

Productivity and Skills

March 2005

Professor John Van Reenen
Director, Centre for Economic Performance, LSE

1. Overview

- Much debate about skills in terms of around equity (e.g. basic skills) BUT efficiency arguments also important
- The UK's productivity problem: Paradox Lost? (Unfortunately not)
 - Role of skills in explaining Britain's performance
- What do we know about the impact of skills on productivity?
 - Wages: vs. productivity
 - Macro vs. sector based analysis
- What role for government?
 - How to achieve the goals?

2. What is labour productivity?

Basic “economic welfare” measure (GDP per capita)

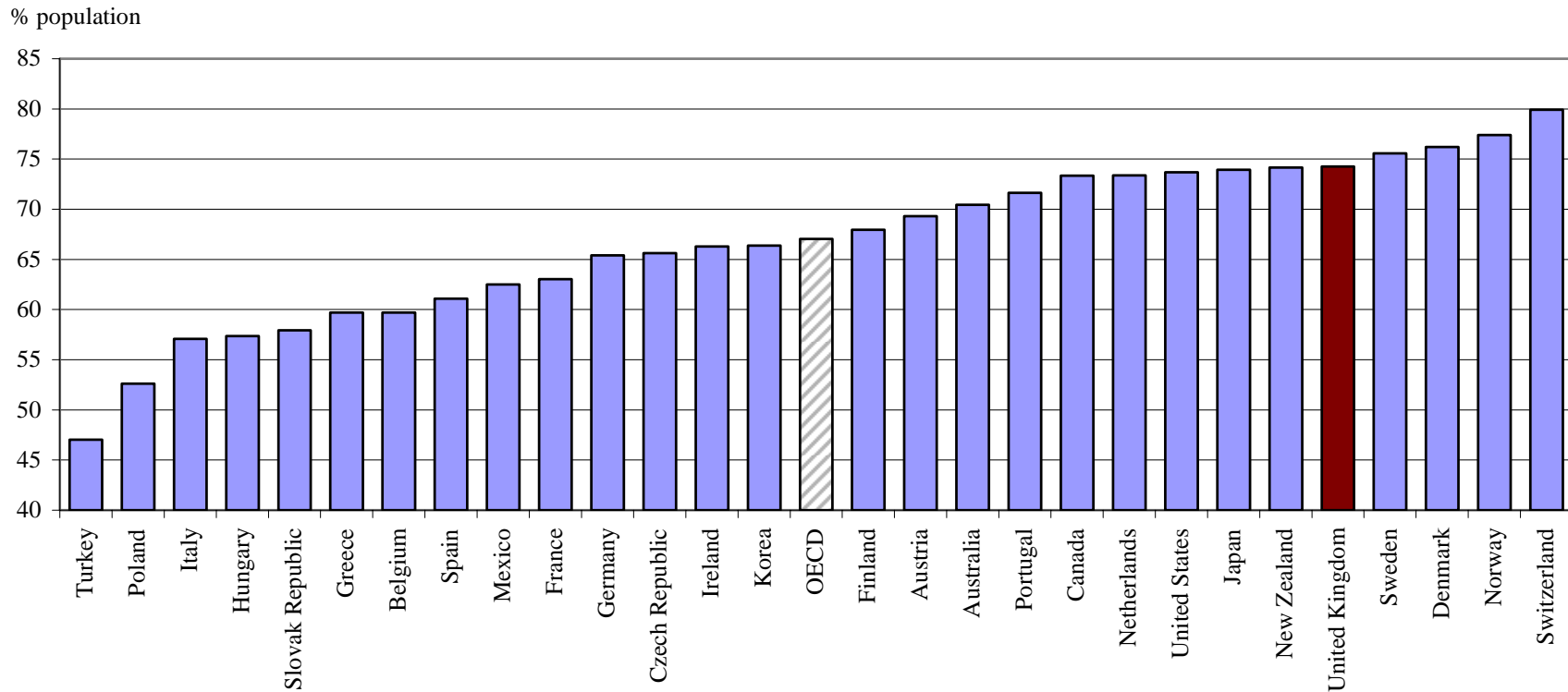
$$\frac{\text{GDP}}{\text{Population}} = \frac{\text{GDP}}{\text{hours}} \times \frac{\text{hours}}{\text{workers}} \times \frac{\text{workers}}{\text{population}}$$

Labour productivity Employment rate (Demographics)

- US has much much higher GDP per capita than EU15,but similar GDP/hour (productivity)
- This is mainly because there are more Americans in work, and they work very long hours

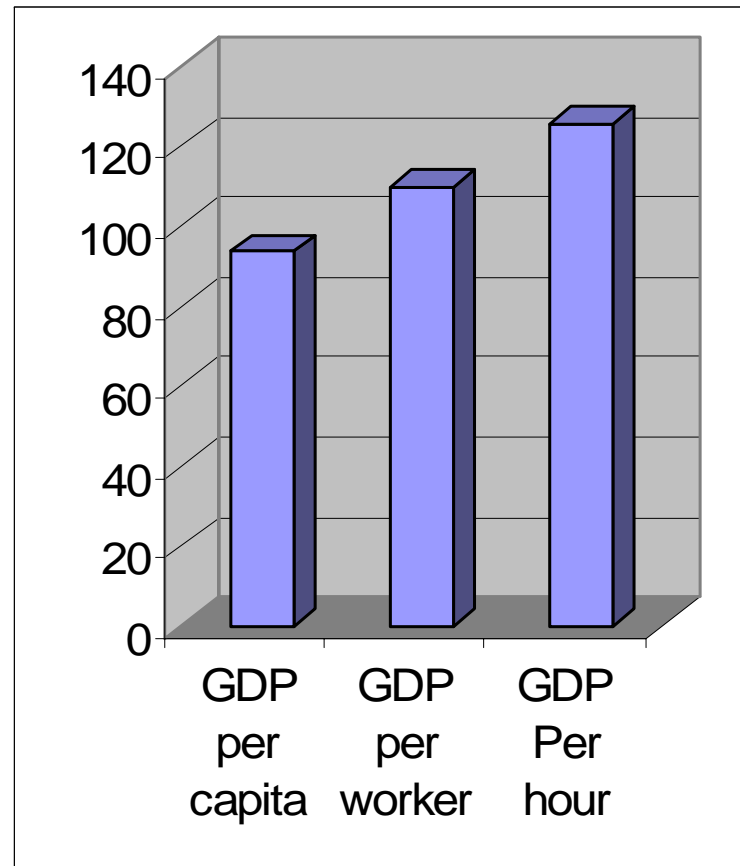
2.2 UK (and USA) have high proportion of population in work

