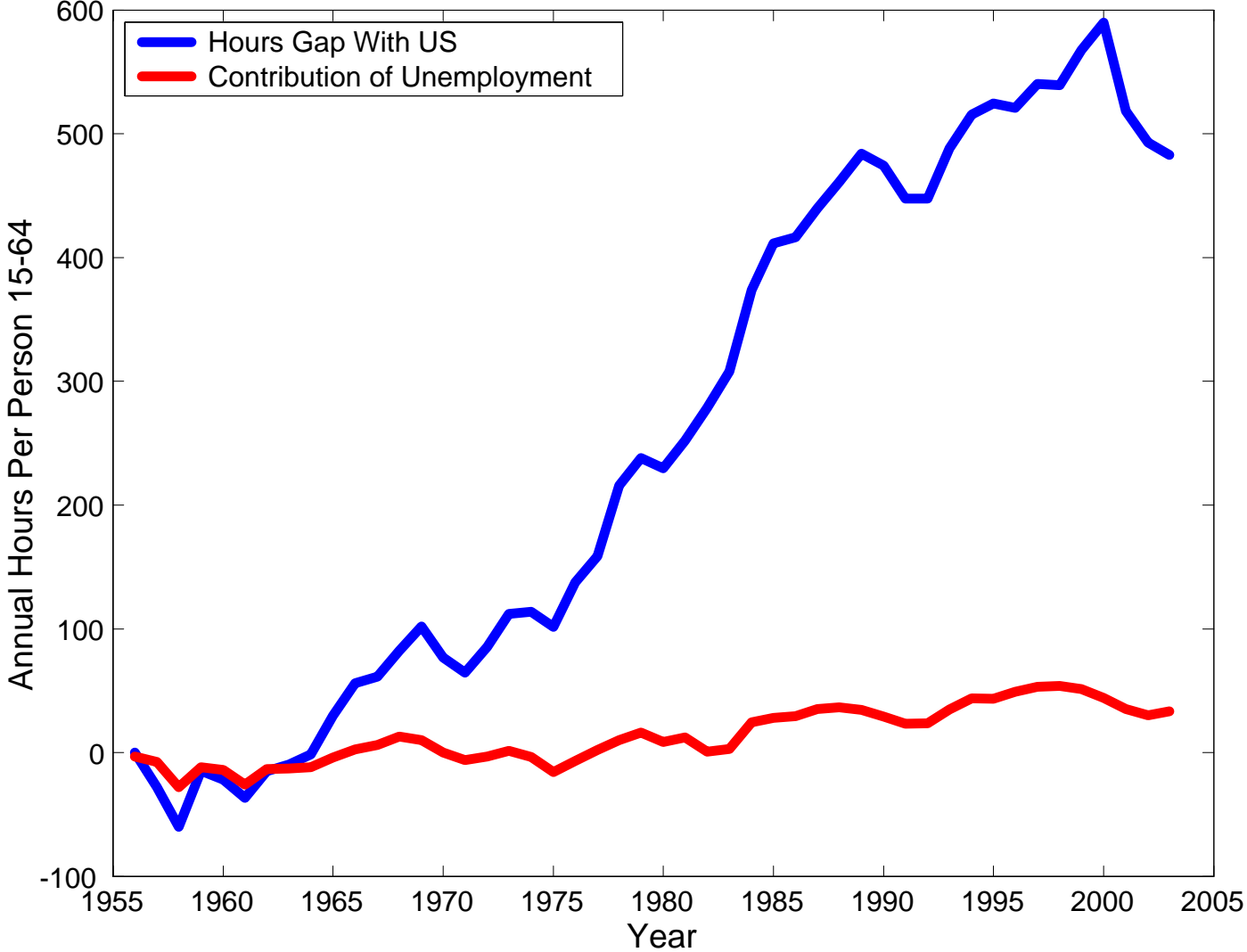
Answer: No, both qualitatively and quantitatively

Qualitatively:

