

# Two Centuries of Economic Growth: Europe Chasing the American Frontier

Robert J. Gordon

Northwestern University

MIT Macro Seminar, April 26, 2005

# Outline of the Two Papers

- Paper #1, “Why is Europe so Productive yet so Poor?”
  - Interpretation of falling *relative* hours per capita in Europe vs. U. S.
  - Major hypothesis: only a *small portion* of falling relative hours per capita represents welfare value of leisure
  - Audacious claim that U. S. PPP GDP per capita overstates U. S. welfare advantage
- Like a fine wine, Paper #1 has been fermenting
- Seminar will have data, references, and interpretations that are go well beyond the written version

# Paper #2, Economic History Revisited

- Why did Europe fall Behind?
- Unique point of view
  - Divided by epoch: 1870-1913, 1913-50, 1950+
  - Divided by reason: Pre-1913 the “USE” Device
  - Post-1913: Exploiting the Great Inventions
- Rewriting the “Stanford Economic History”: Abramovitz, David, Wright

# Post-1995: Europe Stops Catching Up, Falls Behind Again

- Comes at end of Paper #2, links both papers
- Since 1995, Europe has fallen back on Productivity but started a tiny recovery in Hours per Capita
  - Why the Role of IT was Exaggerated
  - Has the Role of Retailing Been Exaggerated?
  - Enduring U. S. Advantages



# Back to Part #1:

## What are the Substantive Issues

- “Why is Europe so Productive yet so Poor?”
- Superficial Answer: H/N has been falling
- Why?
  - Blanchard (*JEP*, p. 4): “The main difference is that Europe has used some of the increase in productivity to increase leisure rather than income, while the United States has done the opposite.”

# An Opposing View

- By definition the decline in Europe's  $Y/N$  related to  $Y/H$  can be divided into:
  - Decline in relative  $H/E$  (35% 1960-95)
  - Decline in relative  $E/N$  (65% 1960-95)
- Voluntary Leisure?
  - Some of decline in  $H/E$  is not voluntary
  - Most of decline in  $E/N$  is not voluntary
- New References for Welfare Interpretation
  - Freeman-Schettkat (2005) & Alesina (2005)

# Part #1:

## What are the Data Issues?

- How to Compare Europe GDP vs. US GDP
- Thanks to Peter Neary AER Dec 2004:
  - Geary vs. EKS vs. “QUAIDS”
- Alternative methods of converting Ypc to international PPP
  - Maddison and PWT use Geary-Khamis
  - OECD and Eurostat use EKS (Eltetö, Köves, and Szulc), a multilateral extension of Fisher “ideal”
  - Groningen web site gives both

# An Operational Procedure

- My calculations from Neary for EU-15 / US 1980
  - Neary preferred QUAIDS = 74.3
  - GK 71.4, EKS 77.5
  - Average Groningen GK and EKS = 74.4
- Hence all charts from here on use average of GK & EKS
- This applies only to GDP, not to population, hours, employment, labor force

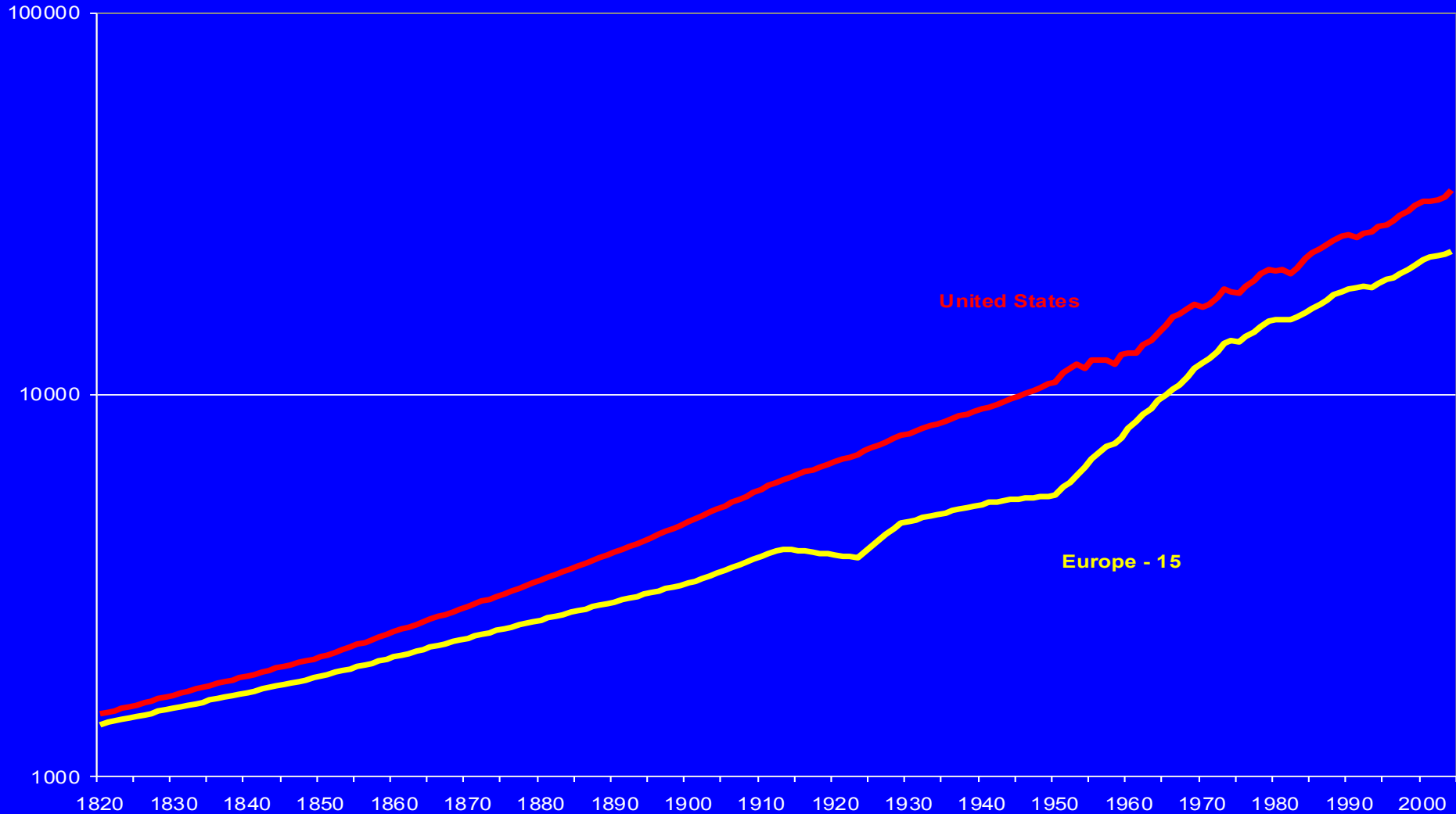
# Other Data Issues

- Hedonic Price Indexes: Data Noncomparable?
- Studies for Germany show difference in AAGR productivity of  $\sim 0.2$
- Some EU countries use hedonics for computers so overall EU difference would be less
- More interesting: Overstatement of U.S. GDP (energy, prisons, disperson)

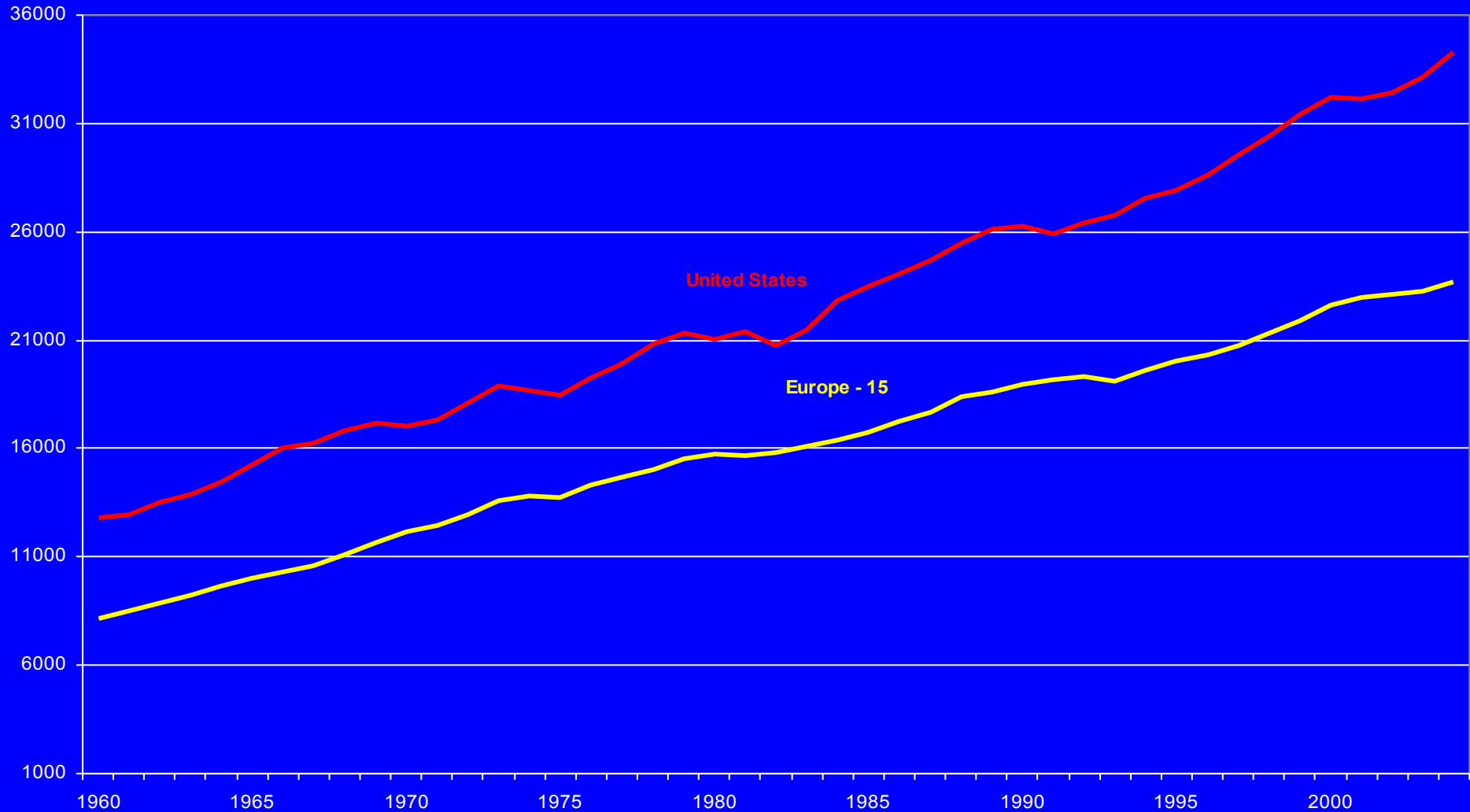
# A Preview of ALL THESE SLIDES

- Slides of Europe vs. U. S., 1820-2004 for Y/N, 1870-2004 for Y/H
- Maddison through 1950, ratio-linked to Groningen 1950+, average GK and EKS
  - Maddison piecewise loglinear trends. Years for Y/N: 1820, 1870, 1913, 1923, 1929, 1941, 1950
  - Y/H 1870, 1913, 1929, 1938, 1950
- Each slide, a wide angle back to the start, then a “close-up” 1960-2004
- Ratios, then Ratios of Ratios

