Human Resource Management (HRM) and Productivity

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Berkeley, November 2009
Introduction

1. What is HRM?
2. Some “facts” about productivity & HRM
3. Theoretical Perspectives
4. Some determinants of HRM
   - Incentive Pay
   - Work Organization (decentralization)
5. Effects of HRM on productivity
6. Conclusions & areas for research
Scope: What aspects of HRM do we look at?

- Pay
  - Individual incentive pay
  - Group incentive pay
- **Work organization**
  - Decentralization/delegation
  - Teams, job design
- Promotion (e.g. appraisals, tournaments)
- Hiring (e.g. screening)
- Firing
- Hierarchy – span of control, levels
- Skill acquisition
“Facts” on productivity and HRM

Theories

Determinants of HRM

Effects of HRM on productivity
Some Facts on Productivity

1. Aggregate growth basically a productivity story (Solow; post 1995 US “miracle”; reallocation)

2. Large cross country variation (Jones and Romer, 2009)

3. Large cross sectional dispersion *within* countries
   - e.g. Syverson (2004, 2009) Within 4 digit sector (in US) a plant at 90th percentile 4x output per worker as 10th percentile. TFP 2x
   - These plant differences are persistent

• Measurement Issues
  - Plant-specific prices (Foster et al, 2009, TFPQ/ TFPR)
Some Facts on HRM

• Incentive/Performance Pay
  – Levels (e.g. Brown, 1990)
  – Trends
  – NB: Direct vs. Indirect measures

• Other HRM Practices
  – Levels
  – Trends

• International Comparisons
  – Bloom and Van Reenen (2009) CEP Management and Organizational practice surveys
Fig 2.1 Growth of performance pay in the US (PSID, full time males), 1976-1998

Source: Lemieux, MacLeod and Parent (2009), Figure IV
Figure 2.1: HRM Practices in large US firms, 1987-1999

<table>
<thead>
<tr>
<th>Year of Survey</th>
<th>More than 20% of employees have Individual incentives (e.g. performance bonuses)</th>
<th>More than 20% of employees have gainsharing (e.g. team bonuses)</th>
<th>More than 20% of employees in teams</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>38</td>
<td>7</td>
<td>37</td>
</tr>
<tr>
<td>1990</td>
<td>45</td>
<td>11</td>
<td>51</td>
</tr>
<tr>
<td>1993</td>
<td>50</td>
<td>16</td>
<td>65</td>
</tr>
<tr>
<td>1996</td>
<td>57</td>
<td>19</td>
<td>66</td>
</tr>
<tr>
<td>1999</td>
<td>67</td>
<td>24</td>
<td>61</td>
</tr>
</tbody>
</table>

Note: Fortune 1000 companies. Sampling response falls rapidly over time.
Figure 2.3: Trends in Performance Pay 1984-2004, UK WERS (individual, gain-sharing, profit related pay and ESOP)


Note: Whether largest occupational group in establishment covered by any performance pay
**Figure 2.5 Proportion of Workers in EU15 whose pay is partially determined by piece rate or productivity related payments**