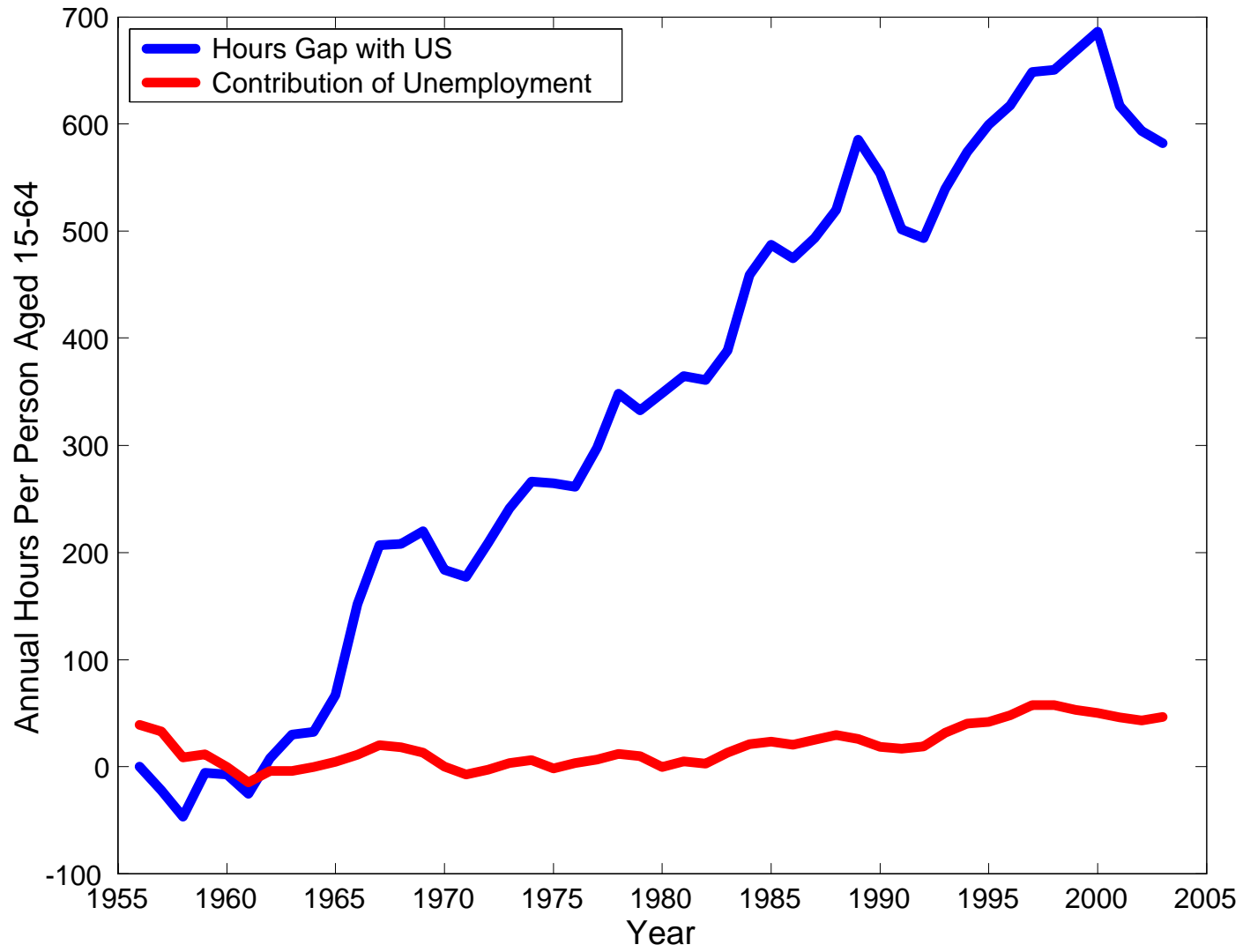




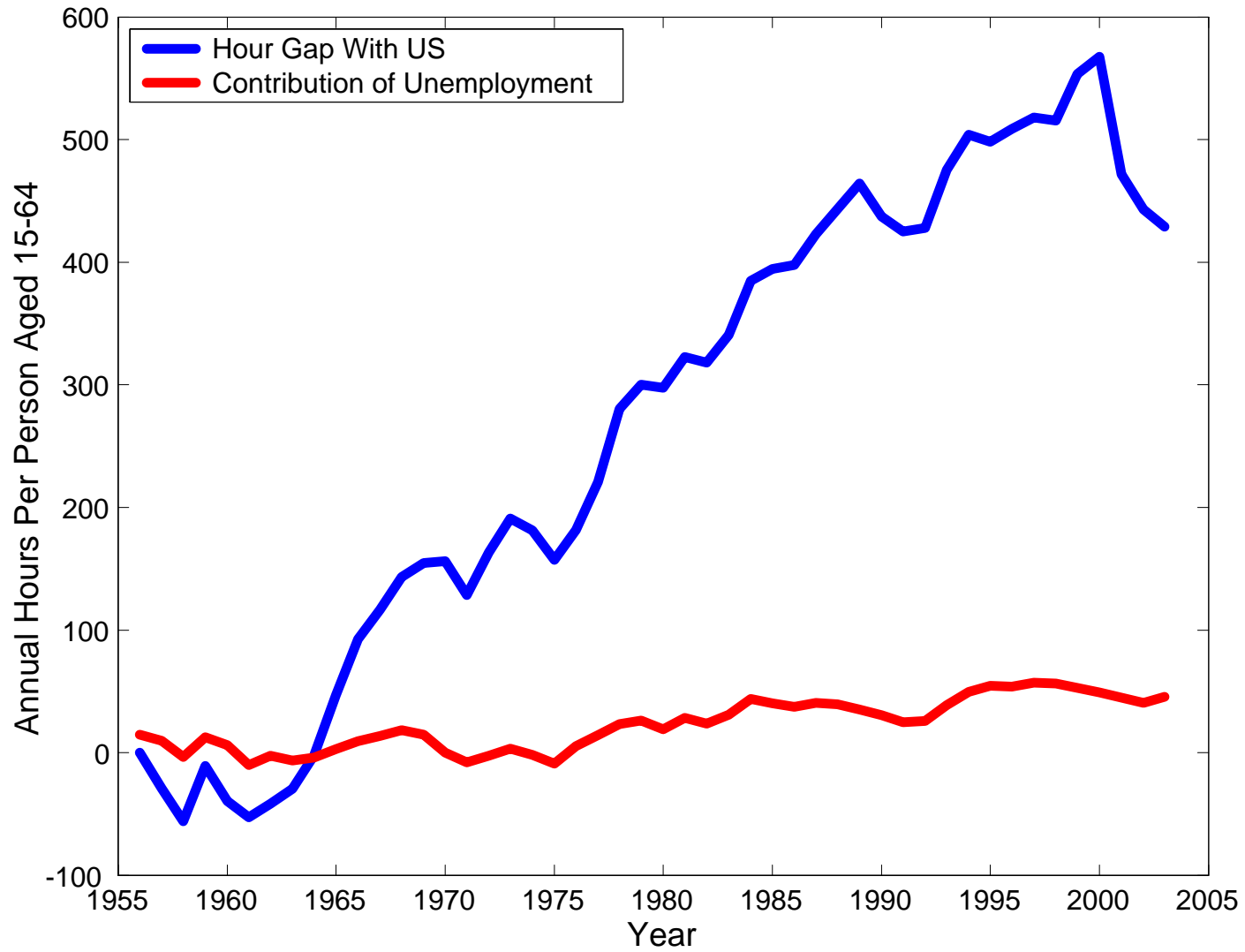
Contribution of Unemployment: France



Contribution of Unemployment: Germany



Contribution of Unemployment: Belgium



Tax Rates

To implement the analysis with taxes one obviously needs time series data on effective labor tax rates for a large set of countries.

Previous Work:

Mendoza et al (1994) use NIPA data and OECD Revenue Statistics to estimate average tax rates on labor, consumption and capital.

