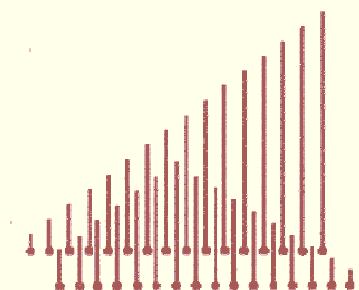


# Accounting for UK economic performance

Ray Barrell, Dawn Holland and

Iana Liadze

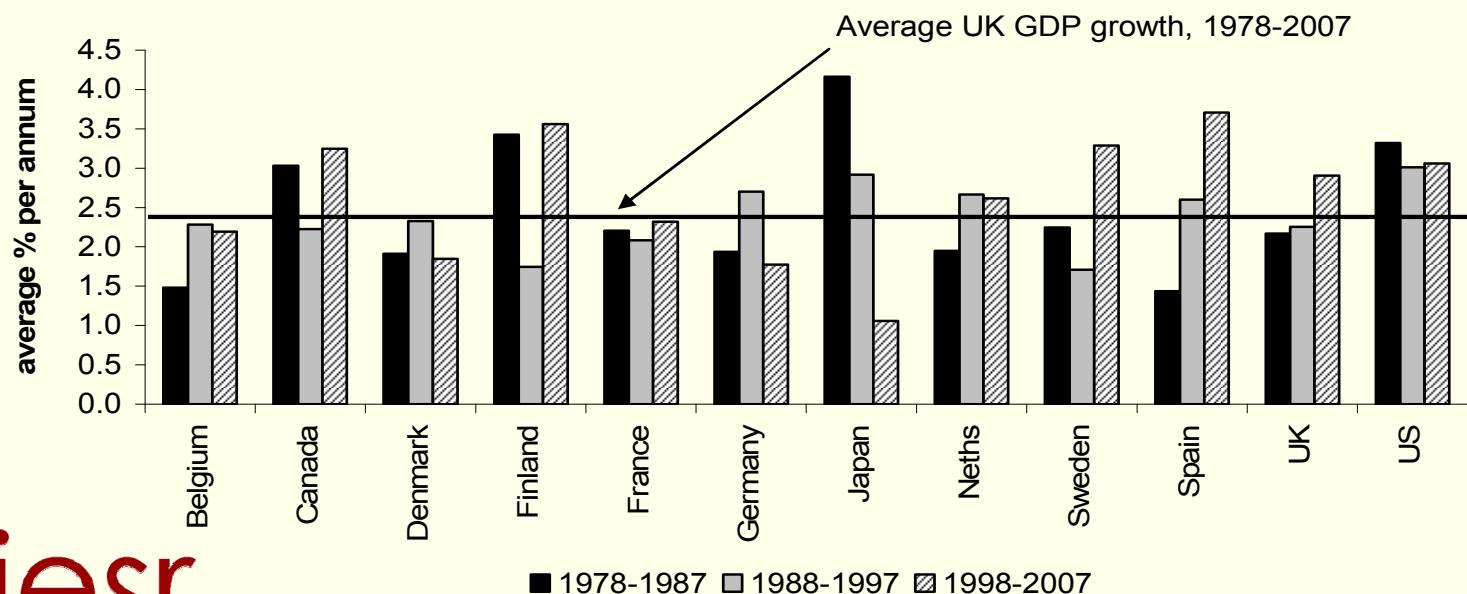
June 2010



National Institute  
of Economic and  
Social Research

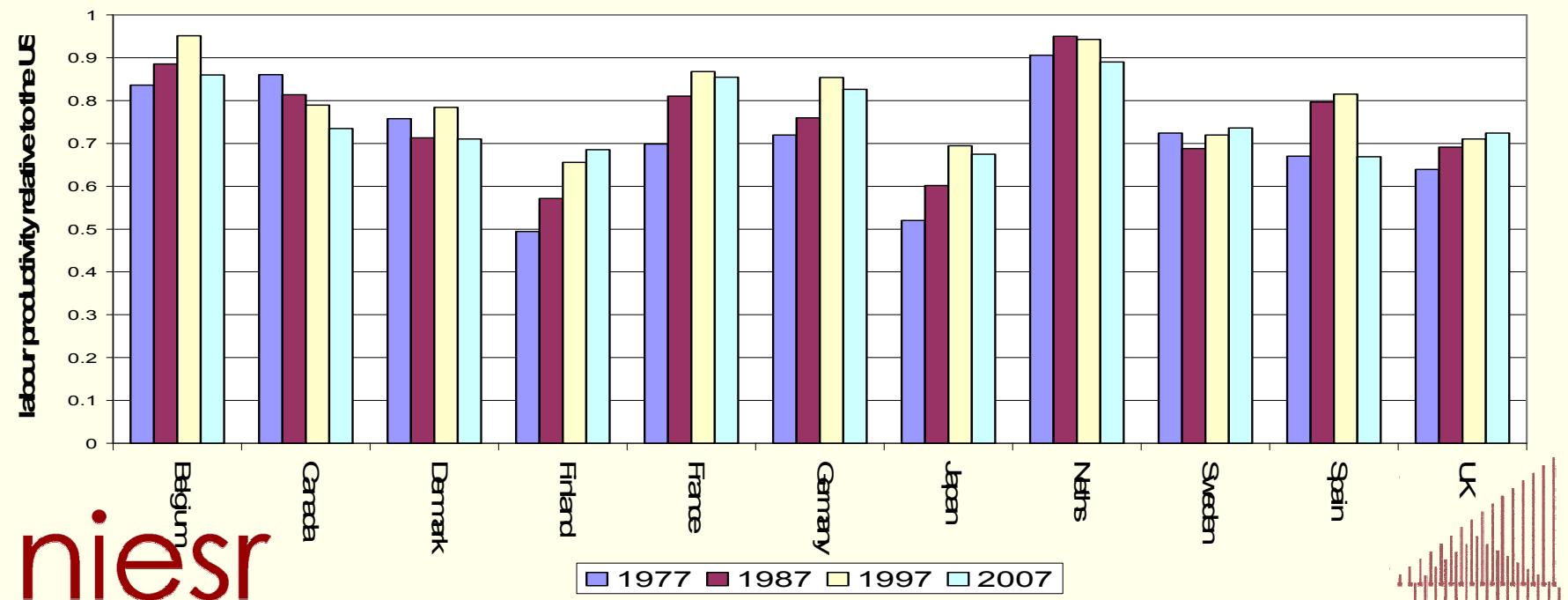
# UK growth in perspective

- UK growth and performance appeared to improve 1997-2007
- Growth accounting and regressions on productivity to explain why
- Take account of skills and financial services



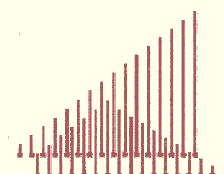
# Output relative to the US

- UK output per person hour in basic prices rose
- Decompose into market efficiency, technology , skills and capital effects
- Construct skills indices from EUKLEMS



# Skills and production

- Labour input is not raw but cooked
  - Need share in workforce for low, medium and high skills
  - Need relative wages for each skill group
  - We assume the unskilled are 1.0 all the time in all the countries
- We create labour quality indices with time vary weights on the relative productivity and also using Tornquist index
  - $TQ = \sum_{J=1}^3 S_{jt} (\ln x_{jt} - \ln x_{j,t-1})$  (1)



# Growth Accounting

- We start with a production function

$$Y = f(K_t, L_t, T_t)$$

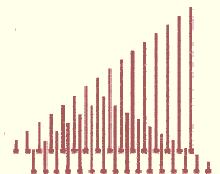
- We do a log approximation for growth

$$d \ln(Y_t) = \theta_{K_t} d \ln(K_t) + \theta_{L_t} d \ln(L_t) + dA_t$$

- We decompose labour into persons hours and skills and rewrite the growth equation

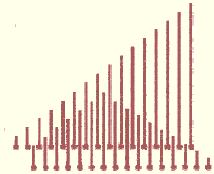
$$d \ln(Y_t) = \theta_{K_t} d \ln(K_t) + (1 - \theta_{K_t}) d \ln(E_t * Hours_t) + (1 - \theta_{K_t}) d \ln(S_t) + dA_t$$

