Centre for Research into Business Activity

Macro Implications of Intangibles: Evidence from the UK

Jonathan Haskel
Queen Mary, University of London; CeRiBA, CEPR and IZA
Funding from EU FP7, Project COINVEST

NAS/NSF/BEA/Congress Conference on Intangibles,
Washington 23rd June 2008

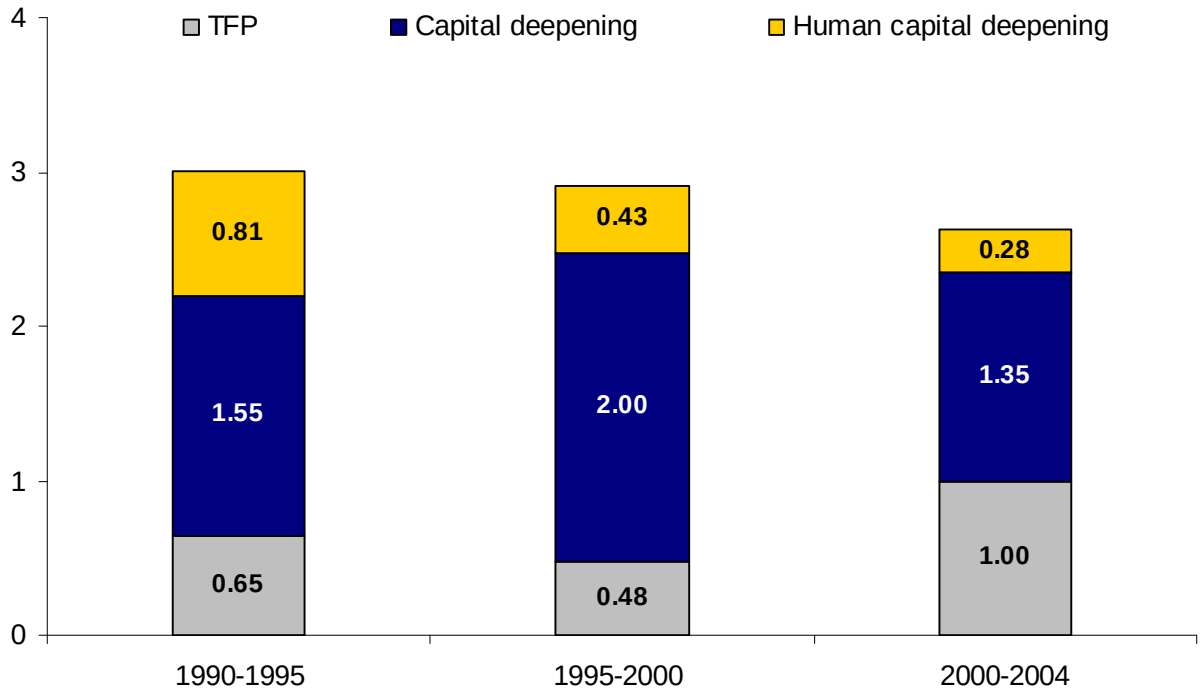
www.CeRiBA.org.uk

CeRiBA

Background to UK work

- Where is the new economy?
  - Investment/GDP: flat since 1950s
  - π/GDP: flat
  - LPG and TFPG falling
- Policy concerns
  - Lisbon agenda, make the EU "the most competitive and dynamic knowledge-driven economy by 2010" (EU, 2000).
  - Desire for a UK “innovation index”
- Outline of presentation
  - How adding intangibles to the UK data matters
  - Better data on intangible investments

UK LPG/TFPG without intangibles



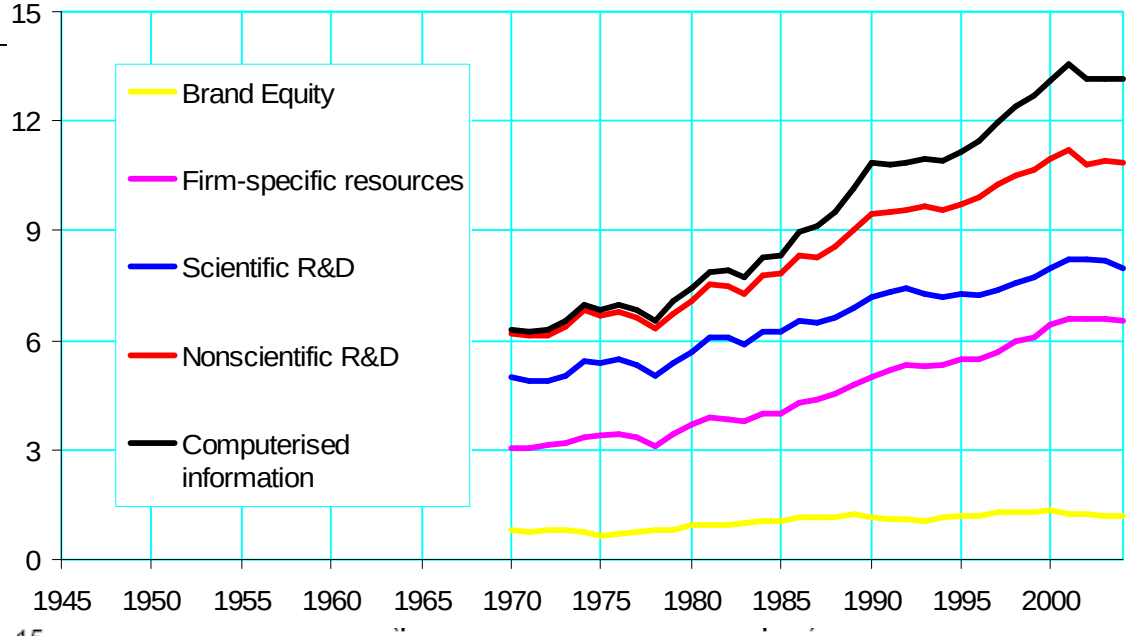
UK work to explain poor prod'y perform

- Joint Fed, Bank of England project (Basu et al. (2004), Oulton and Srinivasan (2005))
- LPG and TFPG slowdown 1995-00.
  - Industry level, bottom up
  - Hours
  - Capital services not stocks
  - Capitalise software
- Finding: slowdown remains
- Question: can intangibles explain?