Basic idea is to allocate tax revenue across categories and then compute appropriate tax base for each type of tax.

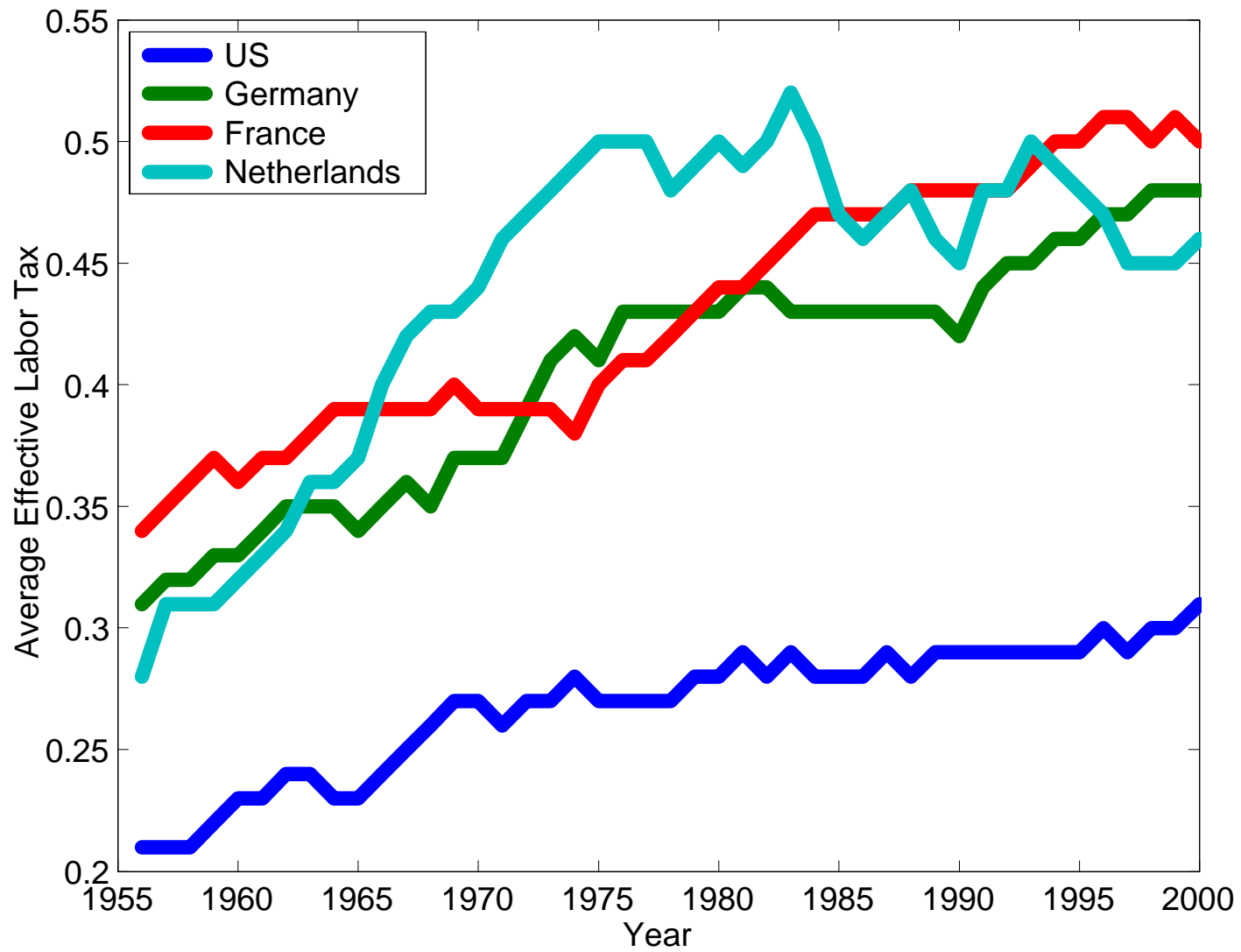
Issues that arise in implementing this procedure:

- household tax payments not separated according to source
- proprietors income not separated into labor and capital components
- property taxes
- indirect taxes

Limitation of the estimates: Estimates are for average tax rates not marginal tax rates.

For our purposes another issue is that the Mendoza et al estimates do not start until 1965 for most countries, and even later for some others.