Employment Rate, 2003



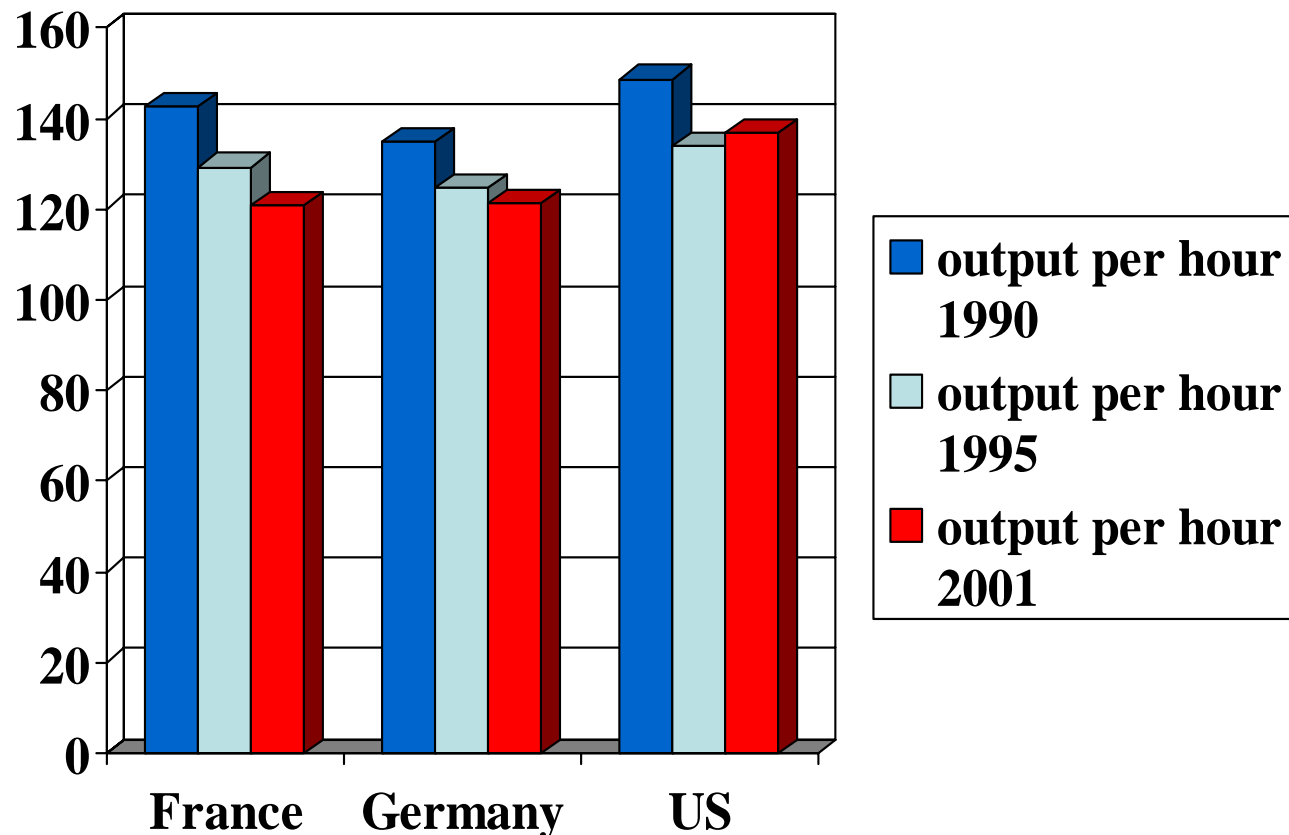
Source: OECD Labour Force Statistics.

2.3 GDP per capita vs. productivity, 2003: France (UK=100)



Source: ONS (2005), Eurostat (2005)