# The Broad Sweep of 2 Centuries: Income per Capita

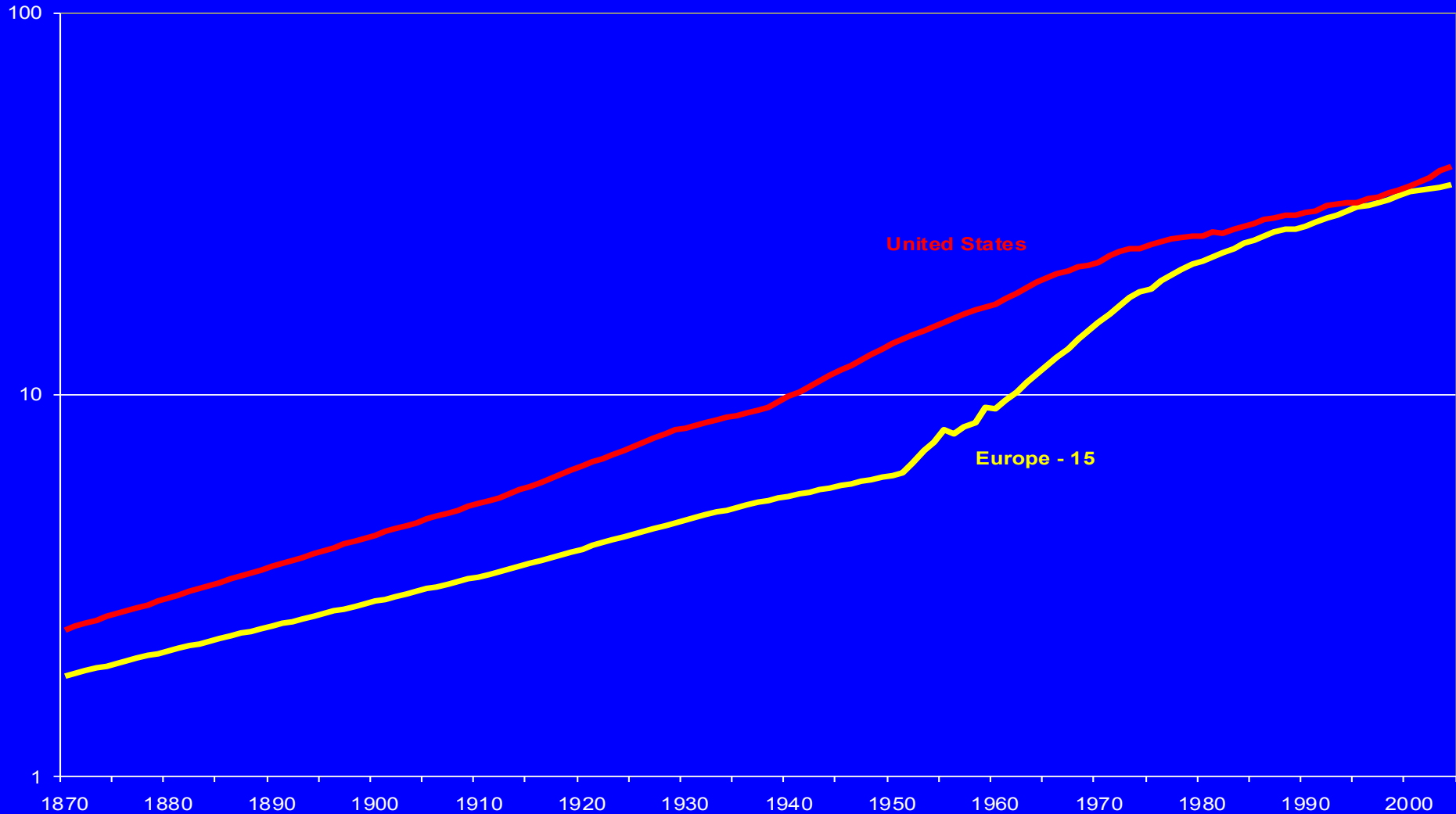


# Since 1960: Europe Fails to Converge and then Falls Behind

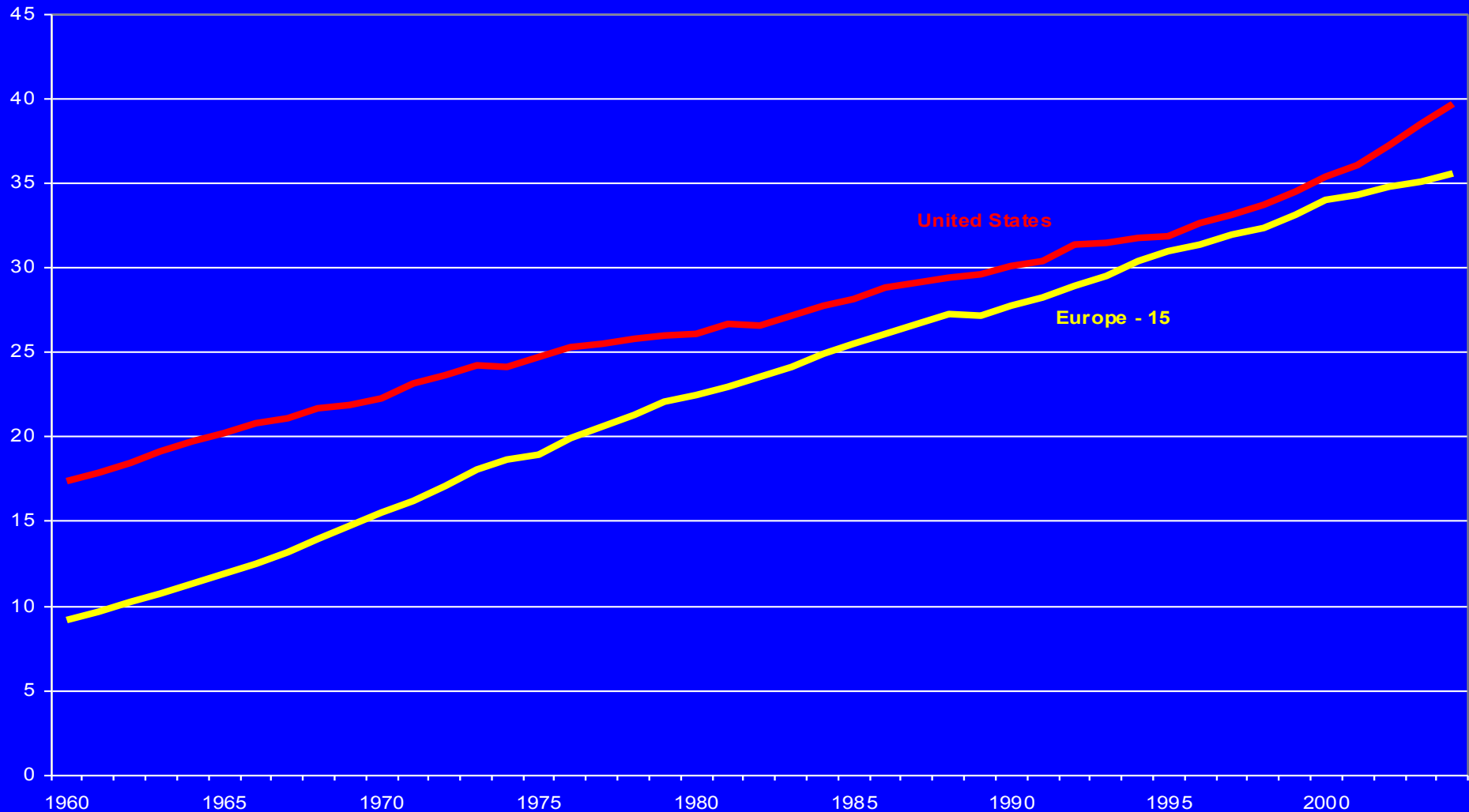




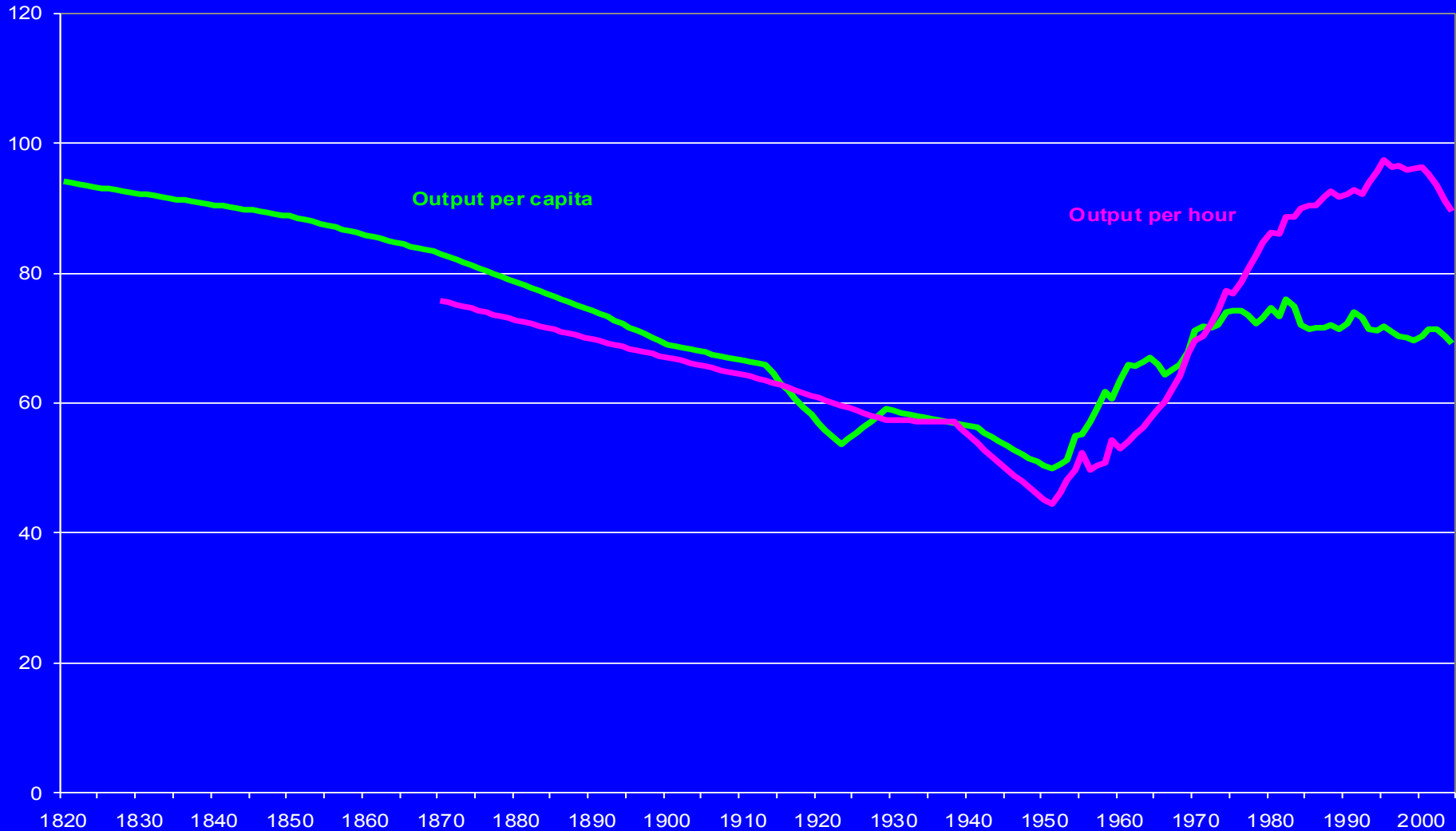
# Productivity since 1870: Almost Catching Up is Not Enough