McDaniel (2006) carries out a similar exercise using only NIPA data and therefore is able to produce estimates for a much longer time period. We use her estimates.



Taxes and Hours of Work

Consider the following very specialized static representative agent economy.

Preferences:

$$a \log c + (1 - a) \log(1 - h)$$

Technology:

$$c = Ah$$

In the competitive equilibrium with no government, we have:

$$h^* = a$$

Assume that government taxes labor income at rate τ .

We distinguish several cases depending on what happens with revenue.

Cases 1-2: Revenues used to finance government consumption.

Cases 3-5: Revenues used to finance transfer payments.
Key point is that different transfer payments provide different incentives for work.

Case 1: Government uses revenues to buy output and then throws the output away.

Case 2: Government uses revenues to hire workers at the market wage rate but has them produce nothing.

Case 3: Lump-sum transfer (i.e., independent of hours worked)

$$c = (1 - \tau)wh + T \text{ and } T = \tau wh$$

Case 4: Transfer used to subsidize consumption.

$$(1 - s)c = (1 - \tau)wh \text{ and } T = sc = \tau wh$$

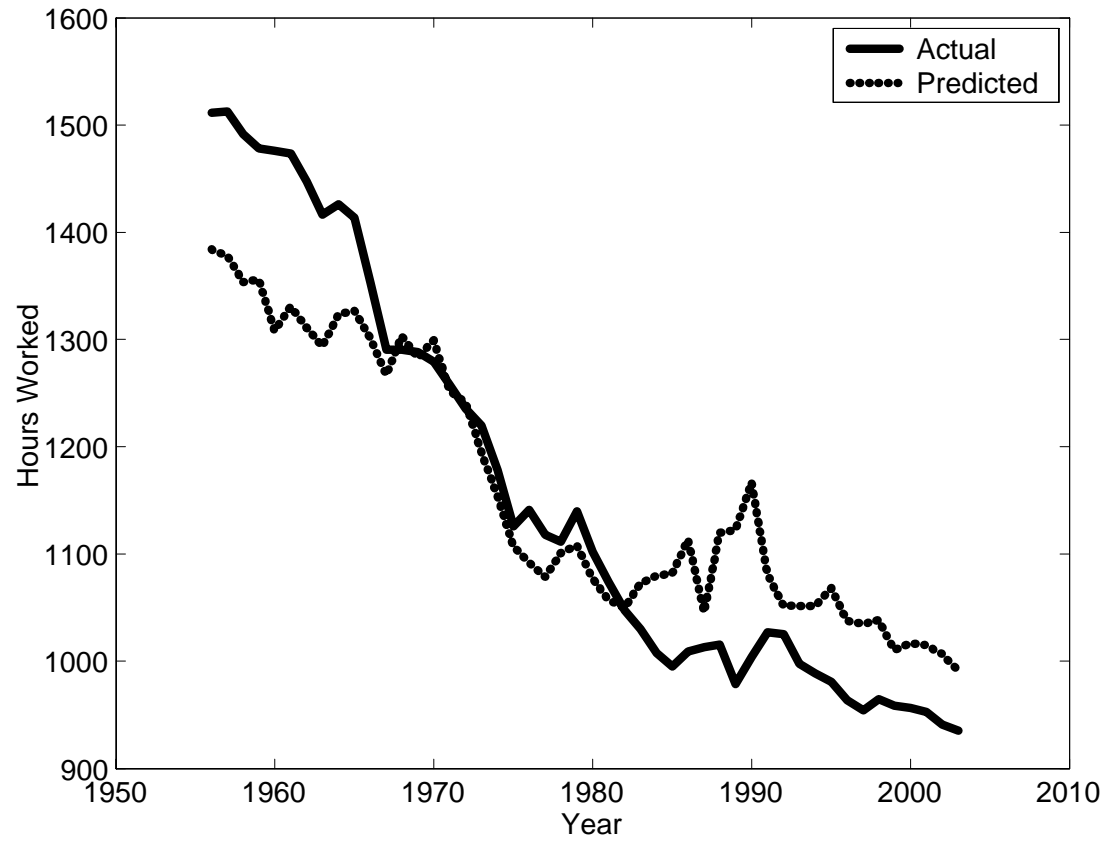
Case 5: Transfer is used to subsidize leisure.

