Knowledge Based Capital:
The Role of Investments in Management Practices

Kathryn L. Shaw

December 3, 2012

A Policy Framework for Knowledge-Based Capital

OECD Directorate for Science, Technology and Industry

and MIT Center for Digital Business

STANFORD
GRADUATE SCHOOL OF BUSINESS

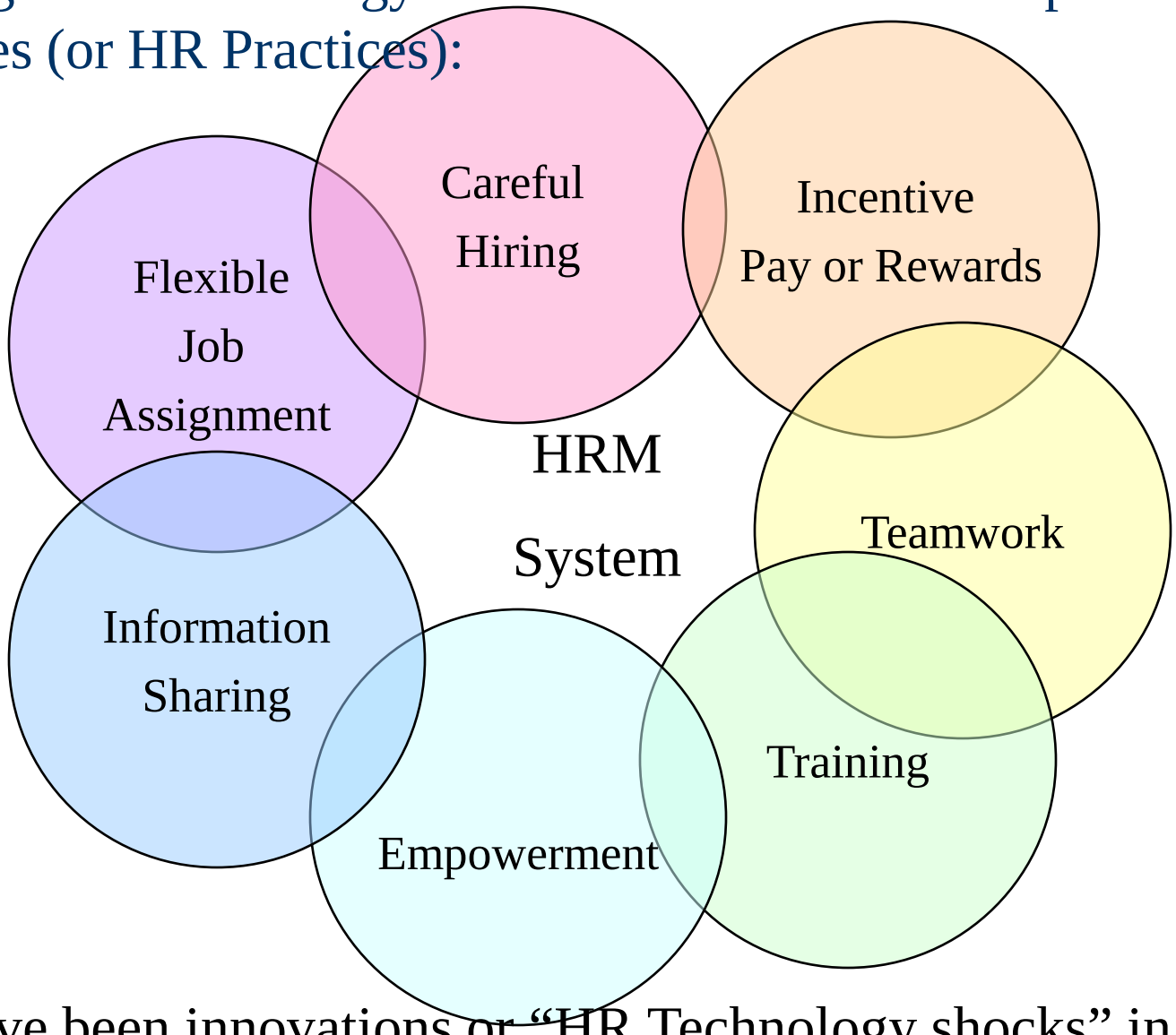
What are the questions?

1. How have firms' management practices changed over time?
2. How much do managerial innovations raise productivity, and why?
3. What policies encourage new investments?