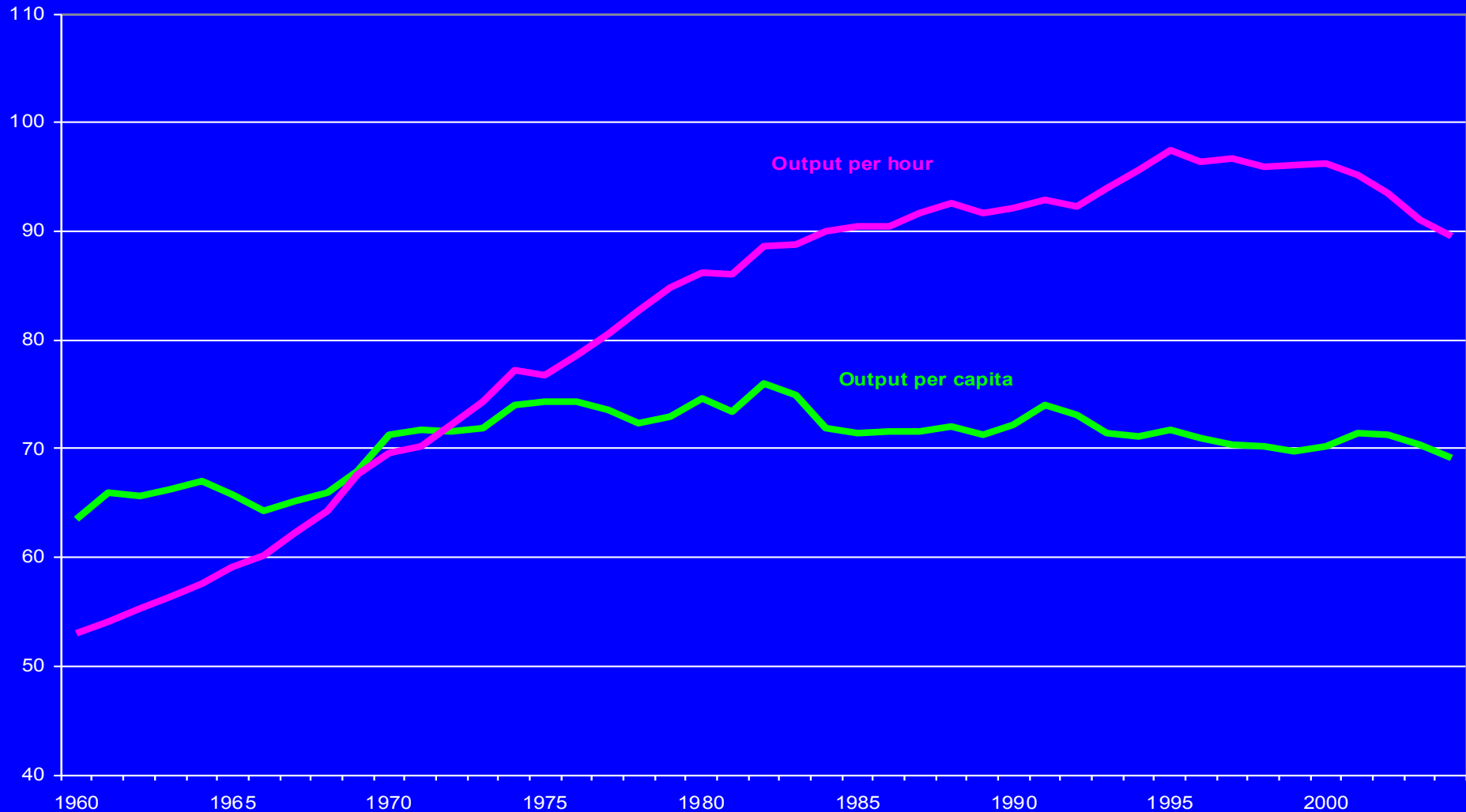
# Productivity Post-1960: The Ratio Reaches 96.9% in 1995



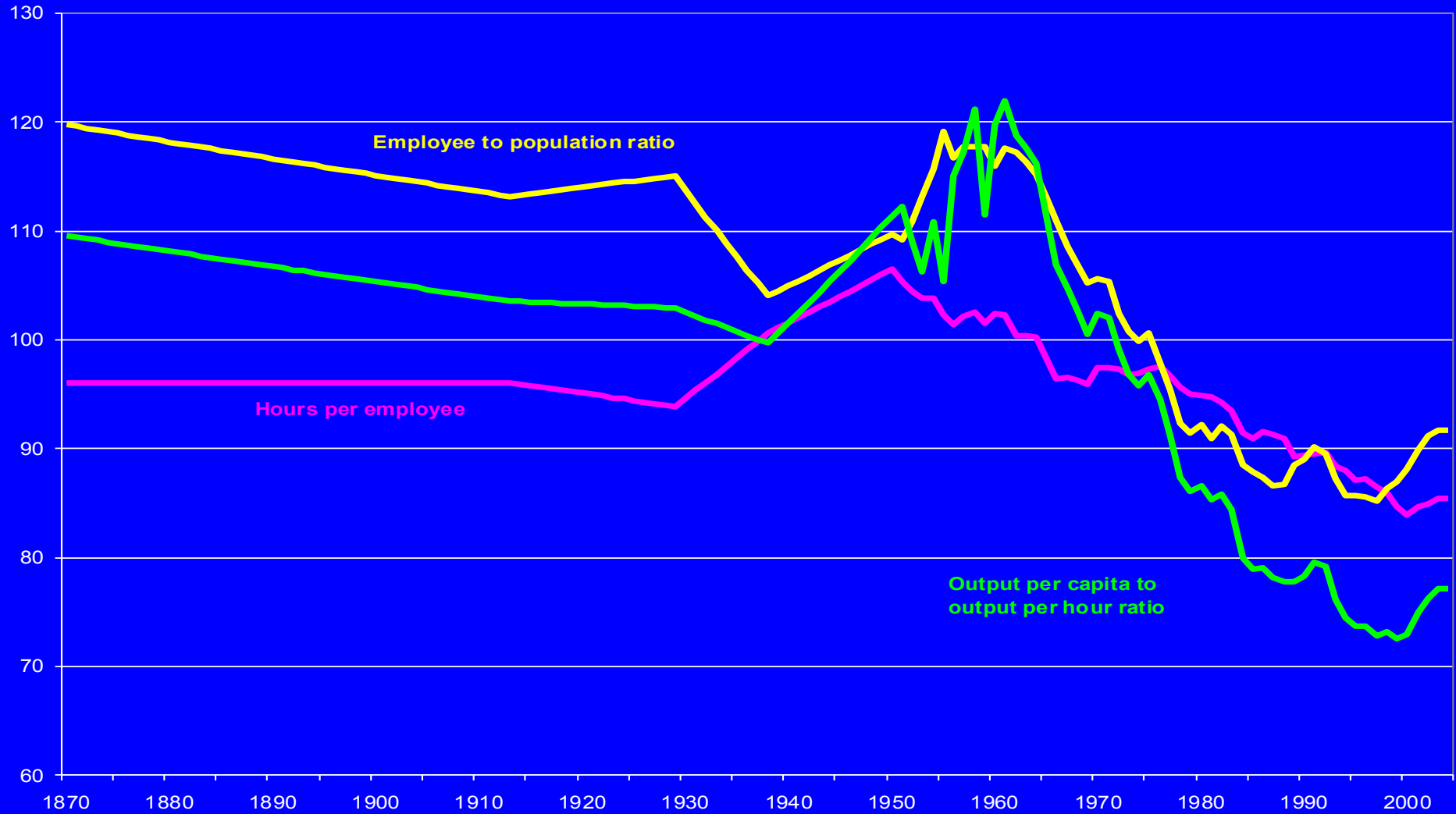
# The Europe / US Ratios Are Much More Dramatic



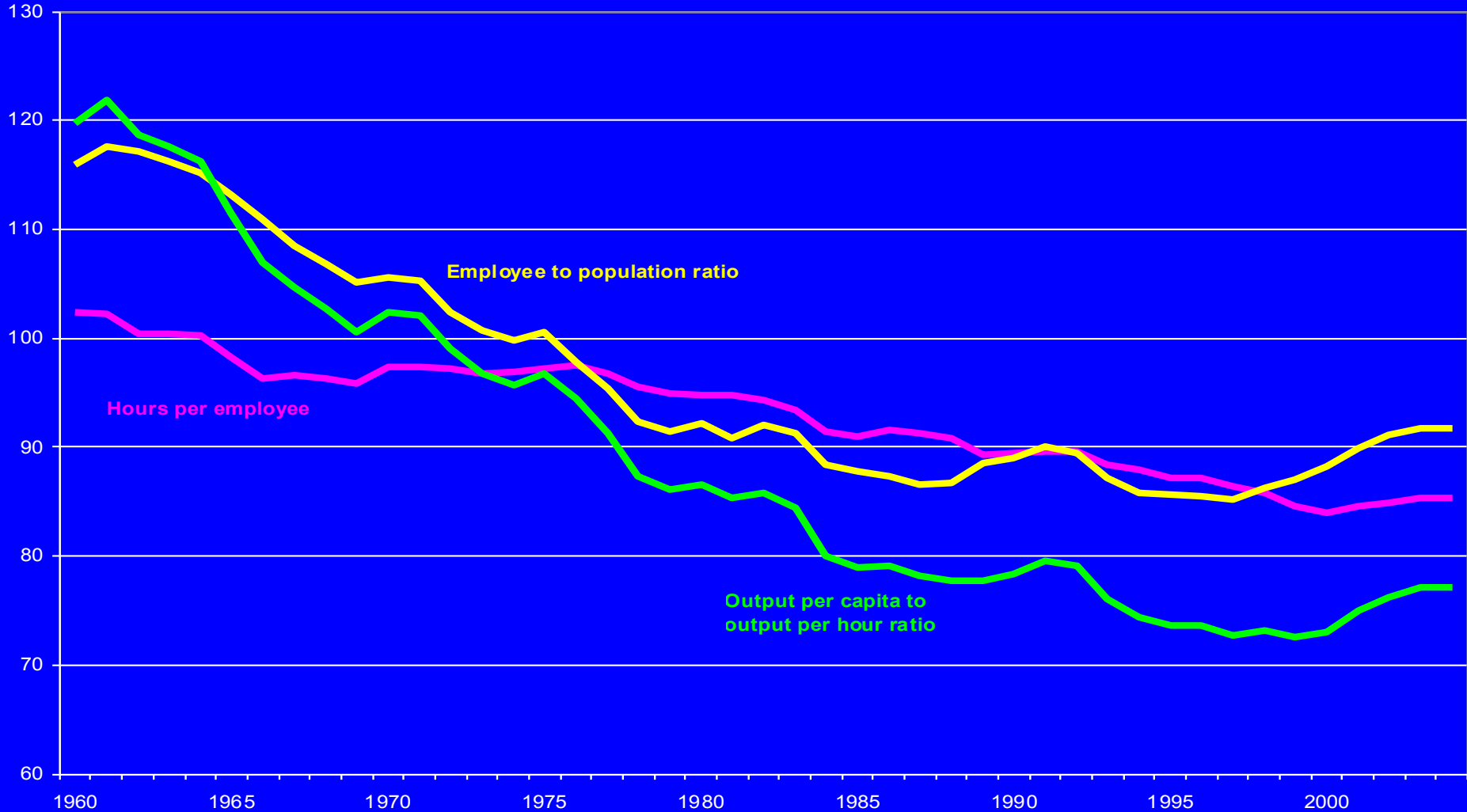
# The Ratios Again: A Post-1960 Close-up