<table>
<thead>
<tr>
<th>ISCO Group</th>
<th>1995</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislators and Managers</td>
<td>0.138436</td>
<td>0.141878</td>
</tr>
<tr>
<td></td>
<td>1362</td>
<td>525</td>
</tr>
<tr>
<td>Professionals</td>
<td>0.065222</td>
<td>0.066596</td>
</tr>
<tr>
<td></td>
<td>1683</td>
<td>1644</td>
</tr>
<tr>
<td>Technicians</td>
<td>0.10009</td>
<td>0.088534</td>
</tr>
<tr>
<td></td>
<td>1964</td>
<td>2200</td>
</tr>
<tr>
<td>Clerks</td>
<td>0.063295</td>
<td>0.097777</td>
</tr>
<tr>
<td></td>
<td>2413</td>
<td>1902</td>
</tr>
<tr>
<td>Service and Sales Workers</td>
<td>0.137954</td>
<td>0.071358</td>
</tr>
<tr>
<td></td>
<td>2111</td>
<td>1806</td>
</tr>
<tr>
<td>Agricultural and Fishery Workers</td>
<td>0.331649</td>
<td>0.211215</td>
</tr>
<tr>
<td></td>
<td>603</td>
<td>83</td>
</tr>
<tr>
<td>Craft and Related Trade Workers</td>
<td>0.184096</td>
<td>0.179635</td>
</tr>
<tr>
<td></td>
<td>2649</td>
<td>1443</td>
</tr>
<tr>
<td>Plant and Machine Operators</td>
<td>0.181857</td>
<td>0.232106</td>
</tr>
<tr>
<td></td>
<td>1071</td>
<td>731</td>
</tr>
<tr>
<td>Elementary Occupations</td>
<td>0.105694</td>
<td>0.072706</td>
</tr>
<tr>
<td></td>
<td>1861</td>
<td>1609</td>
</tr>
<tr>
<td>Armed Forces</td>
<td>0.040136</td>
<td>0.04847</td>
</tr>
<tr>
<td></td>
<td>125</td>
<td>83</td>
</tr>
<tr>
<td>Unknown</td>
<td>0.117977</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>72</td>
</tr>
<tr>
<td>All</td>
<td>0.128</td>
<td>0.106</td>
</tr>
<tr>
<td></td>
<td>15842</td>
<td>12026</td>
</tr>
</tbody>
</table>

**Source:** EWCS (European Working Conditions Survey)  

Authors’ calculations from question: “What does your remuneration include: piece rates or productivity payments”

**Notes:** First number is proportion answering “yes” with number in italics the number of workers giving an answer
**BLOOM - VAN REENEN (2007) SURVEY METHODOLOGY**

1) Developing management questions (Table A1)
   - Scorecard for 18 monitoring, targets and people (7 HR practices around pay, promotions, retention and hiring). ≈45 minute phone interview of manufacturing plant managers

2) Obtaining unbiased comparable responses ("Double-blind")
   - Interviewers do not know the company’s performance
   - Managers are not informed (in advance) they are scored
   - Run from LSE, with same training and country rotation

3) Getting firms to participate in the interview
   - Introduced as “Lean-manufacturing” interview, no financials
   - Official Endorsement: Bundesbank, PBC, RBI, etc.
   - Run by 55 MBA types (loud, assertive & business experience)
(16) EXAMPLE: Promoting high performers

<table>
<thead>
<tr>
<th>Score</th>
<th>(1): People are promoted solely upon the basis of tenure</th>
<th>(3): People are promoted primarily upon the basis of ability and effort</th>
<th>(5): We actively identify, develop and promote our top performers</th>
</tr>
</thead>
</table>


(15) EXAMPLE: DEALING WITH POOR PERFORMERS

| Score | (1): Poor performers are rarely removed from their positions | (3): Suspected poor performers stay in a position for a few years before action is taken | (5): We retrain and move poor performers out of the position soon after a weakness is identified |

If you had an employee who could not do his job properly, what would you do? Could you give me a recent example? How long would underperformance be tolerated? Do some individuals always just manage to avoid being fixed/fired?
Figure 2.8: HR Management Across Countries

US: 695 firms
Canada: 336 firms
Germany: 270 firms
Japan: 122 firms
Great Britain: 762 firms
Northern Ireland: 92 firms
Sweden: 270 firms
Poland: 231 firms
Republic of Ireland: 102 firms
Australia: 382 firms
France: 312 firms
Italy: 188 firms
India: 620 firms
China: 524 firms
Portugal: 140 firms
Brazil: 559 firms
Greece: 171 firms

Management scores, from 1 (worst practice) to 5 (best practice)

Note: Averages taken from medium sized (100 to 5000 employees) manufacturing firms (5,850 observations). Scores averaged on seven practices around pay, promotions, retention and hiring. Higher scores indicate better practices.

