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INNOVATION POLICY IN THE RECESSION

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Outline of Presentation

- The current situation
- Discussion of whether constraints on innovation are better discussed in a long-run or short-run perspective
- Innovation and Governance

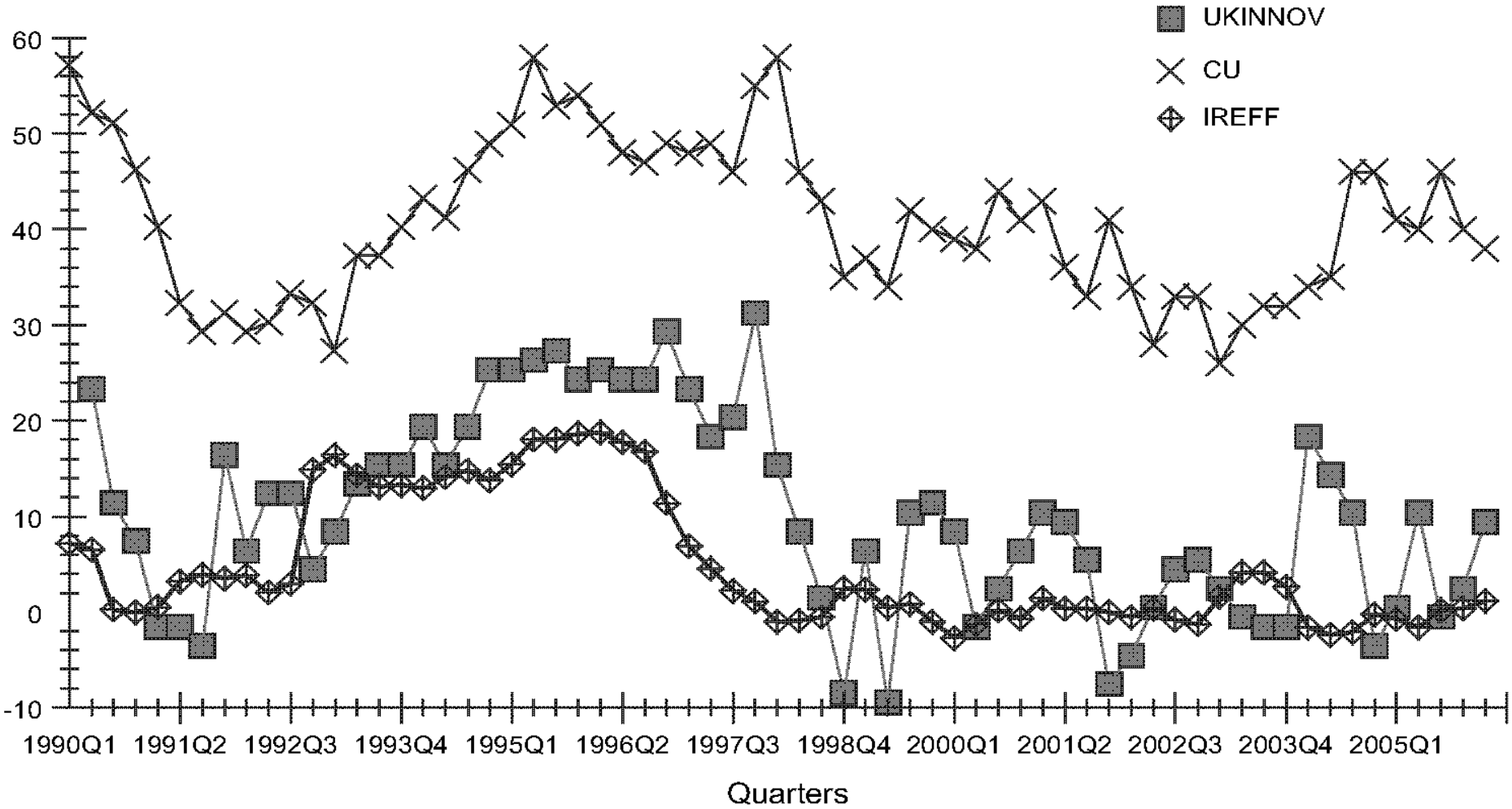
Why short-run relief should not extend to long-lived optimism: the need for radical policy reform in innovation

- There are several reasons for short term complacency in respect to innovation in the financial crisis.