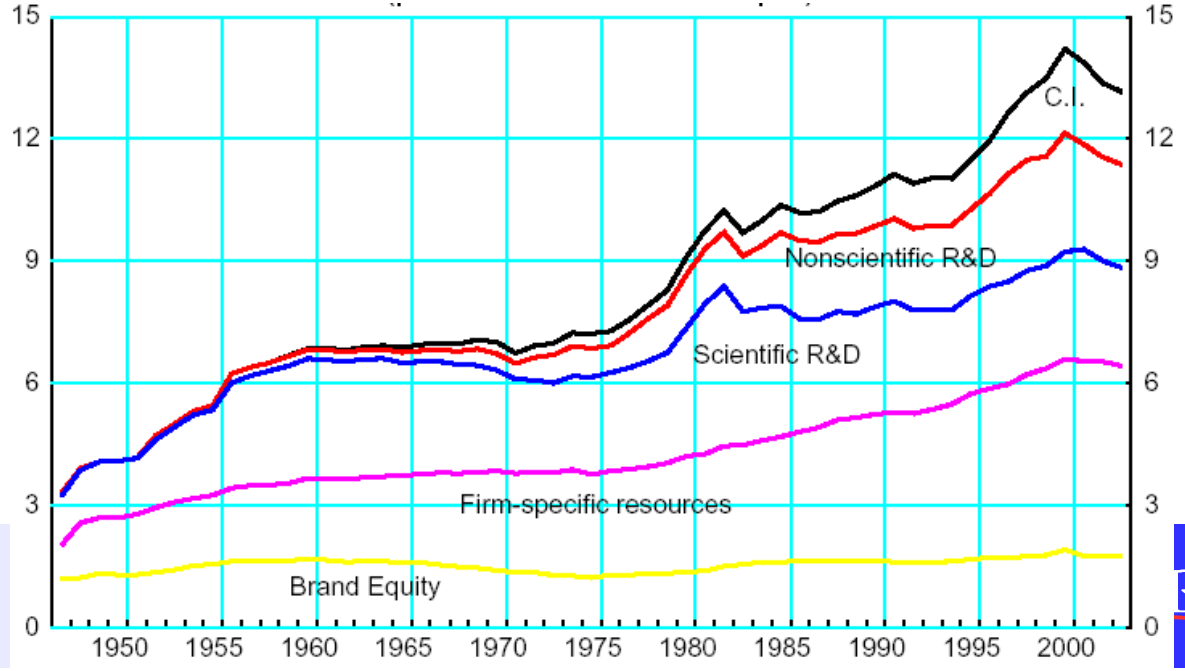
UK intangibles and treatment mirrors US

Type of intangible investment	Includes the following intangibles	Current treatment in National Accounts
Computerised information	(1) Computer software (2) Computer databases	Both treated as investment
Innovative property	(1) Scientific R&D (2) Mineral exploration (3) Artistic originals (4) New product development costs in the financial industry (5) New architectural and engineering designs (6) R&D in social science and humanities	Only (2) and (3) treated as investment
Economic competencies	(1) Brand Equity (2) Firm-specific human capital (3) Organisational structure	None of these treated as investment