Source: Bloom, Genakos, Sadun and Van Reenen (2009)
Firm level average people management scores, from 1 (worst practice) to 5 (best practice)

Note: Bars are the histogram of the actual density at the firm level on a country by country basis. Randomly sampled from all medium sized (100 to 5000 employee) manufacturing firms in each country. Source: Bloom, Genakos, Sadun and Van Reenen (2009)
Summary

• The data is not great!
• Incidence of performance pay probably increased over time
  – Group-based increased more than individual based incentive pay
• Team-based HRM practices have increased over time
• “Innovative”/Best Practice HRM more prevalent in US than elsewhere.
  – Mainly accounted for by an absence of firms with very low management scores
“Facts” on HRM and productivity

Theories

Determinants of HRM

Effects of HRM on productivity
Theoretical Perspectives

• Traditional Personnel
  – every situation different

• Design/Personnel Economics
  – Application of economics to HR issues (Lazear, 1996)
  – Generalizations (e.g. Lazear and Oyer, 2009; Gibbons and Waldman, 1999)

• "Management as a technology"
  – Incorporates firm heterogeneity in productivity
  – Barriers to adoption of best practice (cf. technological diffusion): e.g. information, imperfect competition, adjustment costs
  – Sources of best practices (a) always true; (b) new idea (e.g. lean manufacturing, Taylorism), (c) some other change (e.g. new ICT like SAP makes measuring output cheaper and therefore more PRP)
“Facts” on HRM and productivity

Theories

**Determinants of HRM**

Effects of HRM on productivity
Determinants of HRM. Two examples

• Incentive Pay
  – Product market Competition/Globalization
  – Labor Regulation
  – Risk and Uncertainty (Prendergast Problem)

• Work Organization: Decentralization
  – Measurement issues (formal vs. Real)
  – Theory: principal-agent (Information vs. Incentives trade off)
  – Acemoglu, Aghion, Lelarge, Van Reenen & Zilibotti (2007, QJE)
Figure 2: Proximity to frontier and decentralization
Decentralization to Profit Centers (COI)

% Firms decentralized into Profit Centers

proximity increases
Figure 1: Heterogeneity and decentralization
Decentralization to Profit Centers (COI)
Determinants of Decentralization

• Principal-Agent (AALVRZ)
• Knowledge Hierarchies
  – Information costs vs. Communication costs (Garicano, 2000, JPE; Bloom, Garicano, Sadun & Van Reenen, 2009)
• Human Capital complementarity
  – Skills (e.g. Caroli and Van Reenen, 2001)
• Cultural/legal
  – e.g. trust, Bloom et al, 2009
“Facts” on HRM and productivity

Theories

Determinants of HRM

Effects of HRM on productivity
What is the question?

• If firms are optimizing why should there be any effect of HRM on productivity?
  – Productivity not the same as profits
  – “Management as a technology”, inefficient firms, diffusion, etc.

• Whether there is a positive effect of HRM on productivity may be less interesting than
  – Magnitude of the effects (cf. production function)
  – Mechanisms (e.g. selection vs. same individuals)
  – Heterogeneity of the effect (e.g. complementarity between different HR practices; between HRM and other aspects of firm – ICT, skills, etc.)
Note: Average across 3,803 firms in 13 countries. Revenue productivity=sales/employee. Cells show deviations from country, industry and year mean. e.g., the left column shows that firms with a management score of 1 to 1.5 have on average 50% lower revenue productivity than other firms in the same country, industry (grouped by 154 3 digit manufacturing cell) and year (2000 to 2008).
Identification

\[ y_{it} = \beta_i m_{it} + \alpha' x_{it} + \eta_i + u_{it} \]

- Cross section
- Fixed effects
- Single firm studies (generalizability? Comparison group?)
- Randomized control trials
A quick tour (Table 5.1).

• Individual incentive pay (increase in productivity)
  – Lazear (2000). Safelite. 44% (~22% selection)
  – Bandeira et al (2007, 2009). Fruit farm. 21% (~10% selection; social connections reduce in importance)
  – Freeman and Kleiner (2005). Shoes (6%)
  – Shearer (2004). Tree Planters – random assignment 22% (0% selection)

• Distortions and Individual incentive Pay
  – Many theory possibilities, but net effect positive above
Group incentive pay (prody increase)