- 1. Innovation tends to be given a relative boost in depressions

- 2. There is no *general* financial squeeze

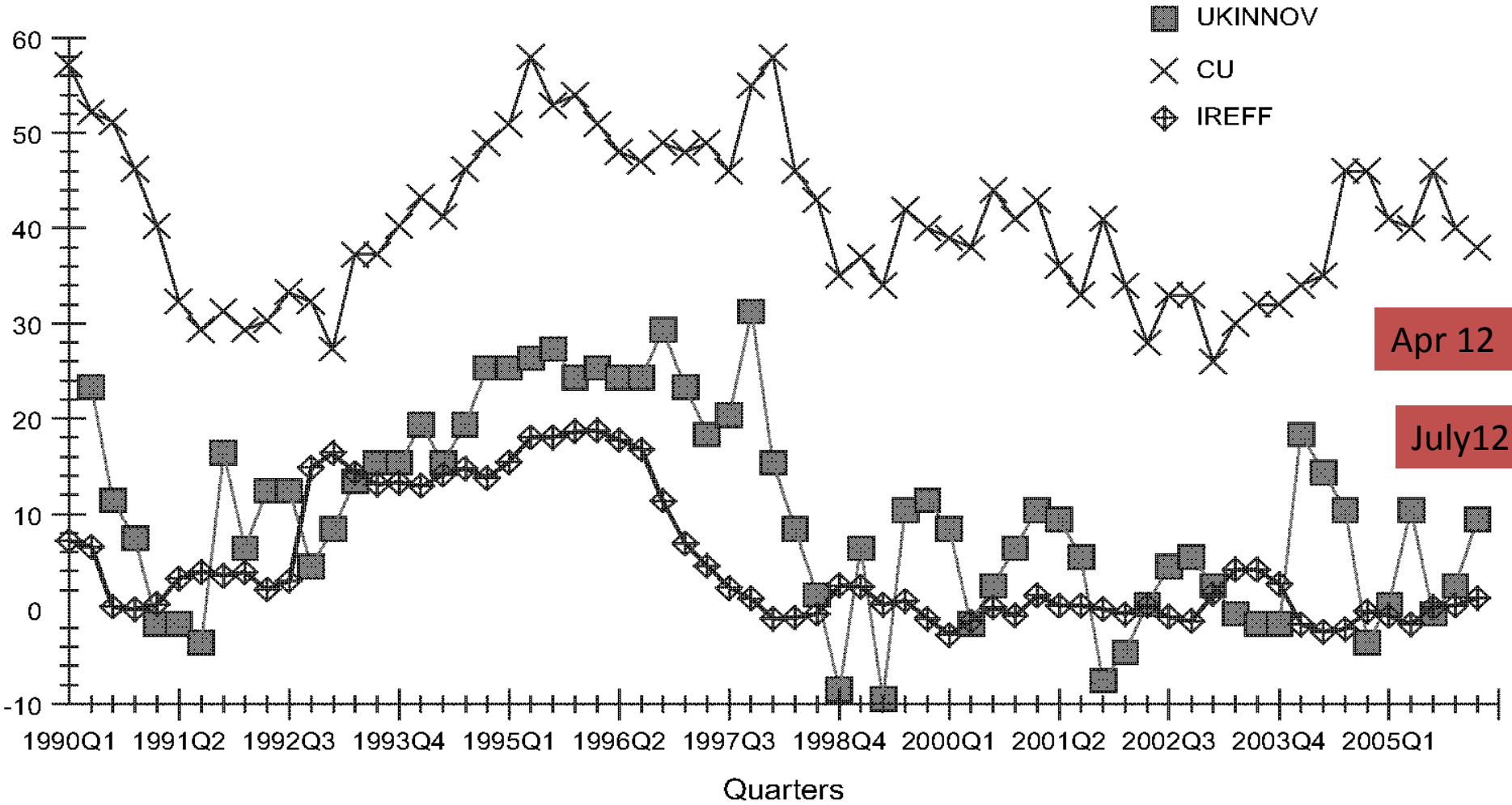
Innovation growth rate in UK manufacturing Crisis (Driver & Oughton 2008) using CBI data



CU=utilization

IREFF=inverse real effective exchange rate

Innovation growth rate in UK manufacturing Crisis (Driver & Oughton 2008)



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Is innovation really pro-cyclical?