2.4 UK Productivity Gap, 1990-2001, Market Economy (UK=100)

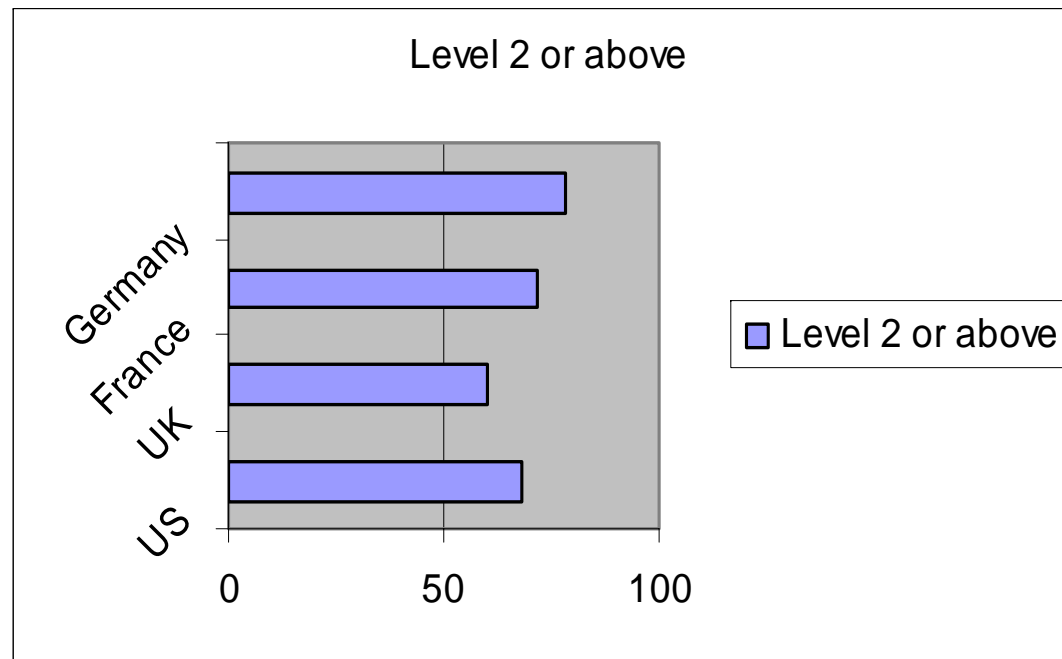


Source: Broadberry and O'Mahony (2005)

2.5 Are skills to blame for UK's historically poor productivity position?

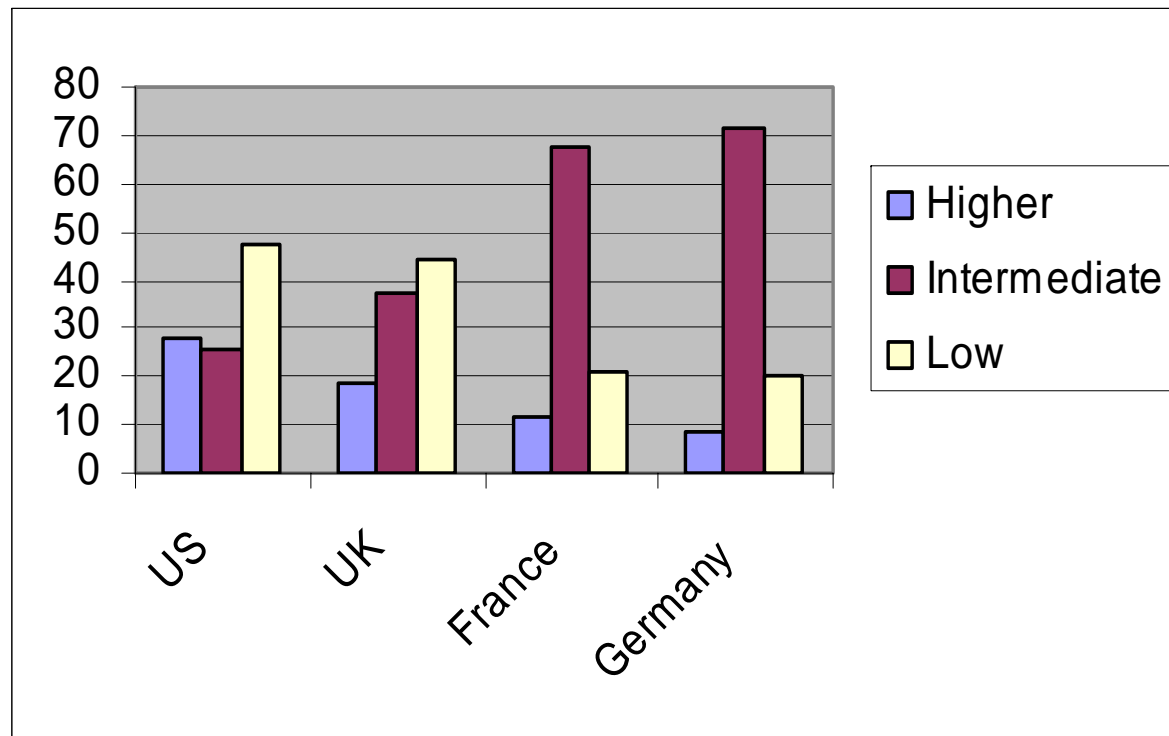
- UK good at the top (e.g. Oxbridge) but poor at the bottom and middle of skills distribution
- United States also poor at the bottom, but has a larger proportion of graduates to make up for it

