MANAGEMENT AS A TECHNOLOGY?

John Van Reenen (LSE)
FFBVA Lecture, Madrid
June 2013

Draws heavily on joint work with Nick Bloom (Stanford) and Raffaella Sadun (HBS)
MANAGEMENT AS A TECHNOLOGY?

Nick Bloom (Stanford), Raffaella Sadun (HBS) & John Van Reenen (LSE)
MOTIVATION

- Evidence of extensive firms & plant productivity differences in last 10-20 years
- Finding has influenced many fields: trade (e.g. Melitz, 2003), labor (e.g. Card, Heining & Kline, 2013), macro (Hsieh & Klenow, 2009), IO (e.g. Syverson, 2004), etc.
- This talk:
  - Some management practices like a technology, not simply different contingent styles
  - Productivity heterogeneity related to certain core management practices
  - Matters a lot in explaining income levels across countries (50% of US-Southern EU productivity gap)
LARGE DIFFERENCES BETWEEN COUNTRIES

Source: Jones and Romer (2009). US=1
PRODUCTIVITY DISPERSION

• Large cross sectional dispersion within countries
  – Within US SIC4, plant labor productivity $90^{th}-10^{th} \approx 4x$ (TFP $\approx 2x$). Syverson (2004, 2011).
  – Persistent Productivity Differences
  – Also find big productivity variation outside US, typically larger

• Is it all measurement problems? NO
  – Robust to different methods of TFP estimation (Solow residual, Olley-Pakes,1996; Blundell-Bond, 2000; Ackerberg et al, 2007)
  – Using plant-specific prices (Foster et al, 2009)
  – Other measures of firm performance (e.g. profitability, size, management quality, etc.) show wide variation
FIRM HETEROGENEITY HAS LONG BEEN RECOGNIZED

“...we have the phenomenon in every community and in every trade, in whatever state of the market, of some employers realizing no profits at all, while others are making fair profits; others, again, large profits; others, still, colossal profits.”

Francis Walker (Quarterly Journal of Economics, ‘87)
FIRM HETEROGENEITY HAS LONG BEEN RECOGNIZED

“...we have the phenomenon in every community and in every state of the market, of some employers realizing no profits at all, while others are making large profits; others, still, colossal...”

Francis Walker (Quarterly Journal of Economics, 1887)
REASONS FOR FIRM HETEROGENEITY

• TFP Heterogeneity due to “hard technologies”
  – R&D, patents, diffusion of ICT (information and communication technologies), etc.
• These hard technologies matter a lot, but:
  – After controlling for technology, still a big TFP residual
  – E.g. Productivity effects of ICT depend on firm management/organization (e.g. Bresnahan, Brynjolfsson and Hitt, 2002, QJE; Bloom, Sadun & Van Reenen, 2012, AER)
• Heterogeneity of management practices?
  – Econometric tradition that fixed effects in production function = managerial ability (Mundlak, 1961)
  – Business case studies
Measuring Management

Management Models

Data Description

Empirics
1) Developing management questions
   • Scorecard for 18 monitoring (e.g. lean), targets & people (e.g. 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, Bank of England, RBI, etc.
   • Run by 100 MBA types (loud, assertive & business experience)
| Score | (1): Measures tracked do not indicate directly if overall business objectives are being met. Certain processes aren’t tracked at all | (3): Most key performance indicators are tracked formally. Tracking is overseen by senior management | (5): Performance is continuously tracked and communicated, both formally and informally, to all staff using a range of visual management tools |

**Note:** All 18 questions and over 50 examples in Bloom & Van Reenen (2007) & Appendix D

http://worldmanagementsurvey.org/
### INCENTIVES - e.g. “HOW DOES THE PROMOTION SYSTEM WORK?”

| Score | (1) People are promoted primarily upon the basis of tenure, irrespective of performance (ability & effort) | (3) People are promoted primarily upon the basis of performance | (5) We actively identify, develop and promote our top performers |

**Note:** All 18 questions and over 50 examples in Bloom & Van Reenen (2007) & Appendix D

[http://worldmanagementsurvey.org/](http://worldmanagementsurvey.org/)
Plant locations from World Management Survey (~8,000 firms, 3 major waves: 2004, 2006, 2009; 20 countries)

