

COINVEST

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How Does Intangible Investment Affect International Productivity Comparisons? Evidence from the US and UK

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Preliminary work, please do not quote

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Overview

- Productivity level gap enduring question
- Lisbon agenda: “make the EU the most dynamic and competitive knowledge-based economy in the world”
- Incorporation of intangibles is knowledge investment
 - Changes real outputs (value added, V)
 - Changes inputs (tang capital, intang capital, labour, X and TFP)
- Research questions for the paper
 - How does comparative
 - V/L change?
 - X/L change?
 - TFP change?
 - COINVEST will examine for many countries, this a pilot for US versus UK



Theory (e.g. Caves et al, 1982)

$$\ln \left(\frac{TFP^{US}}{TFP^{UK}} \right) = \ln \left(\frac{V^{US} / H^{US}}{V^{UK} / H^{UK}} \right) - \left(\frac{s_k^{US} + s_k^{UK}}{2} \right) \sum_j^N \overline{w}_{jt}^{-USUK} \ln \left(\frac{K_{jt}^{US} / H^{US}}{K_{jt}^{UK} / H^{UK}} \right)$$

$$V^{UK} (\$) = \frac{V^{UK} (\pounds)}{PPP}$$

$$\ln \left(\frac{K^{US}}{K^{UK}} \right) = \sum_j^N \overline{w}_{jt}^{-USUK} \ln \left(\frac{K_{jt}^{US}}{K_{jt}^{UK}} \right)$$

$$\overline{w}_{jt}^{-USUK} = \frac{1}{2} \left(w_{jt}^{US} + w_{jt}^{UK} \right)$$



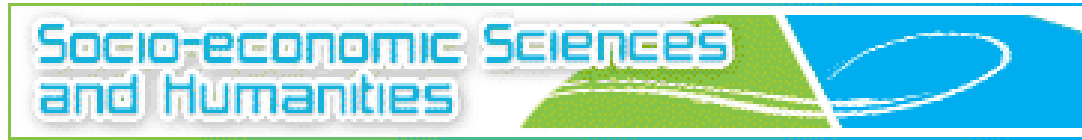
Issues

- Output
 - V = mkt sector real GDP, currently measured and adjusting for intang
 - PPP from Gronigen
 - GDP has some intang e.g. software, minerals. So results for “some intang” versus “all intang”.
 - PPPs: vary across studies
- Labour
 - Employee-hours worked
 - No skill adjustment



Capital

- Bottom-up, PIMs. Aggregation of many assets
- Assets
 - “Some intang”
 - Tangibles (plant, machines, buildings)
 - Software (UK uses US deflators)
 - “innovative property” (UK = minerals, artistic orig; US= minerals)
 - “All intang”
 - Tangibles (as above)
 - Software (as above)
 - Innovative property (as above plus R&D, design)
 - Economic competencies (brands, firm-investment in training, organisational capital)
- PPPs for capital (Gronigen)
- Real VICS benchmarked to year 2000 p^AK
- Rental prices endog (ex post method)