# Ratios of Ratios: The Real Clue to What is Going On



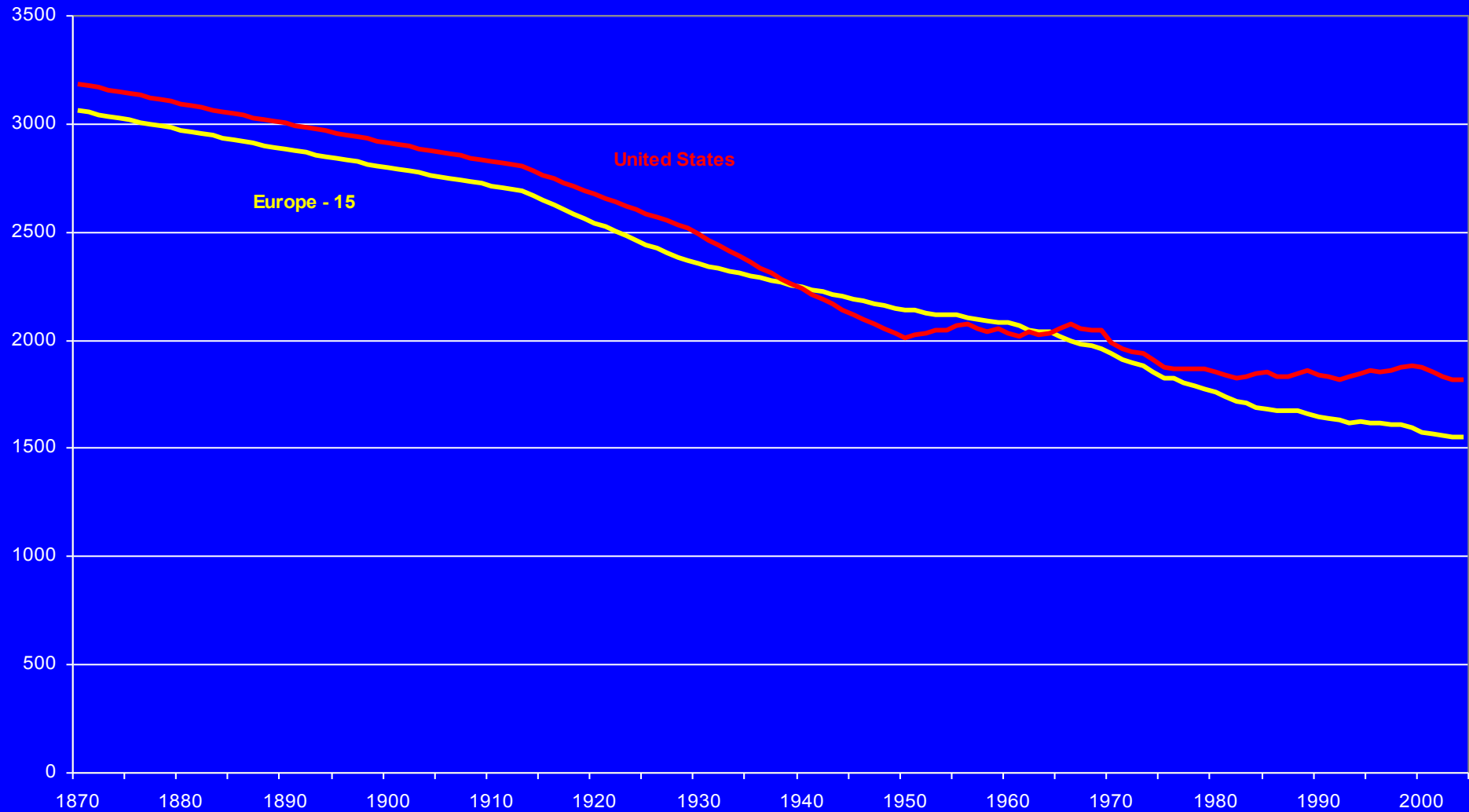
# Ratios of Ratios: The Post-1960 Close-up



# What are the Numbers that Go with these Lines?

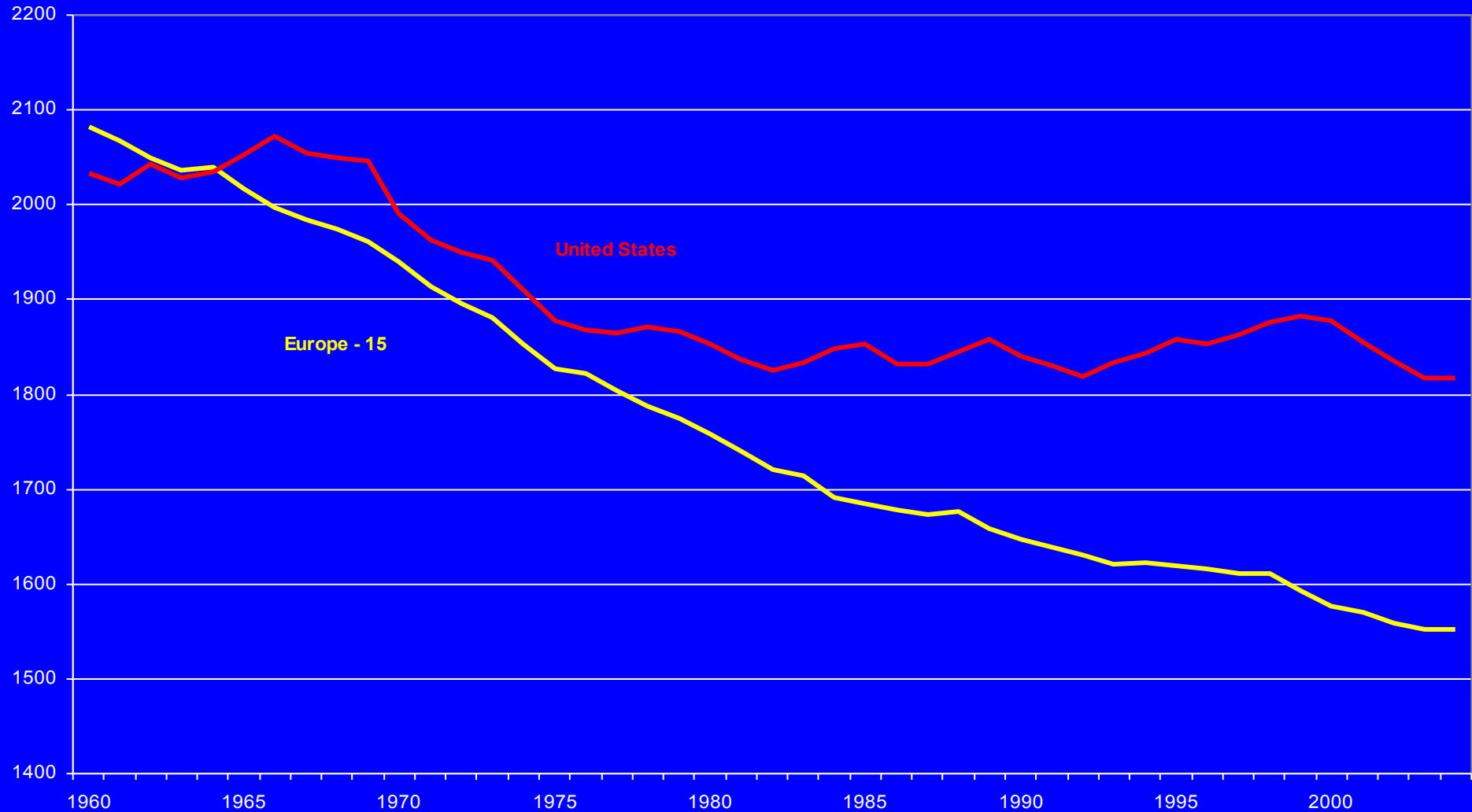
	(Y/N) / (Y/H)	H/E	E/N
1960	119.8	102.4	115.9
1995	73.6	87.1	85.6
2004	77.1	85.4	91.7
<b>% Log Change</b>			
1960-1995	-48.6	-16.1	-30.3
1960-2004	-44.1	-18.1	-23.4