- Without distinguishing forms of innovation, it appears as mildly pro-cyclical. This is because a lot of innovation is correlated with investment spending which is clearly cyclical.
- When capital spending falls there is usually free cash flow and skilled labour slack available to be applied to new ideas. The rate of return on cost-saving innovations may also rise where demand becomes more competitive. New markets may be indispensible as old ones disappear.
- Some empirical evidence notes that innovation expenditure is more robust to the crisis than capital expenditure (Geroski and Gregg 1993)
- Recent data from the CBI show innovation at relatively high levels – being above long term mean in April and July this year

Is Innovation Finance Constrained?

- The notion of business as finance constrained due to the financial crisis is not proven.
- Banks have increased their reluctance to lend but companies are also probably less disposed to ask for money.
- Non-bank financing for small firms exists
- Venture capital is at its long term average
- No doubt there is a finance gap but it is not clear that it has got much worse

Dependent variable is INVESTMENT INTENTIONS BALANCE

Regressor	SMALL	MEDIUM	LARGE
CONST			
LDV	***	***	***
OPT	***	***	***
OPT(-1)	***		†
DUMCRISIS*OPT	*	*	*
R-Squared	0.865	0.619	0.577

CBI ITS data. I am grateful to the CBI for access to this data.
102 observations used for estimation from 1987Q1 to 2012Q2
All variables have expected signs ; no evident diagnostic problems.
Note: two-sided significance *** (0.1%) **(1%) *(5%) †(10%)

Extended Specification

- **Credit constraint**: CBI response on twelve month forecast of "inability to raise external capital".

- Since "capital accumulation and financial constraints determined simultaneously" (Von Kalckreuth 2006) we construct residual from a autoregression with two lags that includes the logit of capacity utilisation count for each size class. These residuals (FINCON) are included in the next slide of reported investment results.

Dependent variable is INVESTMENT INTENTIONS BALANCE

Regressor	SMALL	MEDIUM	LARGE
CONST			
LDV	***	***	***
OPT	***	**	***
OPT(-1)	**		*
DUMCRISIS*OPT	***	**	***
FINCON(-1)	**		
DUMCRISIS*FINCON(-1)			***
R-Squared	0.876	0.719	0.716

CBI ITS data. I am grateful to the CBI for access to this data
102 observations used for estimation from 1987Q1 to 2012Q2
The medium group includes an outlier dummy for 2009Q1
All variables have expected signs ; no evident diagnostic problems.
Note: two-sided significance *** (0.1%) **(1%) *(5%) †(10%)