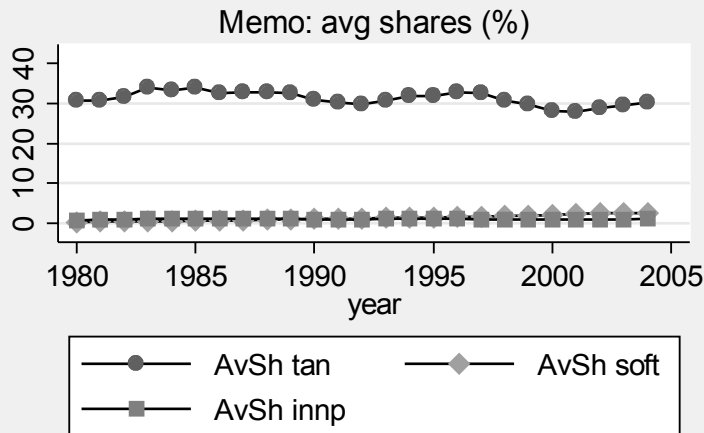
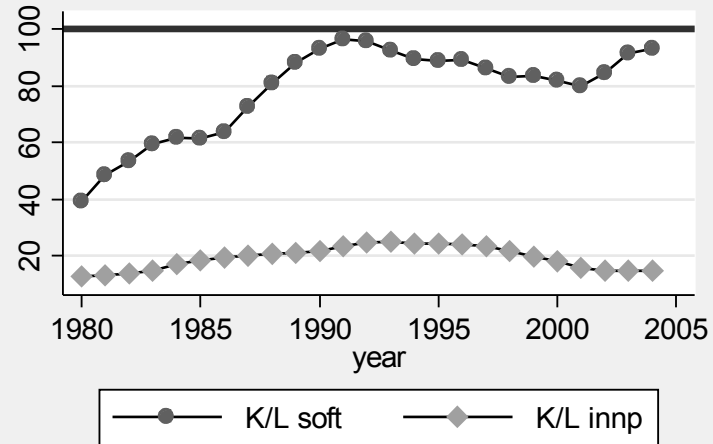
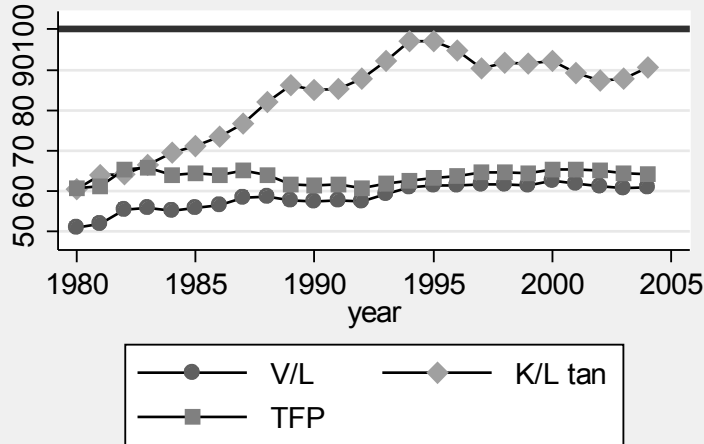


Results

- Within country growth accounting
- Between country levels



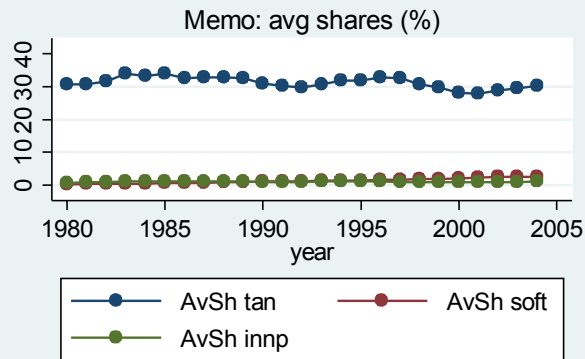
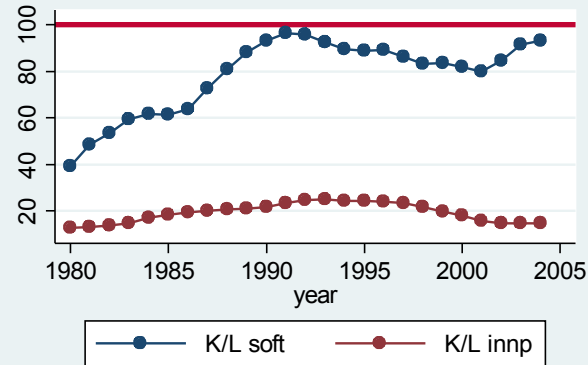
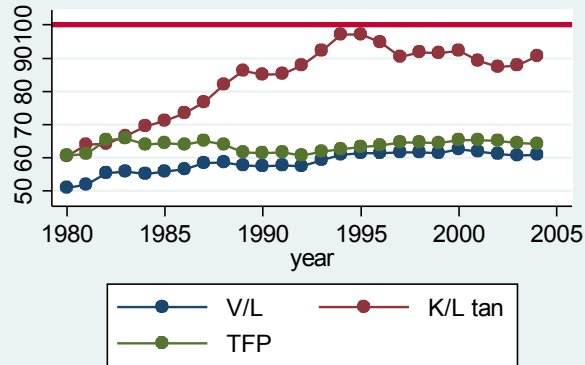
UK v US: Some Intangibles



- K/L tan and soft gap narrow to near zero, so V/L narrows slightly, from 50% to 40%.
- TFP gap about same