Four Key Points

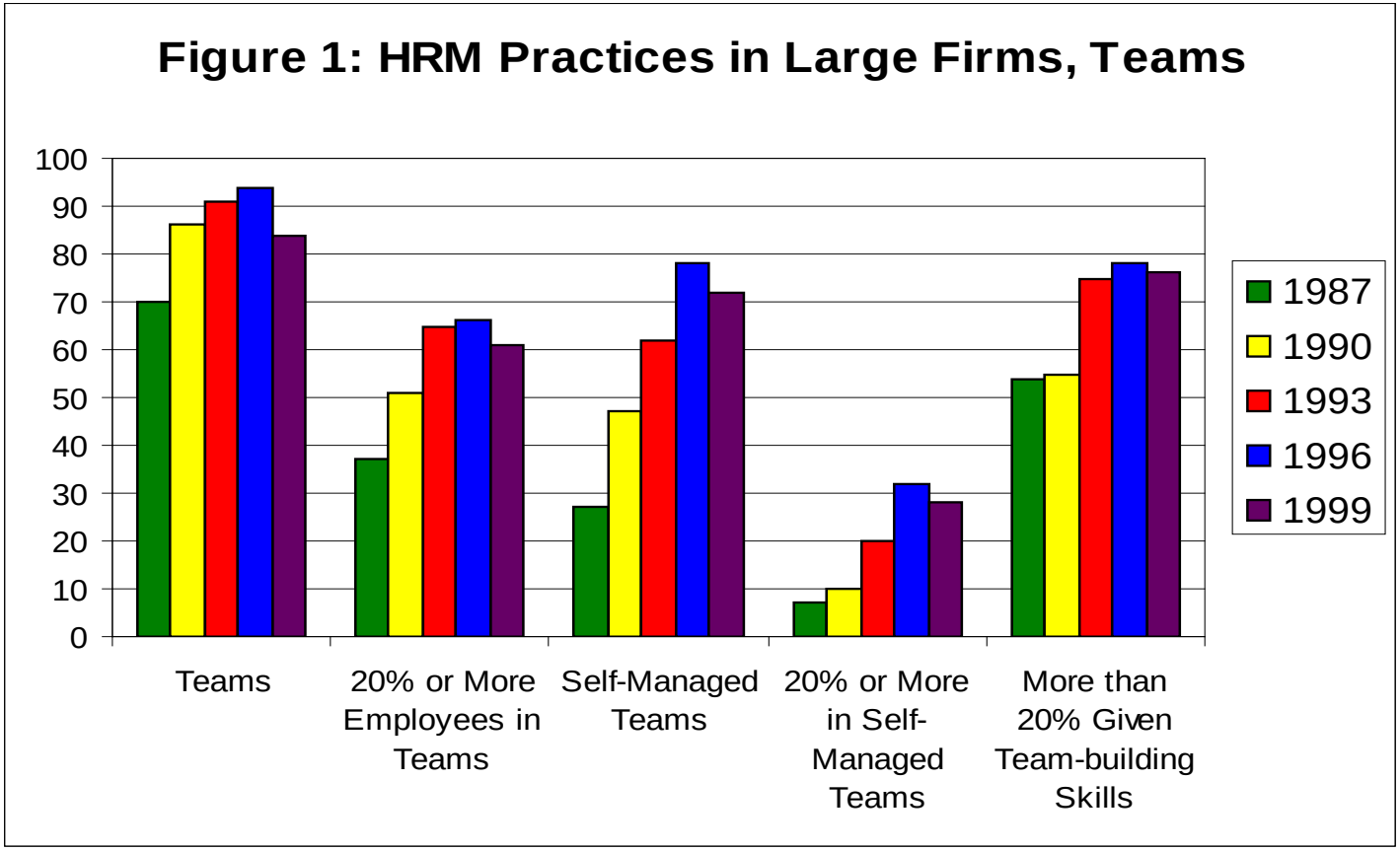
Key Point 1: “HR Technology Shocks” have been sizable.

Defining “HR Technology Shocks” as Innovative People Management Practices (or HR Practices):



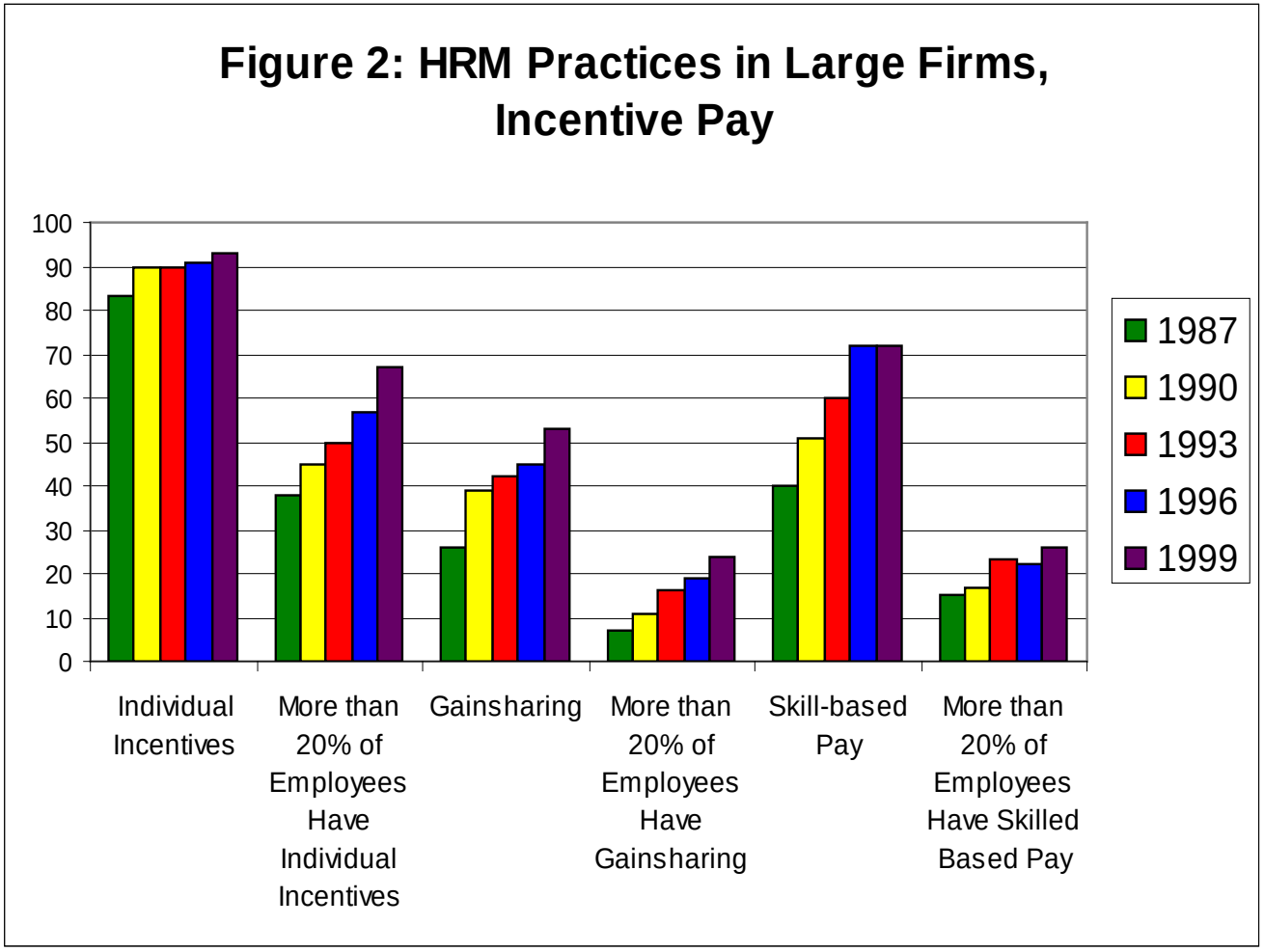
There have been innovations or “HR Technology shocks” in all areas. These are comparable to the “IT Technology Shocks” we know.

The first round of HR innovations were teamwork.



Original data: see also Lawler, Mohrman, and Benson (2001), Shaw (2003a,b), Lazear and Shaw (2007).

The first round also included incentive pay.



See footnote to Figure 1.

