

Fourth RODOLFO DEBENEDETTI Lecture, March 2006

Earnings Differences among People:

**A simple race between Supply and
Demand?**

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Earnings Differences among People

Introduction

1. Taking the Supply and Demand Story Seriously

- Modelling the pursuit race between technology and education
- From the skill premium to the distribution of earnings among people

2. Empirical Evidence about Earnings Dispersion

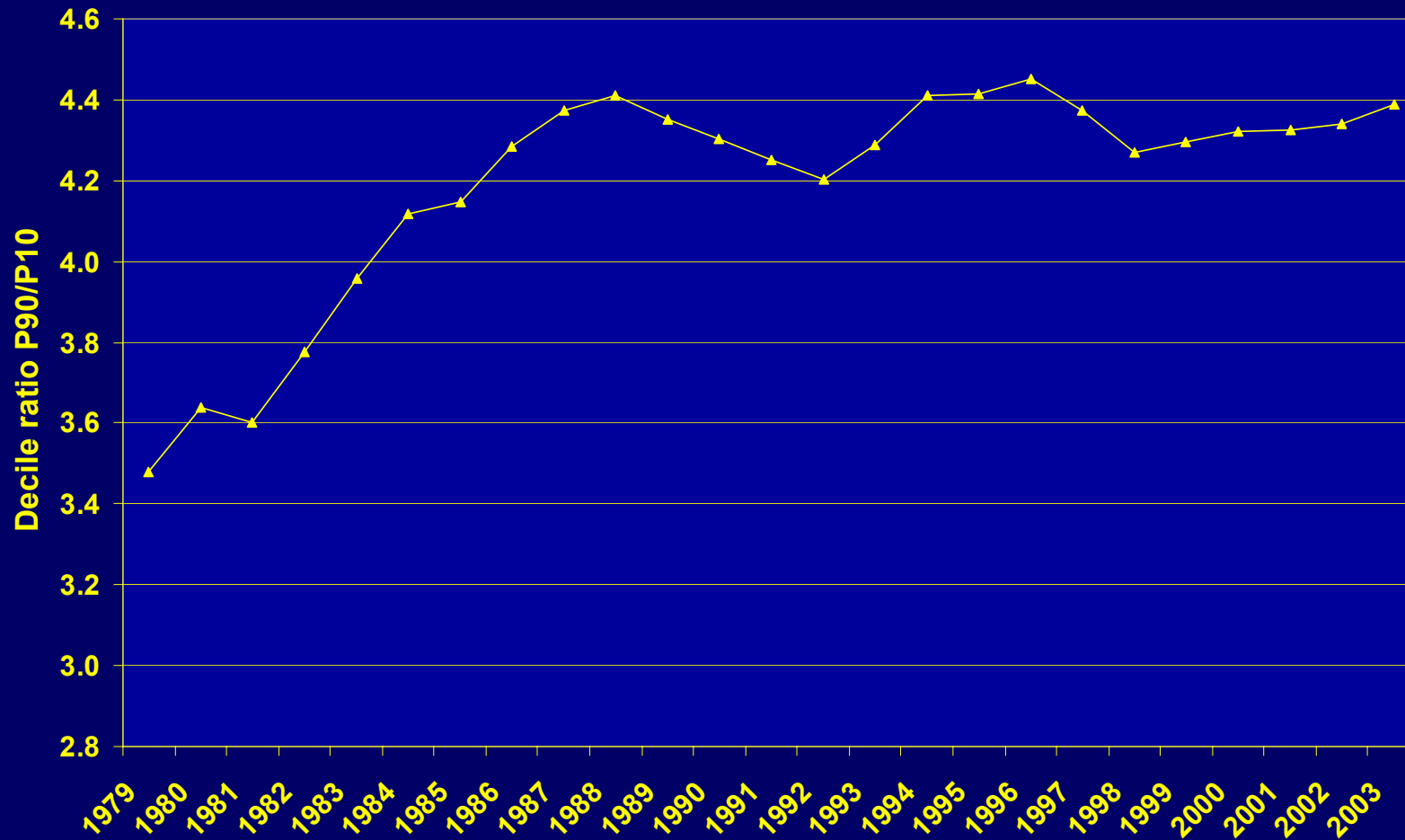
- An augmented dataset on earnings for 20 OECD countries
- Patterns of change in the 1980s and 1990-2000

3. Alternative Explanations

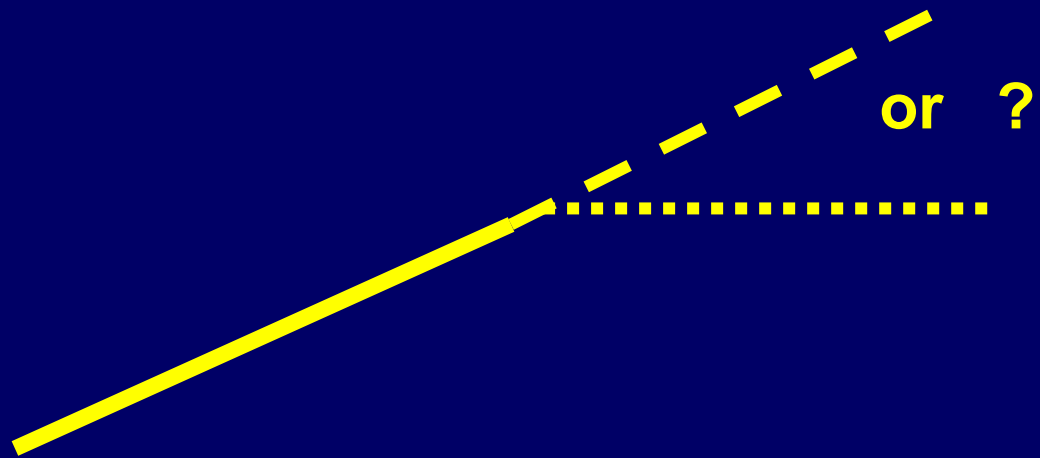
- (A Behavioural Model of Changing Pay Norms)
- Earnings at the top: superstars and managerial pyramids

Conclusions

Increasing decile ratio in the US 1979-



Different Time Patterns



There is general agreement that the main factor behind the increase in the relative wage of skilled versus unskilled workers is a steady increase in the relative demand for skilled workers.

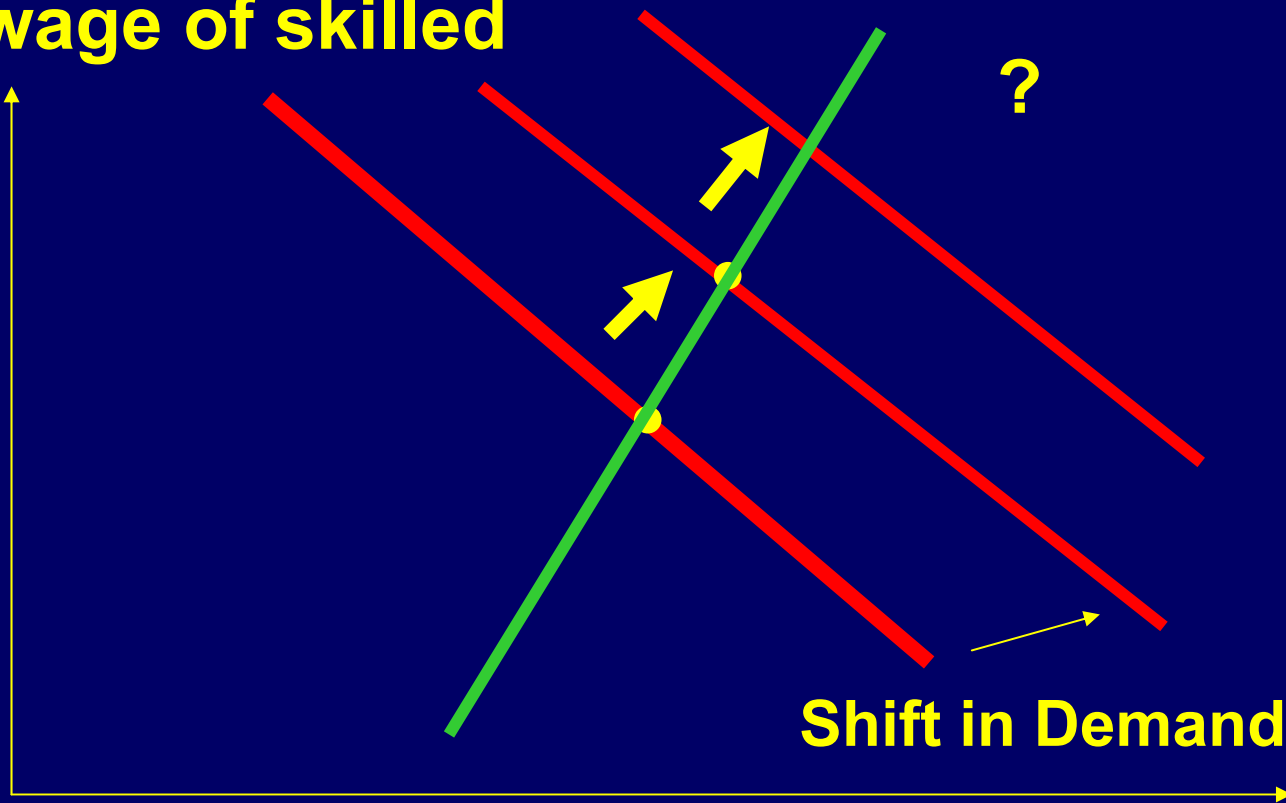
(Blanchard, *Macroeconomics*, page 524).

Globalisation: fall in relative price of goods in which unskilled workers are more intensively engaged.

Technical progress biased in favour of skilled workers.