Medium sized manufacturing firms (50-5,000 workers, median≈250)
Now extended to Hospitals, Retail, Schools, etc.
Extension to nearer population surveys (e.g. US MOPs)
ADDITIONAL CONTROLS FOR “NOISE”

INTERVIEWEE CONTROLS

• Gender, seniority, tenure in post, tenure in firm, countries worked in, foreign, worked in US, plant location, reliability score

INTERVIEWER CONTROLS

• Set of interviewer dummies, cumulative interviews run, prior firm contacts

TIME CONTROLS

• Day of the week, time of day (interviewer), time of the day (interviewee), duration of interview, days from project start
Measuring Management

Management Models

Data Description

Empirics
ECONOMIC PERSPECTIVES ON MANAGEMENT

• Management as Design
  – Organizational Economics (Gibbons and Roberts HOE, 2013) e.g. Personnel Economics
  – Contingent management School (Woodward, 1958)
  – Optimal “styles” of management

• Management as a Technology (MAT)
  – Management a part of firm’s TFP
  – Consider simple model based on Bartelsman, Scarpetta & Haltiwanger (2013, AER), GE with firm heterogeneity (in productivity and distortions) & imperfect competition
  – Various extensions
SIMPLE FORMAL MODEL OF MAT

Timing
1. Entrepreneurial entry decision with sunk cost, \( c_e \)
2. If enter draw permanent management quality \((A_i)\) from a known distribution. Also a transitory management \(\varepsilon_{it}\) shock each period.
   - Distortions like regulations & corruption modelled symmetrically: \(\tau_i + \kappa_{it}\)
3. Firm (i) exits or (ii) produces & pays a fixed overhead labor cost, \(f\)
4. Firm chooses capital (cost of capital is \(R\))
5. i.i.d. shocks to management \((\varepsilon_{it})\) & distortions \((\kappa_{it})\)
6. Firms choose variable labor, \(n\) (wage is \(w\))
THREE MAIN PREDICTIONS WE EXAMINE

1. Firm **performance** (e.g. Size, TFPQ, TFPR, labor productivity/LPR) increases in management quality ($M_{it} = A_i \varepsilon_{it}$). From FOC, etc.

2. Average management quality is higher when **competition** is higher. From cut-off, $S_i$.

3. **Covariance** (reallocation) between firm size & management quality; (e.g. OP term cov($M$, $n$)) is higher when distortions (var($\tau_i + \kappa_{it}$)) are lower.
   - Across countries (e.g. US vs. Southern EU)
   - Policies (e.g. high vs. low trade barriers; high vs. low labor regulation)
THE COVARIANCE BETWEEN MANAGEMENT AND SIZE DECLINES AS ECONOMIC DISTORTIONS INCREASE

The Relationship Between OP Covariances and Distortion Dispersion

- COV(LPR)
- COV(TFPR)
- COV(Management)
Measuring Management

Management Models

Data Description

Empirics
MY FAVOURITE QUOTES:

The traditional British Chat-Up

[Male manager speaking to an Australian female interviewer]

*Production Manager:* “Your accent is really cute and I love the way you talk. Do you fancy meeting up near the factory?”

*Interviewer* “Sorry, but I’m washing my hair every night for the next month….”
Production Manager: “Are you a Brahmin?’

Interviewer “Yes, why do you ask?”

Production manager “And are you married?”

Interviewer “No?”

Production manager “Excellent, excellent, my son is looking for a bride and I think you could be perfect. I must contact your parents to discuss this”
MANAGEMENT PRACTICE SCORES ACROSS COUNTRIES

Note: Unweighted averages taken across all firms within each country; 9,995 obs
HUGE VARIATION IN MANAGEMENT SCORES ACROSS FIRMS WITHIN COUNTRIES

<table>
<thead>
<tr>
<th>Argentina</th>
<th>Australia</th>
<th>Brazil</th>
<th>Canada</th>
<th>Chile</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>France</td>
<td>Germany</td>
<td>Greece</td>
<td>India</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>Japan</td>
<td>Mexico</td>
<td>New Zealand</td>
<td>Poland</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portugal</td>
<td>Republic of Ireland</td>
<td>Sweden</td>
<td>United Kingdom</td>
<td>United States</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Bars are the histogram of the actual density. Scores from 9,995 management interviews across 20 countries.
FAMILY-RUN FIRMS TYPICALLY HAVE THE WORST MANAGEMENT