Intangible investment by asset type, % of MGVA



UK

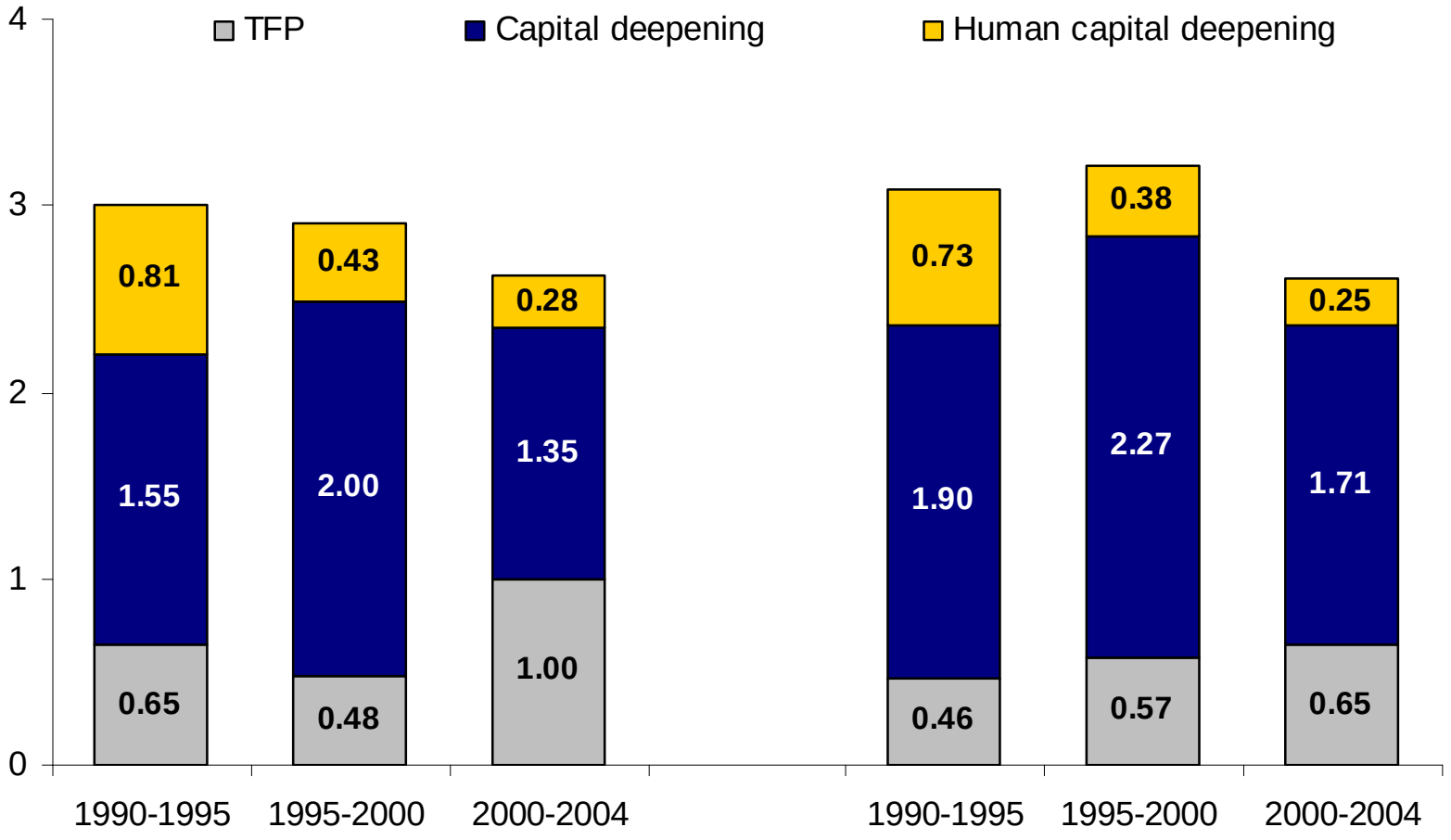


US

Growth accounting, outline

- Data on invest in intang
  - 1970-2006. Pre-1970 much interp
  - Training is X section
  - Own account for software
- Deflate and build real intang asset stocks
  - Mostly mkt-sector prices. US software. CHS deprec rates
- Recalculate GDP to include intang
- Build Hall/Jorgenson capital services
  - Rental rates ex post equal
- Labour quality adjustment
  - Ed'n, gender, age