2.6 Proportion of population with Level 2 qualifications or above lower in UK than other countries



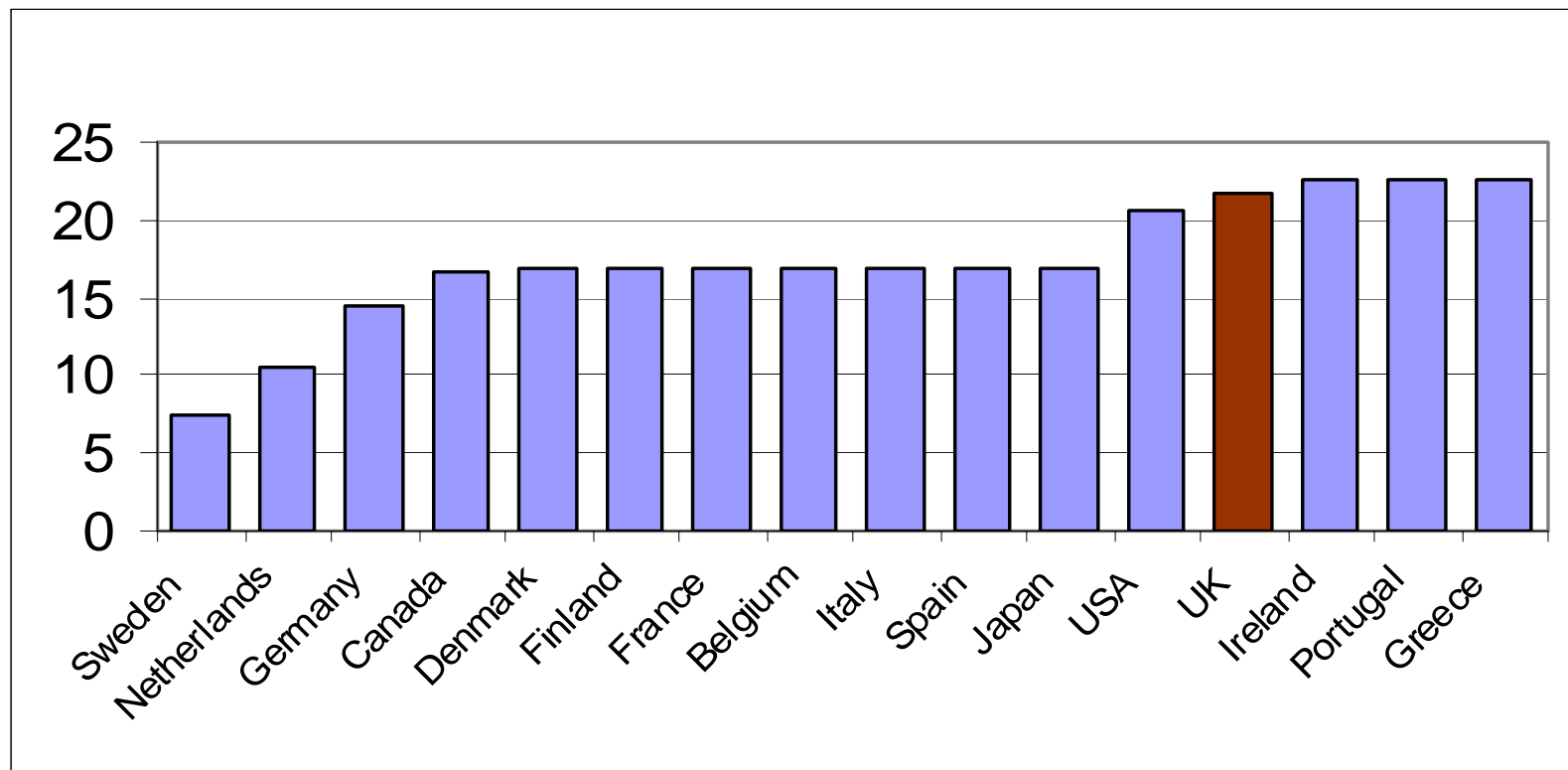
Source: Skills Audit Update (Steedman et al, 2005)

2.7 UK Skill Position: Fewer grads than US, fewer intermediate skills than EU



Source: Broadberry and O'Mahony (2005)

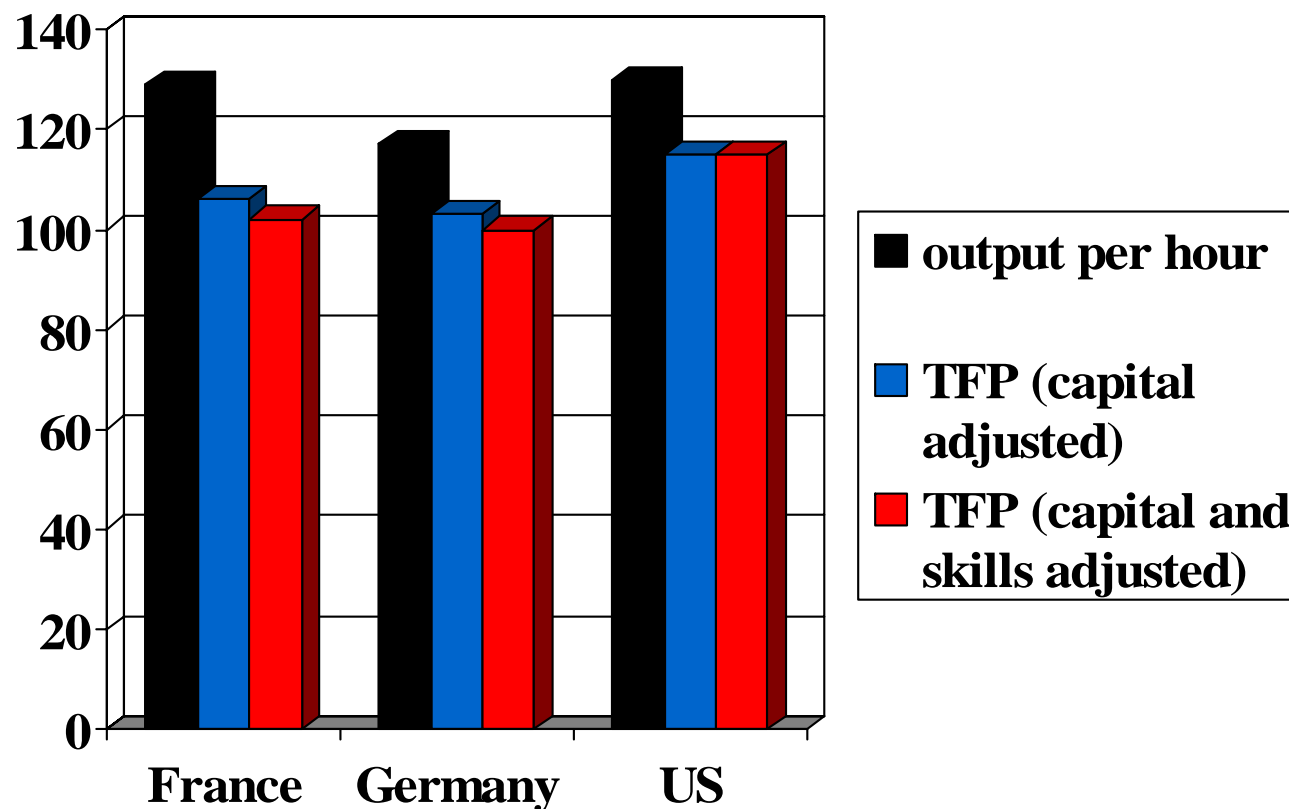
2.7 Too many Functionally illiterate in UK (% aged 16-65, 1995)