$$c = (1 - \tau)wh + s(1 - h) \text{ and } T = s(1 - h) = \tau wh$$

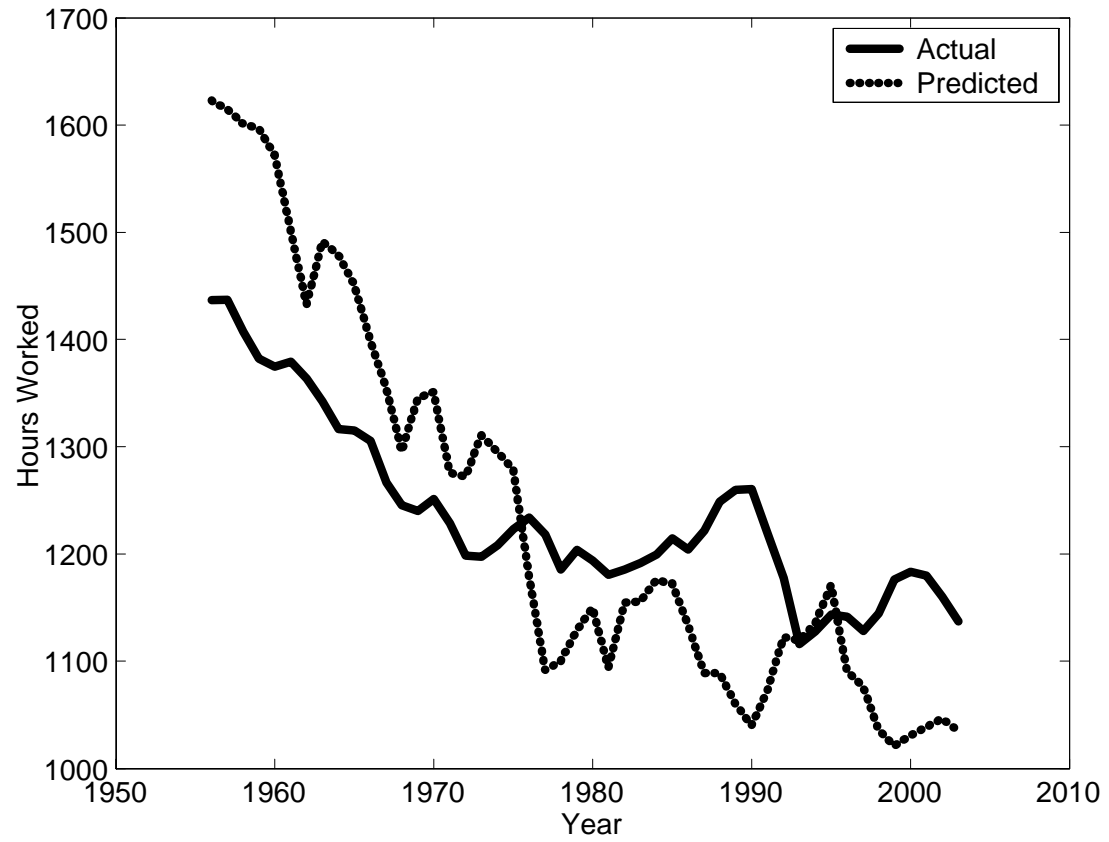
Equilibrium Hours Worked

No government	a
Revenue thrown away	a
Hire non-workers	a
Lump-sum transfer	$a\left(\frac{1-\tau}{1-a\tau}\right)$
Subsidy to c	a
Subsidy to $(1 - h)$	$a(1 - \tau)$