LPG/TFPG, market sector, without & with intan

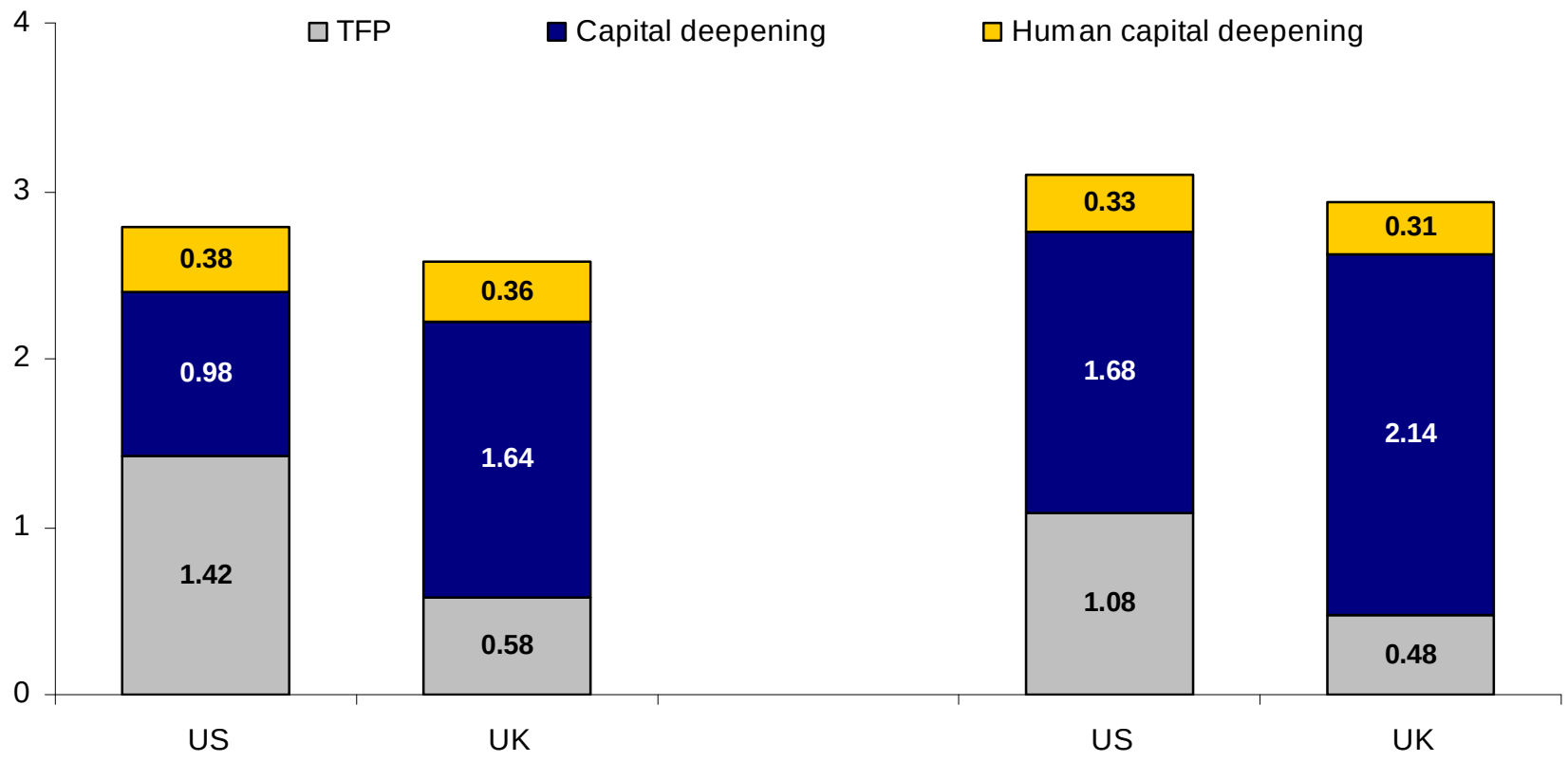


Existing National Accounts

Including all intangibles

CeRiBA

US and UK LPG and TFPG with and without intangibles, 1995-2003



Contribution of Intangible Capital Deepening to the Annual Change in Labour Productivity, Nonfarm Business Sector (percentage points) (Market sector for UK). Percentage of tot intang capital deepening (US=0.84pppa, UK=0.60pppa)

	US	UK
all intangibles, also those in the NA	1995-2003	1995-2003
	(1)	(2)
Intangible capital deepening		
Computerized information	32	31
Innovative property	26	24
Scientific	10	1
Nonscientific	17	24
Economic competencies	42	45
Brand equity	10	6
Firm-specific resources	32	39

Better measuring intangibles and innovation: innovation surveys?

- EU “Community Innovation Survey”
- UK CIS = 12 pages
- If you had ½ page what would you ask?

Structure of innovation surveys

1. Innovation. Did you innovate
    1. Yes, no
    2. fraction of sales
2. Spending on
    1. R&D, design, marketing, training
3. Information sources for innov'n (yes/no)
    1. joint ventures, clients, suppliers, trade fairs
4. Barriers to innovation what stopped you innovating?
    1. Cost
    2. Skilled labour
5. Other
    1. organisational change (1/0),
    2. public support received

Priority of innovation survey questions

Question	Comment
1.Innovation. Did you innovate	
Yes, no	capital deepening
fraction of sales	used by consultancies
2.Spending on	
R&D, design, marketing, training	useful for intangibles
3.Information sources for innov'n (yes/no)	
joint ventures, clients, suppliers, trade fairs	interesting for academic study
4. Barriers to innovation what stopped you innovating?	
Cost, skilled labour	does not work due to identification probl
5.Other	
1.organisational change (1/0),	binary, no quantity
2.public support received	binary, no quantity

Conclusions

- Intangibles
  - makes big difference for UK
  - considerable interest to construct innovation index
  - some innovation survey questions could be useful

Extras

Agenda

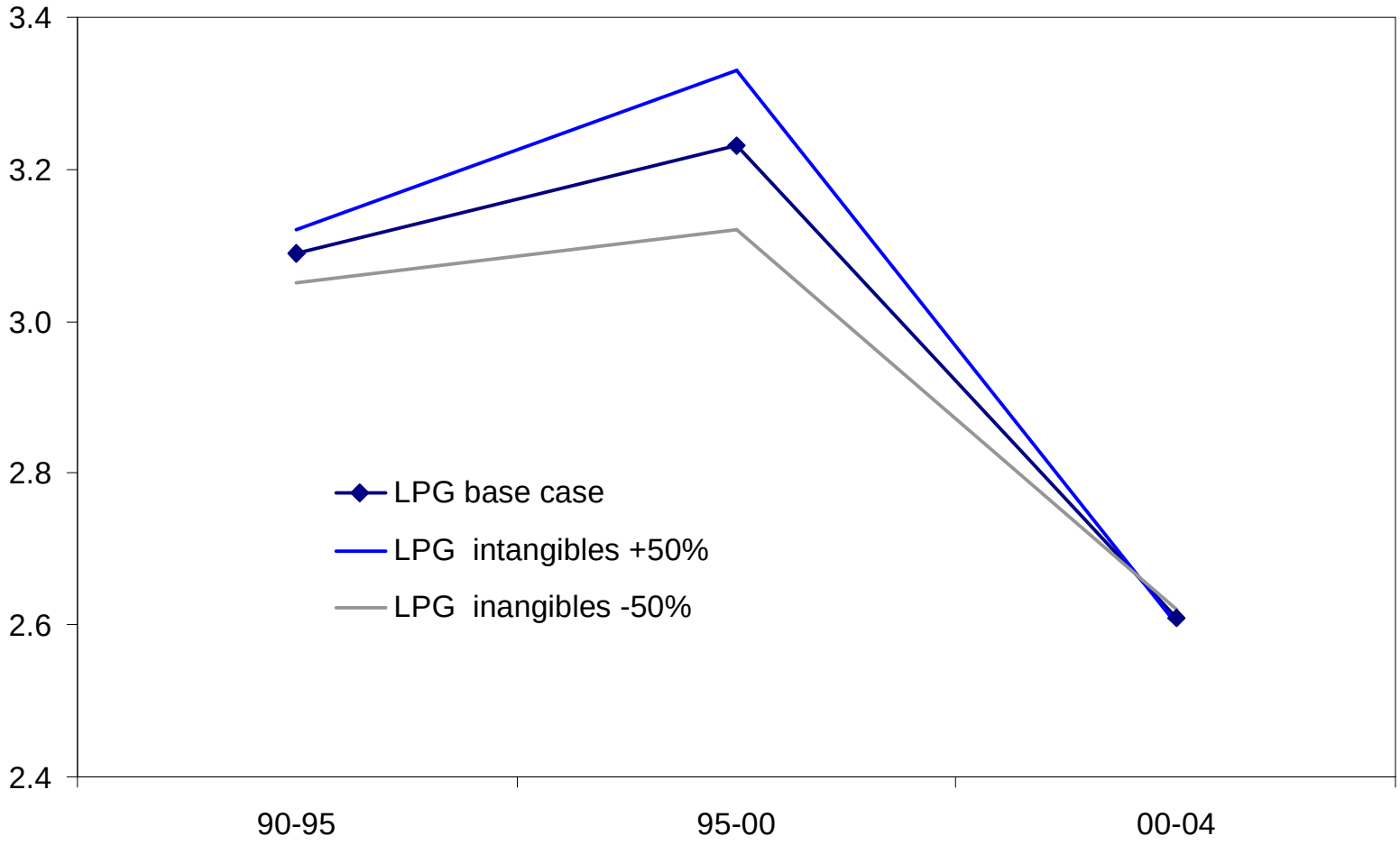
- Questions
  - Contribution of intang to GDP/productivity in UK
  - Significance of international flows
- UK answers
  - UK background: falling LPG, TFPG
  - Apply CHS method
  - Main findings
    - Investment
      - X-section: £ of intang= £ of tang (2004)
      - Time series: 1970: intang I/Market GDP=7%, 2004= 14%
    - Prod growth
      - 1990s: rising LPG and TFPG
      - 2000s: falling LPG, rising TFPG