2.8 UK Basic Skills Gap: Little Improvement

	% of Adults Below IALS Level 2					
	Numeracy			Literacy		
	Age 16-25	Age 26-35	Age 36-45	Age 16-25	Age 26-35	Age 36-45
Belgium (Flanders)	7	9	17	8	12	20
Switzerland (German)	7	13	19	7	17	24
Netherlands	8	7	10	8	6	9
Sweden	5	4	7	4	5	7
Germany	4	5	6	9	12	14
Ireland	8	20	23	16	16	21
Britain	22	20	19	17	18	17
USA	26	20	18	23	20	19

2.9 UK Productivity Gap, Whole Economy 1999 (UK=100)



Source: O'Mahony and de Boer (2002)

2.10 “Accounting” for UK Productivity Gap

- Gap with Germany and France mainly due to lower fixed capital inputs
- About a quarter of US gap with UK due to human capital, another quarter is fixed capital. Half that remains is “total factor productivity” (TFP) – technology, management, organisation
- But does this underestimate importance of skills?
 - Big weight given to graduates because of higher wages, underestimates intermediate and basic skills
 - More skills means that more capital installed in France/Germany
 - More skills means better technology, better organisation and therefore higher TFP

3. Economic Evidence on Skills and Productivity

- Indirect: look at wages
 - Micro-economic evidence on qualifications and wages
 - Micro-economic evidence on training and wages
- Direct: look at productivity
 - Macro-economic evidence on growth
 - An alternative approach: industry level training and schooling

3.1 Wages and Schooling

- Idea is that higher human capital means higher productivity. Higher productivity means employers pay higher wages
- Correlate individual wages with years of schooling (controlling for other factors such as gender, experience, race, unions, etc.)
- A major academic industry (10,000s of papers)
- A year of extra schooling is associated with about 10% higher pay (Card, 1999)
- Major methodological problem that high ability people will get higher wages and more schooling (possibly as a signal)
 - Look at twins (e.g. Ashenfelter and Krueger, 1994)
 - Look at “natural experiments” such as different compulsory school laws (e.g. Angrist and Krueger, 1992)
- **Even these more sophisticated measures still find important returns to human capital of about 8-10%**

3.2 Wages and vocational training/qualifications

- Similar methods to schooling and wages
- Also look at randomised experiments (e.g. Heckman 1999 survey) – “demonstration projects”
 - Overall disappointing
 - U.S. Training experiments (mainly for low skilled young men) have low/zero pay-offs
 - U.K. With the exception of professional qualifications the wage pay-off to vocational qualification is low (McIntosh, 2003). Exception is for young people who left school unqualified and managed to obtain level 3 vocational qualification (below this no return). Very few managed this.