- Then we do growth accounting



# Growth accounting

		percentage point contribution to average annual GDP growth											
		Belgium	Canada	Denmark	Finland	France	Germany	Japan	Neths	Sweden	Spain	UK	US
<b>GDP at basic prices</b> (% change)	1978-1987	1.5	3.0	1.9	3.4	2.2	1.9	4.2	2.0	2.2	1.4	2.2	3.3
	1988-1997	2.3	2.2	2.3	1.7	2.1	2.7	2.9	2.7	1.7	2.6	2.3	3.0
	1998-2007	2.2	3.2	1.8	3.6	2.3	1.8	1.1	2.6	3.3	3.7	2.9	3.1
<i>of which</i>													
Hourly labour input (unadjusted)	1978-1987	-0.7	2.0	0.9	0.3	-0.9	-0.2	1.0	-0.1	1.2	-1.9	-0.2	1.7
	1988-1997	-0.1	0.9	-0.3	-1.3	-0.2	-0.1	-0.2	1.1	-0.4	0.7	0.3	1.4
	1998-2007	1.2	1.9	0.8	1.0	0.4	0.1	-0.7	1.1	1.0	3.7	0.6	1.0
<b>Output per person hour</b>	1978-1987	2.2	1.0	1.0	3.1	3.1	2.2	3.1	2.1	1.1	3.4	2.4	1.6
	1988-1997	2.4	1.3	2.6	3.0	2.3	2.8	3.1	1.5	2.1	1.9	1.9	1.6
	1998-2007	1.0	1.3	1.0	2.5	1.9	1.7	1.8	1.5	2.3	0.0	2.2	2.0
<i>of which</i>													
Skills accumulation	1978-1987	-0.1	0.1	0.0	-0.4	-0.2	0.4	-0.3	-0.4	-0.3	-0.2	0.7	0.5
	1988-1997	-0.1	0.9	-0.1	0.0	0.2	0.3	-0.1	0.6	0.1	-0.1	0.7	0.9
	1998-2007	0.0	0.3	0.2	0.5	-0.2	0.0	-0.2	0.5	0.0	0.0	-0.1	1.0
<b>TFP (excluding skills)</b>	1978-1987	1.4	0.3	0.6	2.5	1.8	0.8	2.3	1.7	1.0	1.9	1.0	0.8
	1988-1997	1.6	-0.4	2.2	2.2	1.0	1.5	1.6	0.6	1.1	0.8	0.6	0.4
	1998-2007	0.7	0.6	0.7	1.7	1.3	1.2	1.4	0.5	2.0	-0.3	1.6	0.4
<b>Capital deepening</b>	1978-1987	0.8	0.5	0.3	0.9	1.5	0.9	1.1	0.8	0.4	1.7	0.6	0.3
	1988-1997	0.9	0.6	0.5	0.9	1.2	1.0	1.6	0.4	0.9	1.2	0.6	0.3
	1998-2007	0.3	0.4	0.2	0.2	0.8	0.6	0.5	0.4	0.2	0.3	0.7	0.6



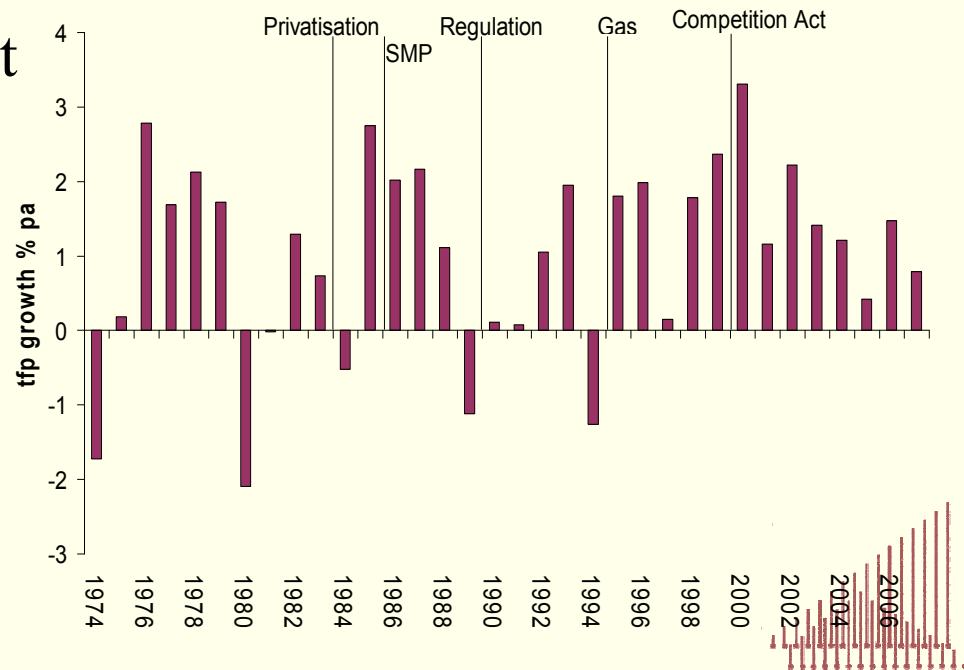
# UK performance

- UK performance improved in the last period relative to other periods and countries
  - Only Finland and Sweden clearly better on tfp
  - Skills accumulation effect of HE expansion offset by wage compression
- US growth heavily skills related
- Deregulation may have helped