Management scores after controlling for country, industry and number of employees. Data from 9085 manufacturers and 658 retailers. “Founder owned, founder CEO” firms are those still owned and managed by their founders. “Family firms” are those owned by descendants of the founder. “Dispersed shareholder” firms are those with no shareholder with more than 25% of equity, such as widely held public firms.
MULTINATIONALS APPEAR TO ACHIEVE GOOD MANAGEMENT PRACTICES WHEREVER THEY LOCATE

Sample of 7,262 manufacturing and 661 retail firms, of which 5,441 are purely domestic and 2,482 are foreign multinationals. Domestic multinationals are excluded – that is the domestic subsidiaries of multinational firms (like a Toyota subsidiary in Japan).
Education for non-managers and managers appear linked to better management.

Sample of 8,032 manufacturing and 647 retail firms.
DECOMPOSING THE RELATIVE MANAGERIAL DEFICIT BETWEEN COUNTRY \( j \) AND THE US ECONOMY

\[
M^k - M^{US} = (OP^k - OP^{US}) + (M^k - M^{US})
\]

Difference in aggregate share-weighted Management scores

Difference in reallocation (between firm)

Difference in unweighted Means (within firm)
FIG 6: MANAGEMENT SCORES & REALLOCATION ACROSS COUNTRIES RELATIVE TO THE US LEVEL

Notes: Total weighted mean management deficit with the US is the number on top of bar. This is decomposed into (i) reallocation effect (OP, blue bar) and (ii) unweighted average management scores (sd=1, red bar). Domestic firms, scores corrected for sampling bias.

Similar ranking to Bartelsman, Haltiwanger & Scarpetta (2013)
**FIG 6: MANAGEMENT SCORES & REALLOCATION ACROSS COUNTRIES RELATIVE TO THE US LEVEL**

Notes: Total weighted mean management deficit with the US is the number on top of bar. This is decomposed into (i) reallocation effect (OP, blue bar) and (ii) unweighted average management scores (sd=1, red bar). Domestic firms, scores corrected for sampling bias.

Similar ranking to Bartelsman, Haltiwanger & Scarpetta (2013, AER) sub-sample.
## Table 3 – Cont. Up to Half of Cross Country TFP Gap Accounted for by Management

<table>
<thead>
<tr>
<th>Country</th>
<th>Share-Weighted Average Management Deficit with US</th>
<th>TFP GAP with US</th>
<th>Proportion of TFP Gap due to Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Sweden</td>
<td>-0.25</td>
<td>32.2</td>
<td>7.8%</td>
</tr>
<tr>
<td>Japan</td>
<td>-0.35</td>
<td>33.6</td>
<td>10.4%</td>
</tr>
<tr>
<td>Canada</td>
<td>-0.50</td>
<td>22.3</td>
<td>22.4%</td>
</tr>
<tr>
<td>Great Britain</td>
<td>-0.74</td>
<td>20.3</td>
<td>36.5%</td>
</tr>
<tr>
<td>Italy</td>
<td>-0.81</td>
<td>17.2</td>
<td>47.7%</td>
</tr>
<tr>
<td>France</td>
<td>-0.82</td>
<td>25.3</td>
<td>38.7%</td>
</tr>
<tr>
<td>Brazil</td>
<td>-0.98</td>
<td>59.6</td>
<td>16.9%</td>
</tr>
<tr>
<td>China</td>
<td>-1.01</td>
<td>78.3</td>
<td>14.9%</td>
</tr>
<tr>
<td>Argentina</td>
<td>-1.17</td>
<td>57.3</td>
<td>20.6%</td>
</tr>
<tr>
<td>Portugal</td>
<td>-1.18</td>
<td>24.9</td>
<td>48.2%</td>
</tr>
<tr>
<td>Greece</td>
<td>-1.65</td>
<td>51.0</td>
<td>32.4%</td>
</tr>
<tr>
<td><strong>Unweighted av.</strong></td>
<td></td>
<td></td>
<td><strong>25%</strong></td>
</tr>
</tbody>
</table>