Sensitivity tests

- Vary depreciation rates
- Vary price deflators

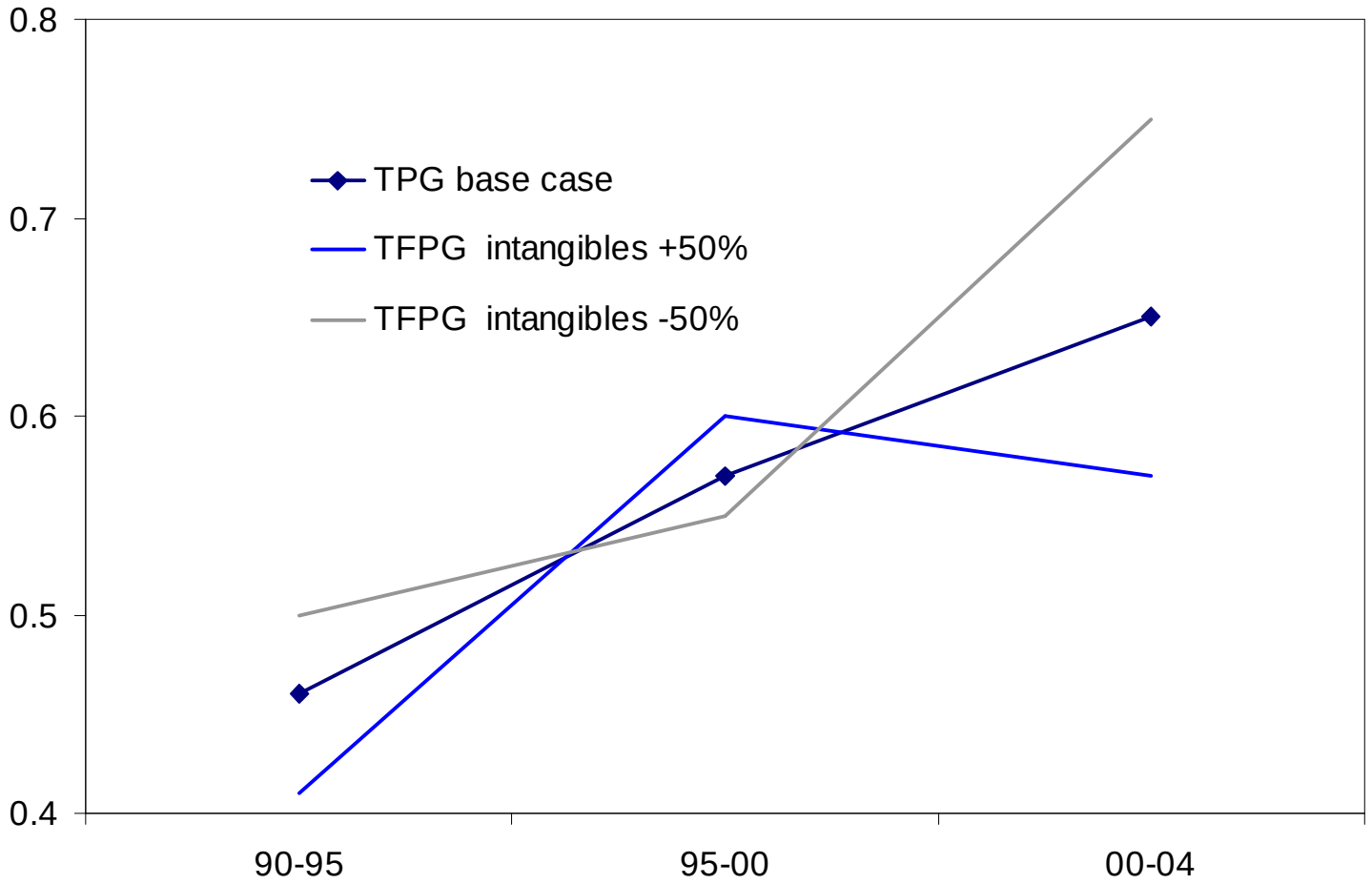
Sensitivity of LPG

Intangible investment increased and decreased by 50 % for uncertain items (R&D, fin and arc, market research, organisational structure)