## Events in regulation

- 1) Privatisation starts 1984
- 2) SMP starts 1986
- 3) Emphasis on competition starts
- 4) Gas restructured
- 5) Competition act
- 6) Financial deregulation

Annual ftp growth in the UK



# Was it because of financial services

**Table 2. Growth decomposition 1998-200**

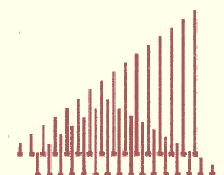
\* Sample period for France is 2000-2007

\*\* Sample period for Japan is 1997-2005

\*\*\* Sample period for Sweden is 1999-2007

# Estimating labour productivity

- Estimate a panel using Pesaran's CCE
  - Check variables are stationary and find minimum cointegrating set, then estimate in ECM form
- Output per person hour depends on
  - knowledge (R&D, FDI),
  - market efficiency (openness, ESM, join EU)
  - Skills from the Tornquist estimates
  - Crisis scars that affect risk premia

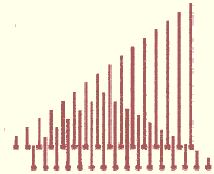


# Estimation results

**Table 5: Estimation results**

	Belgium	Canada	Denmark	Finland	France	Germany	Japan	Neths	Sweden	Spain	UK	US
Error correction	-0.2 (0.000)	-0.26 (0.007)	-0.544 (0.000)	-0.57 (0.000)	-0.164 (0.003)	-0.217 (0.011)	-0.118 (0.008)	-0.26 (0.003)	-0.383 (0.000)	-0.213 (0.000)	-0.352 (0.001)	-0.251 (0.009)
Ln(FDI/Y)	0.013 (0.04)	0.12 (0.019)	-	-	0.09 (0.046)	-	-	0.078 (0.017)	0.071 (0.014)	0.031 (0.000)	0.066 (0.000)	0.097 (0.005)
Ln(R&D/Y)	-	-	0.249 (0.000)	0.463 (0.000)	0.411 (0.063)	0.317 (0.049)	0.58 (0.043)	-	-	-	-	-
Ln(Open)	-	0.175 (0.009)	-	0.098 (0.004)	-	0.153 (0.068)	-	-	0.249 (0.051)	-	0.457 (0.000)	-
European single market	0.119 (0.005)	-	0.112 (0.000)	-	-	0.129 (0.002)	-	0.065 (0.038)	-	-	-	-
EU membership 1986	-	-	-	-	-	-	-	-	-	0.113 (0.007)	-	-
Ln(Skill_tq)	-	-	-	-	-	-	-	-	-	-	0.349 (0.04)	0.715 (0.000)
Long run crisis effect	-	-	-	-0.029 (0.053)	-	-0.132 (0.032)	-	-	-	-	-	-0.063 (0.052)
Crisis date				1991			1997				1988	
DLn(Y/EH(-1))	-	-	-	0.413 (0.002)	-	-	-	-	0.461 (0.001)	0.449 (0.001)	0.403 (0.028)	-
AvLn(Y/EH)	0.085 (0.000)	0.085 (0.000)	0.085 (0.000)	0.085 (0.000)	0.085 (0.000)	0.085 (0.000)	0.085 (0.000)	0.085 (0.000)	0.085 (0.000)	0.085 (0.000)	0.085 (0.000)	0.085 (0.000)
AvDLn(Y/EH)	0.718 (0.000)	0.718 (0.000)	0.718 (0.000)	0.718 (0.000)	0.718 (0.000)	0.718 (0.000)	0.718 (0.000)	0.718 (0.000)	0.718 (0.000)	0.718 (0.000)	0.718 (0.000)	0.718 (0.000)

Note: probabilities in parenthesis; estimation period 1974-2008;