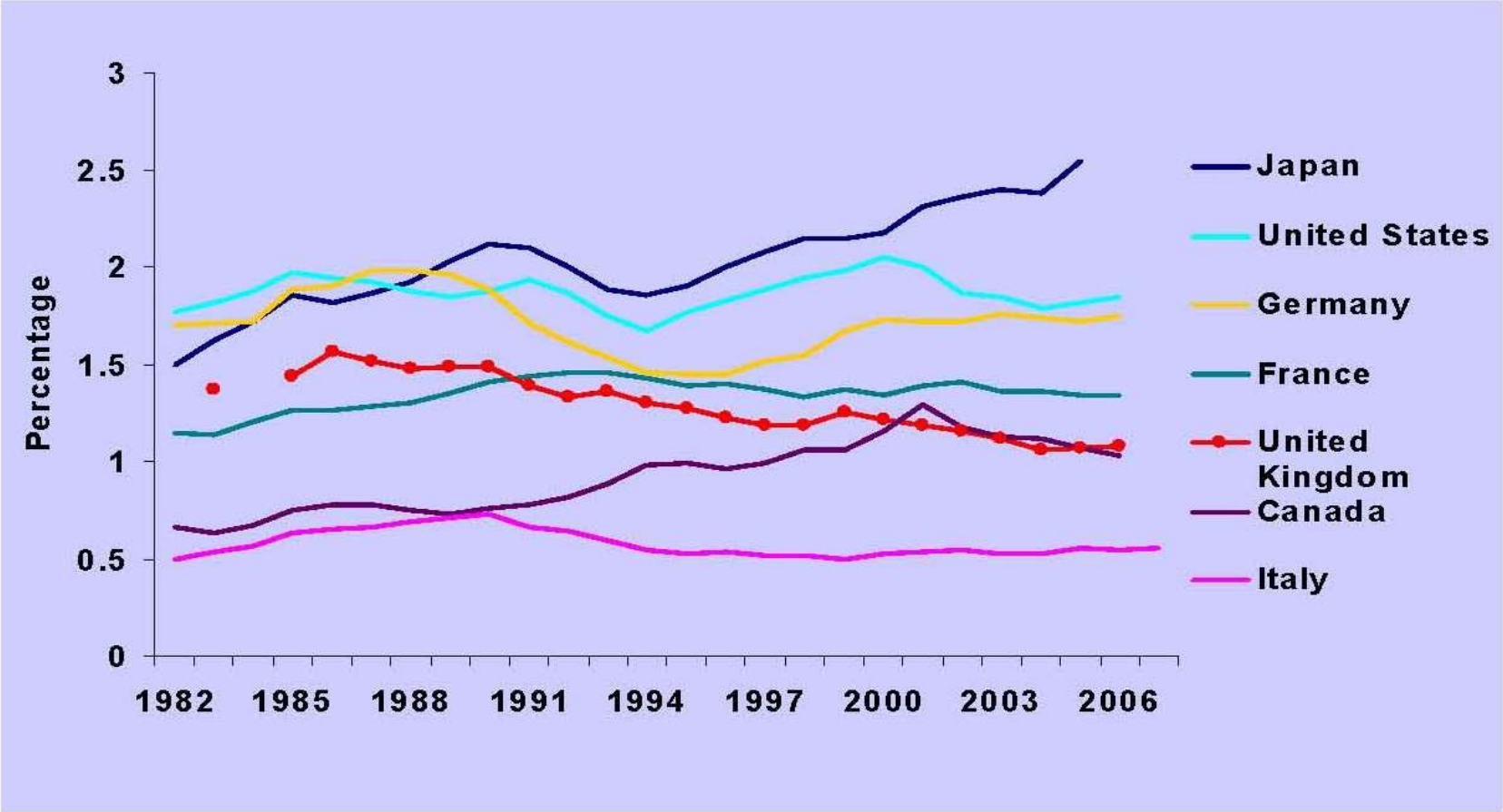
Financial constraint on innovation in the crisis?

Small firms seem to experience a financial constraint similar to previous cycles (the financial accelerator effect) while medium firms *do not seem to have a finance constraint over the whole period.* Large firms' financial constraints probably relate to the difficulty of raising equity finance and doing deals.

All of this suggests that finance is not the major constraint on firms that want to innovate, especially those of medium size.

The short-term story is that innovation of a non-capital intensive kind is continuing during the crisis – but that does not mean that there is not a long run problem.

Figure 7: Business R&D as percentage of GDP, G7 countries



Source: OECD MSTI 2007-2

Explaining R&D Trends – A role for governance?

- CEO tenure down and performance-related turnover up, in all regions (Kaplan & Minton 2006; Booz Allen 2009).
- Shift to external directors (Higgs 2003)
- Shift to metrics such as EVA (Rebérioux 2007)
- More active shareholders (ICR 2006)
- Buy-backs (Hill and Taylor 2000;Lazonick 2008;Perraudin et al 2008)
- Greater legal protection for shareholders (Conway et al 2008)

Long run performance of innovation?

Arguably, R&D has become more influenced by ownership and corporate governance as companies have adopted a more shareholder-oriented view.

A strong shareholder-oriented approach may be inappropriate for industries where intrinsic motivation is required, due to asymmetric information, inability to monitor and the low relationship between individual effort and group results.

Boards and investors may react by discouraging R&D and by returning money to shareholders

Principal-Agent approach & team work & multi-tasking.

- Monitoring is difficult e.g. where production is team based. Incentives also have difficulties e.g. They may encourage free-riding within the team. Where multi-tasking is involved high-powered incentives may result in disproportionate attention given to tasks that are measureable or easily linked to a measureable output. Incentives can spur risk-taking, but there is both an agency cost in doing so if the agent is risk -neutral or averse and a danger of excessive risk-taking if there is downside protection for agents or if behavioural patterns are poorly understood. All of these are just the normal forms of difficulties faced in many standard contract arrangements (He and Wang 2009).