# Hours per Employee Declined in Tandem until 1970, then diverged

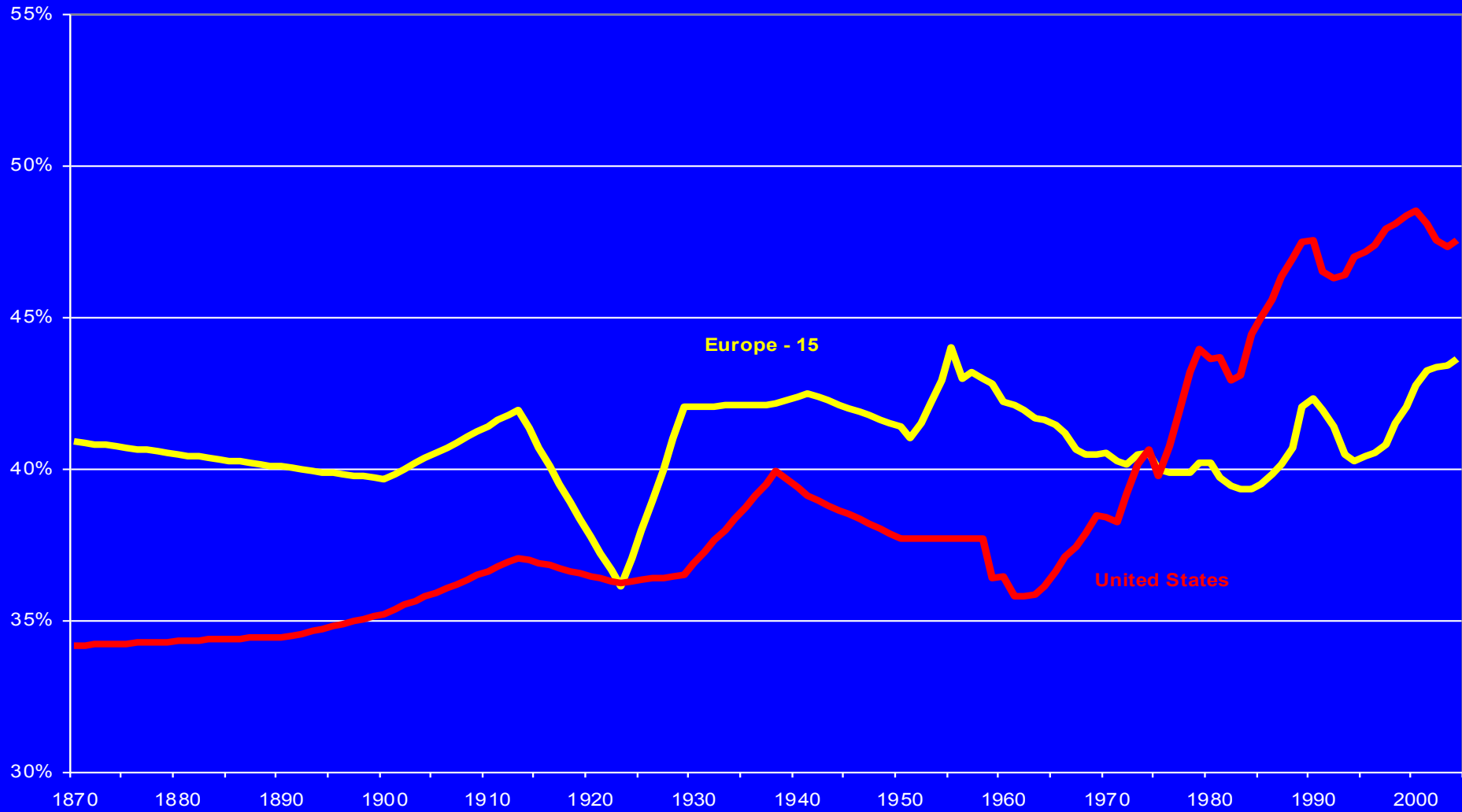




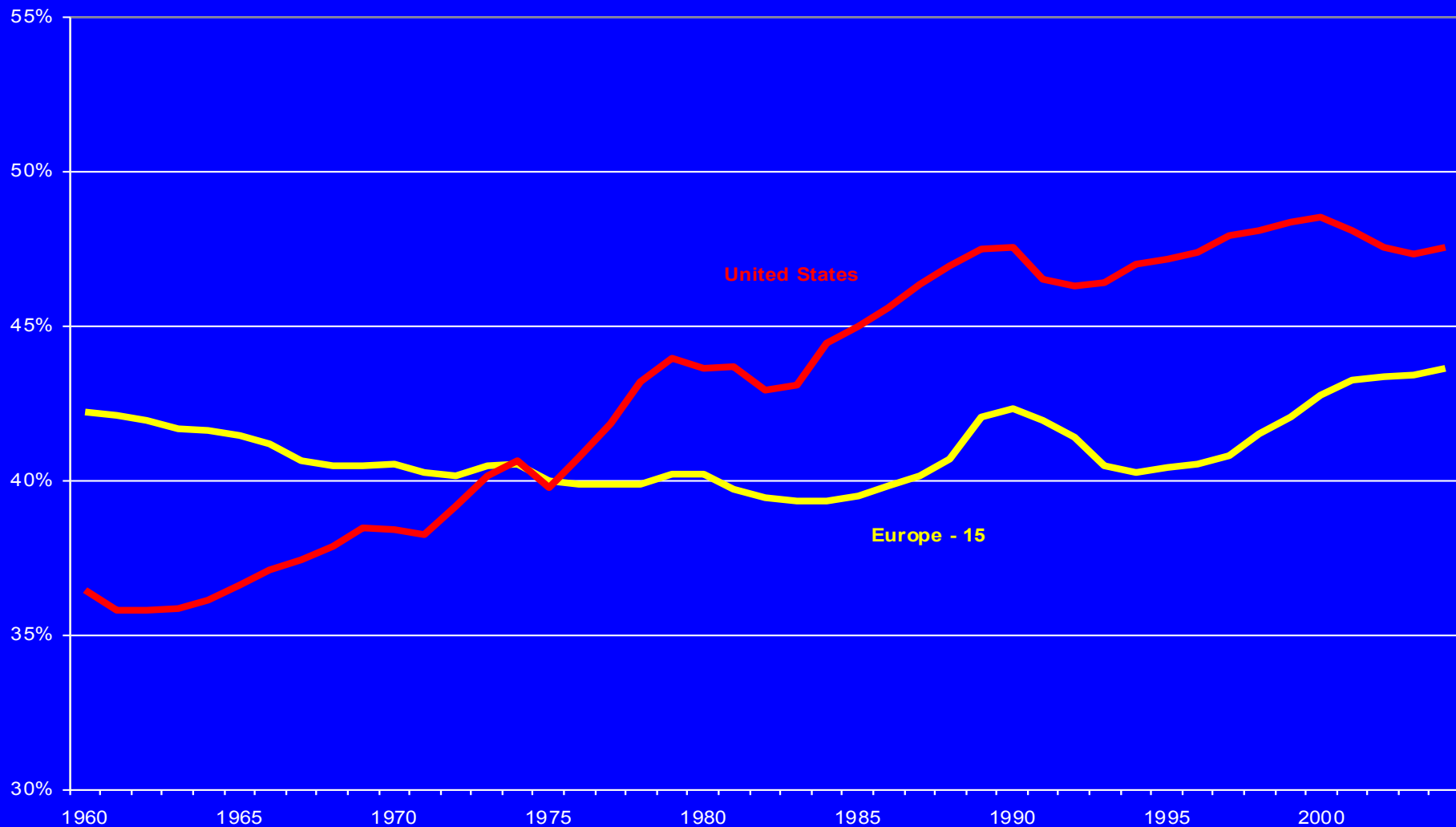
# A Close-up of Hours per Employee after 1960



# Employment per Capita back to 1870



# Employment per Capita after 1960: U.S. Women and Teens Marched Off to Work 1965-1990



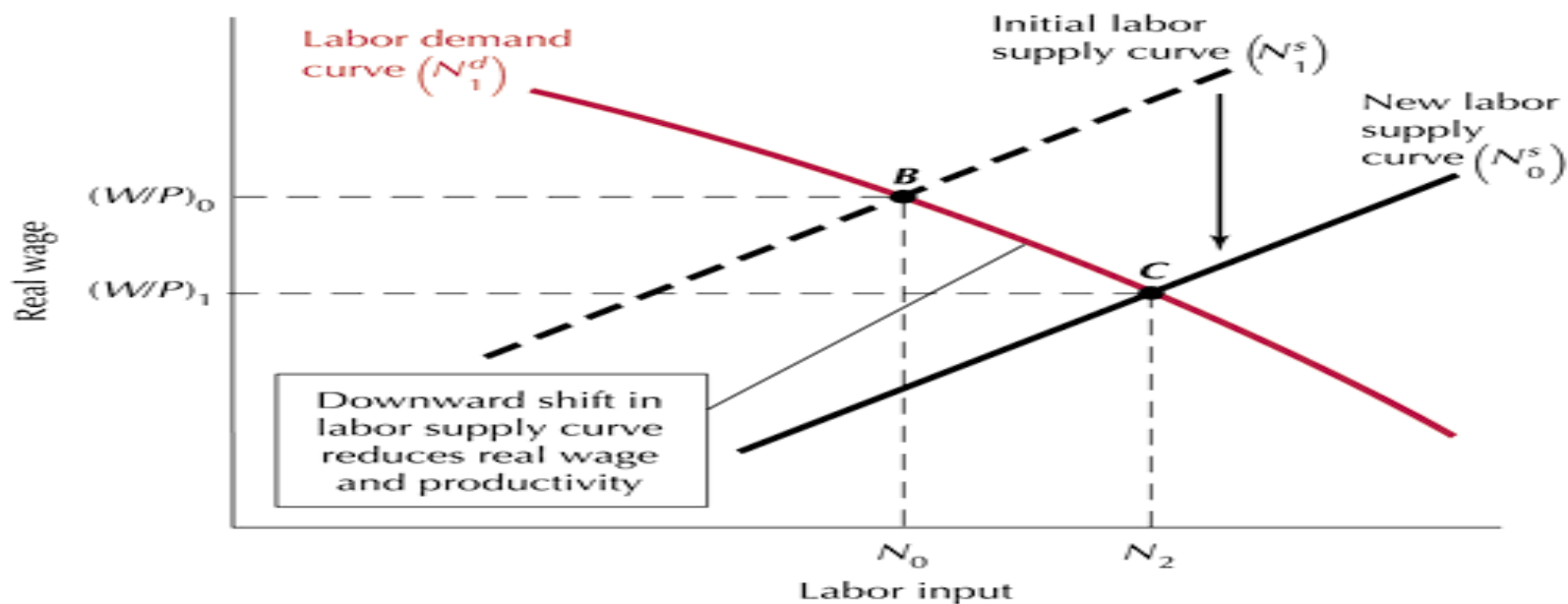
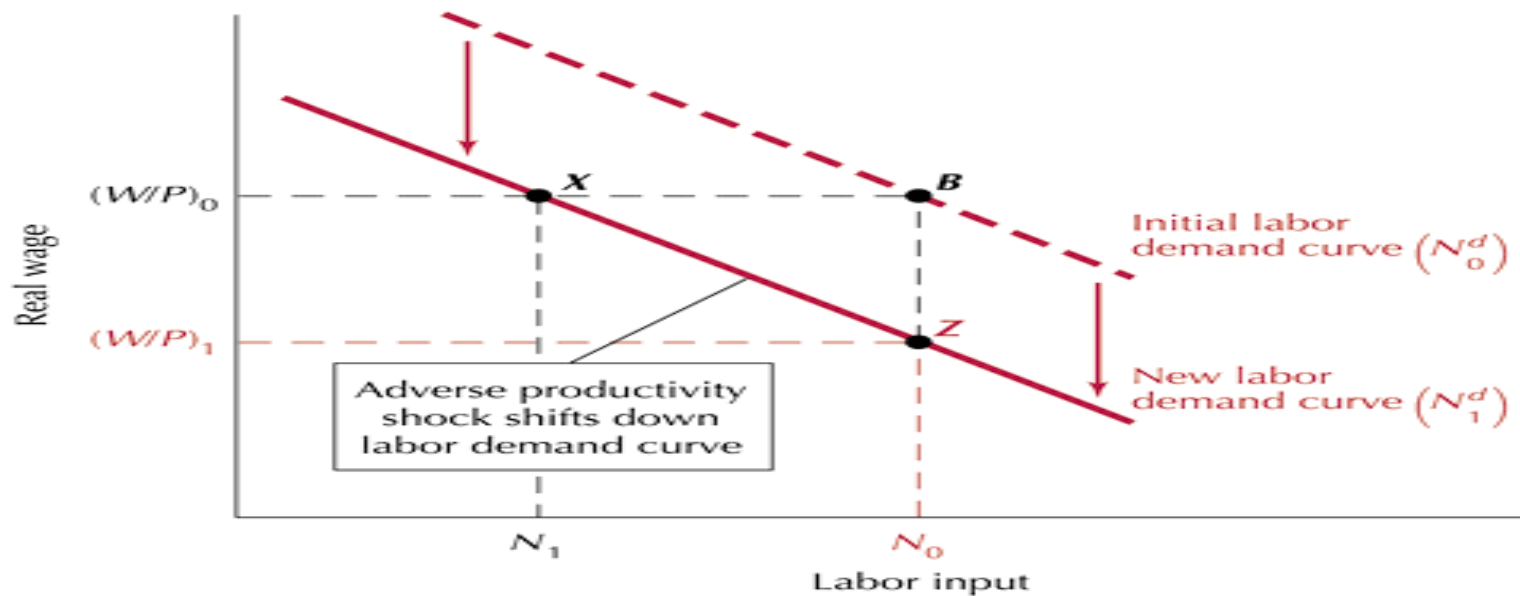
# An Outline of Issues for Discussion

- Europe's failure to converge is not just a matter of voluntary vacations
- Much more of the change 1960-95 was the decline in employment per capita
- Even lower hours are not entirely voluntary
  - “If the French really wanted to work only 35 hours, why do they need the hours police?”
  - Alesina:
    - Short hours are a victory for unions and parliamentary politics, not for free choice
    - So is early retirement, a major source of falling E/N

# What Matters for Welfare is $Y/N$ + Differential Leisure, not $Y/H$

- Europeans have “bought” their high productivity ratio with every conceivable way of making labor expensive
  - High marginal tax rates (payroll and income taxes)
  - Firing restrictions
  - Early retirement (55! 58!) with pensions paid for by working people
  - Lack of encouragement of market involvement by teens and youth

REAL WAGES AND PRODUCTIVITY:  
WHICH IS THE CHICKEN AND WHICH THE EGG?