Relative wage of skilled workers

$$w_s / w_u$$



Relative demand for skilled workers L_s / L_u

Need to model dynamics

Simple temporary equilibrium model

At any point in time, supply is fixed and relative wage ω clears the market $D[\omega] = S$

Over time, demand shifts at exogenous rate g

$$d\ln D/dt = g - \sigma d\ln \omega/dt \quad (1)$$

Supply adjusts according to premium over cost of acquiring skills

$$d\ln S/dt = \beta [\omega - e^{rT}] \quad (2)$$

Hence

$$d\ln \omega/dt = (\beta/\sigma) [g/\beta + e^{rT} - \omega]$$

$$d\ln\omega/dt = (\beta/\sigma) [g/\beta + e^{rT} - \omega]$$

β zero means pure rent, differential grows without limit

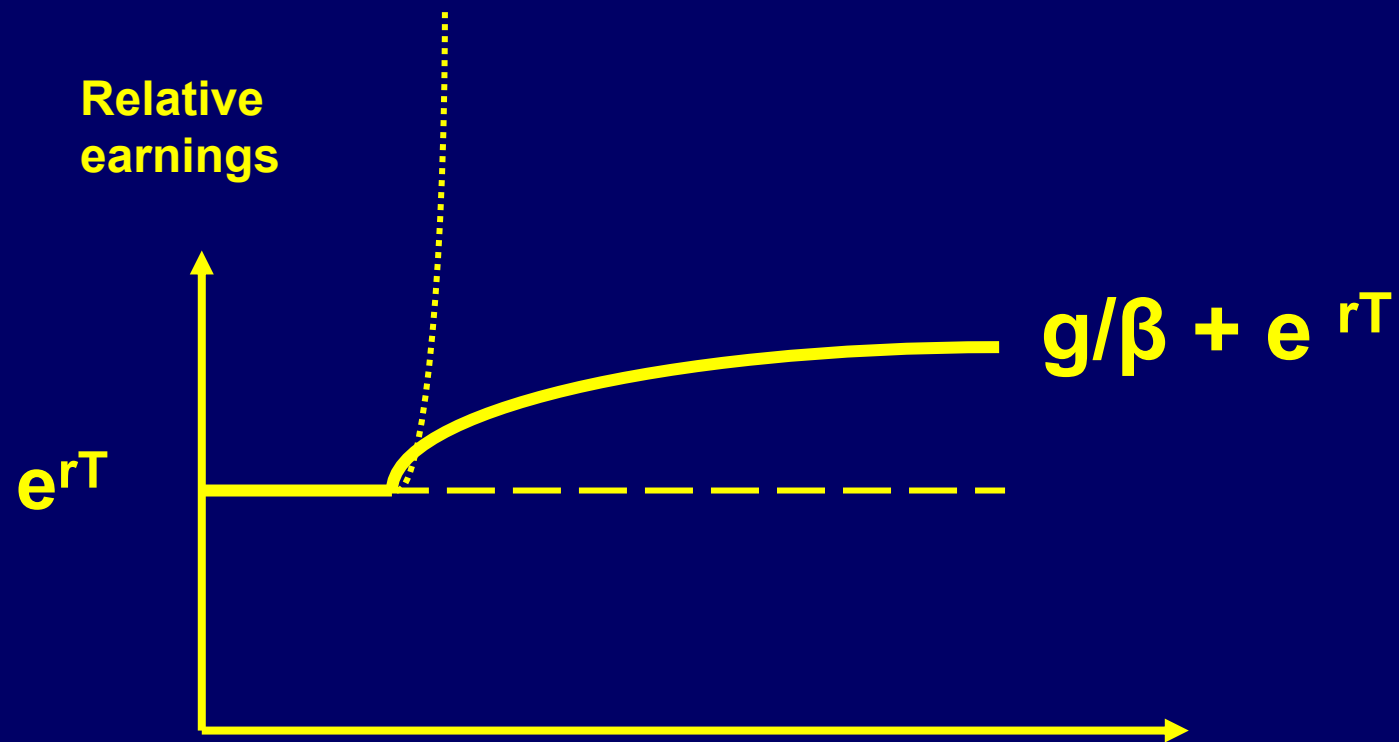
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β strictly positive means convergence

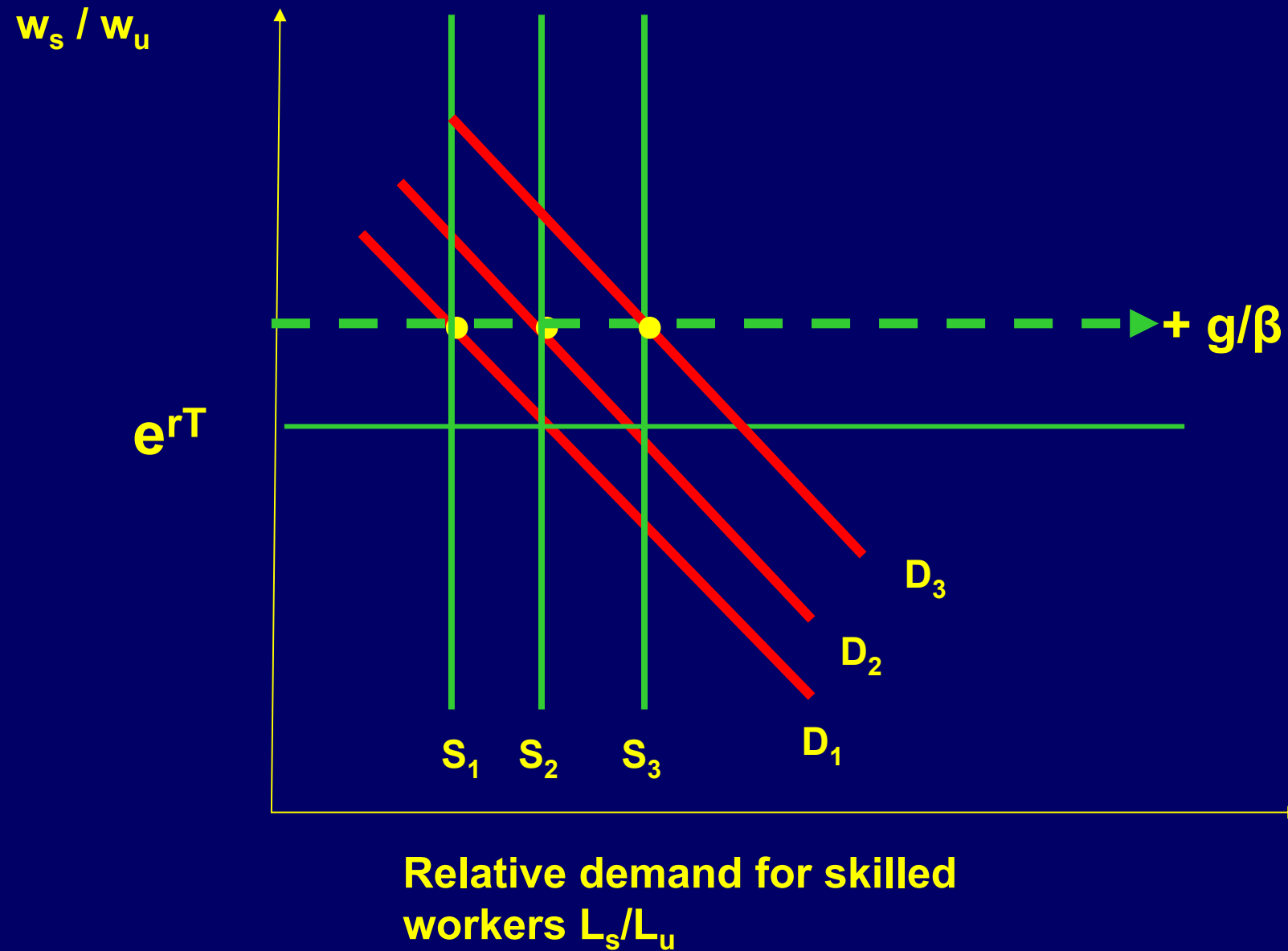
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β infinite means pure compensating differential

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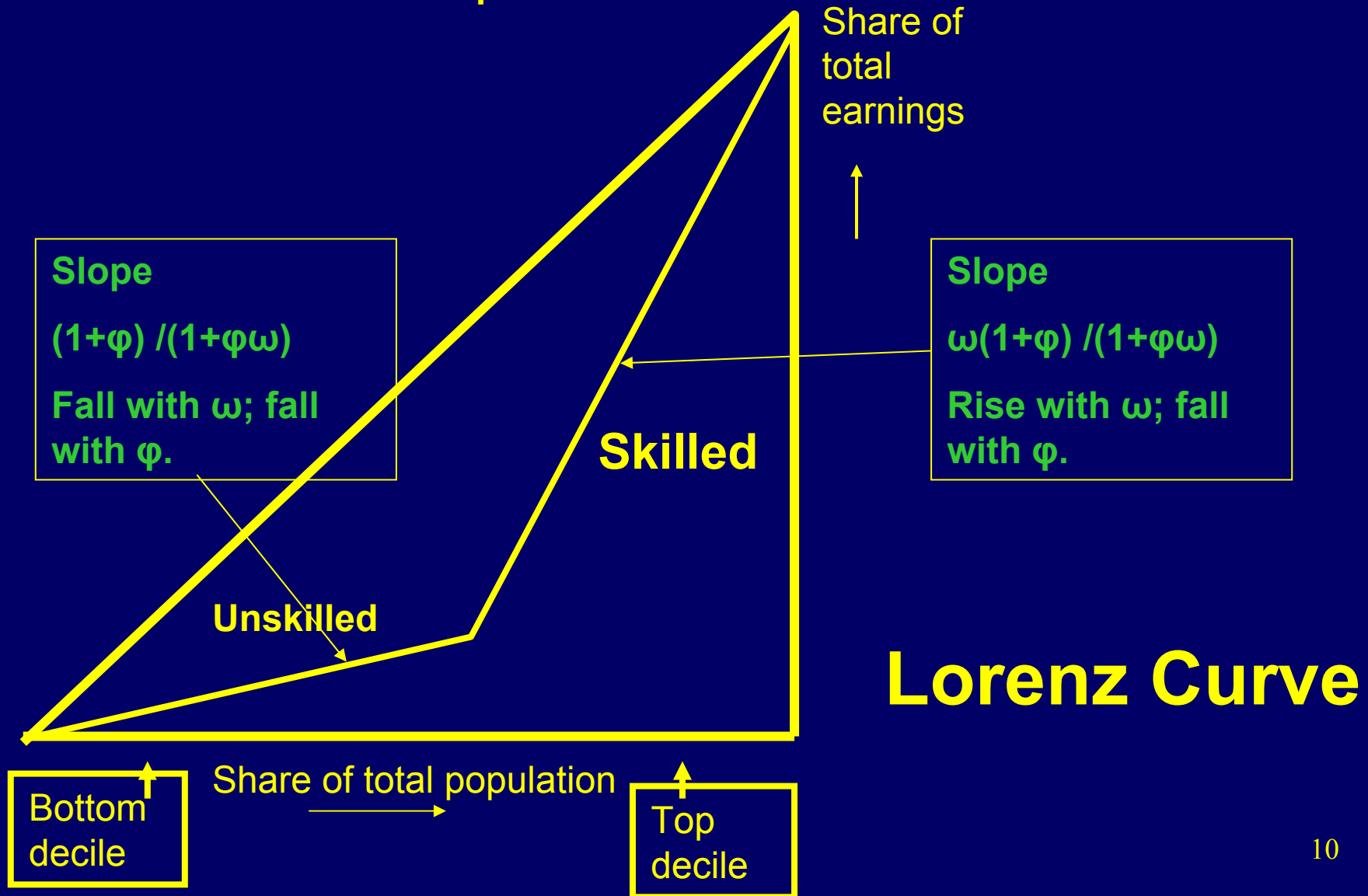