The use of Performance pay is still rising, but hard to measure because it comes in so many forms.

Incentive Pay

Individual	Team
• Piece pay rate (pay tied by a formula to production or sales) (7% of firms) • Skill based pay (72% of firms) • Individual incentives (bonuses or compensation tied to short term or long term performance) (93% of firms) • Typical individual incentives (some unmeasured) •Merit based raises in base pay •Special targeted bonuses •Promotions (tournament)	• Work Comp Incentives (80% of firms) • Gainsharing (53% of firms) • Profit Sharing or Stock Plan (greater than 70% of firms)
Intangible incentives •Worker or team assigned to better job tasks •Achieve higher status relative to peers Noon monetary recognition (96% of firms)	
Measurement of performance – examples •Services •Manufacturing •Knowledge of workers' performance evaluations (tools such as Vitality Curve, Balanced Scorecard, and Software of Success Factors)	

* Barkume and Moehrle (2001)

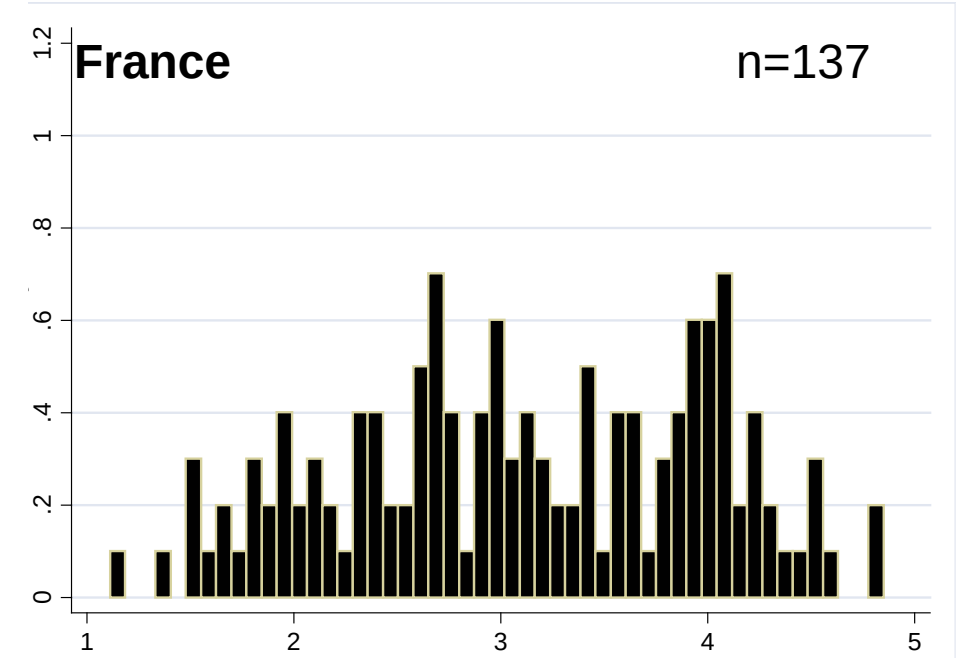
** Lawler, Mohrman, Bensen (2001), Table 5.1

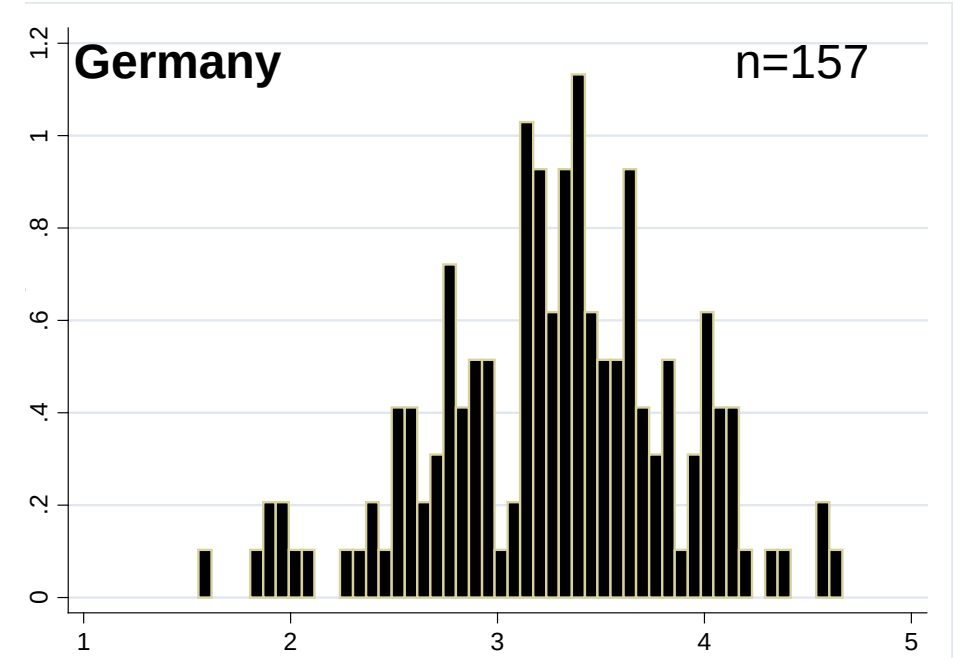
The adoption of High Performance Work Practices varies across countries.