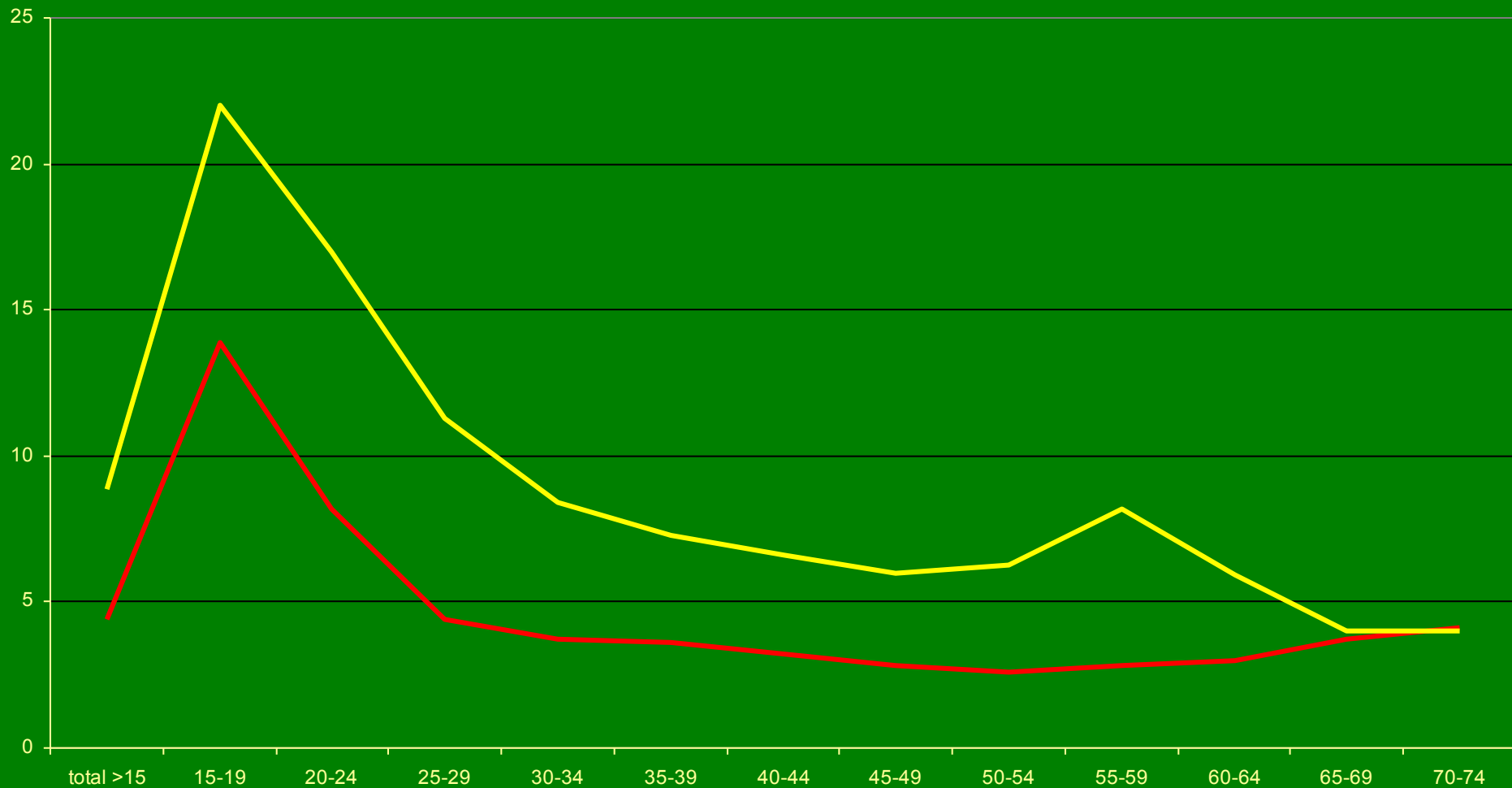


# The Decline in Europe's E/N Matters more than H/E

- First, which age groups are suffering from higher unemployment in Europe?
- Second, which age groups experience lower labor force participation in Europe?
- Third, how does it come together in the distribution of low E/N by age group?
- Note: These graphs are for total population by age and blur male/female differences.