Relative wage of skilled workers



Decile ratio P90/P10 depends only on ω ,

but P90/mean and P10/mean (and Gini index) depend on the ratio of skilled to unskilled in labour force φ



Distributional predictions of continuous demand shift model

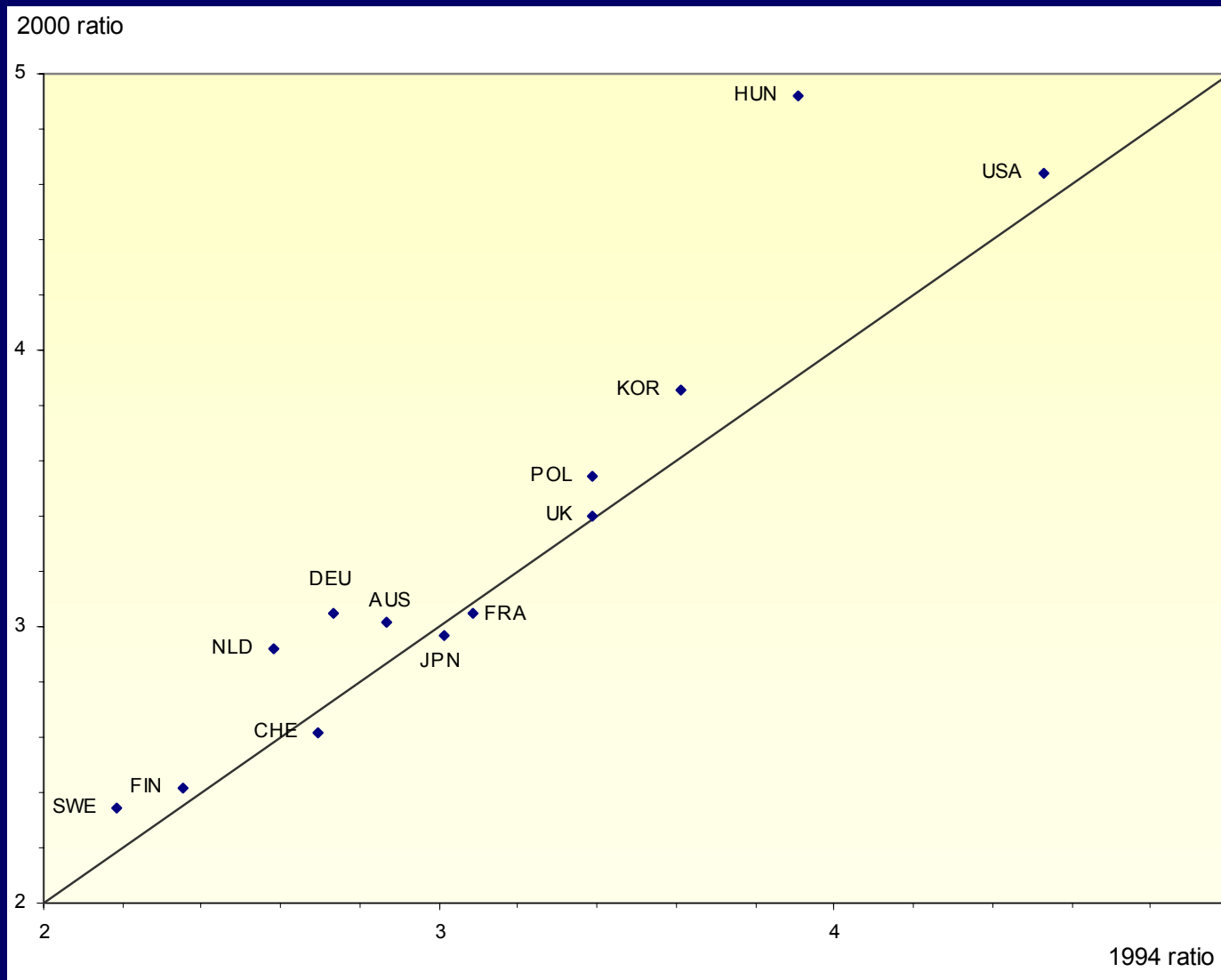
- Wage premium (and hence decile ratio) converges to steady state
- Bottom decile falls as % mean (median)
- Top decile initially may rise or fall as % mean (median) depending on balance of change in wage premium and in skilled/unskilled employment ratio, definitely falls as wage premium converges.

2. Empirical Evidence about Earnings Dispersion

OECD View: Decile ratio widened

“ Gross earnings inequality has increased on average in OECD countries for which data are available. This occurred in countries where labour market performance improved considerably (Australia, the Netherlands), as well as in countries where it deteriorated (Germany, Hungary, Korea and Poland). Broadly unchanged wage dispersion was recorded in [France, Japan, Switzerland and UK]”.

OECD comparison of 2000 and 1994



Decile ratio

- **Short time period: cannot differentiate**



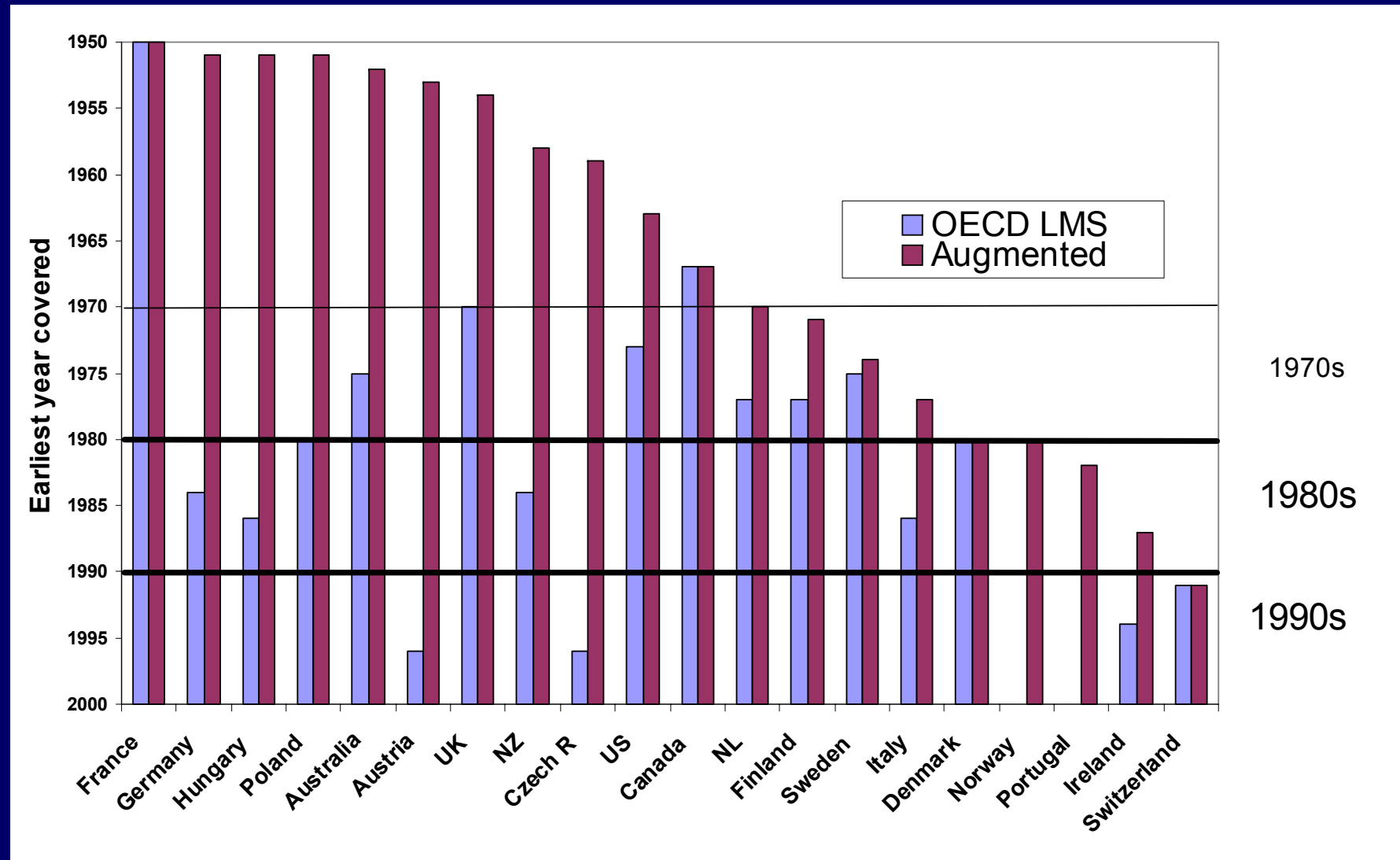
- **Series are not necessarily consistent over time (e.g. Netherlands)**
- **Looks at decile ratio, not bottom and top deciles separately**
- **No clear metric: what constitutes a “rise”**

Gottschalk and Smeeding (1997)	AUS, CA, FI, D, ISR, NL, SWE, UK, US	“Almost all industrial economies experienced some increase in wage inequality among prime-age males during the 1980s (Germany and Italy are the exceptions). ... But large differences in trends also exist across countries, with earnings inequality increasing most in the United States and the United Kingdom and least in the Nordic countries”
Katz and Autor (1999)	AUS, OS, CA, FI, FR, D, IT, JA, NL, NZ, NOR, SWE, UK, US	“The United States and the United Kingdom experienced sharp increases in overall wage inequality ... The pattern of declining wage inequality apparent throughout the OECD (except the United States) in the 1970s ceased in the 1980s and 1990s in almost all nations (with Germany and Norway as possible exceptions). Canada, Australia, Japan, and Sweden had modest increases in wage inequality ... Wage inequality narrowed through the mid-1980s in Italy and France with some hint of expanding in France in the late 1980s and with a large increase in inequality in Italy in the 1990s ... New Zealand also shows large increases in inequality”