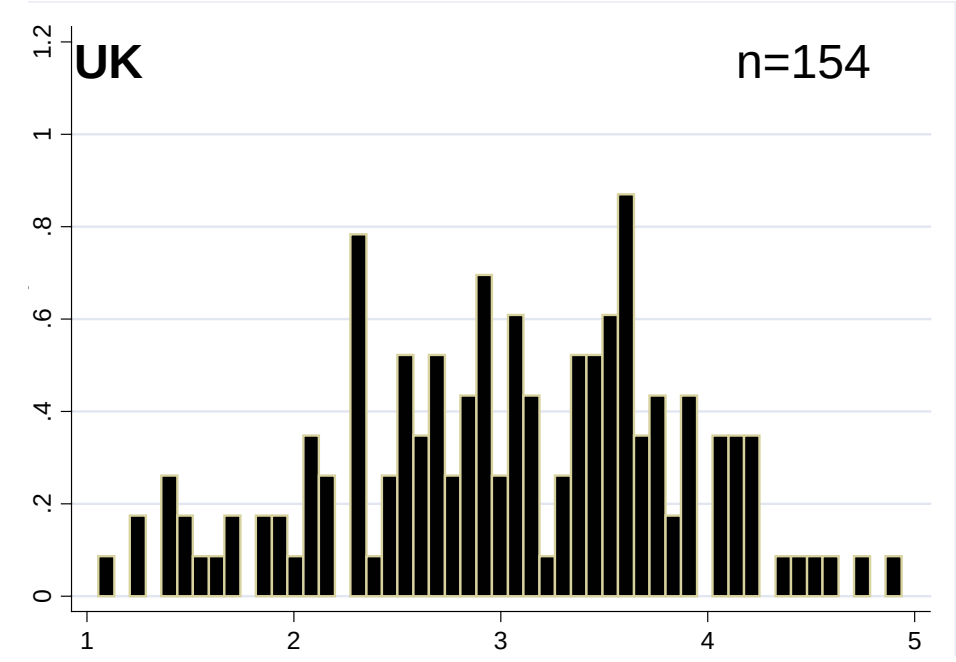
Table 2: Indices of Involvement in HPWOs				
Country	**Work System**	**Skill**	**Incentive**	**HPWO**
	Index	**Index**	**Index**	**Index**
Austria	0.602	0.012	0.028	0.214
Belgium	0.553	0.008	0.03	0.197
Denmark	0.617	0.016	0.018	0.217
Finland	0.57	0.01	0.066	0.215
France	0.548	0.008	0.06	0.205
Germany	0.522	0.008	0.032	0.187
Greece	0.477	0.006	0.019	0.167
Ireland	0.649	0.012	0.025	0.228
Italy	0.497	0.006	0.034	0.179
Luxembourg	0.596	0.013	0.04	0.216
Netherlands	0.66	0.013	0.041	0.238
Spain	0.488	0.016	0.022	0.176
Portugal	0.487	0.011	0.003	0.167
Sweden	0.57	0.01	0.062	0.214
UK	0.675	0.017	0.064	0.252
EU-15	0.562	0.011	0.042	0.205

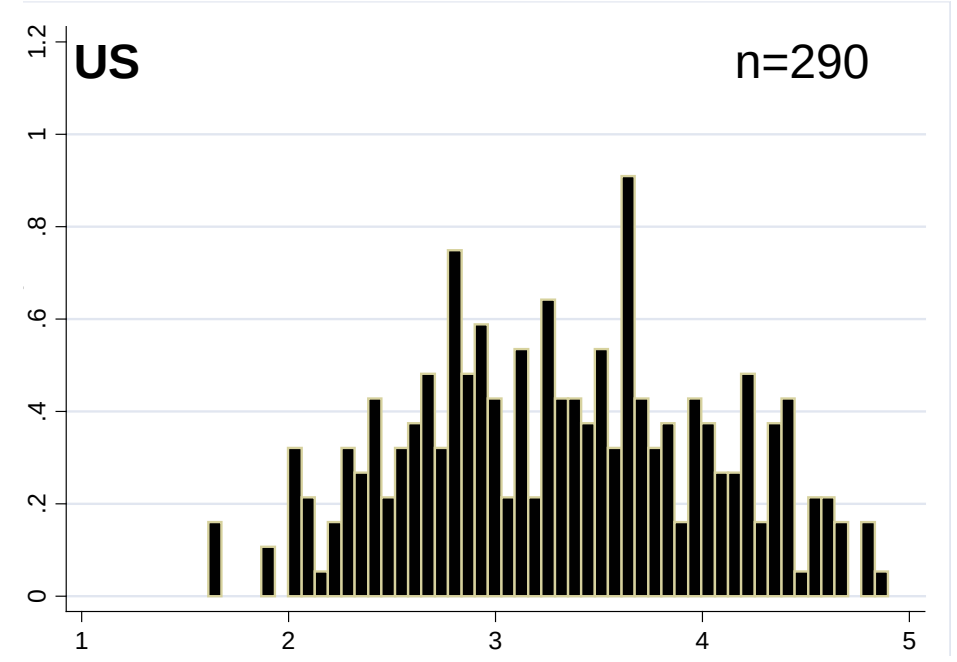
Source: Thomas Bauer, ESWC, 2000.

Bloom and Van Rennen (2007) MANAGEMENT SCORES









Bloom and VanReenen: Management Score by Country

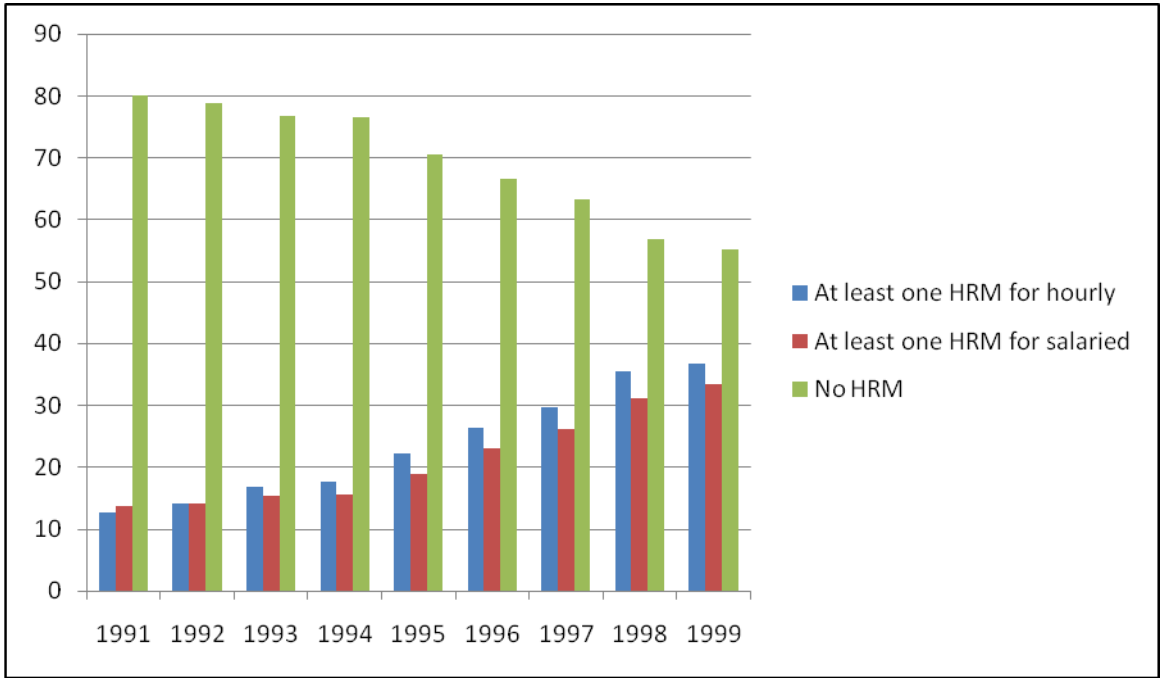
Typical UK managers?