Principal-Agent view is less relevant in the sphere of knowledge intensive work

- Knowledge intensive work is different because it requires inputs that cannot be verified and produces outcomes that may be difficult to value even ex-post because they are frequently in the form of options.
- Some solution must be found to align to make reward and effort corresponding
- This cannot easily be done with the standard management and governance approaches

Long run performance of innovation?

The empirics suggest a complex pattern.

On the one hand, tighter governance results in a greater proclivity to patent and to extract greater value from a given amount of R&D.

However there is also emerging evidence that tighter Corporate Governance puts pressure on companies feel to return cash and reduce R&D spend (Driver and Guedes, Research Policy 2012 Volume 41, Issue 9, November 2012, Pages 1565–1577

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A dichotomy of views : is technology causing a problem for innovation management OR is exogenous governance change the source of the difficulty in managing innovation?

- 1. *innovation as a **management** issue*: the challenge arises from exogenous technical developments requiring more intellectual and creative involvement of the workforce. On this view, a compositional switch to intangible resources presents a new set of managerial challenges that were not deemed important in a world dominated by fixed assets.
- 2. *Alternatively the issue is one of **governance***: governance procedures have for distinct reasons changed radically in ways that are ill-suited to knowledge-intensive activities so that the management task has been made more difficult in respect of innovation.

Crucial to understand the causal structure of the issues that connect innovation, management and governance.
Two different structures are illustrated below:

The Principal-Agent view has lost support in the literature ...

The Resource-Based View of the firm distances itself from the agency approach: "…instead of conceptualising the firm as an institution that exists because it hinders something such as opportunistic behaviour, it is rather seen as existing because it promotes something namely the production of new options" (Foss 1998 p.15). In this spirit, Demsetz (1997) argued for an alternative focus on planning in an uncertain world that required attention to "problems of product choice, investment, marketing policies and scope of operations" (p. 428). Others,writing within the dynamic capabilities sphere: say that "...the emphasis is not just on protecting value but also on creating it" (Helfat and Teece p.28).

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Microfoundations approach: a managerial remedy for a governance problem?

A new literature is emerging on the *microfoundations* of the link between human relations management and knowledge-based work. (Minbaeva et al 2009). This rejects a focus on intrinsic motivation which is seen as ignoring issues of transaction and bargaining costs (Felin et al 2009). Among the measures proposed are the adoption of a partnership model for organizations and a drive to "disaggregate and organise their human capital into smaller and more focused groups and subunits thus allowing for alignment between abilities or effort and rewards " (p.562). Recognising the difficulties of monitoring, a solution is sought in self-selection for jobs where matching is important; e.g. sorting by risk attitude may sometimes mitigate the agency problem.

Microfoundations approach: sticking plaster or cure?

The microfoundations approach like others before seeks to resolve the governance problem by mimicing the high-powered effects of markets inside firms. These ideas usually involve small scale, greater initiative, decentralisation and higher targeted incentives.

There is nothing wrong with such management routines. But they do not seem to address the problem that firms are there to coordinate as well as to motivate.

Management routines have to be embedded in a supportive governance structure if they are to be truly effective

THE END

External capital markets necessitated by pace of change?

- RELATEDNESS: "When it comes to moving capital long distances from declining industries to emerging industries, markets do it more effectively than managers…This is one place where Europe may face problems compared with the US" (Holmstrom 1999a)

- "[Thus] …external capital markets have taken on a larger share of the reallocation of capital" (Holmstrom & Kaplan 2001)

Varieties of capitalism?

	Investment in non-contractible human capital	Proclivity to exploit new strategic opportunities	Facilitated by worker bargain-ing power being:	Capital market
Shareholder governance	Low	Large	Weak	external
Stakeholder governance	High	Small	Strong	internal

Based on Roberts & Van den Steen

Evidence on VoC

- Patent counts and publications
- Radical/incremental innovation: distinction based on forward citations
- Discriminating pattern between radical and incremental innovations in CME and LME countries?
- Difficult to support a varieties of capitalism view for form of technology, though the US is an outlier

(Taylor 2004)

Importance of External Allocation for Sectoral Transfer

- Transfer of resources across (heterogeneous) sectors explains US – Europe gap?
- Testable using shift-share analysis of productivity
- The data do *not* show this (Maudos et al 2008). US hourly labour productivity advantage over Europe lies within sectors (47-sector decomposition) and relates to whatever starting composition it had before the 1990s.