An Augmented Database

- **20 OECD countries**
- **Identifies breaks in series**
- **Multiple sources for most countries**
- **Data back to 1950 where possible**

An augmented database: 20 OECD countries

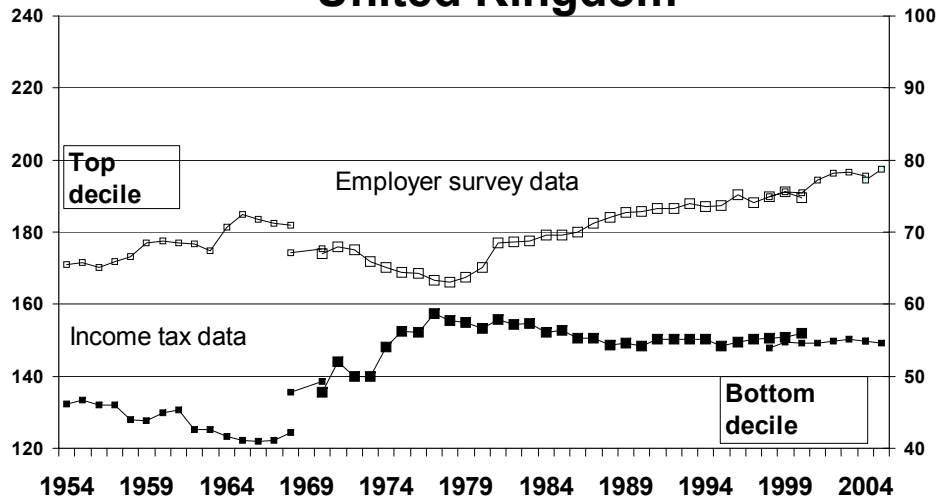


A Checklist

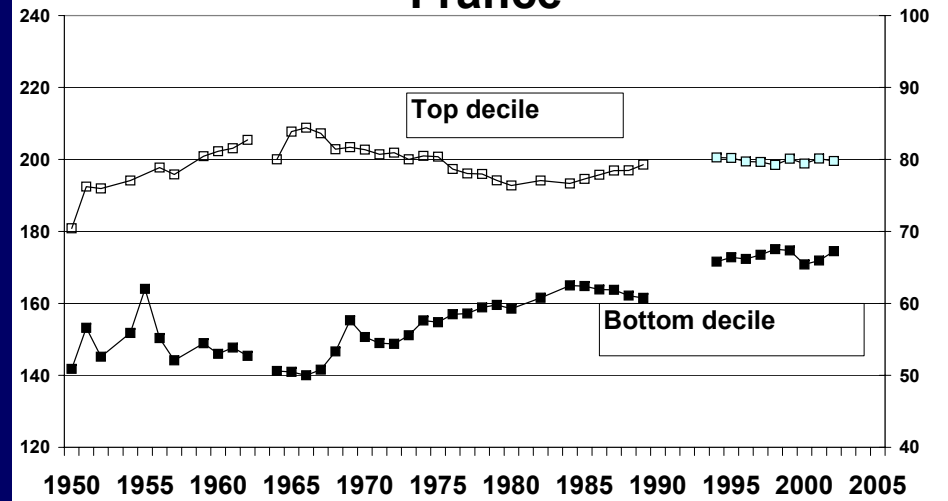
- Cover all sectors of the economy?
- Cover employees of all ages?
- Cover both men and women?
- Cover full time workers or full time and part time?
- Earnings adjusted for hours of work?
- Current earnings or annual earnings?
- Earnings affected by absence/unemployment?
- Gross or net earnings?
- Total earnings or earnings before bonuses/13 month payments?
- Exclusion of certain groups?

- FRANCE: employer tax declarations, excludes agriculture, government employees and domestic service, full time, annual earnings adjusted for hours worked, net of social security contributions.
- UK: employer survey, earnings per current job, adult full-time workers whose pay not affected by absence, gross monthly earnings
- US: household survey, earnings in primary job, full time workers, hourly gross earnings

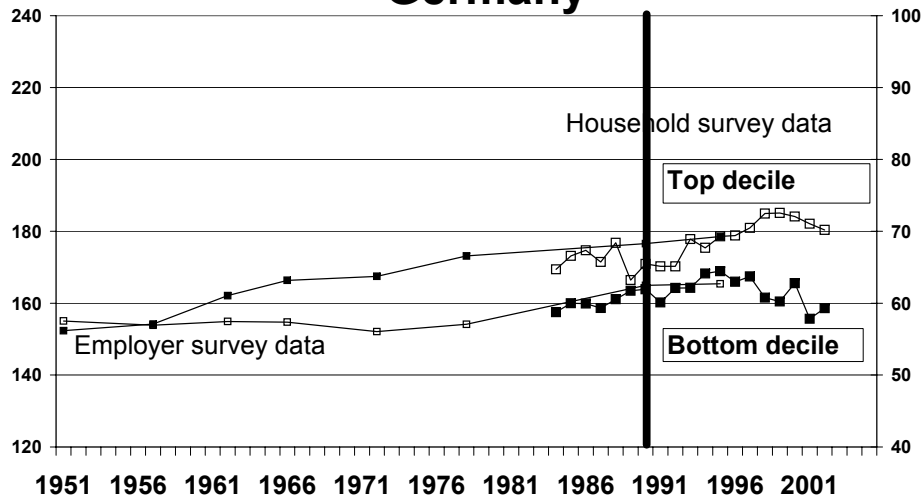
United Kingdom



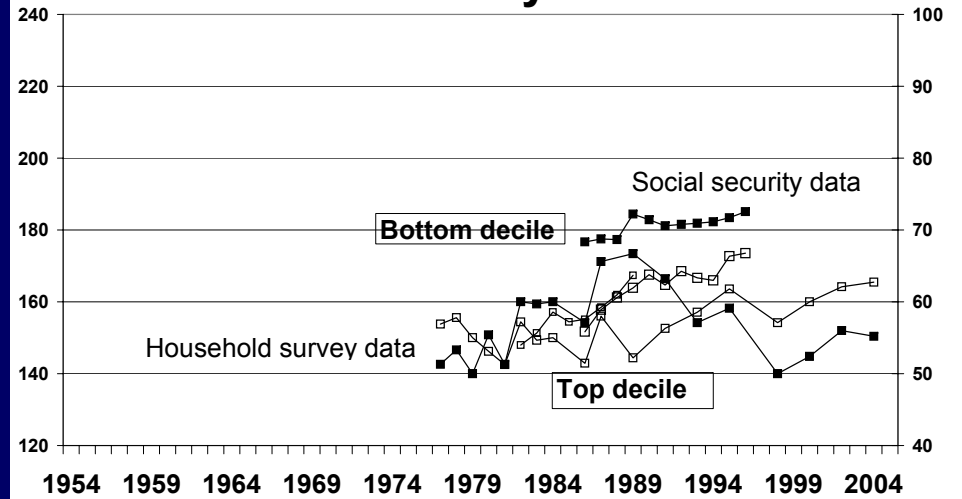
France



Germany



Italy



Metric

- 1979/1980/1981
- versus
- 1989/1990/1991
- versus
- 1999/2000/2001

“Perceptible”: Two percent criterion

P10	50	P90	150	DR	3.00
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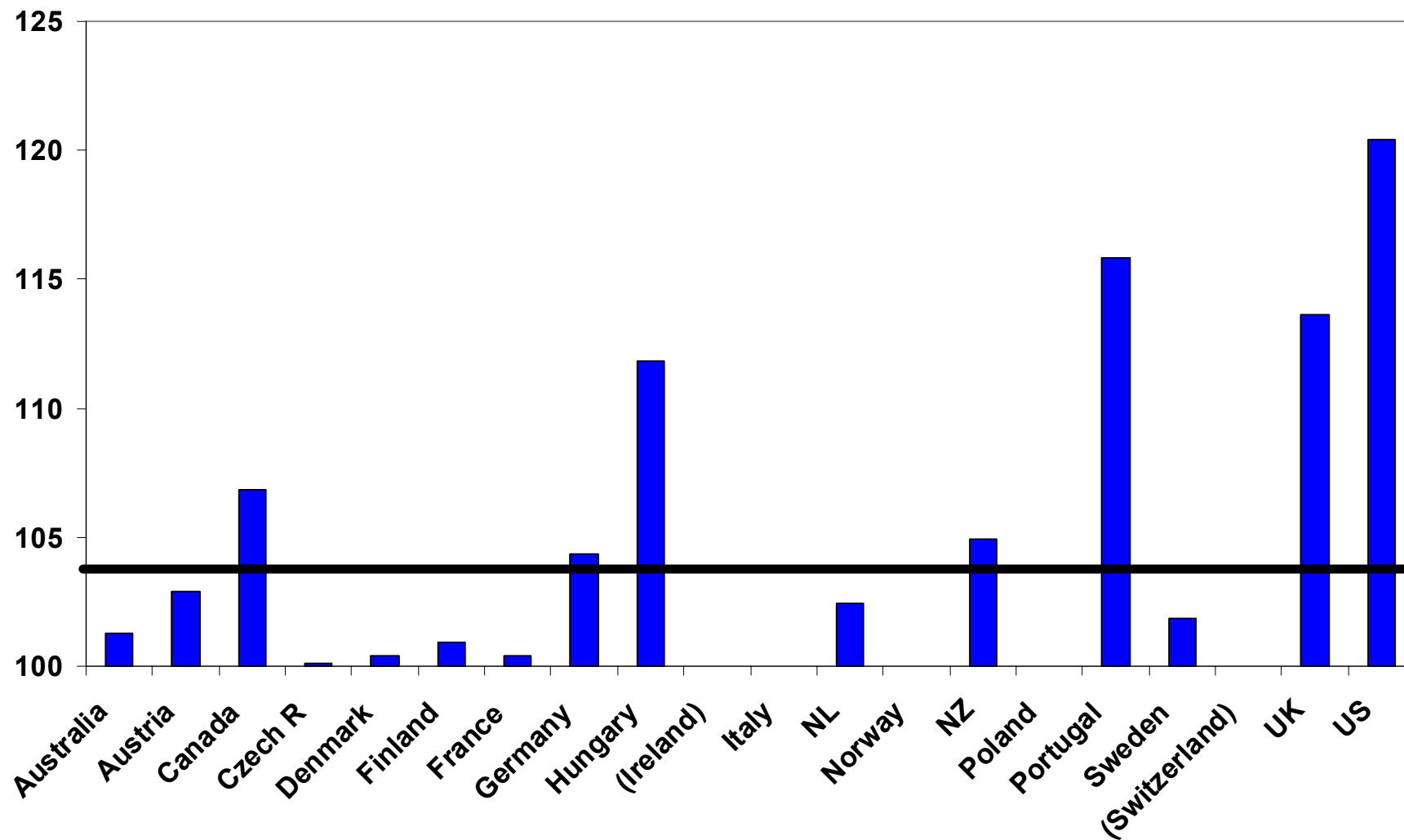
P10	49	P90	153	DR	3.12
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“Large”: Five percent criterion