Bad manufacturing management - a UK tradition?

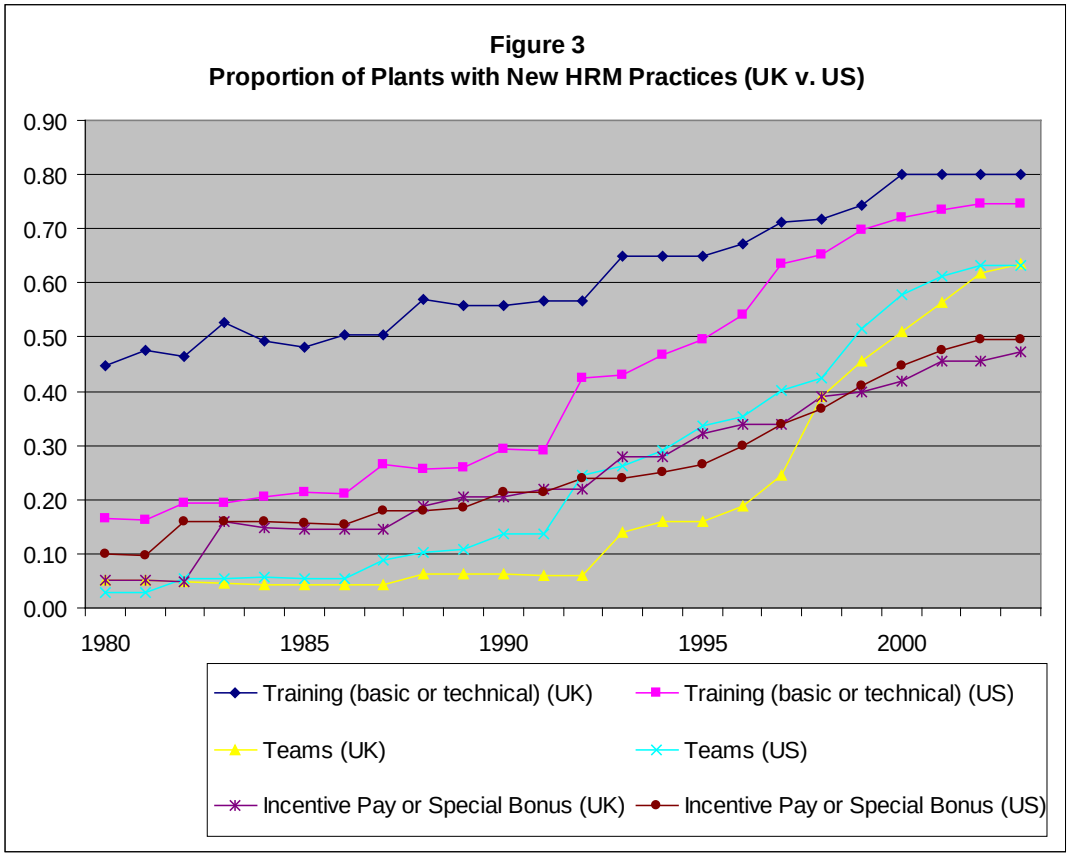
> "*Efficient management is the single most significant factor in the American productivity advantage*"
> [Marshall Plan Anglo-American productivity mission, 1947]

Denmark: similar time series trends.

Source: Tor Eriksson

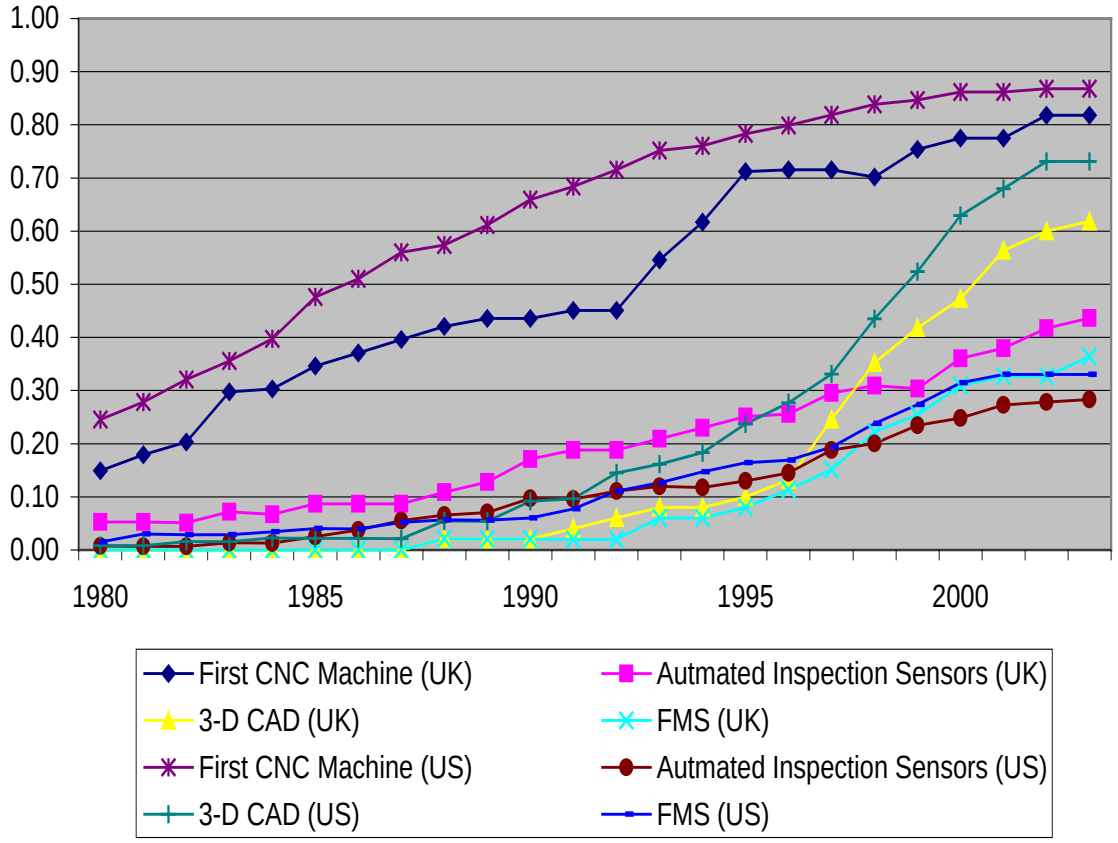


HR Innovations occurred within narrowly defined small industries (Proportion of Valve-Making Plants with New HRM Practices, UK and US)