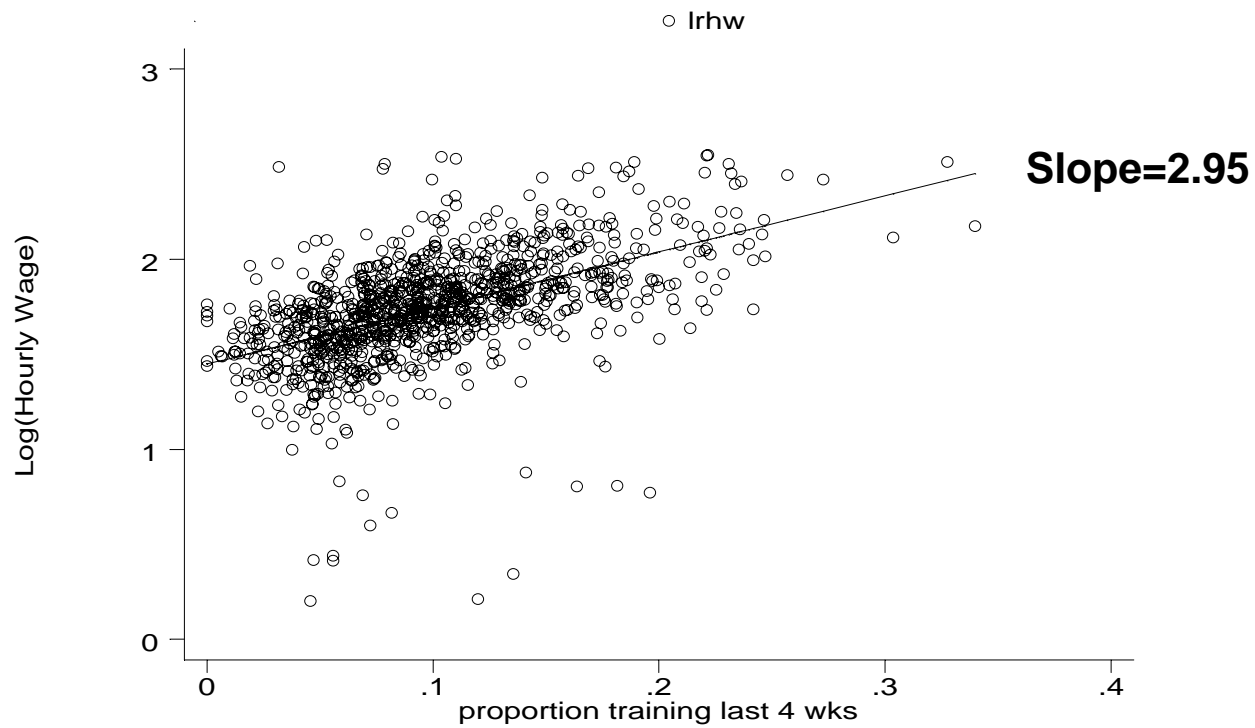
3.3 Economic Growth and skills

- Cross country growth regressions
- Relate growth of productivity to many factors including initial schooling levels (“Barro regressions”)
- Extraordinarily large positive impact (1% increase in school enrolment leads to 2% increase in per capita GDP growth)
- But many problems (Sianesi and Van Reenen, 2003)
 - Is it an effect of education on *growth* of productivity or *level* of productivity
 - Measuring schooling very difficult (especially in developing countries)
 - Among developed countries almost no correlation between schooling and growth
- Basic problem that schooling is correlated with many other growth enhancing factors (e.g. political and legal stability, technology, trade openness, etc)

3.4 A sectoral approach

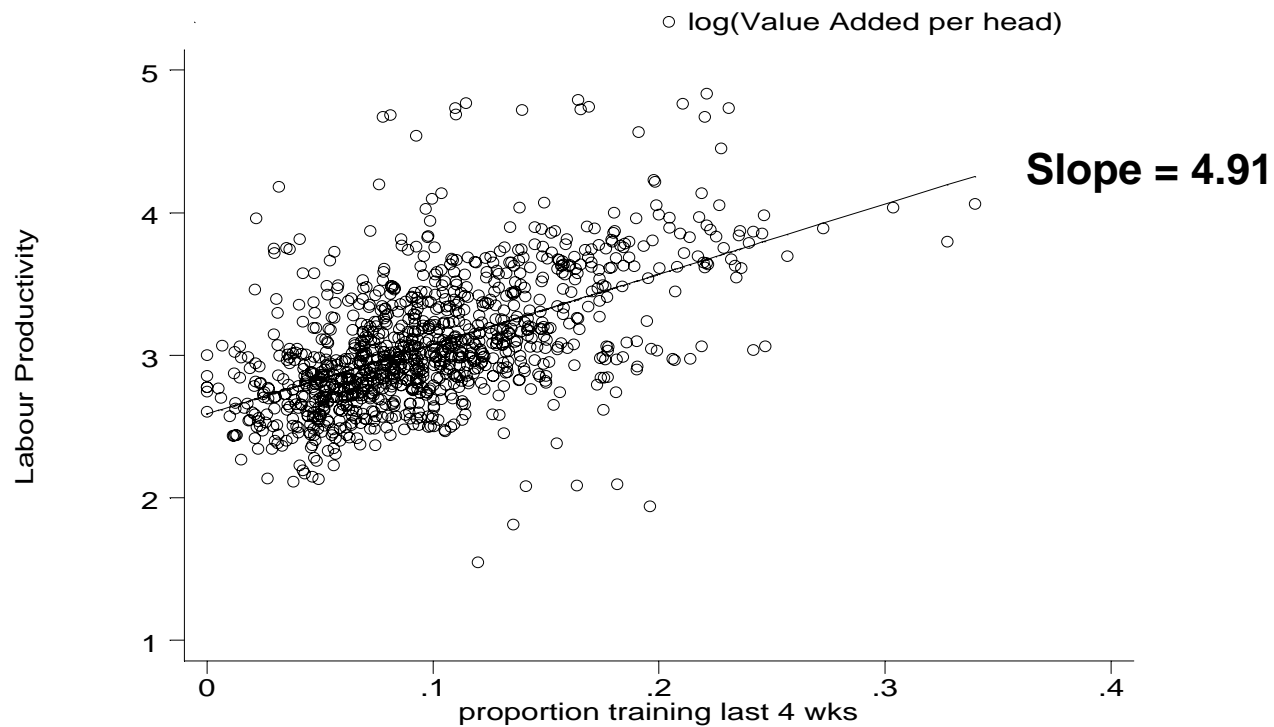
- Dearden, Reed and Van Reenen (2005) look at UK industries since 1983 – does growth in training affect growth in productivity?
- Examine correlation of training with wages and productivity
 - Evidence that 10% increase in training increases **wages** by 3%
 - But same amount of training increases **productivity** by twice as much (6%)
 - Implies that wage effects underestimate benefits of training for productivity (employers make some profits)
- Machin et al (2004) do similar exercise for college degrees (use regional dimension). They also find large productivity effects