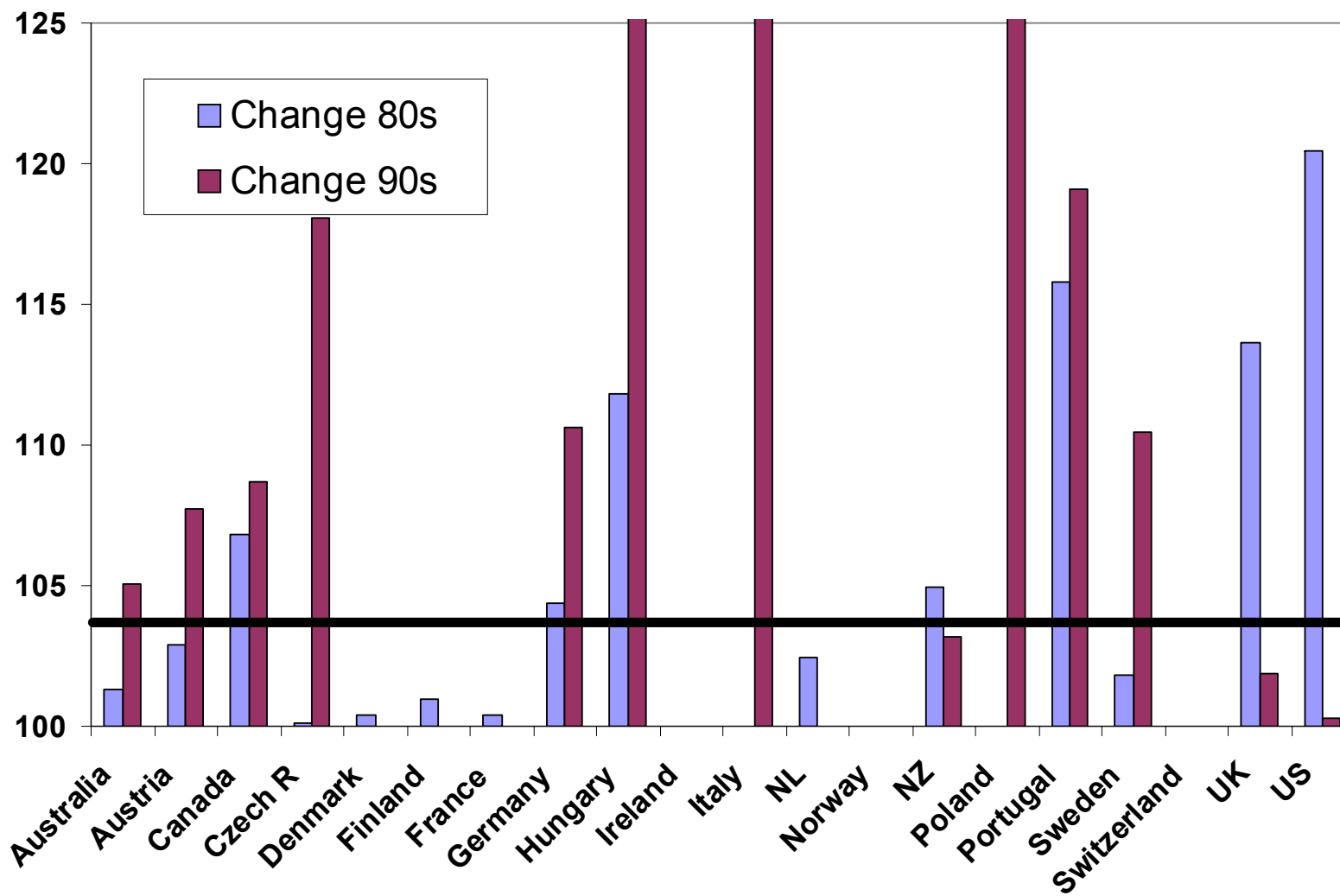
P10	50	P90	150	DR	3.00
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P10	47.5	P90	157.5	DR	3.32
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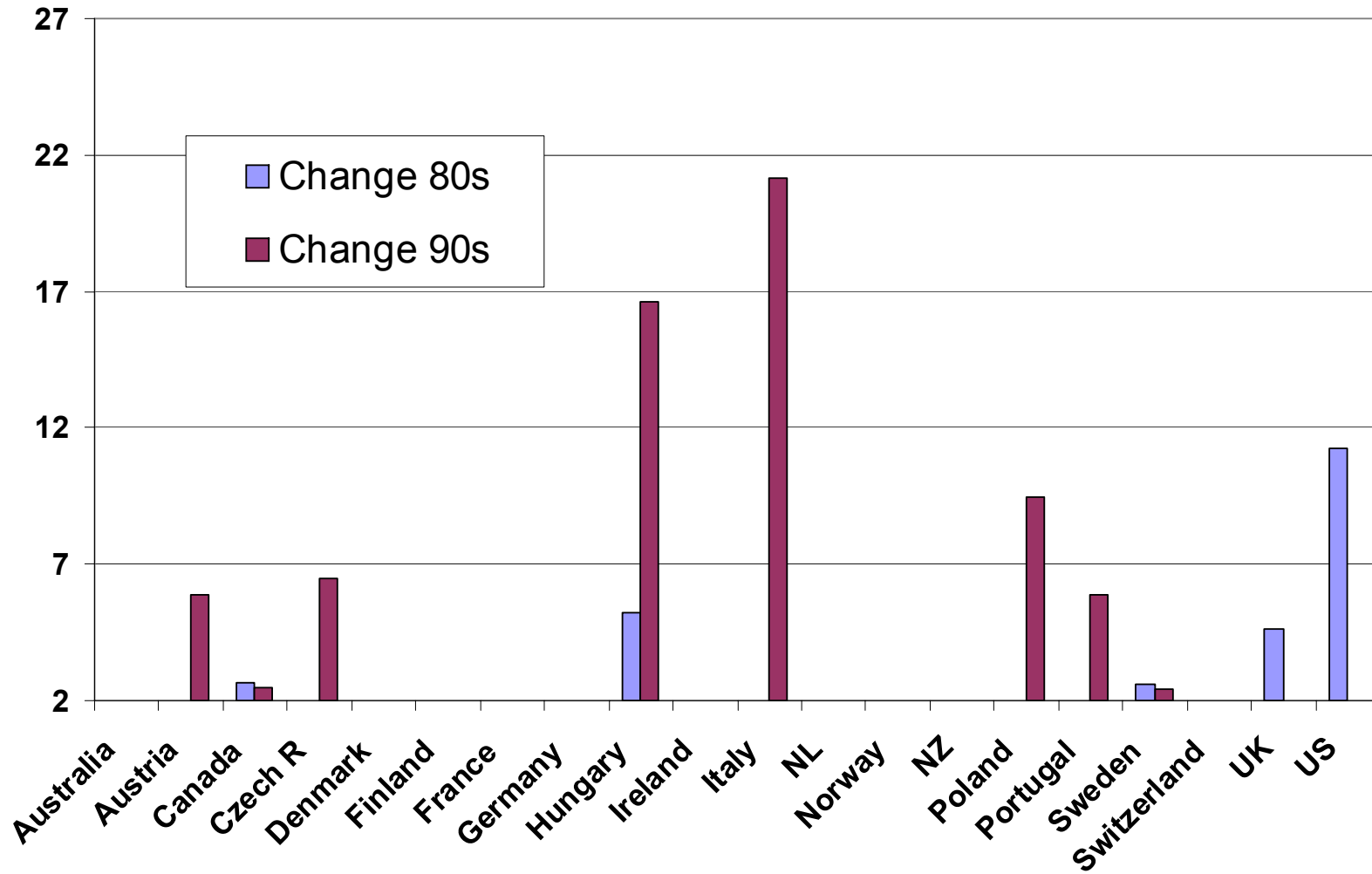
Change in Decile Ratio in 1980s (1980 = 100)