Assume one sd increase in management increases TFP by 10%
Measuring Management

Management Models

Data Description

Empirics
Empirics

- Management effect on Performance
- Management and Reallocation
- Management and Competition
- Extensions
LINK BETWEEN PRODUCTIVITY & MANAGEMENT HOLDS TRUE ACROSS DIFFERENT COUNTRIES

**Firms are grouped in 0.5 increments of assessed management score**
PERFORMANCE REGRESSIONS

Performance measure

\[ \ln Y_{it} = \alpha_M M_{it} + \alpha_L \ln(n_{it}) + \alpha_K \ln(k_{it}) + \alpha_X x_{it} + u_{it} \]

Management (z-score each question, average & z-score again)

Labor

Capital

Other controls

- \( M \), Management Index is average of all 18 questions (sd=1)
- Other controls include: % employees with college degree, average hours worked, firm age, industry, country & time dummies & noise (e.g. interviewer dummies).
# TABLE 4: FIRM PERFORMANCE IS CORRELATED WITH MANAGEMENT SCORE

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Ln(sales)</th>
<th>Ln(sales)</th>
<th>Ln(employment)</th>
<th>Profitability</th>
<th>5yr Sales growth</th>
<th>Exit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimation</td>
<td>OLS</td>
<td>Fixed Effects</td>
<td>OLS</td>
<td>OLS</td>
<td>OLS</td>
<td>OLS</td>
</tr>
<tr>
<td>Firm sample</td>
<td>All</td>
<td>2+ surveys</td>
<td>All</td>
<td>All</td>
<td>Quoted</td>
<td>All</td>
</tr>
<tr>
<td>Management</td>
<td>0.150***</td>
<td>0.033**</td>
<td>0.338***</td>
<td>1.202***</td>
<td>0.039***</td>
<td>-0.006***</td>
</tr>
<tr>
<td>(SD=1)</td>
<td>(0.016)</td>
<td>(0.013)</td>
<td>(0.015)</td>
<td>(0.264)</td>
<td>(0.013)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>Ln(employees)</td>
<td>0.645***</td>
<td>0.374***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.024)</td>
<td>(0.096)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ln(capital)</td>
<td>0.307***</td>
<td>0.237***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.019)</td>
<td>(0.078)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firms</td>
<td>3,493</td>
<td>1,543</td>
<td>7,519</td>
<td>3,917</td>
<td>3,606</td>
<td>7,532</td>
</tr>
<tr>
<td>Observations</td>
<td>8,314</td>
<td>6,364</td>
<td>15,608</td>
<td>9,163</td>
<td>8,365</td>
<td>7,532</td>
</tr>
</tbody>
</table>

Notes: Regressions includes controls for country, SIC3 & year, dummies. Firm-age, skills, noise controls etc. SE clustered by firm.
RANDOMIZED CONTROL TRIALS: BLOOM ET AL (2013)

- Experiment on plants in Indian textile firms outside Mumbai

- Randomized treatment plants get heavy management consulting, control plants get very light consulting (just enough to get data)

- Collected weekly performance data on all plants from 2008 to 2011

- Improved management practices led to large & significant improvements in:
  - **Productivity**: sd increase in management caused 10% higher TFP
  - **Profitability**: around $325k p.a. compared to ~$200k market cost of consultancy
MANY PARTS OF THE FACTORIES ARE DIRTY AND UNSAFE
THE FACTORIES ARE ALSO DISORGANIZED

- Instrument not removed after use, blocking hallway.
- Oil leaking from the machine.
- Cotton lying on the floor.
- Instrument blocking the hallway.
THE TREATED FIRMS INTRODUCED BASIC INITIATIVES

Worker involved in “5S” initiative on the shop floor, marking out the area around the model machine.