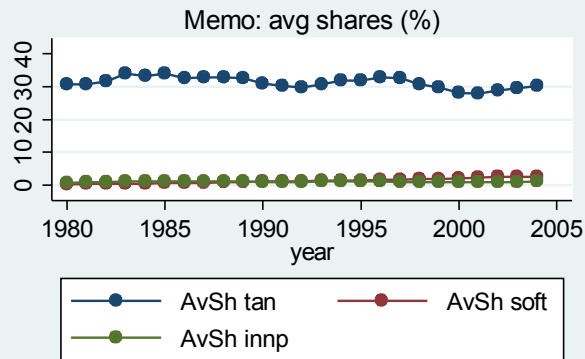
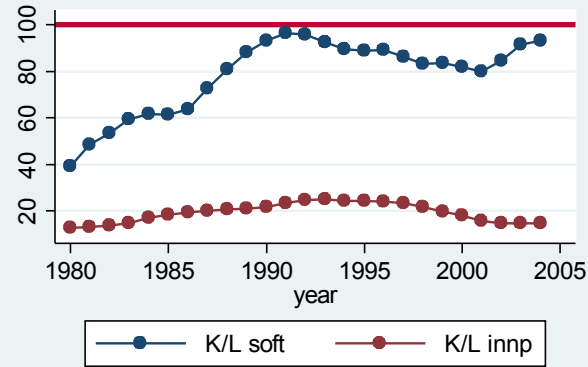
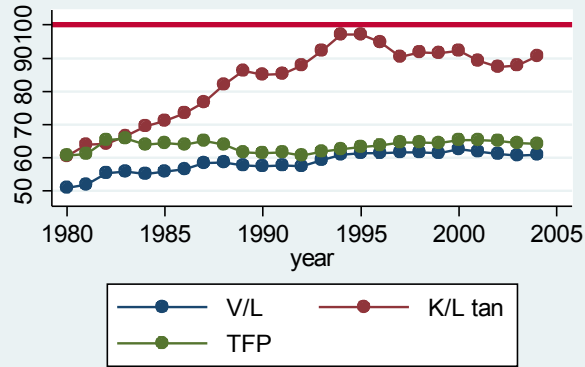
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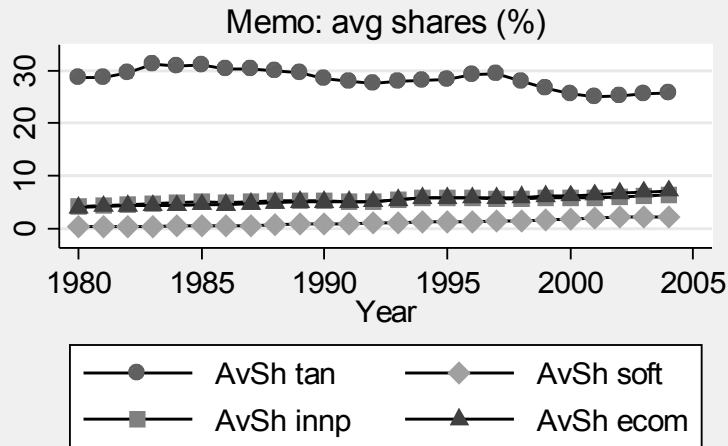
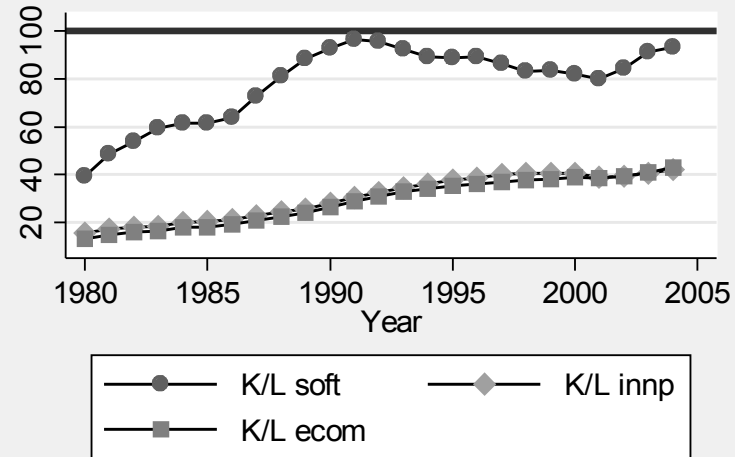