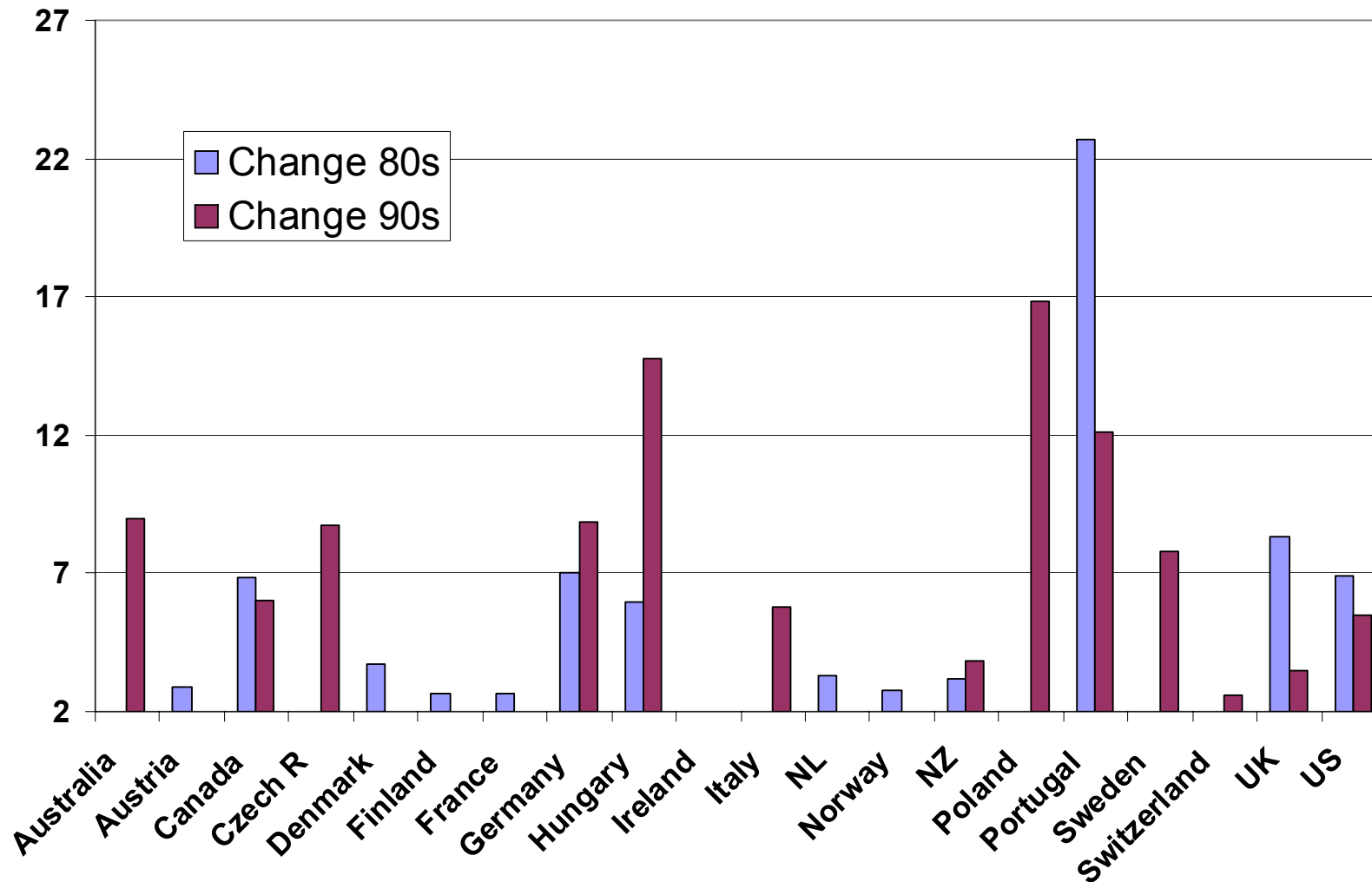
Change in Decile Ratio in 1980s and 1990s



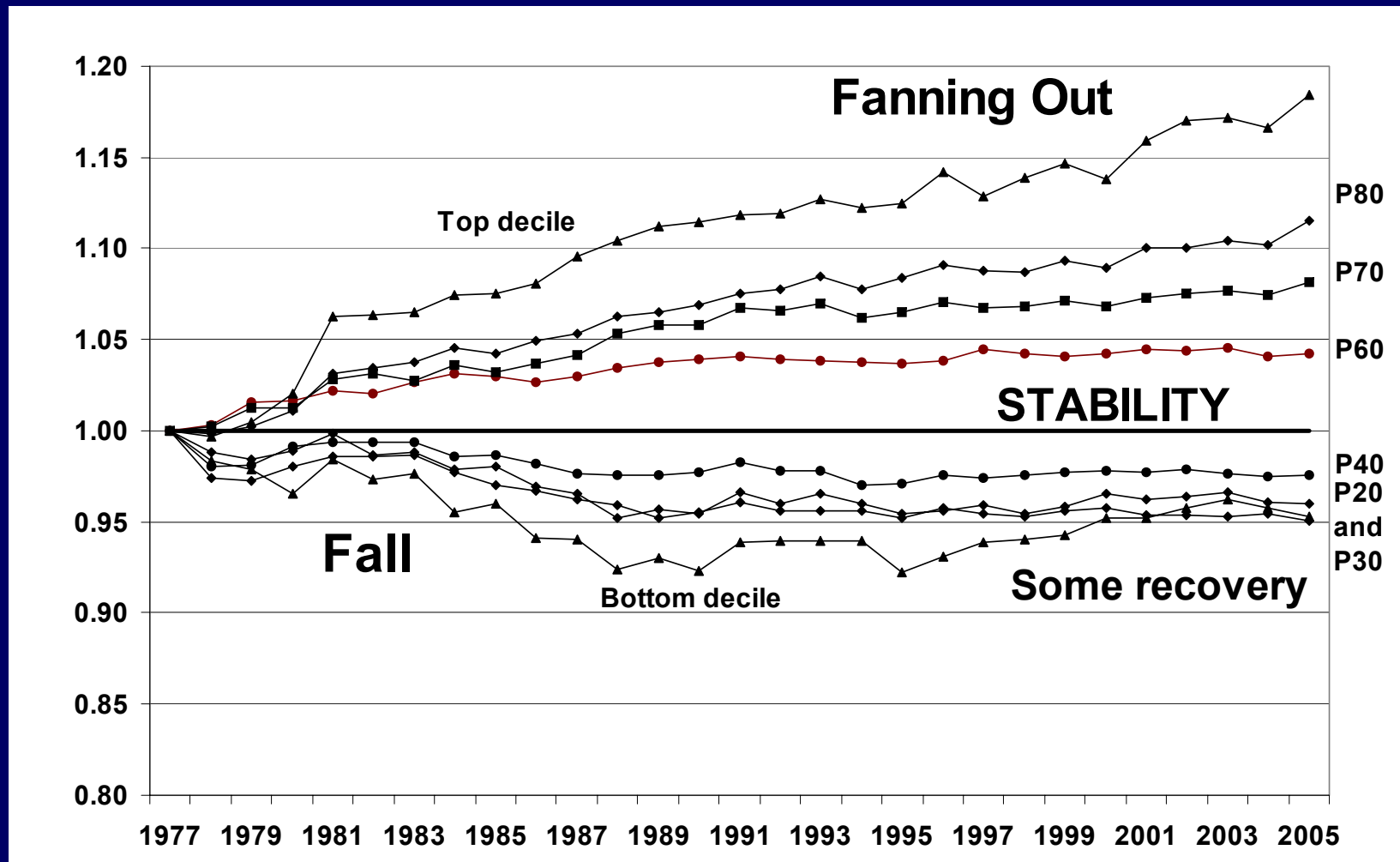
Fall in Bottom Decile as percentage



Rise in Top Decile as percentage



Earnings deciles in the UK (1977 = 100)

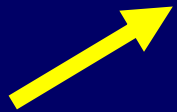


Summary of empirical evidence

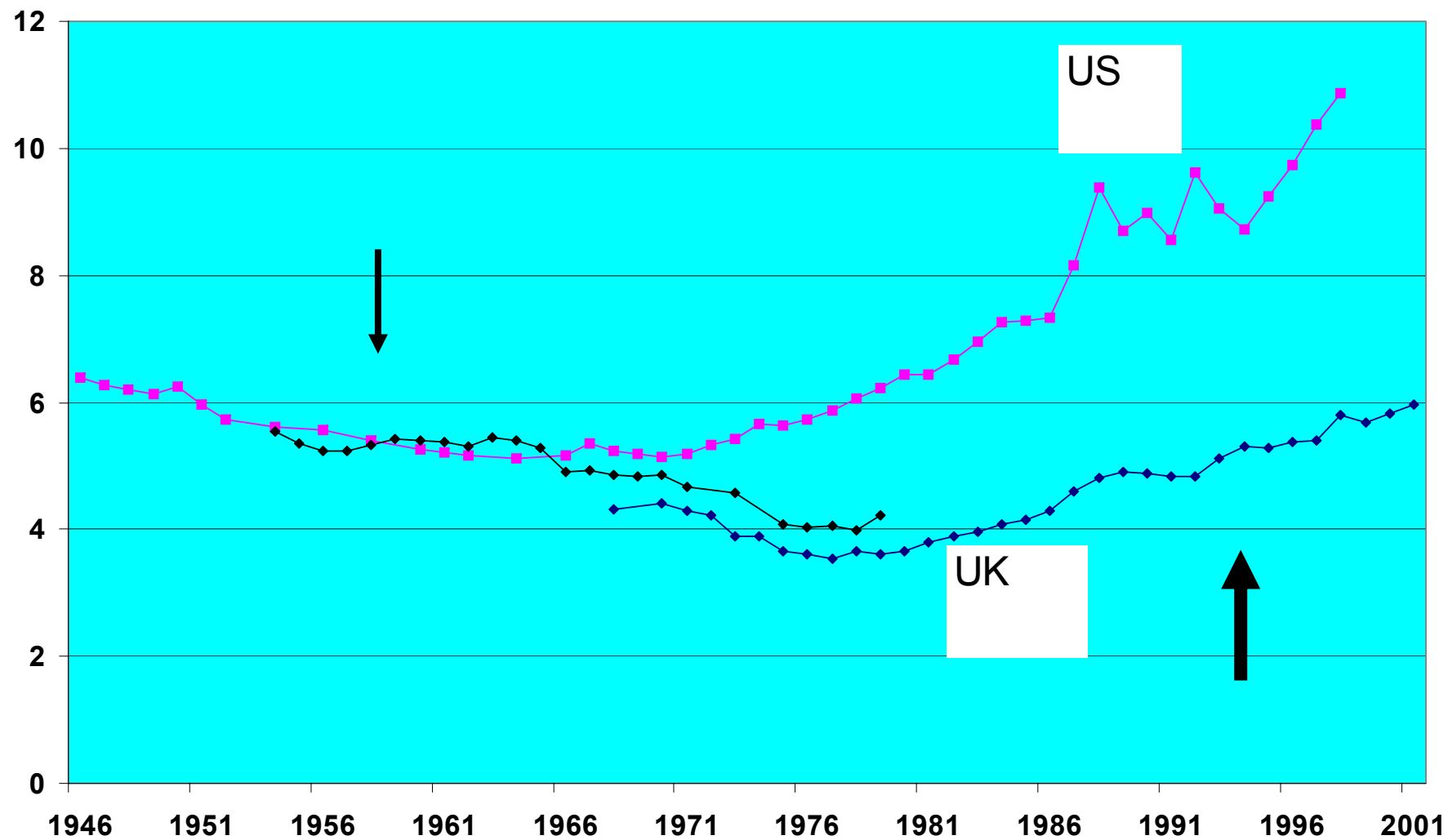
- Widening of decile ratio in majority of OECD countries (13 out of 20)
- Few (4 out of 20) saw widening in both 1980s and 1990s
- **BUT** changes in decile ratio due more to top (19 out of 20) than bottom (10 out of 20, of which 3 transition countries)
- In UK and US, decile ratio broadly stable since 1990 because *rise* in bottom decile offsets rise in top decile
- Shift in demand away from unskilled workers cannot be whole story
- Need alternative explanations,
- In particular, to explain upper part of earnings distribution.