Sources: Bartel, Ichniowski, Shaw (*QJE*, 2007)
Bartel, Ichniowski, Shaw and Correa (2008)

HR Innovations occurred within narrowly defined small industries (Proportion of Valve-Making Plants with Computer-Aided Production Technologies, UK and US)



Source: Bartel, Ichniowski, Shaw (*QJE*, 2007)
Bartel, Ichniowski, Shaw and Correa (2008)

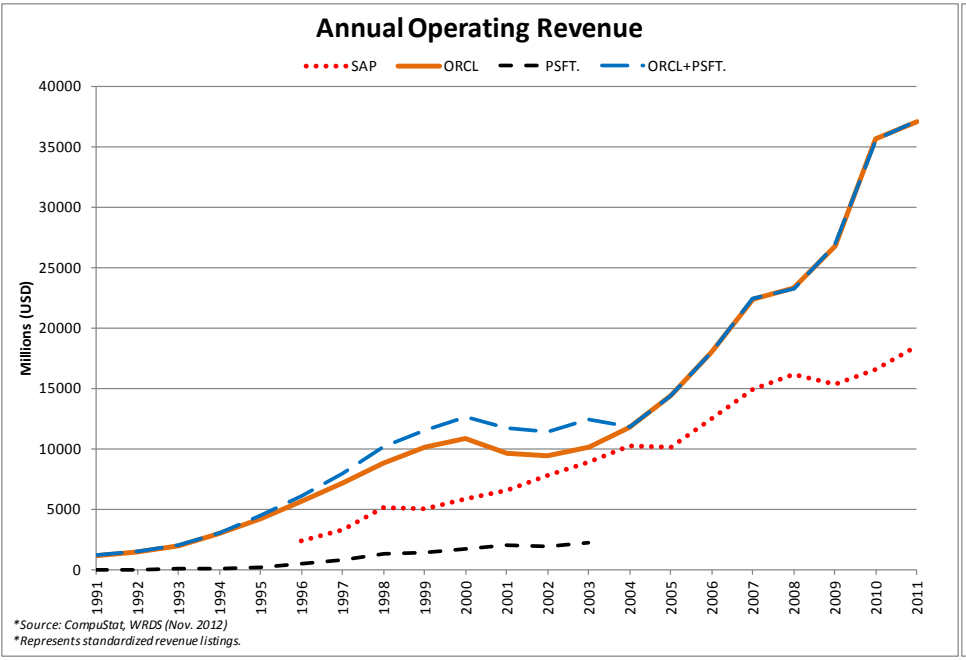
Today's HR Innovations are not measured.

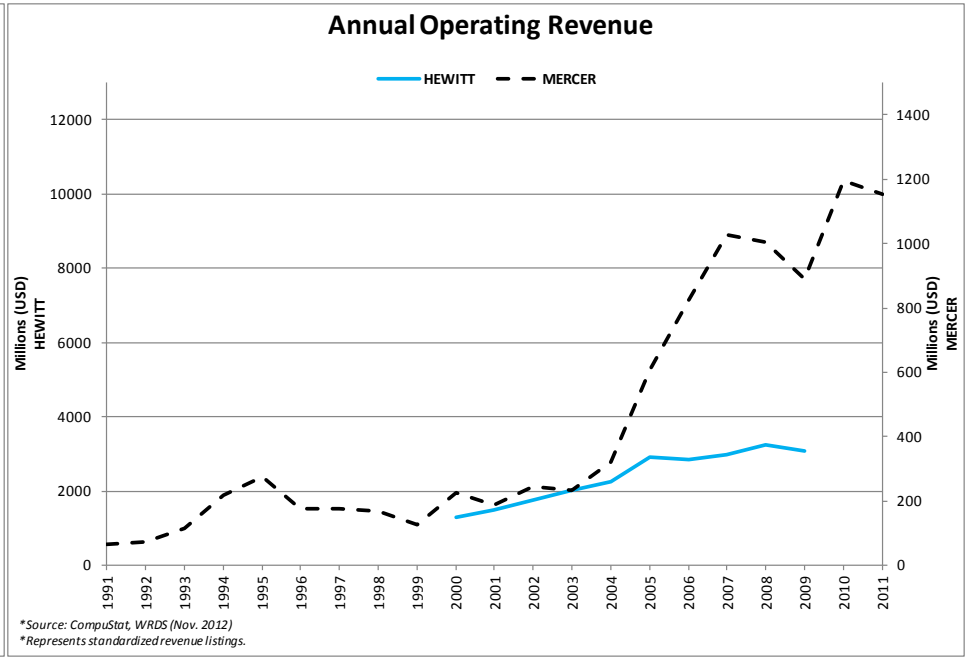
Case study evidence shows that HR innovations are ongoing :

- There are HR innovations or are not IT based. One consulting firm estimates the number of large firms with "training universities" has risen from 400 in 1993 to 2,000 in 2001 to 3,700 in 2010. These are Hamburger University (McDonald's), to Starbucks University, to Lockheed Martin's Center for Leadership opened in 2009.

- Software firms are producing valuable new HR/IT software, or upgrading their product/processes software to focus more on people management.

Management-focused software firms and HR consulting firms continue to grow.