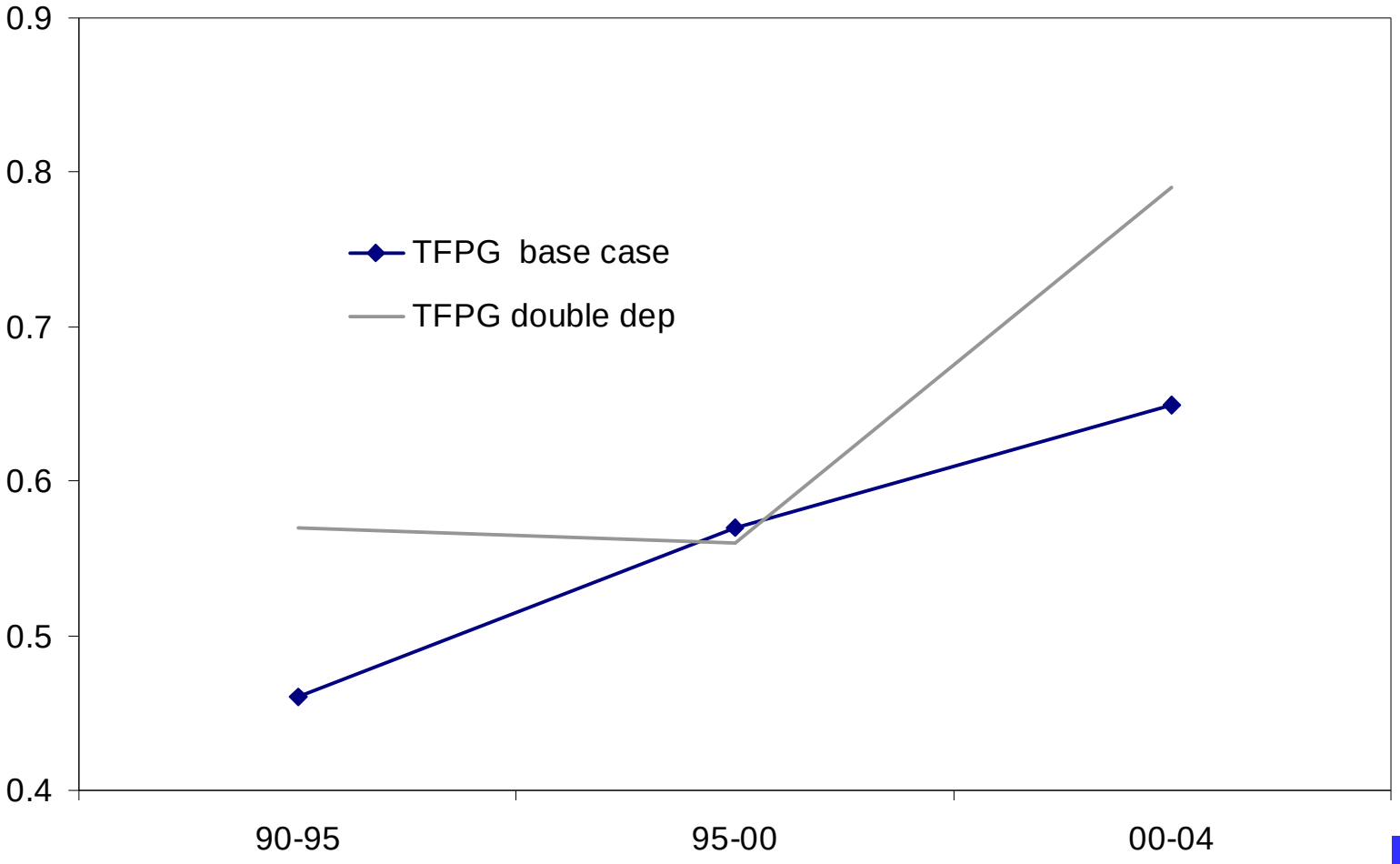
Sensitivity of TFPG

Intangible investment increased and decreased by 50 % for uncertain items (R&D, fin and arc, market research, organisational structure)