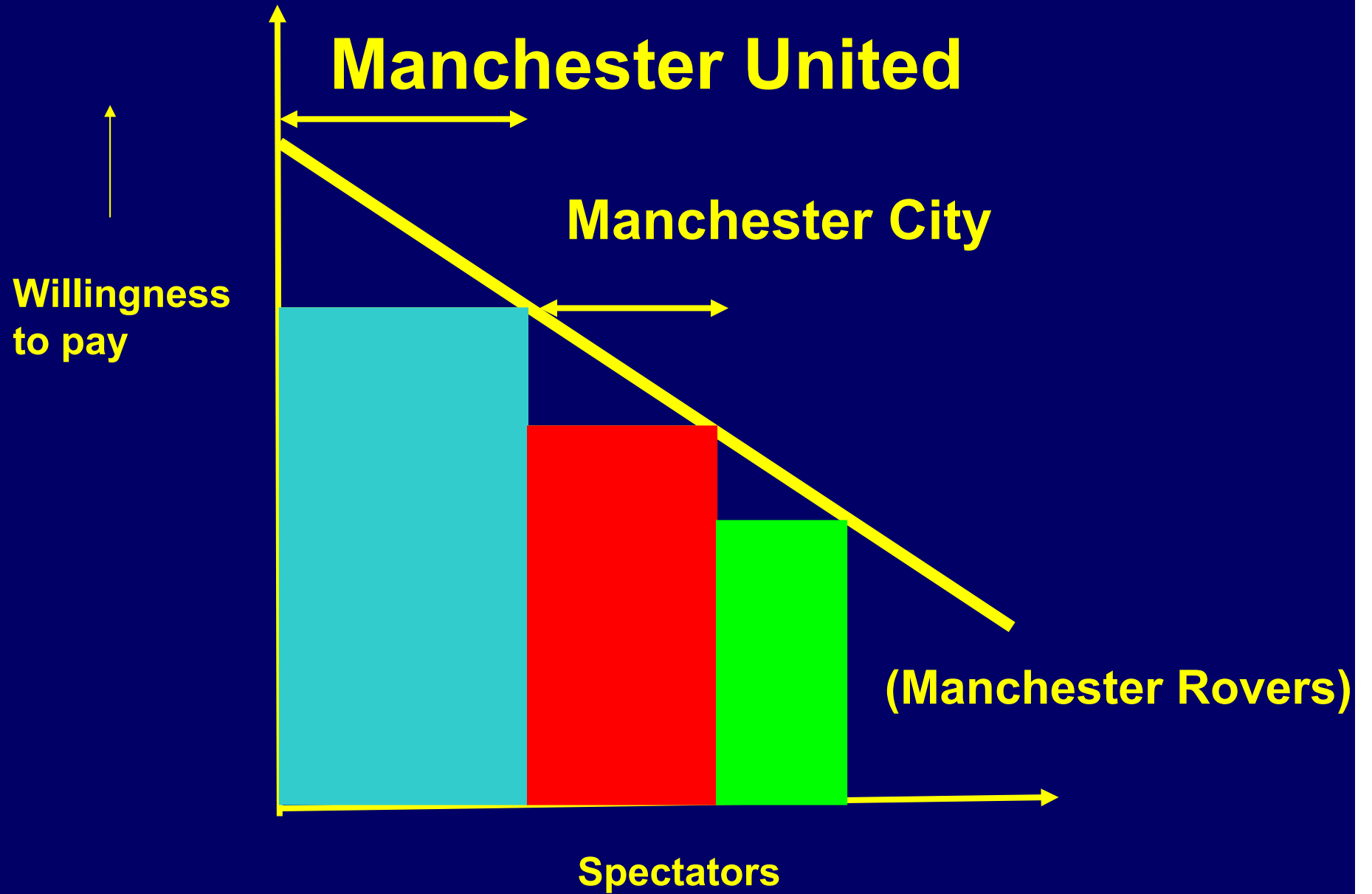
My two main alternatives:

- **Behavioural pay model, with shift in pay norms (Atkinson, 1999)**
- **Superstar rents and managerial pyramids at top**

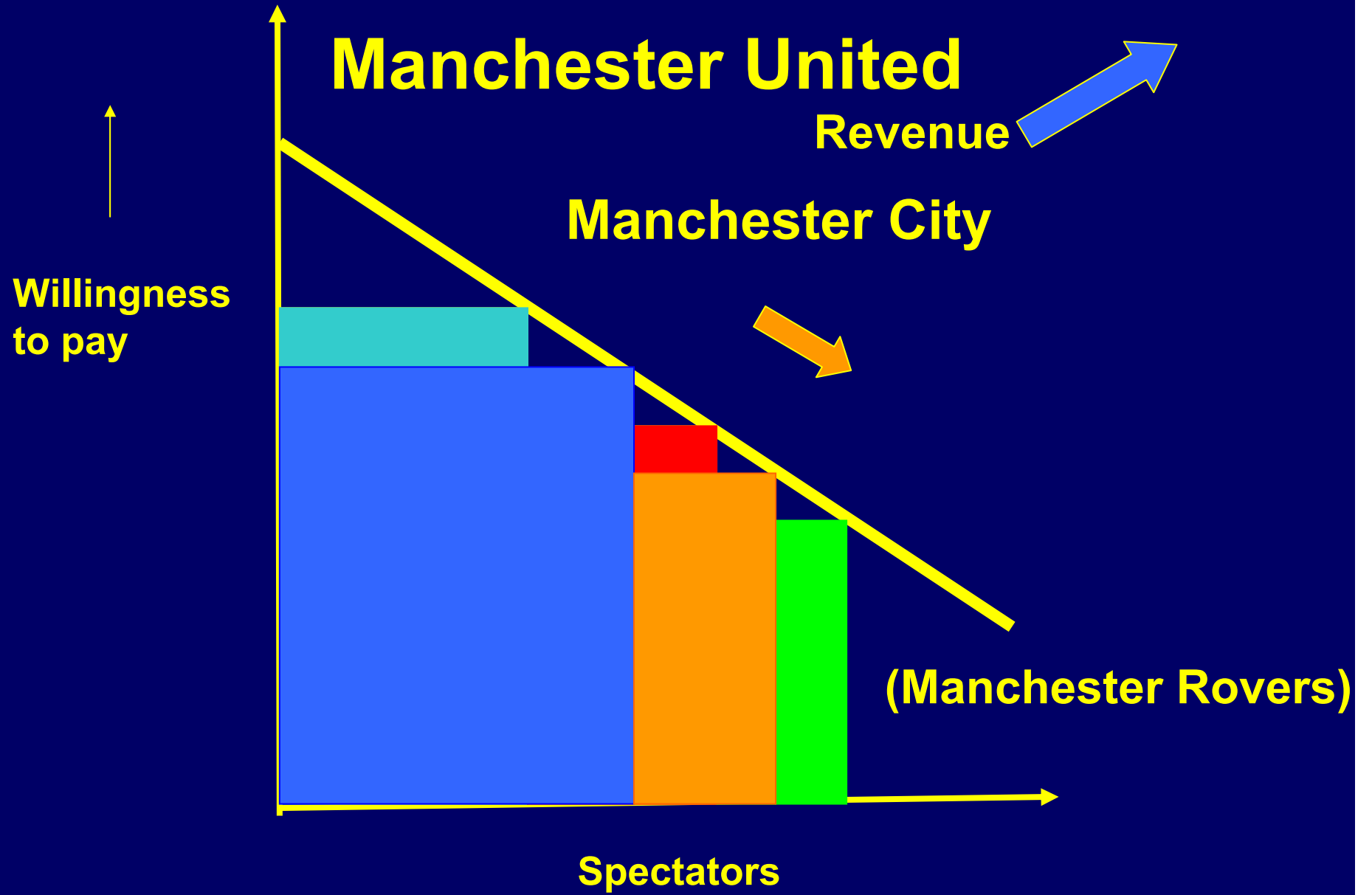


Taking a longer-run view: share of top 1% in total earnings





Superstar rents



Explaining top earnings

Superstar model:

Individuals with high abilities able to extract rent that depends on size of market supplied, affected by technology and globalisation

BUT

- Superstar model not enough on its own, as need to explain previous fall in top earnings

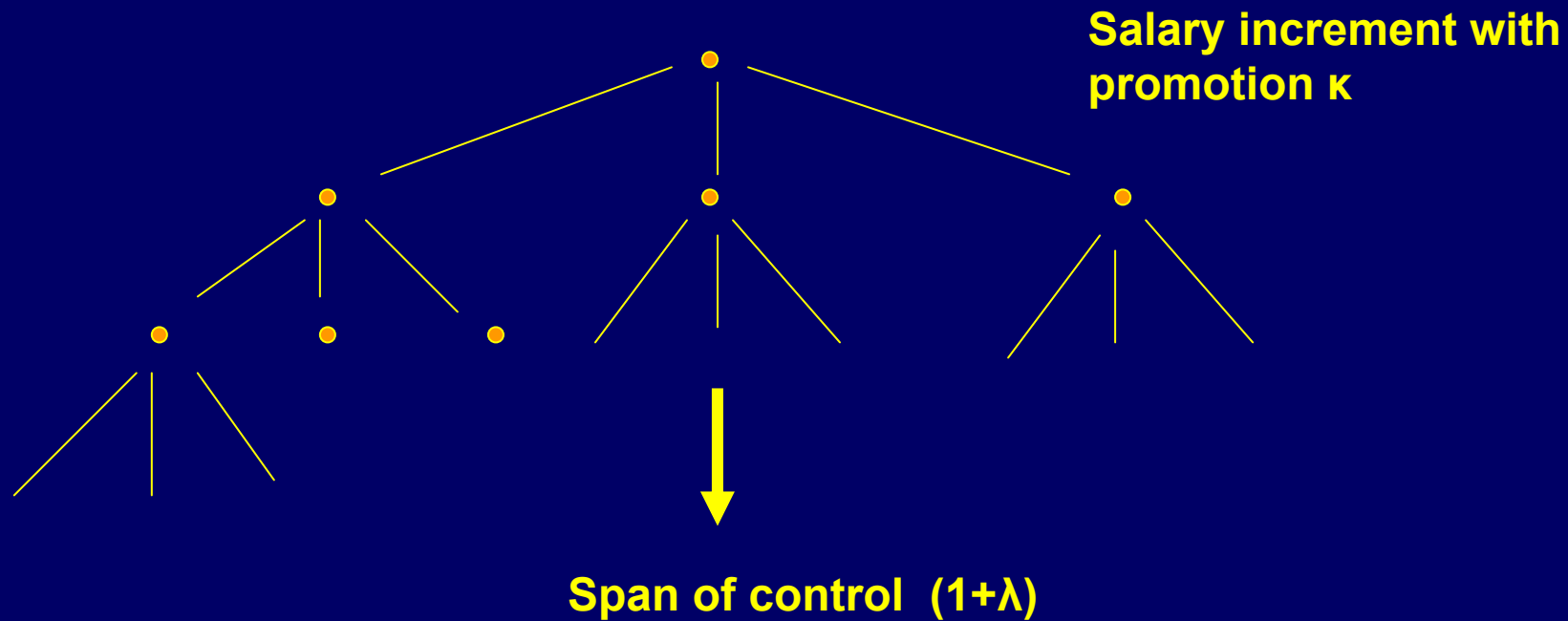
Combine with

- Hierarchy within organisation has regular salary increment, and fixed span of control, generates a distribution with Pareto upper tail