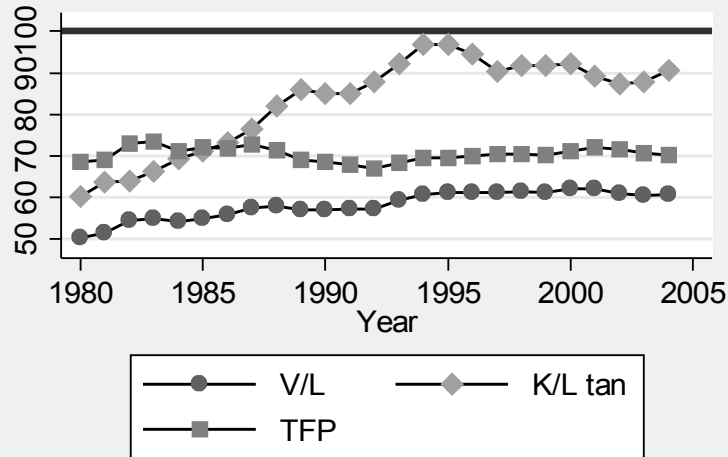
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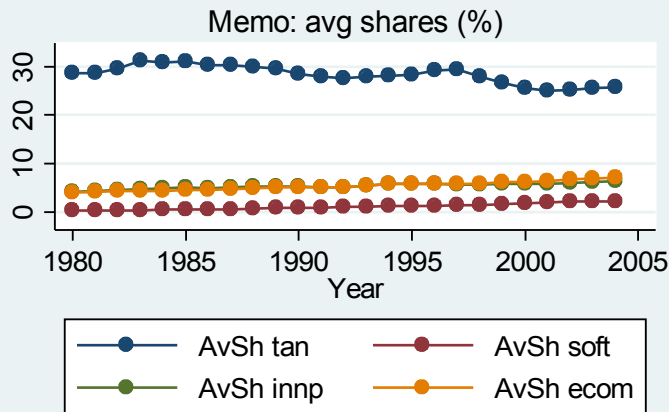
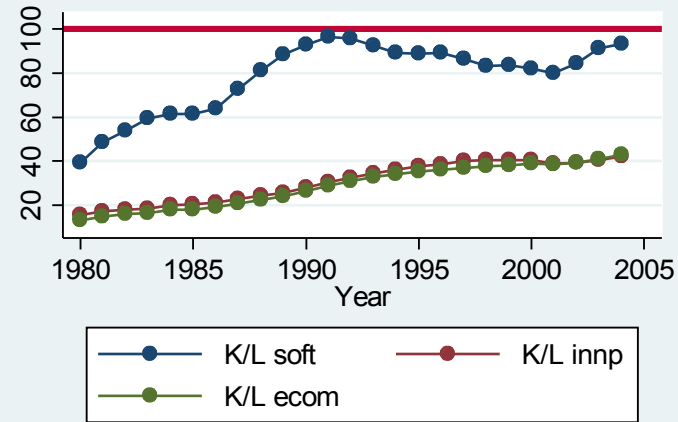
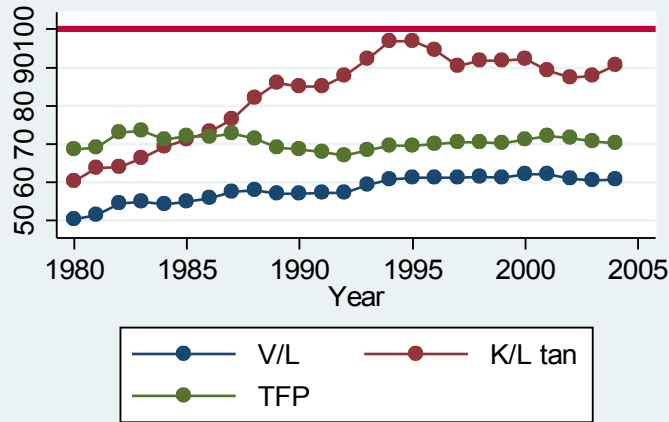
UK v US: Including Intangibles