Snag tagging to identify the abnormalities on & around the machines, such as redundant materials, broken equipment, or accident areas. The operator and the maintenance team is responsible for removing these abnormalities.
PRODUCTIVITY IMPROVEMENTS IN RCT ON ADOPTION OF MANAGEMENT PRACTICES

Notes: Weekly average total factor productivity for the 14 treatment plants which adopted modern management practices for quality, inventory and production efficiency and the 6 control plants. All plants make cotton fabric near Mumbai, India, with between 100 and 1000 employees. Values normalized so both series have an average of 100 prior to the start of the intervention. Confidence intervals bootstrapped over firms. Source: Bloom, Eifert Mahajan, McKenzie, Roberts (2013).
Empirics

- Management effect on Performance
- **Management and Reallocation**
- Management and Competition
- Extensions
EXAMINING THE ROLE OF REALLOCATION

\[ Y_{ijk} = \alpha M_{ijk} + \beta (M \times REALLOCATION)_{ijk} + \gamma REALLOCATION_{ijk} + u_{ijk} \]

- \( Y_{ijk} \) = SIZE (or GROWTH) for firm \( i \) in industry \( j \) country \( k \)
- \( REALLOCATION \) = strength of reallocation forces in firm’s environment (expect \( \beta > 0 \))
  - Set of country dummies, with US as base
  - Explicit policy variables (e.g. country labor regulation indices) & industry*country policies (e.g. trade barriers)
  - Shocks like Great Recession 2008-09 (also have industry*country variation)
TABLE 5: FIRM SIZE CORRELATED WITH MANAGEMENT MORE STRONGLY IN US THAN ELSEWHERE

<table>
<thead>
<tr>
<th>Management (US base)</th>
<th>179.2***</th>
<th>194.1***</th>
<th>353.1***</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNG*Argentina</td>
<td></td>
<td></td>
<td>-273.1**</td>
</tr>
<tr>
<td>MNG*Australia</td>
<td></td>
<td></td>
<td>-259.8*</td>
</tr>
<tr>
<td>MNG*Brazil</td>
<td></td>
<td></td>
<td>-210.1*</td>
</tr>
<tr>
<td>MNG*Canada</td>
<td></td>
<td></td>
<td>-170.3</td>
</tr>
<tr>
<td>MNG*Chile</td>
<td></td>
<td></td>
<td>-167.9</td>
</tr>
<tr>
<td>MNG*China</td>
<td></td>
<td></td>
<td>-95.7</td>
</tr>
<tr>
<td>MNG*France</td>
<td></td>
<td></td>
<td>-497.6**</td>
</tr>
<tr>
<td>MNG*Germany</td>
<td></td>
<td></td>
<td>-18.7</td>
</tr>
<tr>
<td>MNG*Greece</td>
<td></td>
<td>-352.1***</td>
<td></td>
</tr>
<tr>
<td>MNG*India</td>
<td></td>
<td>-148.6</td>
<td></td>
</tr>
<tr>
<td>MNG*Ireland</td>
<td></td>
<td>-257.9**</td>
<td></td>
</tr>
<tr>
<td>MNG*Italy</td>
<td></td>
<td>-288.7***</td>
<td></td>
</tr>
<tr>
<td>MNG*Mexico</td>
<td></td>
<td>-243.3*</td>
<td></td>
</tr>
<tr>
<td>MNG*NZ</td>
<td></td>
<td>-376.9*</td>
<td></td>
</tr>
<tr>
<td>MNG*Japan</td>
<td></td>
<td>-301.4**</td>
<td></td>
</tr>
<tr>
<td>MNG*Poland</td>
<td></td>
<td>-305.2***</td>
<td></td>
</tr>
<tr>
<td>MNG*Portugal</td>
<td></td>
<td>-306.1***</td>
<td></td>
</tr>
<tr>
<td>MNG*Sweden</td>
<td></td>
<td>-213.0</td>
<td></td>
</tr>
<tr>
<td>MNG*UK</td>
<td></td>
<td>-107.4</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Dependent var is firm employment; 5,662 observations; domestic firms only.
RELATIONSHIP BETWEEN MANAGEMENT & SIZE IS MUCH WEAKER OUTSIDE THE US