3.5 Wages and training



Source: Dearden et al (2005); all UK private sector

3.6 Productivity and training



Source: Dearden et al (2005); all UK private sector

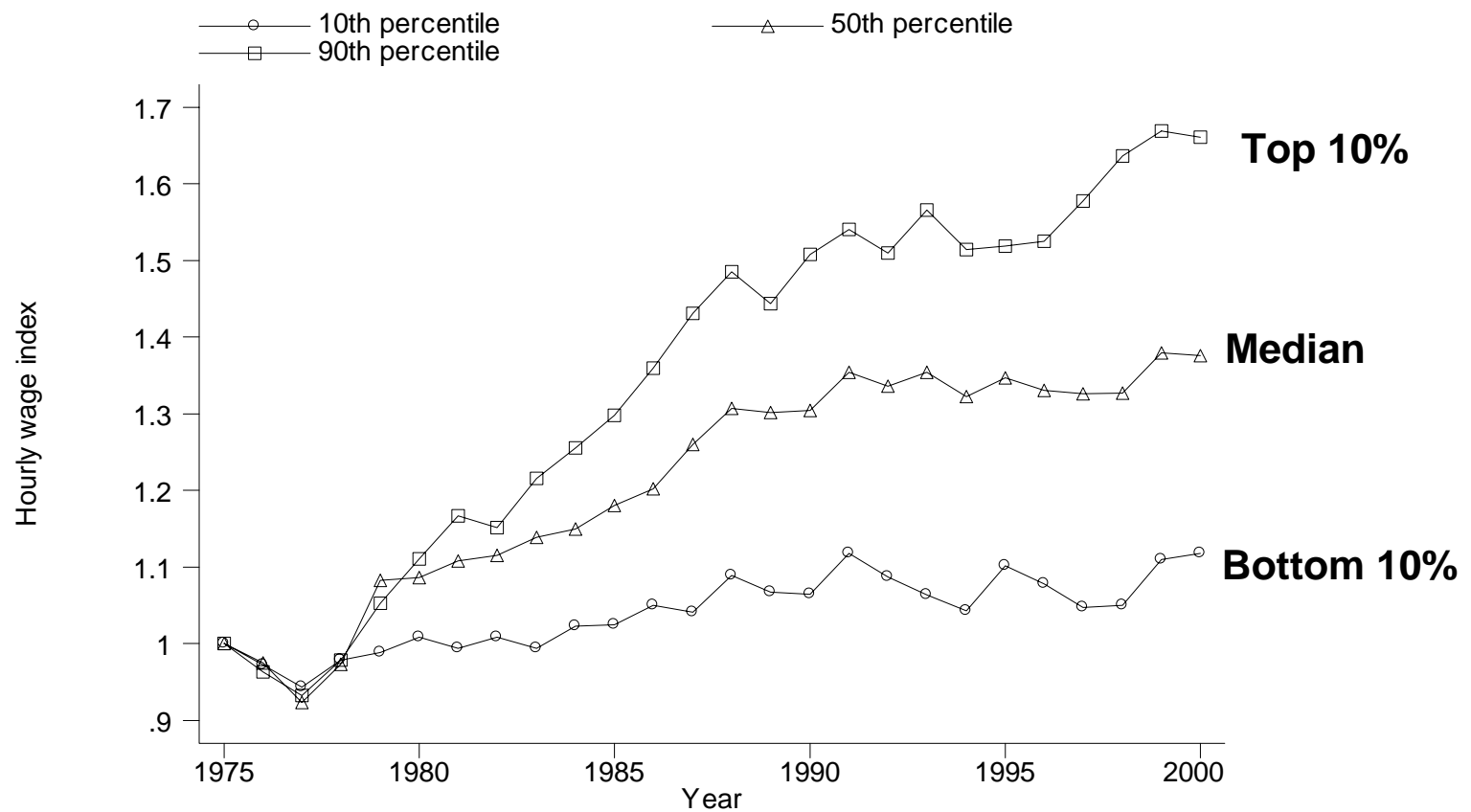
3.7 Sectoral Approach-cont.

- Examine correlation of training with wages and productivity
 - Evidence that 10% increase in training increases **wages** by 3%
 - But same amount of training increases **productivity** by twice as much (6%)
 - Implies that wage effects underestimate benefits of training for productivity (employers make some profits)
- Machin et al (2004) do similar exercise for college degrees (use regional dimension). They also find large productivity effects

3.8 Demand for skills continues to rise

- Supply of skills increases
- Price of skill increases/stable (e.g. wages of those with a degree to those without a degree)
- Implies that demand for skill higher
 - Technology
 - Globalisation
- Increasing effective skill supply would therefore reduce inequality

3.9 Male Real Hourly Wage Inequality, (UK Family Expenditure Survey)



3.10 Continued Increases in employment of the highly educated

Employment Shares by Education

	<i>Per cent</i>					
	<i>1975</i>	<i>1980</i>	<i>1985</i>	<i>1990</i>	<i>1995</i>	<i>1998</i>
<i>Men</i>						
Degree or higher	5.8	8.2	12.1	12.5	15.5	16.3
Higher vocational	4.7	6.8	10.5	11.4	11.7	12.1
Teaching and nursing	1.2	1.3	1.4	1.2	1.3	2.0
Low/Intermediate	38.3	41.2	40.7	47.9	50.7	50.7
No qualifications	50.2	42.6	35.4	27.1	20.7	18.9
<i>Women</i>						
Degree or higher	2.2	3.6	6.2	7.5	10.8	12.5
Higher vocational	0.7	1.3	2.0	2.9	3.8	2.7
Teaching and nursing	5.8	6.8	8.4	7.9	7.4	7.7
Low/Intermediate	33.1	39.6	46.5	52.1	54.3	53.7
No qualifications	58.3	48.8	36.8	29.6	23.6	23.3

Source: Calculated from General Household Surveys. For 1975 through 1995, statistics are based on three pooled years, with the central year reported in the table.

3.11 Management Skills



Are we a nation of David Brents?

- Bad UK management to blame?
- Not much concrete evidence but new CEP/McKinsey Survey finds that UK does score badly on most measures of management best practice (US most advanced, but even France and Germany ahead of UK)
- But UK scores well on lower regulation and competition which should improve managerial quality
- Is the supply of management skills/education weak?