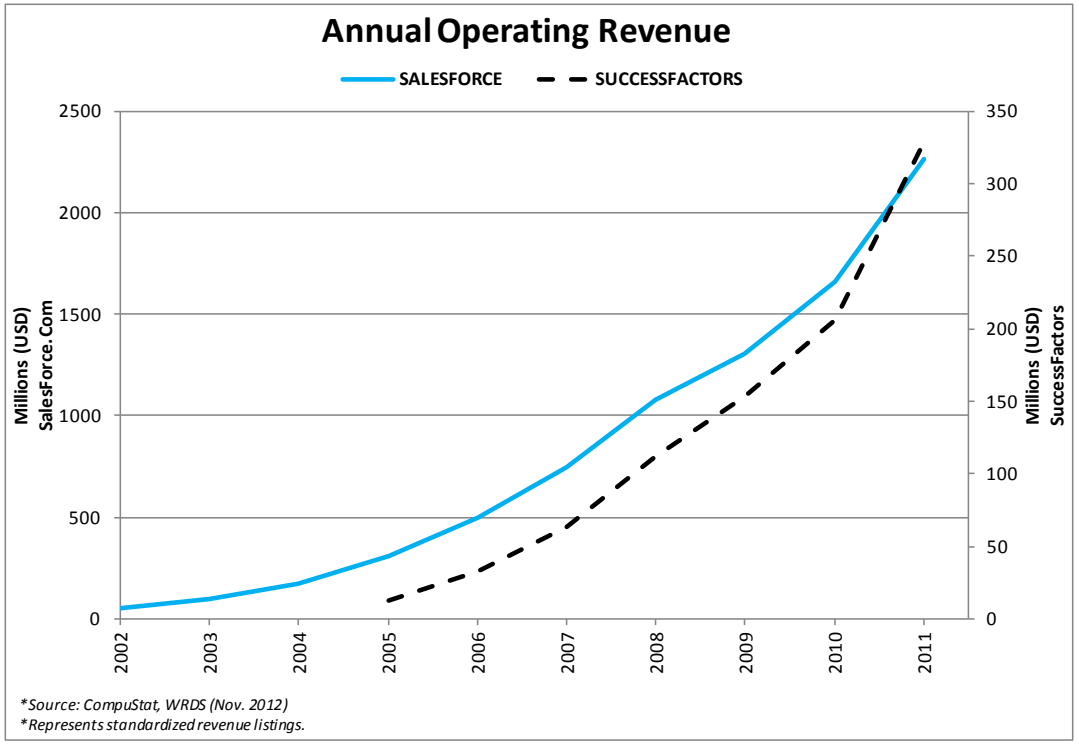


- The IT management-focused firms, of SAP and Oracle, keep growing. Part of this growth is absorbing other firms.

- The aim of innovative firms is to make people management part of operations. Many firms have yet to do this.

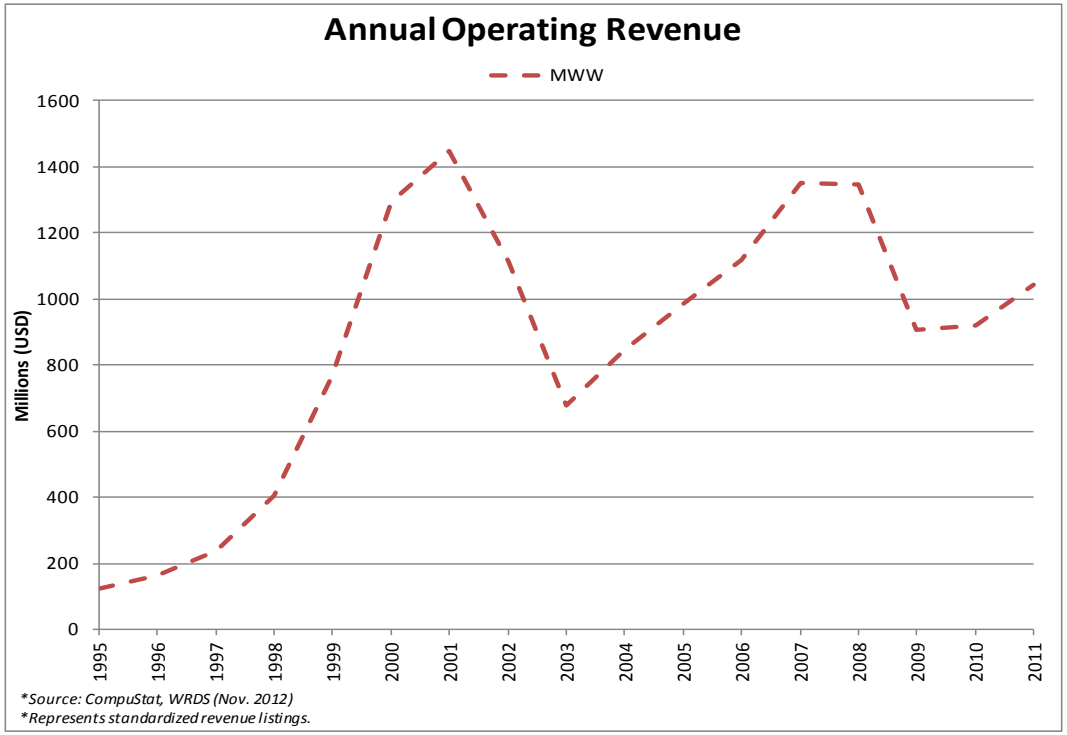
Source: CompuStat Operating Revenue Data (Nov. 2012) .

Firms offering specific People Management Software grew – often quite dramatically – during this decade.



Success Factors creates online software for companies to conduct performance evaluation of workers' productivity.

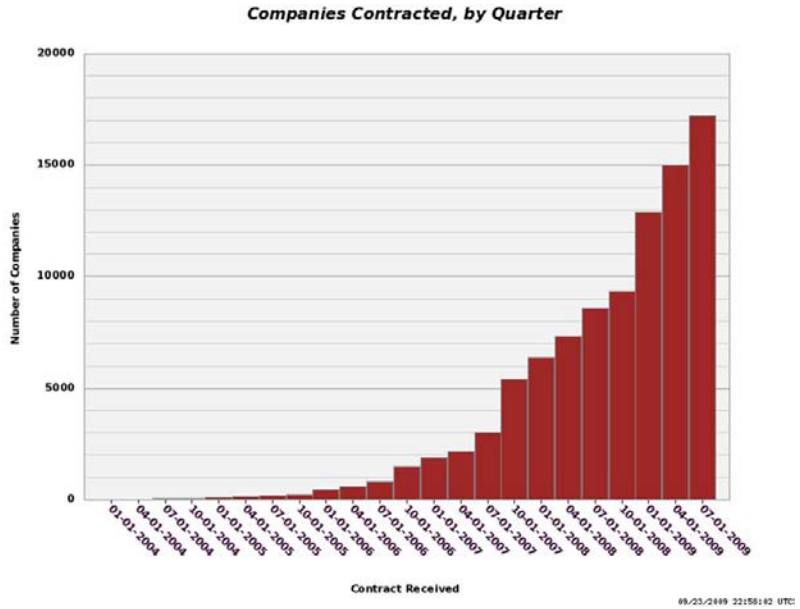
Source: CompuStat Operating Revenue Data (Nov. 2012) .