BUT

- Not generate “enough” concentration of earnings

Pyramidal model



Upper tail approximates a Pareto distribution with exponent λ/κ , where $\lambda > \kappa$

Log
(number of
people
with
earnings
above y)

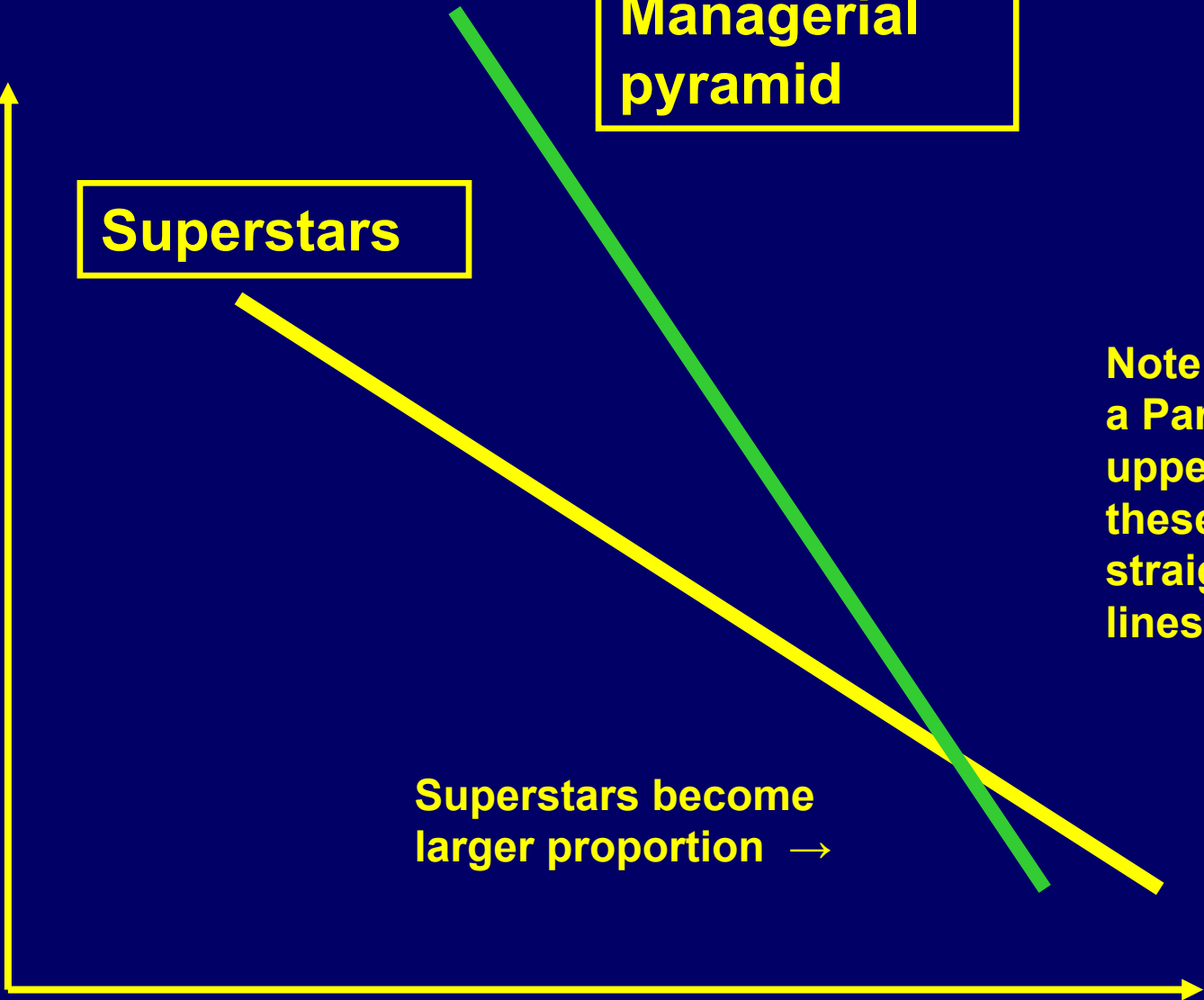
Superstars

Managerial
pyramid

Note: with
a Pareto
upper tail,
these are
straight
lines

Superstars become
larger proportion →

Log (Earnings y relative to mean)



Log
(Number
above)

Managerial
pyramid

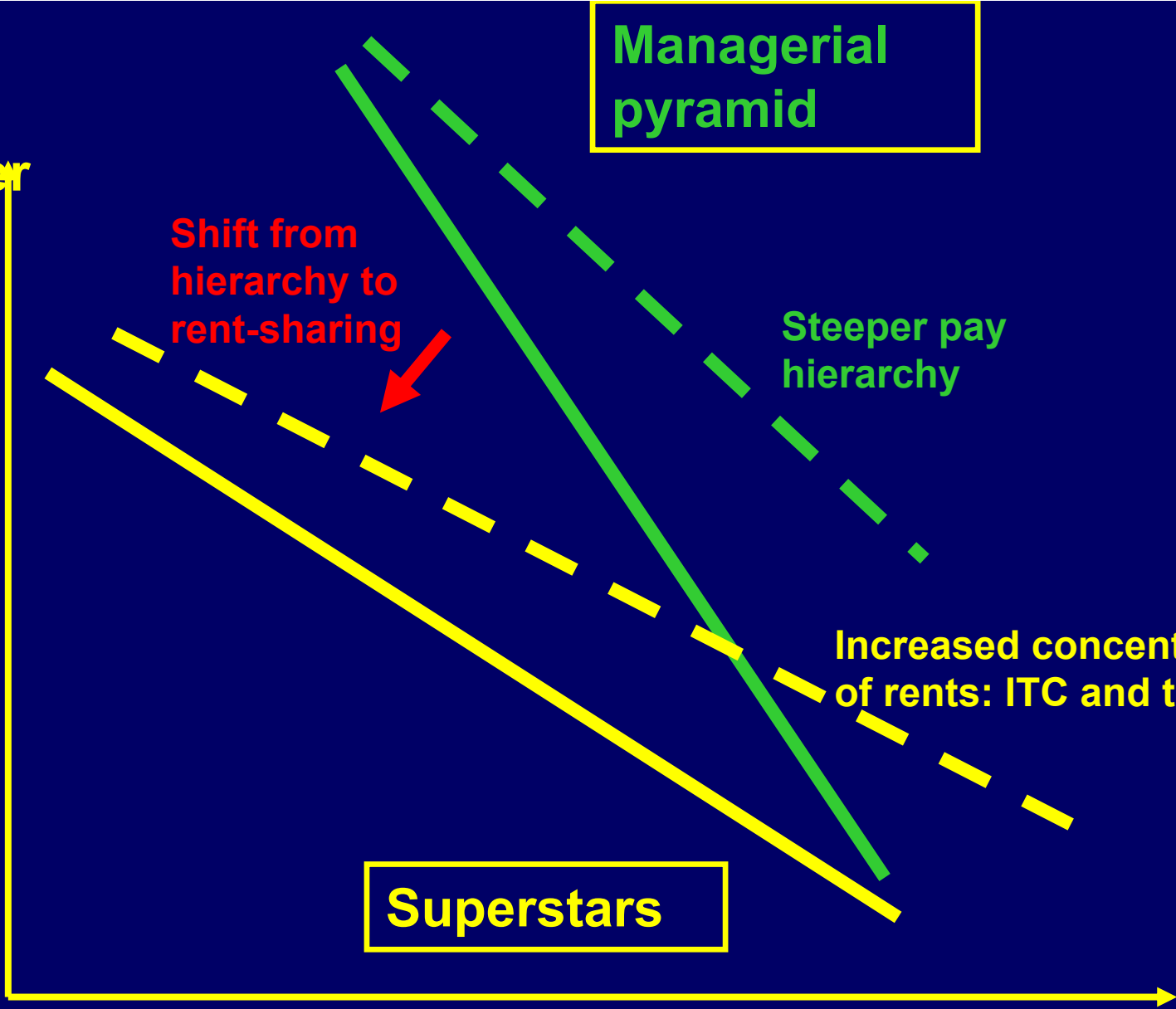
Shift from
hierarchy to
rent-sharing

Steeper pay
hierarchy

Increased concentration
of rents: ITC and trade

Superstars

Log (Earnings)



	Earlier C20	Recent decades
Concentration of rents		↑
Steepness of hierarchy		↑
Relative weight of rents vs hierarchy		↑

	Earlier C20	Recent decades
Concentration of rents	↑	↑
Steepness of hierarchy	↓	↑
Relative weight of rents vs hierarchy	↓	↑

Not a simple Race between Technology and Education

- In a *pursuit* race, we have to study dynamics; there may be an equilibrium with constant skilled/unskilled differential.
- There has been widening of earnings dispersion in majority of OECD countries, but few saw widening in both 1980s and 1990s.
- BUT rises in decile ratio due more to changes at top than at bottom.
- Shift in demand for unskilled workers cannot be whole story and we need to consider alternative explanations.
- Top earnings cannot be explained simply by superstar or hierarchy theories and need a combination reflecting shifting balance.

Last word

“Earnings inequalities are one of the most tangible subjects, and obviously one of the most sensitive for European populations, with real implications for each and every individual” (European Commission, *Employment in Europe 2005*, page 164).

Structure of Earnings Survey 2002