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- V/L gap narrows
- But TFP fairly constant, tho smaller than before. More on this...



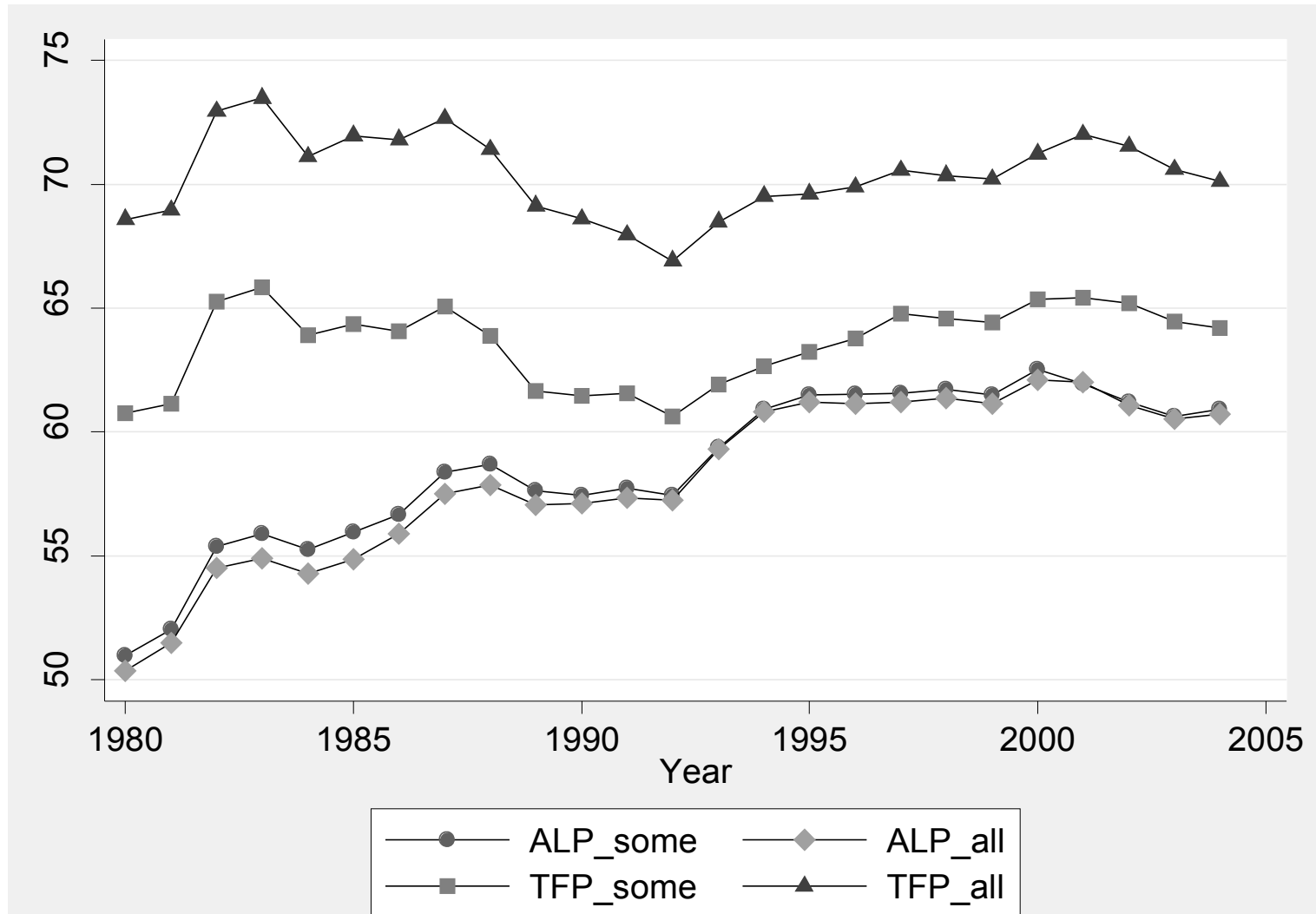
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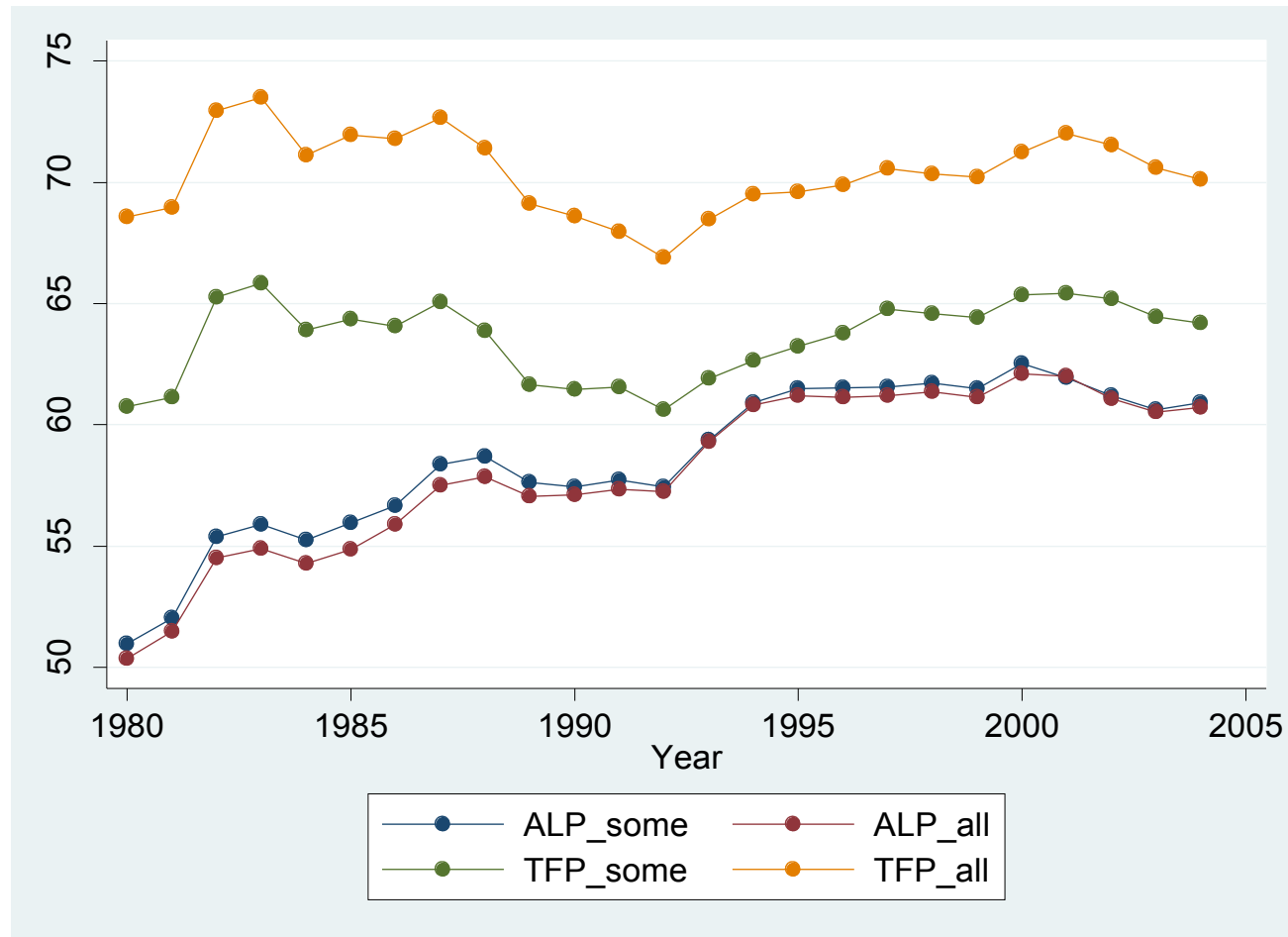