4. But what role for government?

- Employers may be making the “right” amount of training – although they make profits from training, they are also bearing some/all of the cost
- A major government role is to get the environment right – maintain tough product market competition, low barriers to entry, supply of educated workers, etc.
- Reasons for government intervention:
 - Education “spillovers” (innovation, skilled workers complements,..).
 - Financial constraints stopping workers from “buying” training
 - Other market imperfections (e.g. co-ordination)
- Hard evidence on educational spillovers still sparse, but growing
 - Moretti (2004): Average education in a US city benefits establishment productivity

4.1 What types of interventions

- Strong arguments for interventions at early age
- Weaker arguments for subsidies at university level
- Some role in industry, but mainly for employers

4.2 Education Policy

- *Pre-School interventions:* Surestart, Childcare
- *Primary:* literacy/numeracy hour – evidence from Machin and McNally (2004) that this was cost effective way to improve standards
- *Secondary:* how to improve the worst schools? Choice; money to star teachers in worst areas?
- *Post Compulsory:* EMA successful bribes to keep low income kids in school
- *University:* Higher top-up fees to allow expansion and generous loan system to overcome financial constraints

4.3 Skills Policies

- Dearden et al (2000) estimate large potential benefits of improving basic skills (e.g. employment)
- In the long-run education reforms critical
- But big problem of the existing stock of adults
 - *Benefit system* (unemployment, disability, etc.) “New Deal” type model to profile claimants and offer basic skills courses. Benefits contingent on going on courses?
 - Low pay sector traditionally reached by *trade unions*. Still possible in some sectors where unions maintain a presence
- Elsewhere: SSCs have role in co-ordination (e.g. Employer Training Pilots, LSC, etc. SSAs)

5. Conclusions

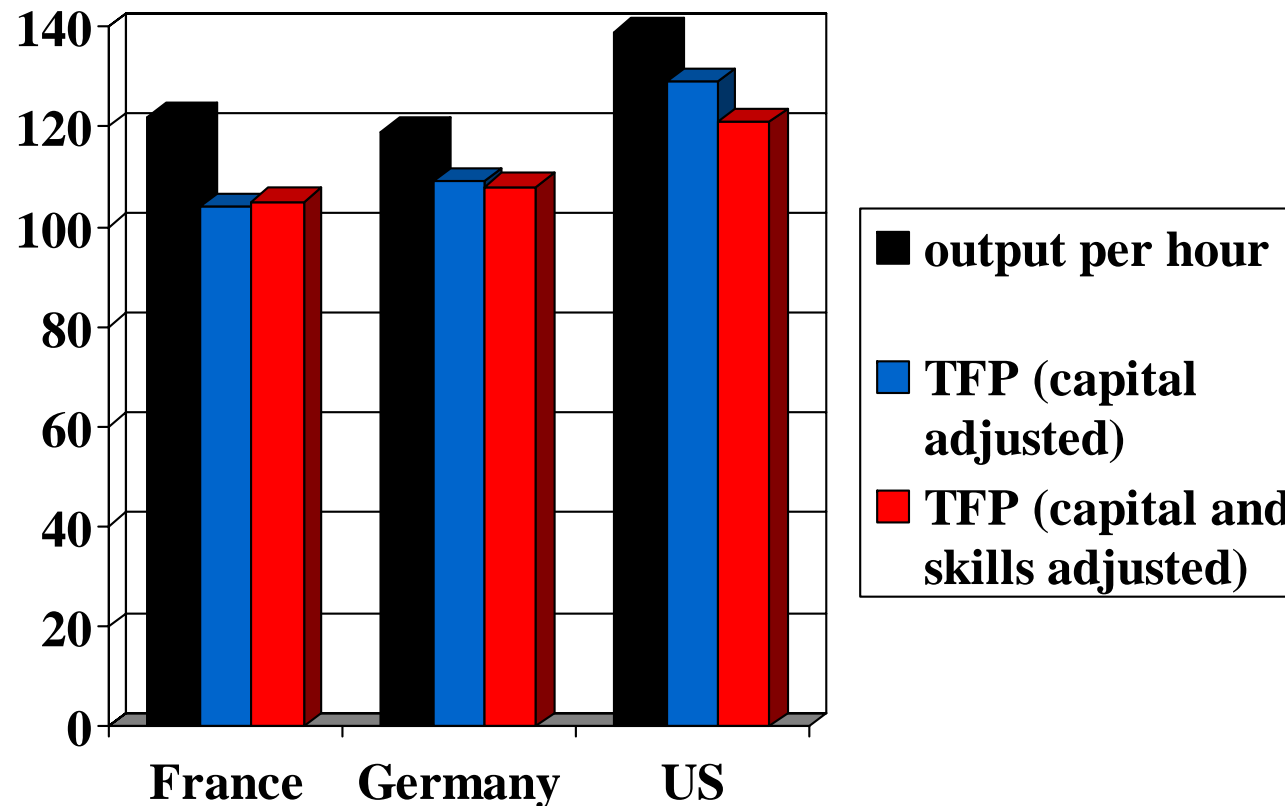
- UK has a productivity gap which is (partly) due to a skills deficit
- The problem is particularly acute at the bottom end of the ability distribution
- This skills deficit matters because better human capital helps improve productivity and innovation
- Improving low end skills is also beneficial in reducing inequality (still growing in UK)
- In short run, a major problem is “connecting” with those who lack skills
- Educational system is the most important mechanism for raising skills in the long-run. We should not fail the next generation.

Selected References

- Dearden, L., Reed, H. and Van Reenen, J. (2005) “The impact of training on productivity and wages: Evidence from British panel data” CEP Discussion Paper No. 674
- Machin, S., Vignoles, A. and Galindo-Rueda (2003) “Sectoral and Area analysis of the Economic Effects of Qualifications and Basic Skills” Department for Education and skills Research Report RR465
- McIntosh, S. (2003) “Skills in the UK” *The Labour Market Under New Labour* (eds Dickens, Gregg and Wadsworth)
- McIntosh, S. and Steedman, H. (2005) “The Skills Audit: An Update”
- Siansei, B. and Van Reenen, J. (2003) “Education and Economic Growth: A review of the literature” *Journal of Economic Surveys* (2003), 17, 2, 157-200
<http://cep.lse.ac.uk/people/vanreenen/papers/wp0205.pdf>

Back Up slides

2.9 UK Productivity Gap, Market Sector, 1999 (UK=100)



Source: O'Mahony and de Boer (2002)