# Factoring out markets

Table XX: Contribution to the change

in productivity

Table XX. Growth

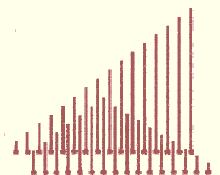
decomposition

percentage point contribution to average annual growth in productivity

		Belgium	Canada	Denmark	Finland	France	Germany	Japan	Neths	Sweden	Spain	UK	US
Output per person hour	1978-1987	2.2	1.0	1.0	3.0	3.1	2.1	3.0	2.1	1.1	3.3	2.4	1.6
	1988-1997	2.3	1.3	2.5	3.0	2.3	2.8	3.0	1.5	2.1	1.8	1.9	1.6
	1998-2007	1.0	1.3	1.0	2.5	1.9	1.7	1.7	1.4	2.2	0.0	2.2	2.0
of which													
Foreign direct investment (as a % of GDP)	1978-1987	0.9	0.3	-	-	0.3	-	-	0.9	0.7	1.1	0.5	1.0
	1988-1997	0.1	0.1	-	-	0.9	-	-	0.4	0.8	0.2	0.1	0.4
	1998-2007	0.1	0.6	-	-	0.9	-	-	0.8	1.0	0.3	0.6	0.6
Research & development (as a % f GDP)	1978-1987	-	-	0.9	2.4	0.9	1.0	1.6	-	-	-	-	-
	1988-1997	-	-	0.9	2.3	0.5	0.0	1.2	-	-	-	-	-
	1998-2007	-	-	0.9	1.7	-0.2	0.3	0.9	-	-	-	-	-
Openness	1978-1987	-	0.2	-	0.1	-	0.3	-	-	0.4	-	0.6	-
	1988-1997	-	0.8	-	0.4	-	0.5	-	-	0.8	-	1.4	-
	1998-2007	-	0.1	-	0.3	-	0.8	-	-	0.7	-	1.0	-
European single market	1978-1987	0.0	-	0.0	-	-	0.1	-	0.0	-	-	-	-
	1988-1997	1.1	-	1.1	-	-	1.2	-	0.6	-	-	-	-
	1998-2007	0.0	-	0.0	-	-	0.0	-	0.0	-	-	-	-
European union (1986)	1978-1987	-	-	-	-	-	-	-	-	-	1.1	-	-
	1988-1997	-	-	-	-	-	-	-	-	-	0.0	-	-
	1998-2007	-	-	-	-	-	-	-	-	-	0.0	-	-
Skills accumulation	1978-1987	-	-	-	-	-	-	-	-	-	-	0.4	0.5
	1988-1997	-	-	-	-	-	-	-	-	-	-	0.4	1.0
	1998-2007	-	-	-	-	-	-	-	-	-	-	0.0	1.2

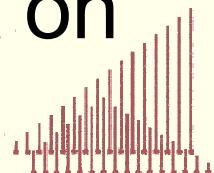
# What drove growth in the UK

- Many factors are common get picked up by the CCE factors (common knowledge)
- There is a core set of R&D countries and FDI also matters in other countries
- Market and openness indicators drive growth and has been important in the UK
  - Market structure and competition introduction was slow and late and changed developments only in the 1990s
  - Skills growth impact slowed



# Costs of crises

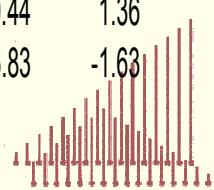
- Recent developments mean sustainable output will be 3 per cent lower
  - Crises affect labour productivity by raising risk premia and reducing K/L
  - Significant permanent crises effects are rare (US, Japan, Finland)
  - There may be an addition from shrinking financial services
- There is no evidence that previous post war crises have had a permanent effect on labour productivity in the UK



# Recent developments

- UK performance has been poor
  - Having a crisis is not an obvious cause
  - Trade and exchange rates explain early responses but not the pattern
- Policy explains half difference with US

	Belgium	Canada	Denmark	Finland	France	Germany	Japan	Neths	Sweden	Spain	UK	US
2008Q2	0.39	0.08	1.25	0.88	-0.43	-0.57	-1.13	0.02	-0.25	-0.02	-0.08	0.36
Quarterly growth	2008Q3	-0.23	0.10	-1.26	0.08	-0.22	-0.32	-1.25	-0.72	-0.62	-0.55	-0.93
	2008Q4	-2.13	-0.95	-2.26	-3.87	-1.48	-2.44	-2.67	-1.23	-4.42	-1.08	-1.80
	2009Q1	-1.73	-1.79	-1.77	-5.19	-1.33	-3.52	-3.61	-2.27	-0.88	-1.69	-2.61
	2009Q2	-0.13	-0.87	-1.92	-0.28	0.27	0.44	1.48	-1.06	0.02	-0.96	-0.69
	2009Q3	0.75	0.23	0.45	0.30	0.22	0.73	-0.14	0.51	-0.11	-0.28	-0.28
	2009Q4	0.30	1.23	0.19	0.02	0.59	0.01	0.94	0.23	-0.56	-0.15	0.44
Cumulative		-2.77	-1.97	-5.26	-7.95	-2.38	-5.60	-6.31	-4.45	-6.70	-4.65	-5.83
												-1.63



# Conclusion

- UK performance improved noticeably in the decade to 2007 even after factoring out financial services
  - Changes in approaches to competition, regulation and openness matter
    - Change in regulation of privatised industries
    - Competition act of 1998
  - Skills contribution declined
- No evidence UK scar will be worse or that previous crises have affected performance