Sensitivity of TFPG

Double depreciation rates for intangibles



Summary of findings on the UK puzzles

1. Investment in new technologies: but I/Y falling

   With intang, I/Y rises

2. Returns to that investment: but π/Y constant

   With intang, p/Y rises

3. Productivity gains: but LPG and TFPG fell after 1995

   With intang, LPG and TFPG both rise

Effect of the intangibles: UK vs US

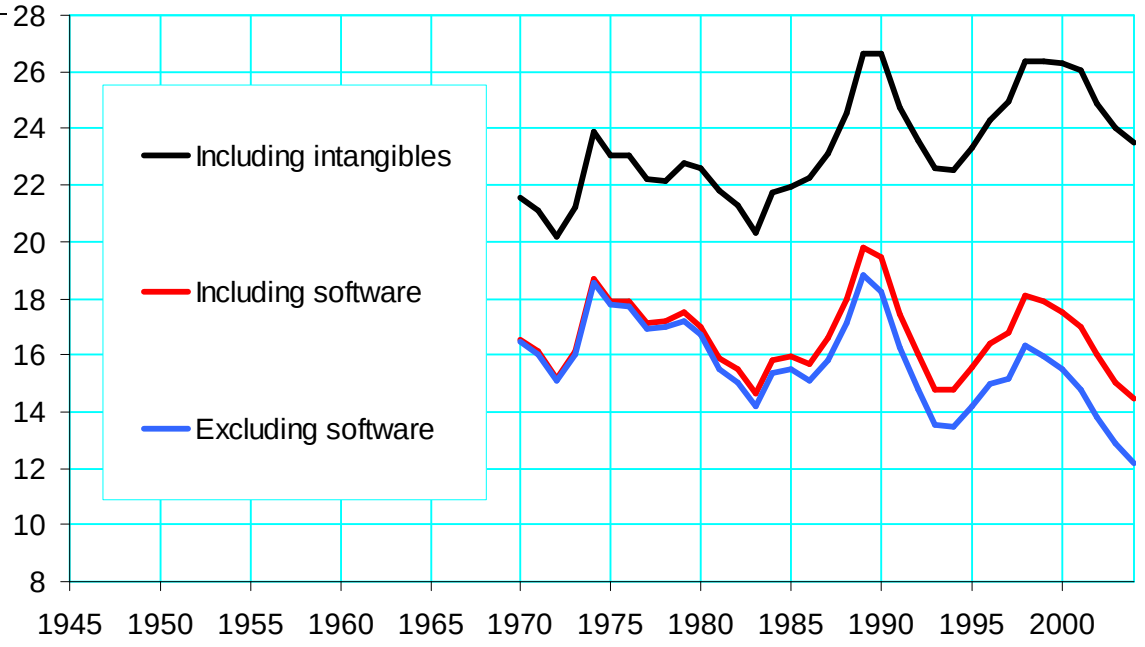
	US	UK
	1995-2003	1995-2003
excluding software		
	(1)	(2)
Labour productivity growth	2.78	2.59
Capital deepening	0.98	1.64
Human capital deepening	0.38	0.36
TFP growth	1.42	0.58

	US	UK
	1995-2003	1995-2003
including software		
	(1)	(2)
Labour productivity growth	2.95	2.73
Capital deepening	1.26	1.82
Human capital deepening	0.37	0.35
TFP growth	1.32	0.56

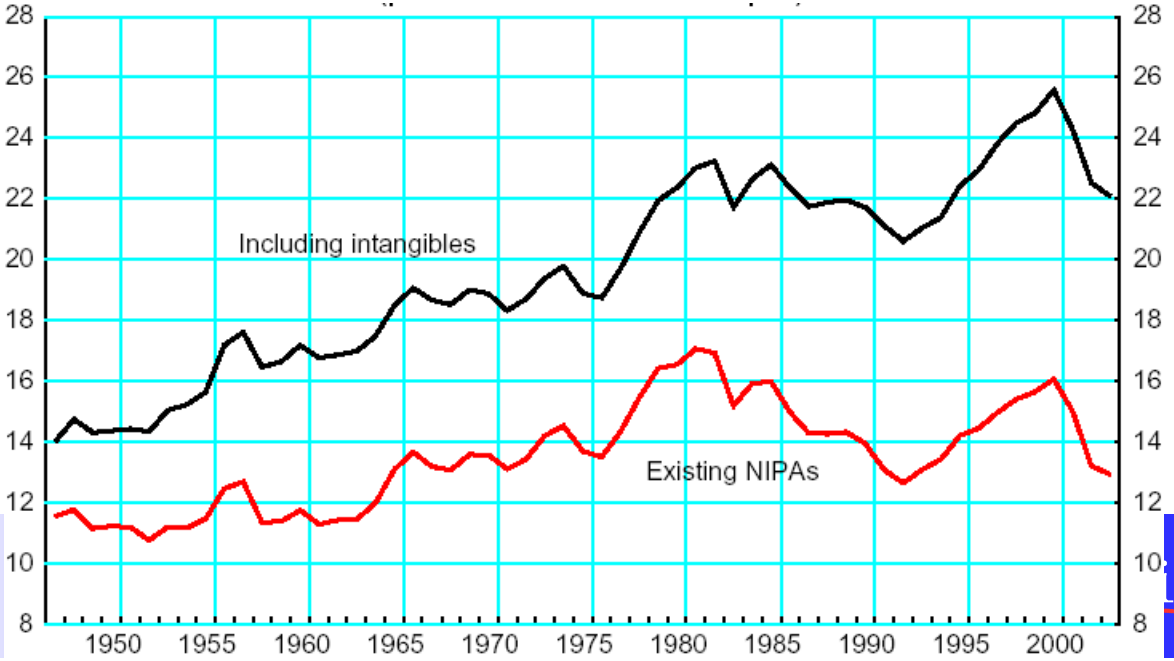
	US	UK
	1995-2003	1995-2003
including all intangibles		
	(1)	(2)
Labour productivity growth	3.09	2.93
Capital deepening	1.68	2.14
Human capital deepening	0.33	0.31
TFP growth	1.08	0.48