- Blasi, Freeman, Mackin & Kruse (2009). *Meta study* finds +ve mean effects (4.5%)
- Hamilton, Nickerson and Owain (2003). *Napa Garment factory* (18%, 4% selection)
- Knez and Simester (2001). *Continental Airlines*
- Boning, Ichinowski & Shaw (2007), Steel *mini-mills*
- Burgess et al (2007). *UK tax collection*
  
  - Generally all find positive effects
Summary of Results on HRM & productivity

- Increase in productivity from individual and group pay schemes
- True across many sectors/firms
- Large selection effect but also incentive effect
- More effective when introduced as a package of “complementary” practices
  - Teams
  - Human Capital
  - ICT (Bresnahan et al, 2002; Bloom, Sadun & VR “Americans Do IT Better”)
- Non-pay HRM practices have (i) had less high quality studies, (ii) positive correlations tend to disappear when fixed effects included (e.g. Black and Lynch, 2004)
Conclusions & Future Work

• Earlier surveys bemoaned paucity of data. Things are improving
  – But data on HRM over time for “stylized facts” weak
• HRM should be seen in context of general management in theory and empirics
• HRM effects on productivity
  – Surprisingly positive effects in general
  – Need for better identification (e.g. field experiments)
  – Links to theory still rather weak
Back Up
Questions

• Should we include more on estimation of productivity?
• Should we include papers looking at effects of human resources (e.g. education and training) on directly measured productivity
| Score | (1): People are promoted primarily upon the basis of tenure | (3): People are promoted primarily upon the basis of performance | (5): We actively identify, develop and promote our top performers |

(16) Promoting high performers
| Score | (1): People within our firm are rewarded equally irrespective of performance level | (3): Our company has an evaluation system for the awarding of performance related rewards | (5): We strive to outperform the competitors by providing ambitious stretch targets with clear performance related accountability and rewards |
(15) Removing poor performers

<table>
<thead>
<tr>
<th>Score</th>
<th>(1): Poor performers are rarely removed from their positions</th>
<th>(3): Suspected poor performers stay in a position for a few years before action is taken</th>
<th>(5): We move poor performers out of the company or to less critical roles as soon as a weakness is identified</th>
</tr>
</thead>
</table>
(7) Consequence management

| Score | (1): Failure to achieve agreed objectives does not carry any consequences | (3): Failure to achieve agreed results is tolerated for a period before action is taken. | (5): A failure to achieve agreed targets drives retraining in identified areas of weakness or moving individuals to where their skills are appropriate |
| Score | (1): We do little to try and keep our top talent. | (3): We usually work hard to keep our top talent. | (5): We do whatever it takes to retain our top talent. |
### Attracting human capital

<table>
<thead>
<tr>
<th>Score</th>
<th>(1): Our competitors offer stronger reasons for talented people to join their companies</th>
<th>(3): Our value proposition to those joining our company is comparable to those offered by others in the sector</th>
<th>(5): We provide a unique value proposition to encourage talented people join our company above our competitors</th>
</tr>
</thead>
</table>

(17) Attracting human capital
<table>
<thead>
<tr>
<th>Score</th>
<th>1: Senior management do not communicate that attracting, retaining and developing talent throughout the organization is a top priority</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3: Senior management believe and communicate that having top talent throughout the organization is a key way to win</td>
</tr>
<tr>
<td></td>
<td>5: Senior managers are evaluated and held accountable on the strength of the talent pool they actively build</td>
</tr>
</tbody>
</table>
Figure 2.9: Promotions, fixing/firing and rewards practices across countries

Note: Averages taken across a random sample of medium (100 to 5000 employee) manufacturing firms within each country. 5,850 observations in total. Source: Bloom, Genakos, Sadun and Van Reenen (2009)
Figure 4.3: Labor market regulation and people management

Source: Bloom, Caroline, Sadir and Van Reenen (2000)
Summary of empirical studies

- General HRM
- Individual Incentive Pay
- Group Incentive Pay
- Other topics
  - Unions
  - Peer effects
- Complementarities
- ICT
- Human Capital
Figure 4.4: Decentralization across countries

Most centralized
- Asia
- Southern Europe

Least centralized
- Scandinavian countries
- Anglo-Saxon countries

Source: Bloom, Sadun and Van Reenen (2009a)