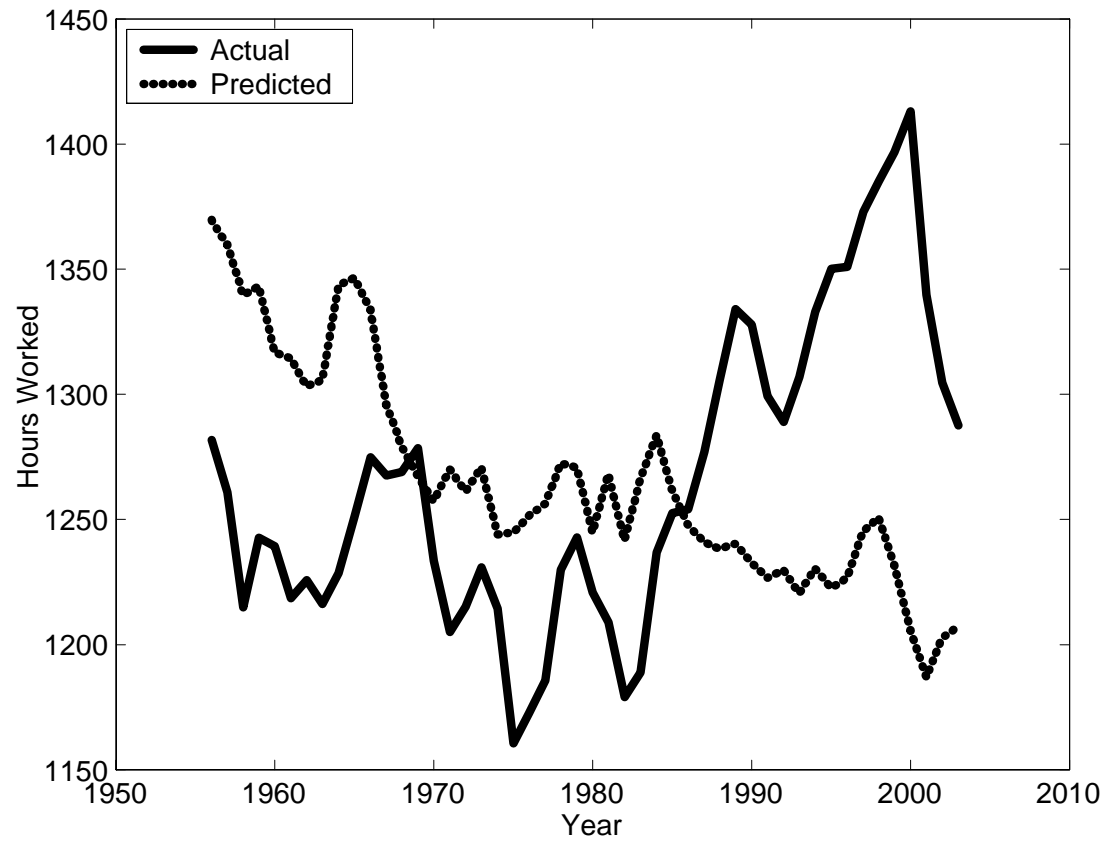
Germany



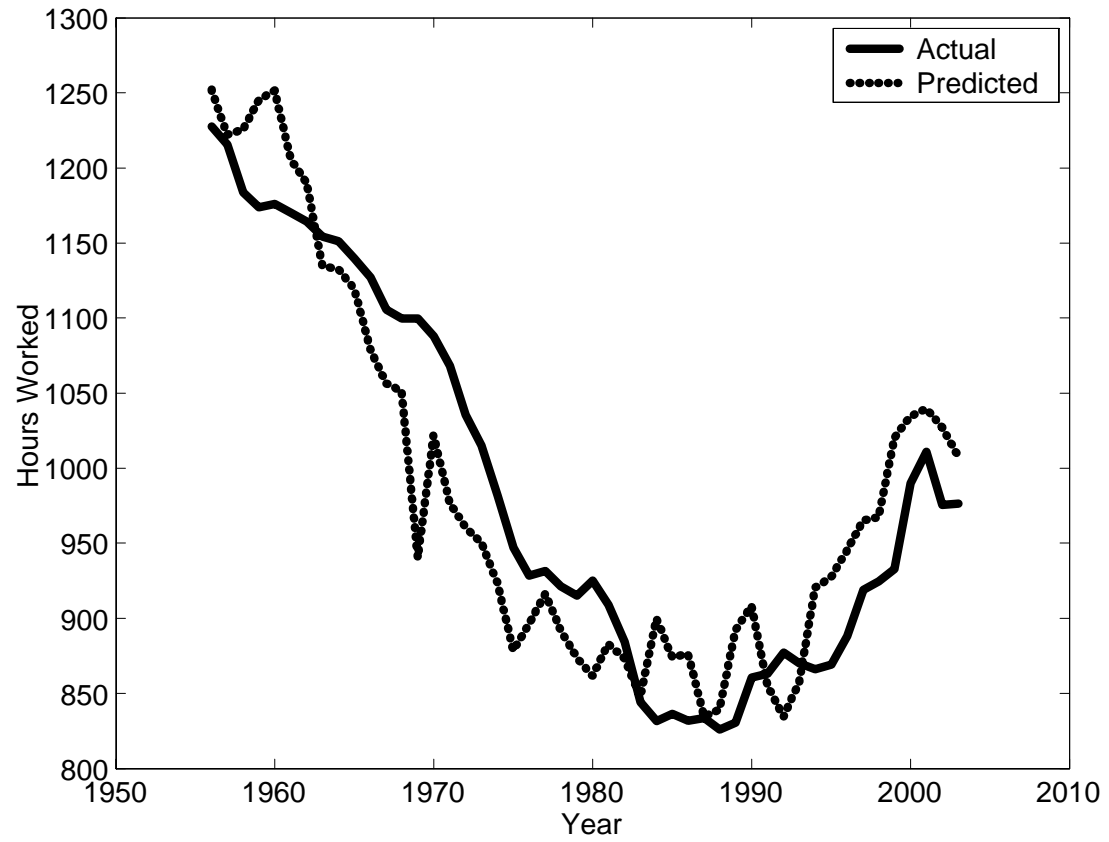
Sweden



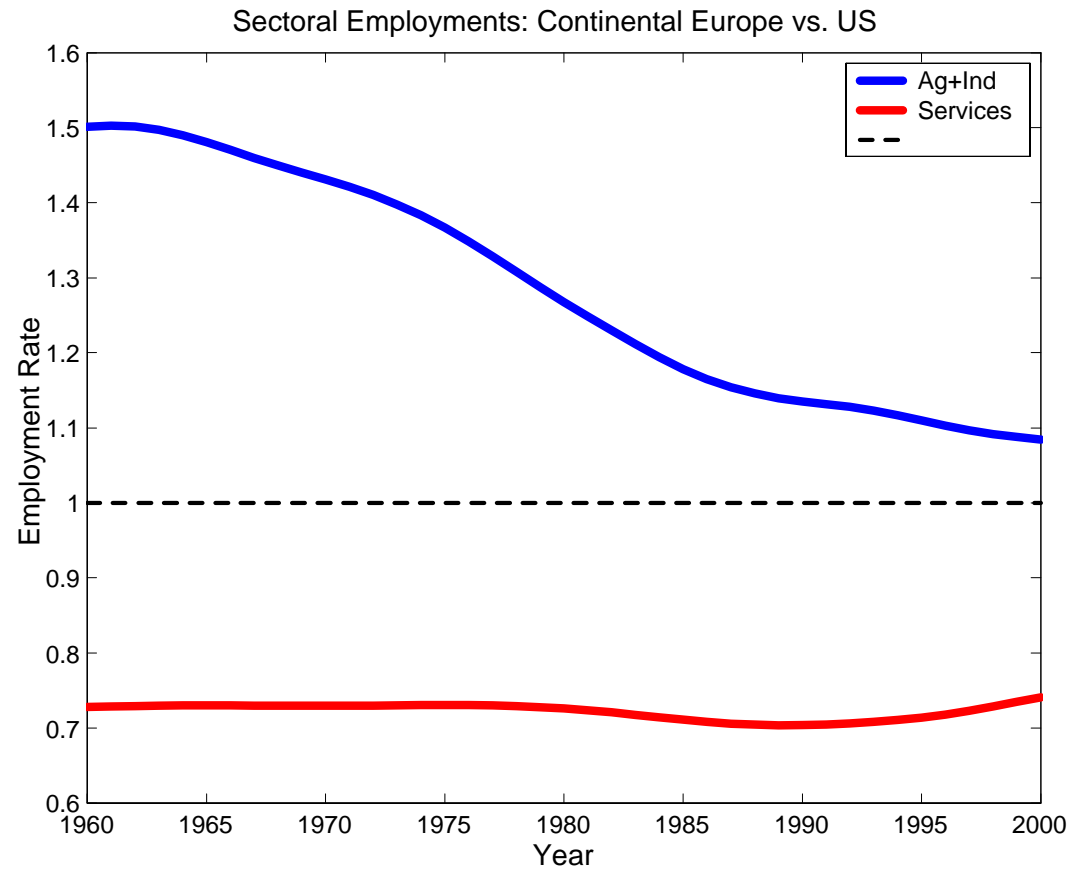
US



Netherlands



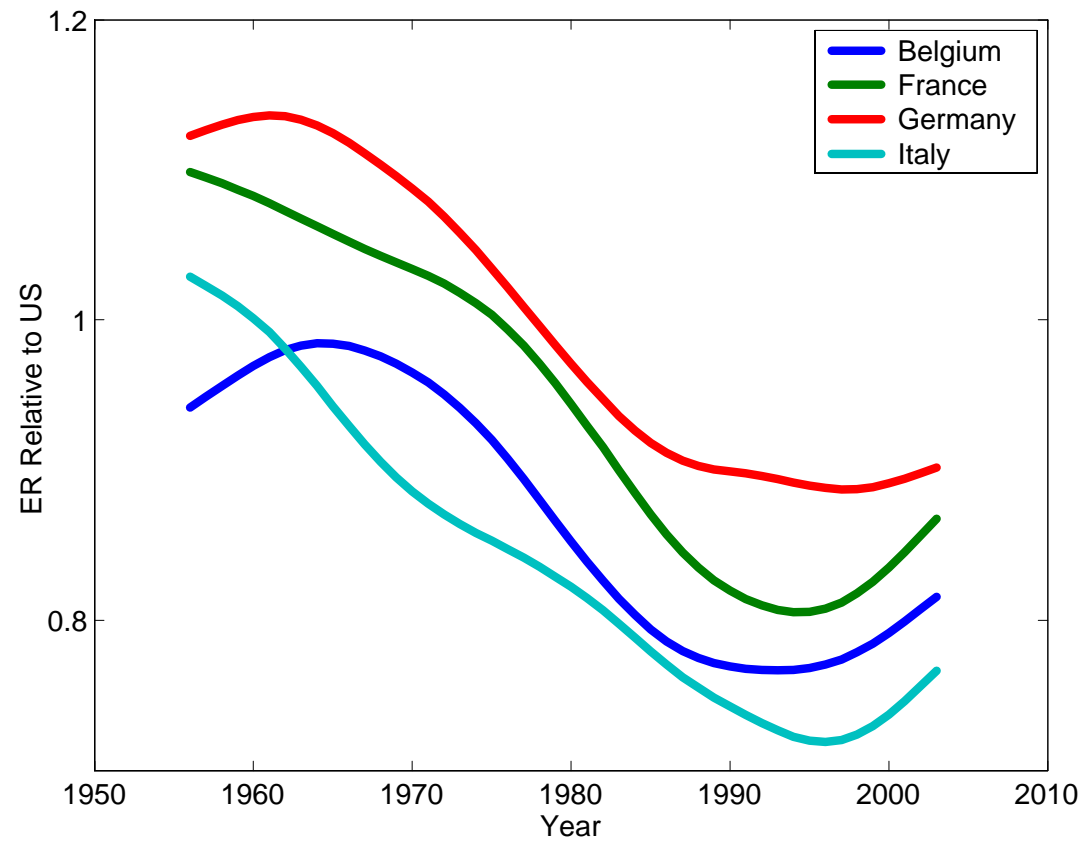
Sectoral Patterns



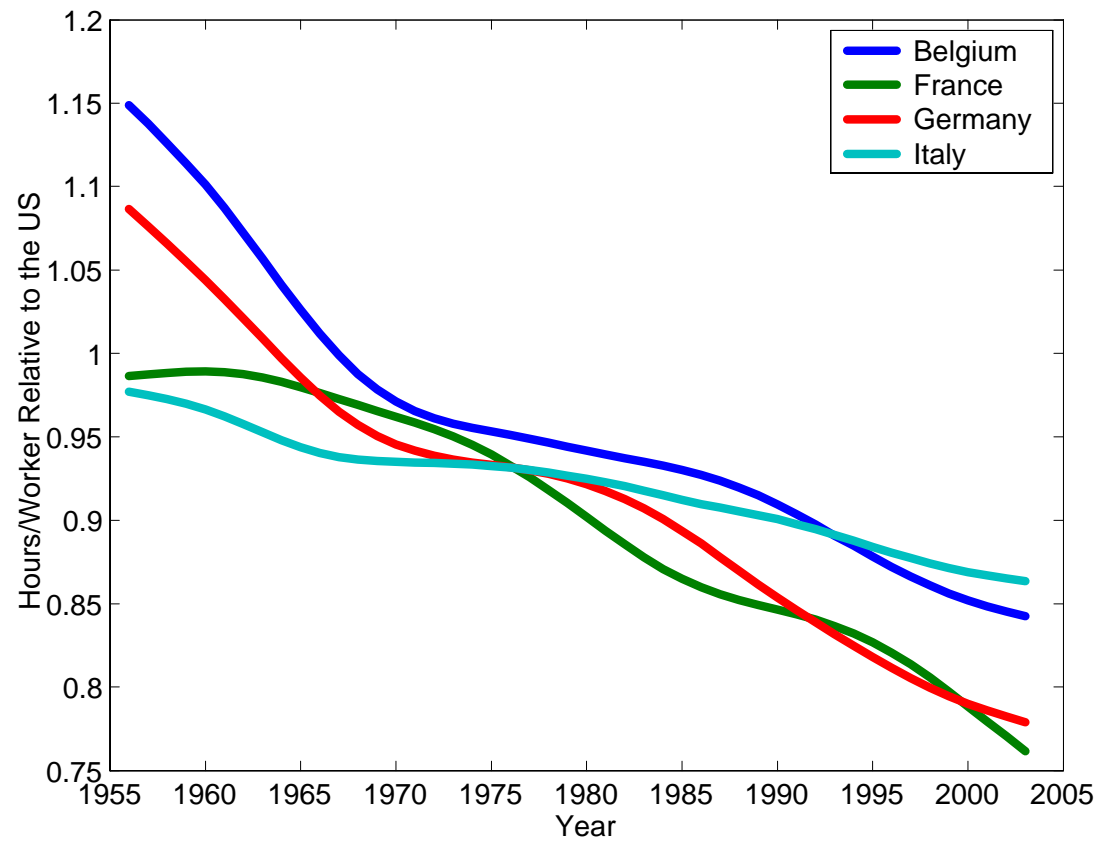
Age Patterns