	US	UK
	1995-2003	1995-2003
Differences between data including all intangibles and data excluding software		
	(1)	(2)
Labour productivity	0.31	0.34
Capital deepening	0.70	0.50
Human capital deepening	-0.05	-0.05
TFP growth	-0.34	-0.10
Differencess between data including all intangibles and data including software		
Labour productivity	0.14	0.19
Capital deepening	0.42	0.32
Human capital deepening	-0.04	-0.04
TFP growth	-0.24	-0.08

Invest share of MGVA

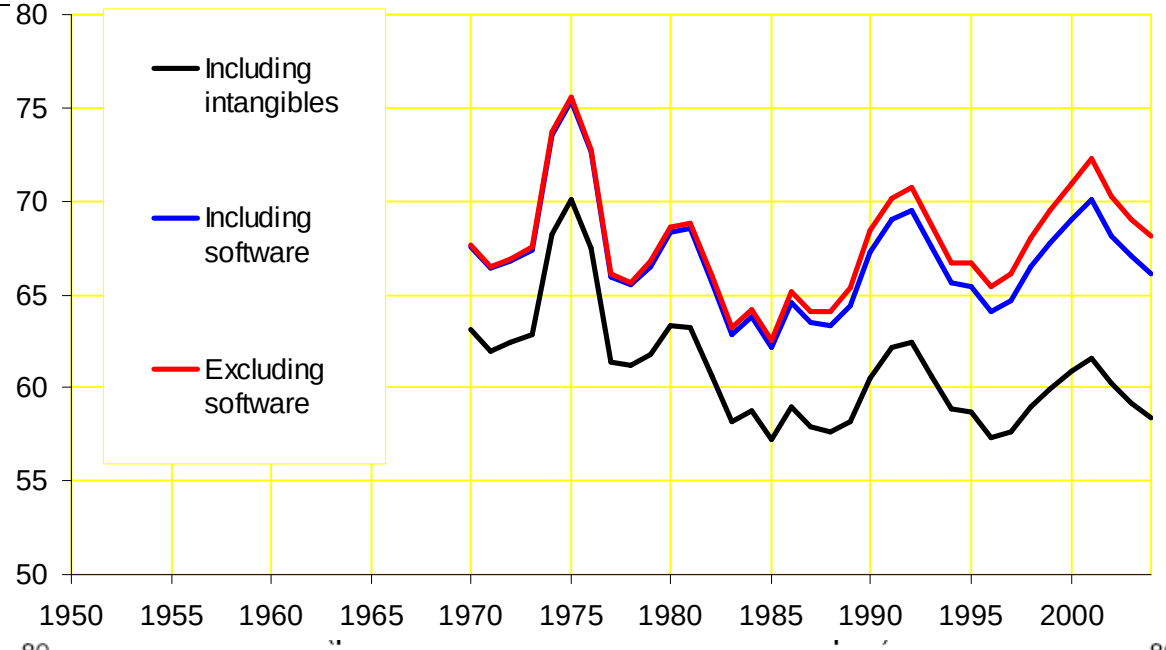


UK

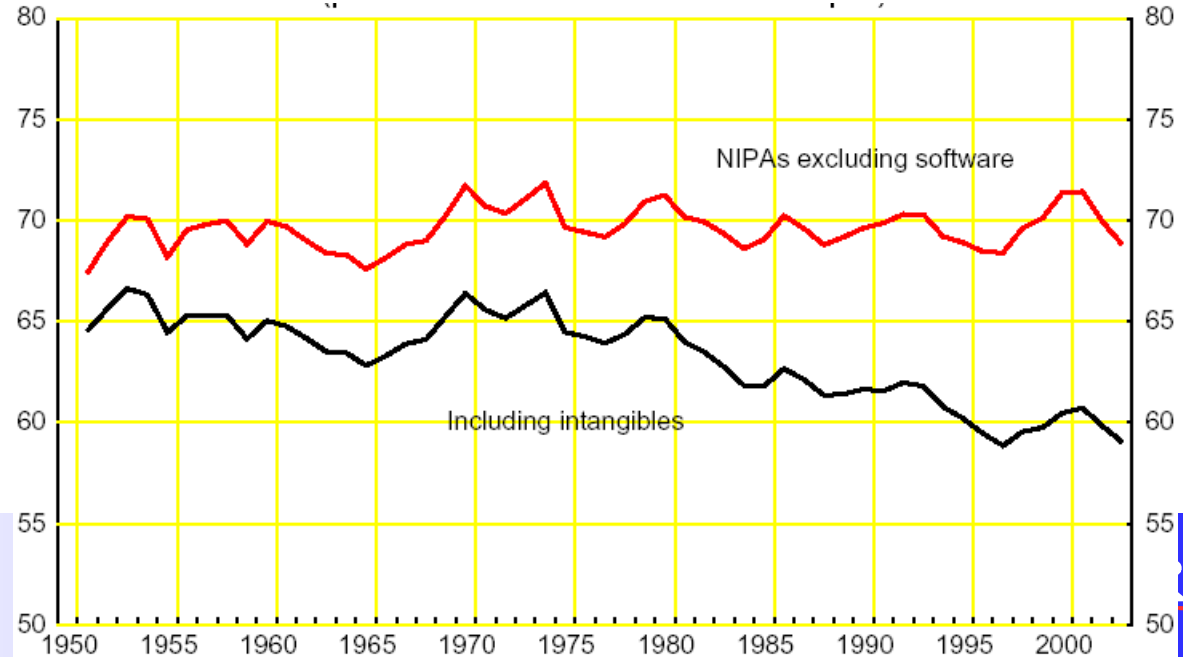


US

Puzzle 2: Lab share / MGVA



UK



US