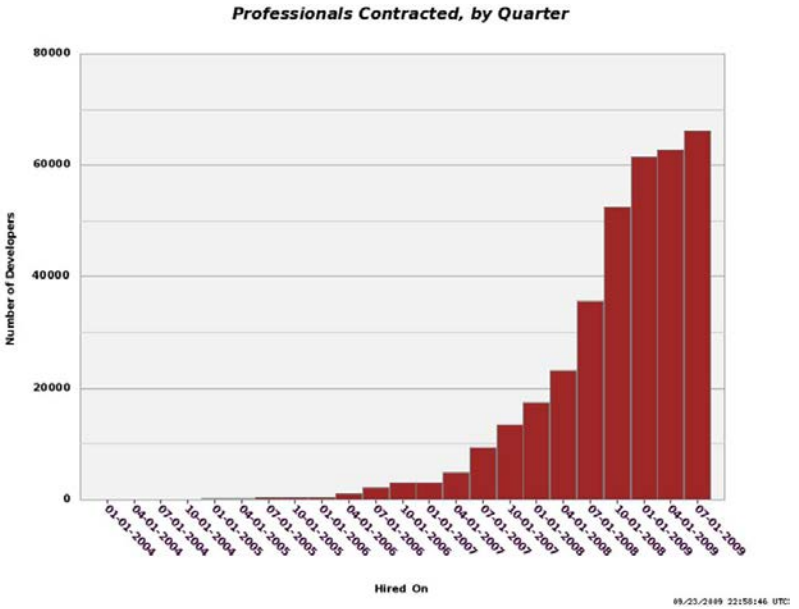


Monster.com maintains a large percent of in-house company hiring websites worldwide.

The growth of LinkedIn and Facebook are likely increasing the quality of job matches.

Source: CompuStat Operating Revenue Data (Nov. 2012) .





These figures show the growth of oDesk, a firm that matches contract workers to companies.

“Companies contracted” are the number of companies that use oDesk matching software to hire IT employees.

“Professionals contracted” are the number of workers hired for a contract IT job through the oDesk software.

Source; Calculations by Chris Stanton using confidential data from oDesk.com.

Key Point 2: Insider econometric studies show companies can achieve big gains from innovative HR practices, and the studies show why.

Lazear (2000)

Incentives (selection)

Incentives (behavioral)

Bandiera, Barankay, Rasul (2009)

HR Practices

Ichniowski, Shaw, Prennushi (1997)

Productivity

Teams

Hamilton, Nickerson, Owan (2003)

Information Technology

Bartel, Ichniowski, Shaw (2007)

Peer Effects

Mas and Moretti (2009)

Key Point 3: The potential upside gains from people management innovations are big.

Key Point 3: The potential upside gains from people management innovations are big.

- Teachers productivity is measured by student test scores. Teacher quality differences explain 7% of the variance of test scores across students.

Run similar productivity regressions for other occupations:

- Call center productivity: individual worker quality explains from 32% of the variance in productivity across workers.
- Agricultural fruit pickers: individual worker quality explains about 13% of the variance in productivity across workers.
- Automobile windshield installers: individual worker quality explains 72% of the variance in productivity across workers.

Star workers are far more productive than low-performers in virtually every occupation. The difference is rising.

The variance of pay is higher for high-skilled workers.

Source:. These data are for professionals hired to work on an individual contract basis for firms, as hired through the oDesk internet job matching site.

Source; Calculations by Chris Stanton using confidential data from oDesk.com.

The value of bosses

- In a technology based service job, replacing a low quality boss with a high quality boss raises the productivity of his team by as much as adding one team member. (Lazear, Shaw, and Stanton, 2012)

The rising variance of pay.

- Over the last 25 years, the variance of pay rose markedly in West Germany. The rising variance is due to (Card, Hoening, Kline, 2012):
  - Rising variance of pay across establishments.
  - Higher quality workers employed by higher quality firms.

➔ There are high upside gains for workers if they are matched to the right firms and have high human capital.

Key Point 4: There are policies that encourage the adoption of new HR technologies.

Bloom and VanReenen (2007): Competition and Management Practices (in manufacturing)

Competition proxies	**Dependent variable: Management**					
Import penetration (SIC-3 industry, 1995-1999)	**0.144** **(0.040)**	**0.156** **(0.084)**				
1 - Lerner index[1] (SIC-3 industry except firm itself, 1995-1999)			**1.515** **(0.683)**	**1.318** **(0.637)**		
# of competitors (Firm level, 2004)					**0.142** **(0.051)**	**0.145** **(0.049)**
Full controls[2,3]	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**

1 Lerner index = (operating profit – capital costs)/sales ≈ rents

2 Includes 108 SIC-3 industry, country, firm-size, public and interview noise (analyst, time, date, and manager characteristic) controls, = 732 obs

3 S.E.s in ( ) below, robust to heteroskedasticity, clustered by country-industry

Policy Options

- Market forces are increasing the adoption of innovative HR practices.

- Further options:
  - Encourage investments in computerized hardware and software. IT and HR are complements.
  - Increase competition. Innovative HR practices are correlated with industry rankings of competition and import penetration.
  - Lower labor market regulations. Innovative HR practices are more likely when workers and firms form better matches.

Four Key Points

1. The “HR Technology Shocks” have been sizable.
2. Insider econometric evidence shows companies have achieved big gains from innovative HR practices.
3. The potential upside gains from human resource management innovations are big.
4. There are policies that encourage the adoption of new HR technologies.

The combination of better management practices and technology should be able to drive productivity gains for years to come, with the management/HR practices being the main bottleneck to further productivity gains, in my mind.”

CEO, for a firm selling HR/IT products to companies.