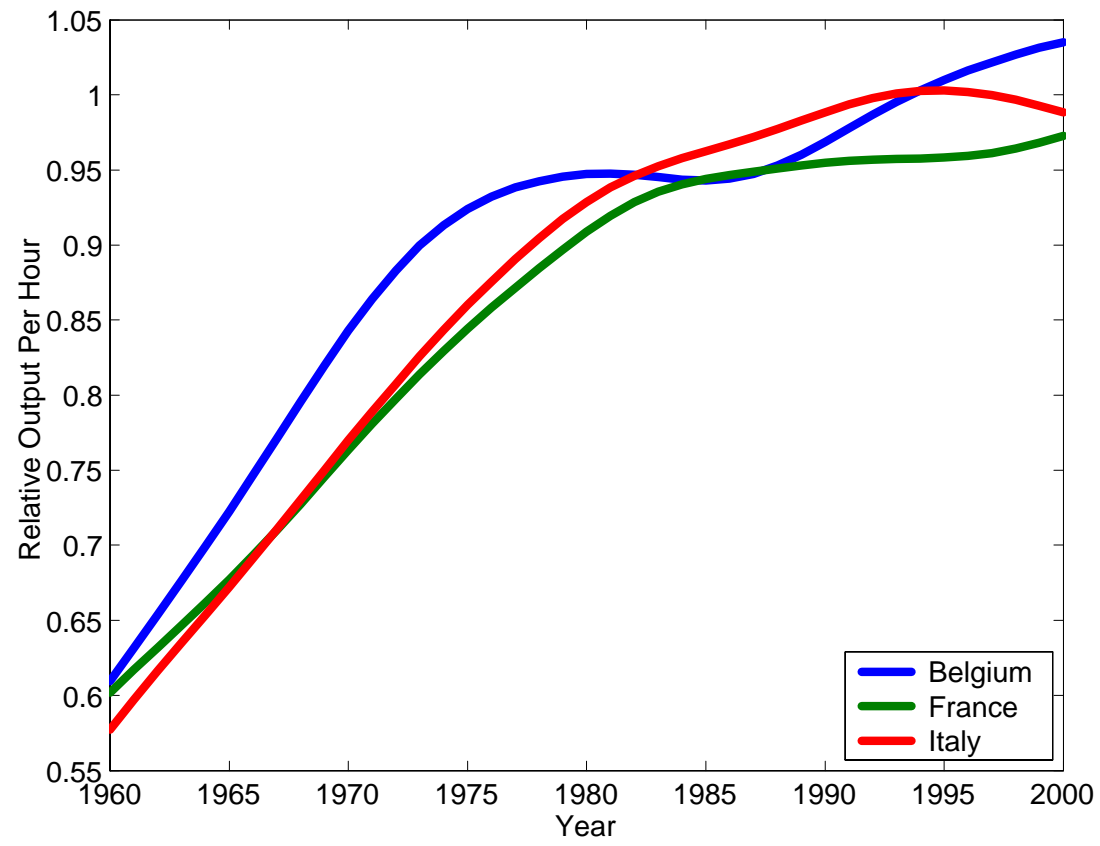
Extensive Margin



Intensive Margin



Productivity



What are people doing if they are not working?

- Freeman/Schettkat (Germany vs. US):

Total time spent working approx. the same, but home production higher in Germany.

- Olovsson (Sweden)

90% of the difference in market work is made up by increased home production

- Ragan (Many European countries)

Differences in total work are about 1/3 as large as differences in market work

- Davis and Henrekson

Indirect evidence: less market work in activities with good nonmarket substitutes.