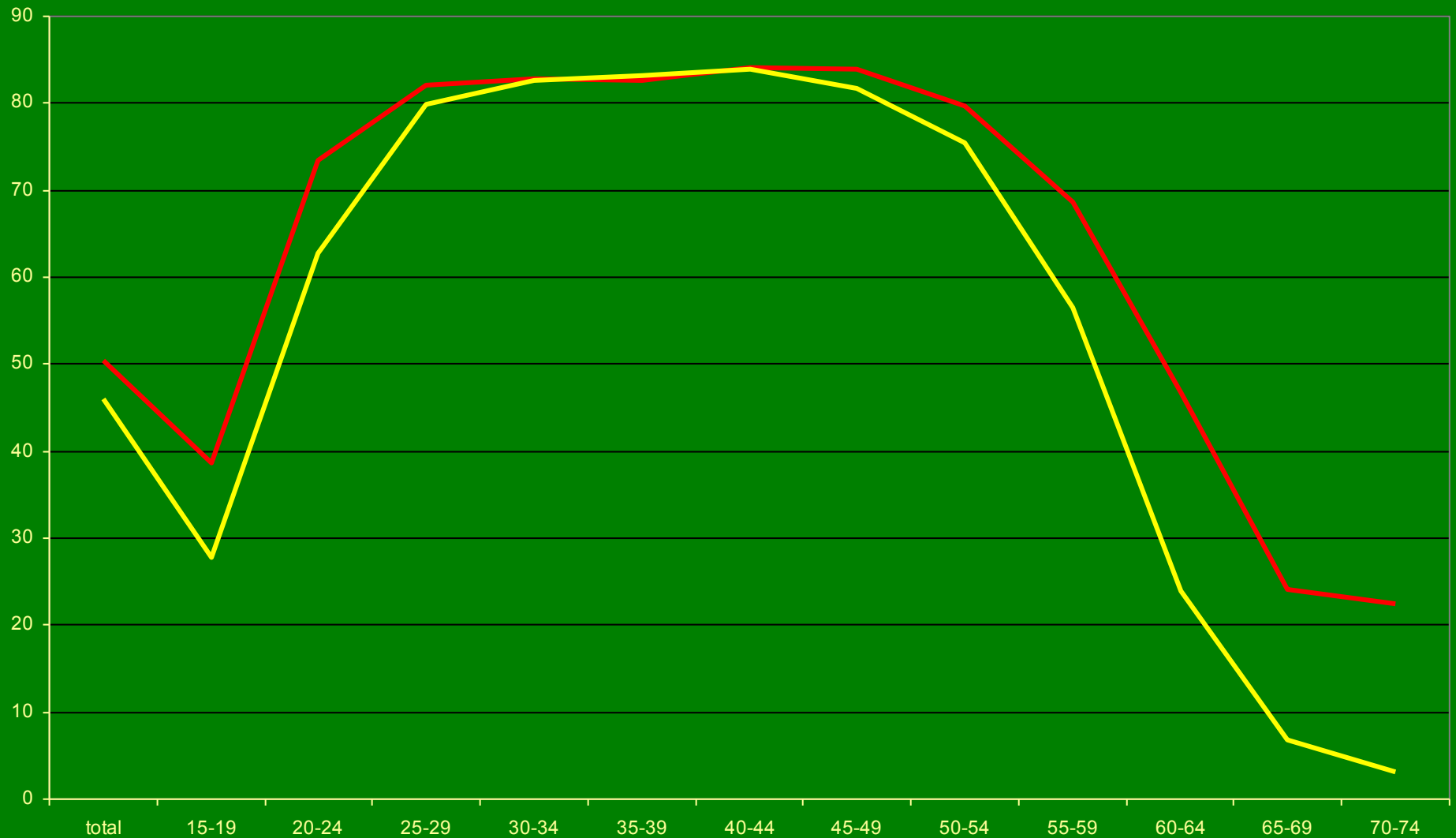
# Leisure? Unemployment by Age

Unemployment by age

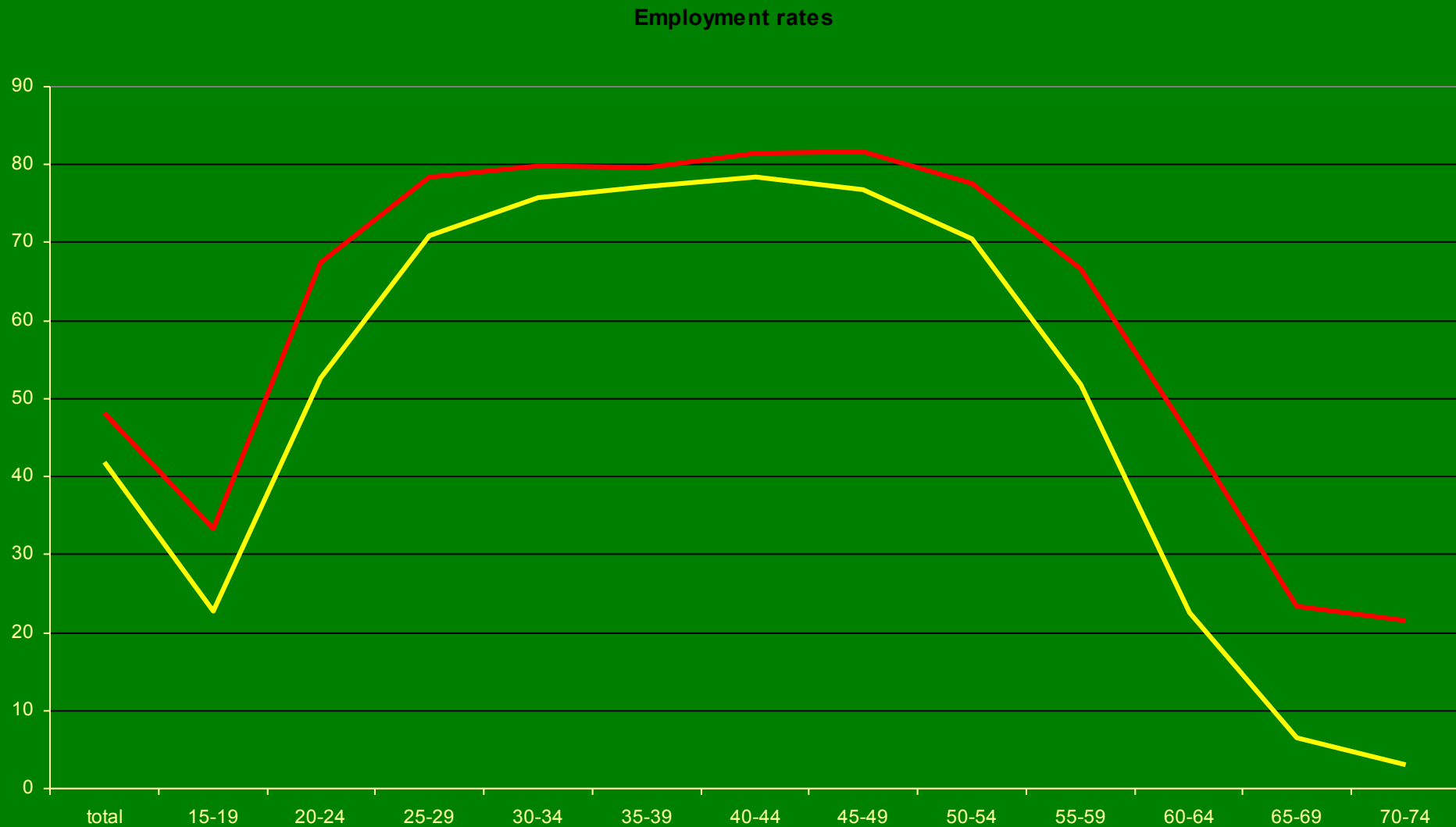




# The "Peaked Hump" in European LFPR



# Putting it Together: E/N by Age



# Decomposing the EU/US Difference in the E/N Ratio

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

# Welfare Aspects of E/N by Age Group

- Youth enter late into Market Employment
- If we are assessing extra European “leisure”, how much if any credit do we give to youth?
  - Disconnected from the market economy
  - American youth are expected to work
- Link with government support of higher education: tuition grants in Europe vs. peer-reviewed research grants in US
  - Plus state university subsidies

# The Welfare Effect of Early Retirement: Back-of-Envelope Handout

- Baseline: work age 20-65, retire 65-84
- No saving, investment
- 30% tax finances pay-as-you-go pensions with balanced govt budget
  - Tax finances equality of consumption in retirement to consumption during work years
- Alternative retirement age at 55 requires tax increase to 45.6%, 25.1% decline in consumption during work years and retirement

# Time Allocation from Freeman-Schettkat

- Freeman average males & females, workday
- M=market, H=home production, L=leisure, P=personal time (sleep)
- I set  $P > 9.0$  as Leisure

	M	H	L	P
Employed	8.0	2.5	4.5	9
Unemployed	1.0	4.5	9.5	9

# Welfare Valuation of Leisure

- Work time is chosen to equate marginal utility of leisure to after-tax wage
- Diminishing marginal utility of leisure
  - Infra-marginal leisure valued  $>$  wage
  - Extra-marginal leisure valued  $<$  wage
- Back-of-envelope.
  - Value weekday and weekend leisure of both workers and retired =  $4/3$  after-tax wage
  - Value hours switched from work to retirement =  $2/3$  after-tax wage

# Welfare calculation

- With 55 retirement age, after-tax wage is 25% less
- Extra hours switched from work to retirement leisure are low-valued (2/3)
- Total welfare = market consumption plus total value of leisure
- Market consumption declines 25.1 percent, welfare declines 22.6 percent, ratio 90% (i.e., leisure offsets 10%)



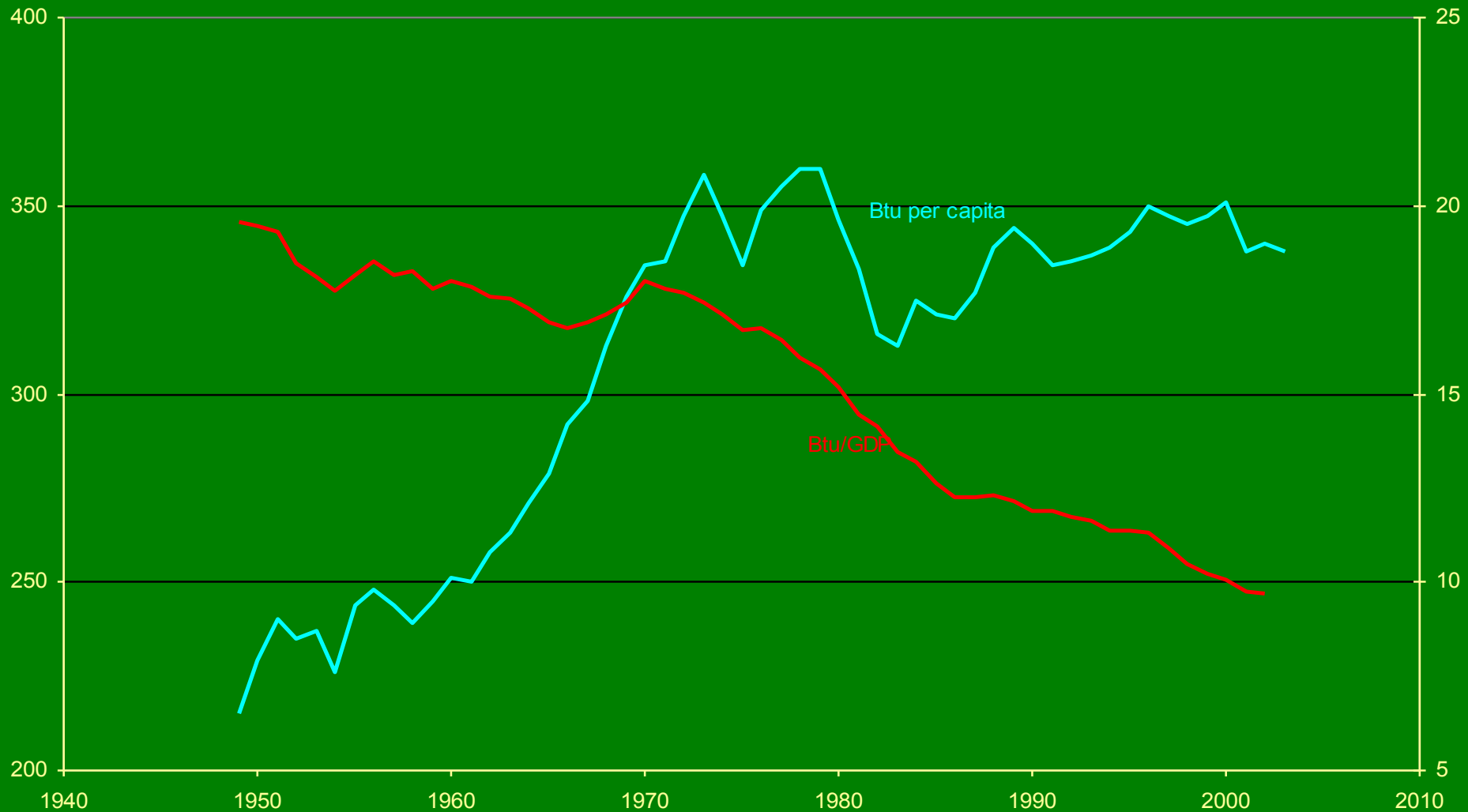
# Conclusion about Leisure Offset

- Europe's decline in H/E, not all of this is voluntary (Alesina)
- Europe's decline in E/N due to unemployment and low labor force participation of youth and early retirees, virtually no leisure offset
- Freeman-Schettkat
  - Part of difference in H/N represents not leisure but household production
  - German mothers cook at home, American mothers go out to eat

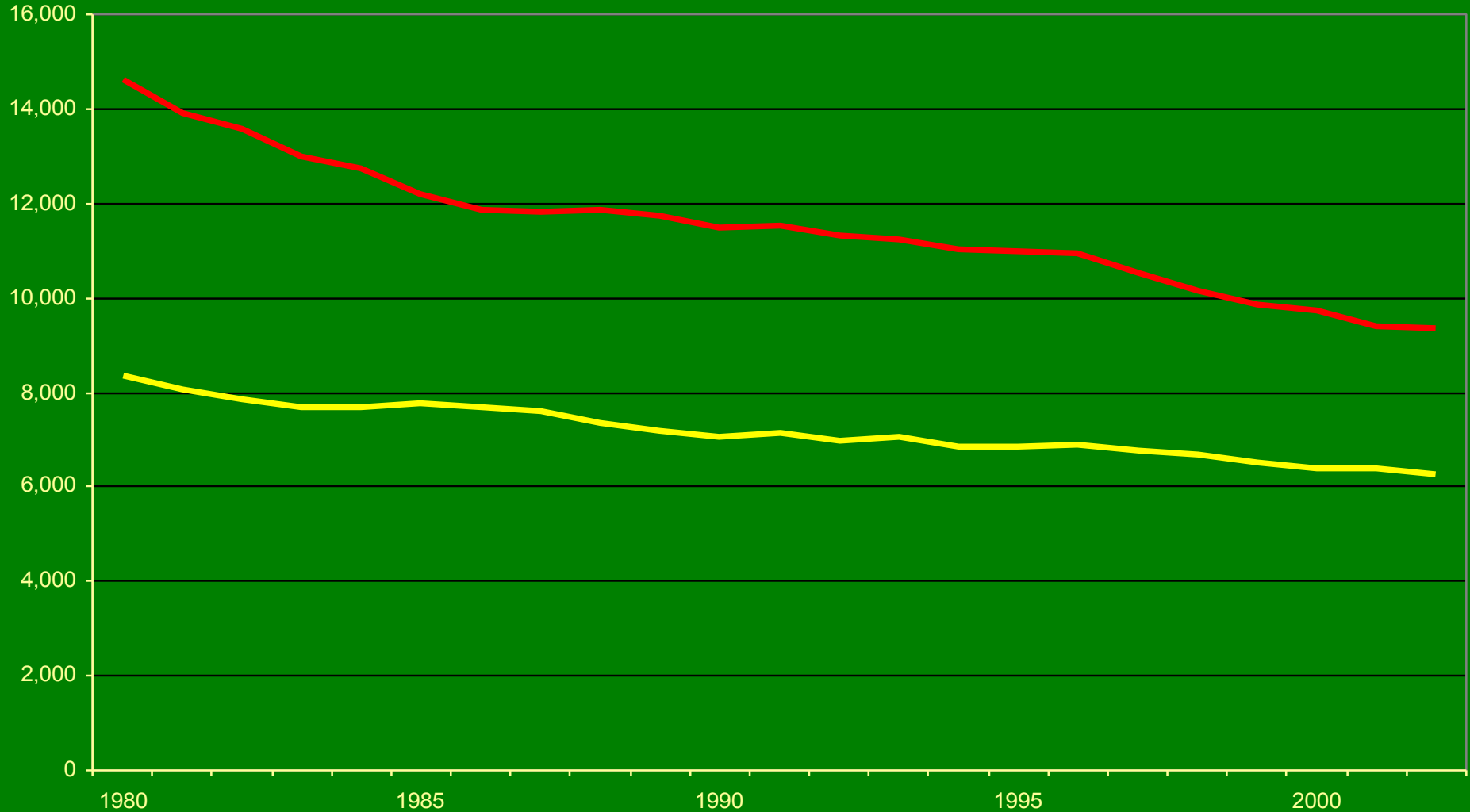
# Turn the Tables on the U. S.: The “Disconnect” between Welfare and PPP-Adjusted GDP

- GDP Exaggerates U. S. GDP per Capita
  - Extreme climate, lots of air conditioning, low petrol prices, huge excess energy use
  - U. S. urban sprawl: energy use, congestion
  - Crime, 2 million in prison
- How much is this worth?