ALP, TFP gaps (US=100)



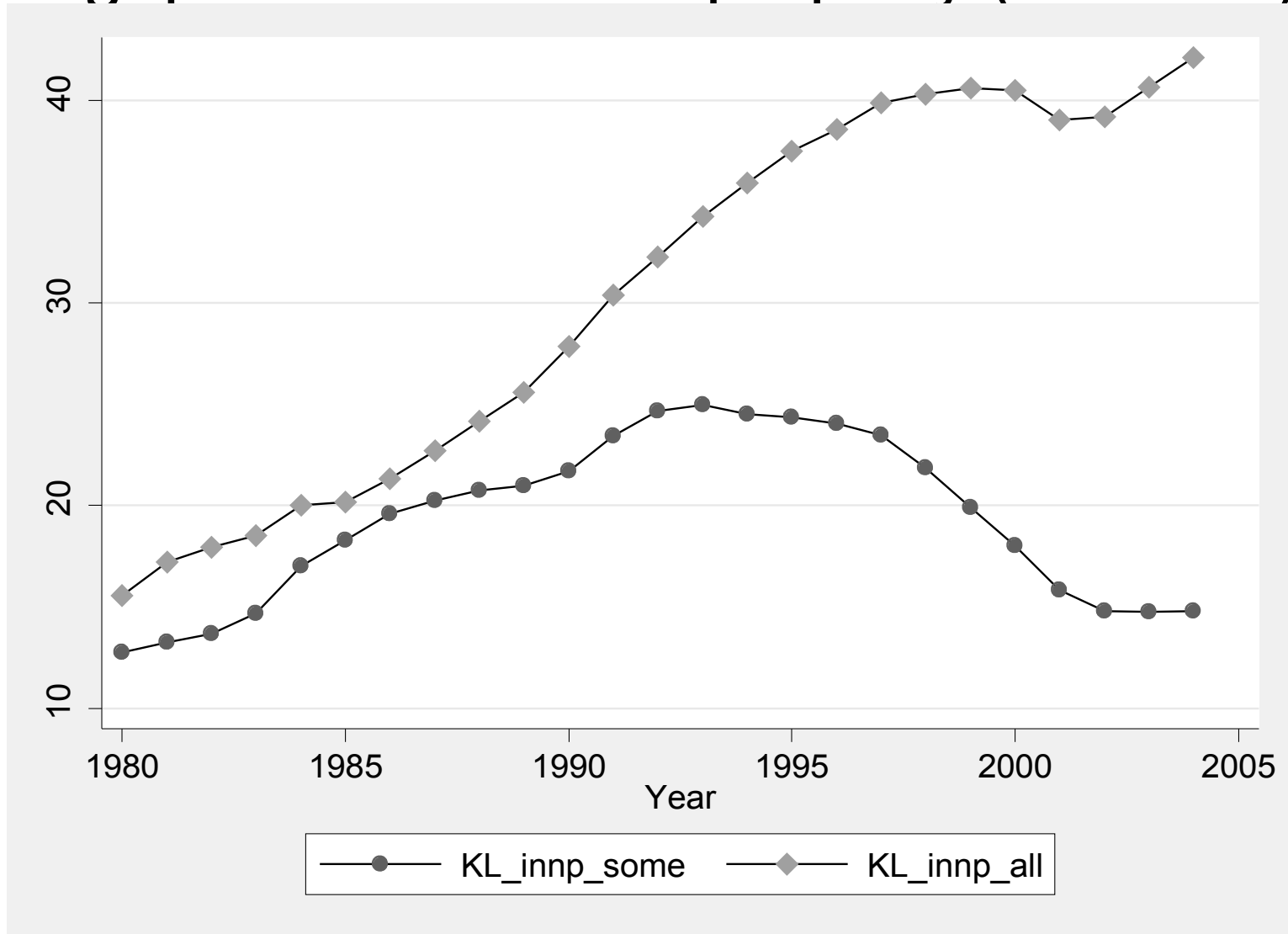


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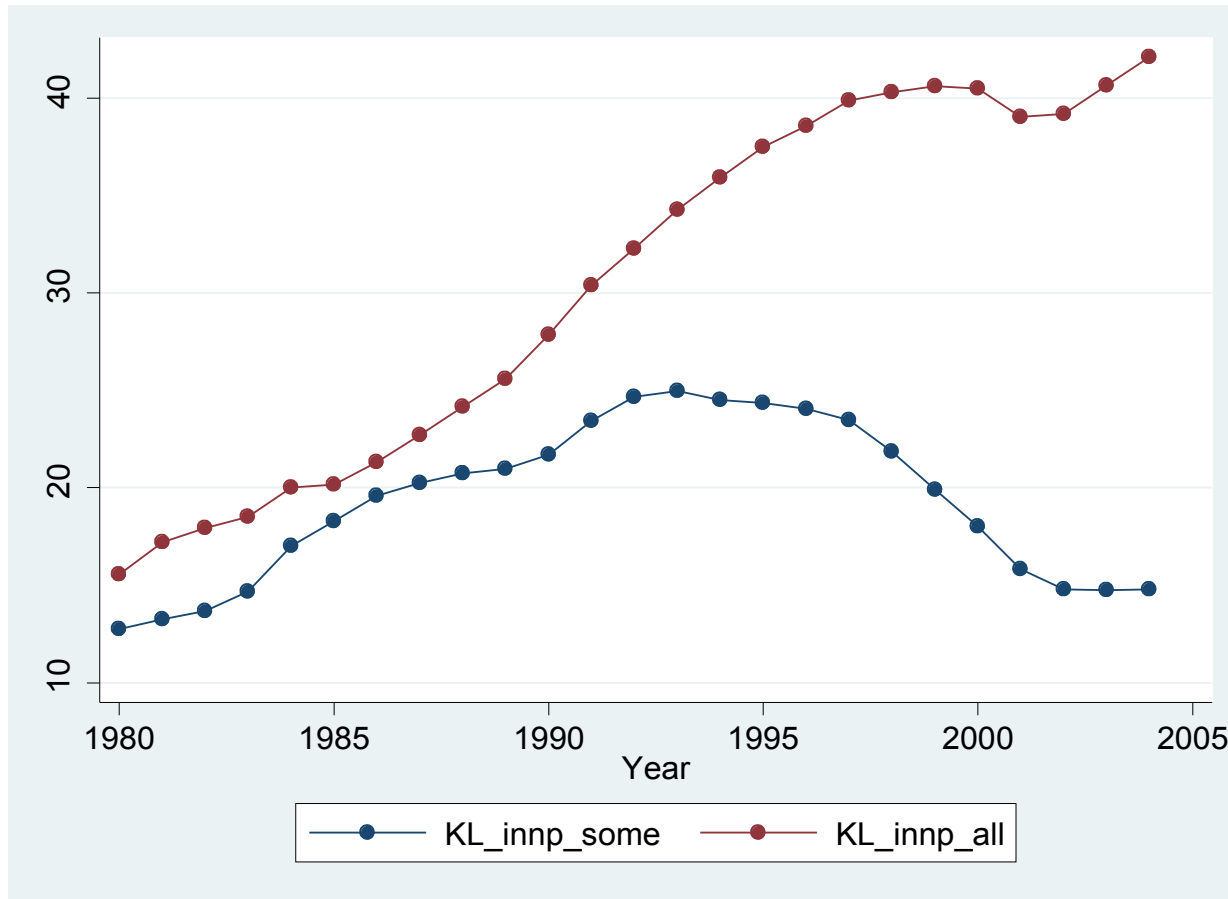


KL gaps for innovative property (US=100)





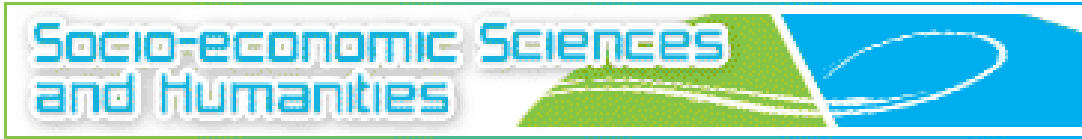
KL gaps for innovative property (US=100)





Summary

- Accounting for the gap
 - Some intang:
 - V/L gap is 40%,
 - 90% TFP
 - All intang:
 - V/L gap is 40%,
 - 70% TFP,
 - 30% ecom and innp
- Further data, more countries
- Lisbon agenda (for the UK)
 - Focus on R&D: still gap, well known
 - Software: effectively no gap
 - Other knowledge investments: UK lags



Spares



Decompositions, some and all intang

year	rlnALP	conKL_~tan	conKL_~soft	conKL_~innp	rlnTFP
1980	0.67	0.15	0.00	0.02	0.50
1990	0.55	0.05	0.00	0.02	0.49
2000	0.47	0.02	0.00	0.02	0.43
2004	0.50	0.03	0.00	0.02	0.44

	Overall					
year	rlnALP	conKL_~tan	conKL_~soft	conKL_~innp	conKL_~ecom	rlnTFP
1980	0.69	0.15	0.00	0.08	0.08	0.38
1990	0.56	0.05	0.00	0.07	0.07	0.38
2000	0.48	0.02	0.00	0.05	0.06	0.34
2004	0.50	0.03	0.00	0.06	0.06	0.36