# A Shrinking Explanation: Declining Btu / GDP



# The EU-US Difference is only 2% of GDP



# Other Additions or Subtractions from Europe's Welfare

- Urban Congestion?
  - London vs. NY?
  - Paris vs. Chicago?
  - Time spent in London underground vs. in a Chicago automobile?
- Prisons, perhaps 1% of GDP
- Undeniable U. S. superiority: housing
  - People value interior square feet (2X in US)
  - People value exterior land (4X in US)

# Putting it Together for 2004

- EU/US Y/N = 68.8
  - Average of GK 65.8 and EKS 71.8
- EU/US Y/H = 89.2
  - Average of GK 85.3 and EKS 93.1
- Raise Europe:
  - 67% of H/E difference (11.8) is leisure = 7.9
  - 10% of E/N difference (8.6) = 0.9
  - Half of Energy use difference = 1.0
  - Prisons and other = 1.0
- Europe's welfare vs. U. S. = 79.6

# Paper #2 is the History: Revising the “Stanford School”

- Organized by time, pre-1913, 1913-50, 1950+
- Within time periods, political union vs. other (USE device -- notice footnote 17)
  - Political union vs. “newness”
  - The heavy role of government in creating the late 19<sup>th</sup> century U. S. growth miracle
- Within time periods, reversible or nonreversible?

# Political Union: Materials-intensive manufacturing

- Wright, raw materials
  - part of political union, not just natural endowment
    - US has advantage in resources vs. individual nations, but not all of Europe
    - No fear of Minnesota and Indiana going to war
  - Wright: doesn't emphasize enough ag, transport, trade. The “Wells Fargo Wagon”
- Late 19<sup>th</sup> Century: The Dynamo of Chicago
  - Fastest Growing City in the World: 1871-1929
  - James Cronon's “Nature's Metropolis”
  - “Devil and the White City”



# But it was not all Political Union: Even a USE Would Have Lagged

- Clear advantages of the New World (which U. S. uniquely? Which others (C, AU, NZ, Argentina?)
  - Agricultural
    - Land intensity indirectly responsible for ascendancy of American manufacturing
  - Newness
    - Common language, self-selection of ambitious immigrants, high motivation, labor mobility
  - American system of manufacturing (guns, watches, British anquish at Crystal Palace 1851)
  - Policy
    - Land for the railroads
    - The Homestead Act!

# Post-1913: Exploiting the great inventions

- Vs. David-Wright on electricity in 1920s US mfg
  - Much more emph needed on ICE
  - Much more emph needed on 1930-50, not just 1920s
- Huge US lead in exploiting both electricity and ICE
  - U. S. in 1929 had 80% of world motor vehicle production
  - U. S. in 1929 had 90% of world motor vehicle registrations
- No mystery about the “Arsenal of Democracy”

# Post-1913: The Great Compression

- Created rents for labor, promoted capital-labor substitution, reduced low-skill jobs
- Immigration
  - Restrictive legislation in the 1920s
  - A respite for low-skilled workers (compare now)
- Trade barriers
  - No importation of low-skilled labor via goods (compare now via China)
- New deal pro-union legislation
  - Pure rents for semi-skilled high-school drop-outs

# World War II!

## The Victory of the Arsenal

- The miracle occurred in an ad-hoc system of government loose control over business improvisation
- The basis was laid starting with Henry Ford in 1914
- Herbert Hoover did something good
- Role of the American system and the engineer
- References: Overy, Walton

# Post WWII

- France: penetration of electricity and ICE: exactly 40 years later
  - That wonderful Landes quote
- Reversal of initial U. S. advantages
  - Raw materials
  - Political union
  - Newness depreciates
  - Reversal of the Great compression
- Did Europe do anything creative except catch up?
  - Welfare state

Combining auto with public transport

# The Great Paradox: The U. S. Funk 1973-95 followed by European Funk after 1995

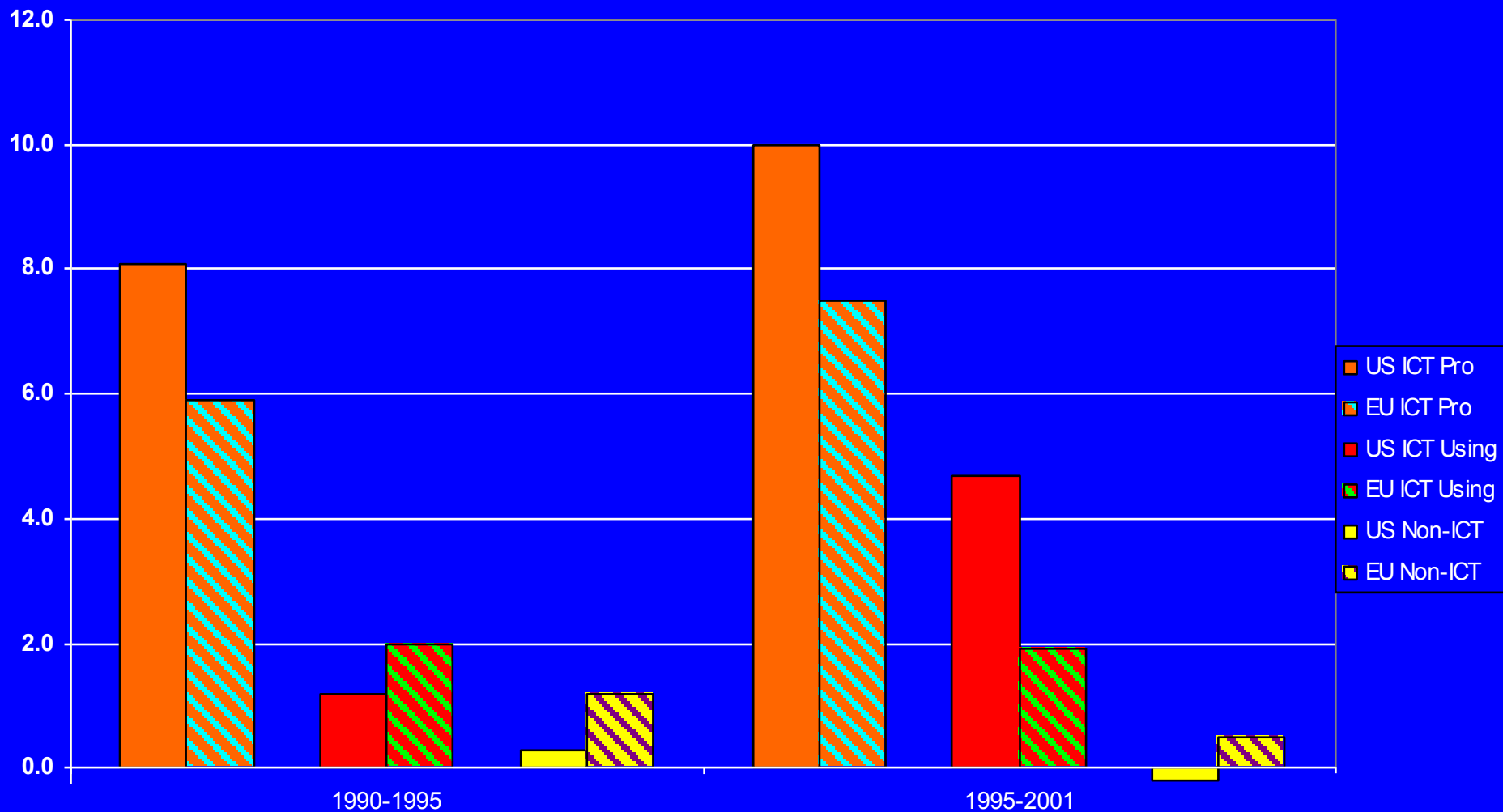
- 1973-95 Europe continues to exploit great inventions
  - Copies U. S. interhighway system but retains railroads and builds TGV
- The teetering U. S. has run into diminishing returns
  - Old inventions, electricity and ICE, fade away
  - The Solow “computer paradox”
- 1995-2004. Europe's productivity growth doesn't revive, the great European funk.

# The Diagnosis for the Turnaround: Basic Paradox about IT

- Both Europe and U. S. Rapidly Adopted New Economy Technology
  - Personal Computers
  - Web Access
  - Mobile Phones
- But Europe hasn't taken off
- Conclusion: Role of IT in U. S. revival must have been exaggerated

# Finding the Culprit Industries

## Output per Hour by Industry Group, EU and US, 1990-2003





# Where is the Difference?

## The Van-Ark Decomposion

- Explaining the difference in Europe vs. US productivity growth post-1995
  - 55% retail trade
  - 24% wholesale trade
  - 20% securities
  - Rest of the economy: ZERO
- U. S. negative in telecom, backwardness of mobile phones

# U. S. Retail Miracle

- Not uniform, concentrated in “large stores charging low prices with self-service format”
- *ALL* of productivity gains post-1990 attributable to *NEW* establishments and closing of old establishments
- Average pre-1990 establishment had *zero* productivity growth

# Europe in Retailing

- Not uniform – Carrefour, Ikea
- U. S. “Big Boxes” (Wal-Mart, Home Depot, Best Buy, Target)
- Europe:
  - Land-use regulation, planning approval
  - Shop-closing restrictions on hours
  - Central-city congestion, protection of central-city shopping precincts
  - Prohibition on discounting by large new stores
  - Related to Phelps’ corporatism

# Not enough emphasis on new vs. old

- It's not just that land-use planning prevents Wal-mart from setting up a new big box on every highway interchange in Europe
- It's that the MIX of retailing in Europe is heavily composed of small, old-fashioned firms
  - Walking down the street in Paris, all those "green crosses"

# Qualification: Measurement Issues

- U. S. Lead in ICT Production Exaggerated because part of Europe (Germany) doesn't use hedonic price indexes for computers
- Big measurement issues in wholesale and retail trade
  - Crediting trade for price declines in electronic goods
  - Failure to perform double deflation

# A New Paper

- Marcel Timmer and Robert Inklaar, Groningen GD-76, April 2005
- Results for MFP

	EU (4)	US
Wholesale NIPA	1.3	2.7
Wholesale new	0.8	0.9
Retail NIPA	1.4	4.6
Retail New	1.6	4.2
Total Trade NIPA	1.3	3.6
Total Trade New	1.1	2.5

# Education and University Research

- U. S. leadership in secondary education, 1910-40
- U. S. leadership in college education, post WWII
- U. S. research universities America's leading export industry even in dismal 1972-95, still the envy of the world
  - Competition between state and private
  - U. S. peer reviewed grants to young professors, not young students
  - Contrast with Europe tuition subsidies

# Let's not Forget: Germany is being Strangled by Euro

- No more monetary policy
- If inflation soars in Portugal or Ireland, German workers are unemployed
- Fiscal policy is strangled by the 3% deficit rule
- Germany is MUCH MORE threatened by Poland and Czech than U. S. by Mexico
- Ross Perot was right in the wrong place
- Different immigration dynamics



# Conclusion (for now)

- Economic research has focused on particular European problems
  - Land use vs. big boxes
  - Employment taxes and low hours per capita
- Broader issues
  - Low fertility rate vs. retirement ages
  - Stark contrast: Czech/Poland vs. Mexico
  - Stark contrast: U. S. can absorb immigrants and Europe cannot