- “Selection” effect – market reallocates jobs to more efficient firms
- An additional sd of management score associated with of employment increase:
  - US ~353 more workers
  - UK ~246 more workers
  - Italy ~65 more workers
  - Greece ~0
- Competitive forces of reallocation much weaker in Southern EU and than US
- Same story with sales growth (dynamic reallocation)
- Related to policies over labor & product market regulation
<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Employment</th>
<th>Employment</th>
<th>Employment</th>
<th>Employment</th>
<th>Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management (MNG)</td>
<td>223.18***</td>
<td>315.02***</td>
<td>344.70***</td>
<td>156.98***</td>
<td>97.93</td>
</tr>
<tr>
<td></td>
<td>(37.48)</td>
<td>(94.53)</td>
<td>(55.99)</td>
<td>(60.44)</td>
<td>(67.25)</td>
</tr>
<tr>
<td>MNG*EPL (WB, 2008; 1=Low, 100=High; cty level)</td>
<td>-1.46**</td>
<td>(0.70)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNG*EPL (OECD, 1985-08; 0=Low, 6=high; cty level)</td>
<td>-68.79*</td>
<td>(38.62)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNG*Trade Cost (WB, 2008; 0=low, 6=high; cty level)</td>
<td>-0.17***</td>
<td>(0.05)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tariff (US $, Feenstra-Romalis, cty-ind specific)</td>
<td>-3.37</td>
<td>(4.10)</td>
<td>-5.26</td>
<td>(4.20)</td>
<td></td>
</tr>
<tr>
<td>MNG<em>Tariff (cty</em>ind specific; Feenstra-Romalis, 2012)</td>
<td>-8.13**</td>
<td>(3.34)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>5,580</td>
<td>5,504</td>
<td>4,916</td>
<td>1,559</td>
<td>1,559</td>
</tr>
</tbody>
</table>

**Notes:** OLS, clustered by firm; dependent variable is firm employment; Domestic firms only. Controls for firm age, skills, noise, SIC3, country dummies, EPL(WB) is “difficulty of hiring”. Trade cost is WB measure of cost of exports (in US$). Last column tariffs are in deviations from industry and country specific mean.
Empirics

- Management effect on Performance
- Management and Reallocation
- **Management and Competition**
- Extensions
COMPETITION & MANAGEMENT

• Various ways that competition may influence management
  – **Selection:** badly run firms more likely to exit, so average management quality higher in a more competitive industry
  – **Effort:** forces badly run firms to try harder to survive (although Schumpeterian effects may counterbalance)
• No obvious relationship in Design perspective
• Using cross section & panel we can find a role for both mechanisms
Sample of 9469 manufacturing and 661 retail firms (private sector panel) and 1183 hospitals and 780 schools (public sector panel). Reported competitors defined from the response to the question “How many competitors does your [organization] face?”
## COMPETITION AND MANAGEMENT

3 competition proxies from Nickell (1996) & Aghion et al. (2005)

<table>
<thead>
<tr>
<th>Competition proxies</th>
<th>Dependent variable: Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import penetration (lagged industry-country level)</td>
<td>0.081** (0.044)</td>
</tr>
<tr>
<td>1- Lerner Index(^1) (lagged industry-country level)</td>
<td>5.035** (2.146)</td>
</tr>
<tr>
<td># of competitors (Firm level)</td>
<td>0.115*** (0.023)</td>
</tr>
<tr>
<td>Observations</td>
<td>2,657</td>
</tr>
<tr>
<td>Firm fixed effects?</td>
<td>No</td>
</tr>
<tr>
<td>Full controls(^2)</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes: “Full controls” includes 108 SIC-3 industry, country, firm-size, public and interview noise (interviewer, time, date & manager characteristic) controls, 2004-2006, UK, US, France and Germany only. Col (1) and (2) clustered SE by ind*cty, col (3) clustered by firm.
IS COMPETITION EFFECT CAUSAL?

• Also use natural experiments to generate exogenous increases in competition
• Trade liberalization following China accession to WTO & subsequent phase out of MFA quotas in textiles & apparel industries in 2005. Bloom, Draca & Van Reenen (2013)
  — Strong first stage on Chinese imports into EU
  — Big improvement in management & productivity in more affected sectors
• Hospital competition in UK under Blair reforms (Bloom, Propper, Seiler & Van Reenen, 2013)
Empirics

• Management effect on Performance
• Management and Reallocation
• Management and Competition
• Extensions
  – Endogenous management
  – Information
  – Management as Design
ENDOGENOUS MANAGEMENT: THE COST OF SKILLS.
USE UNESCO World Higher Education Database university locations (N=9,081)
UNESCO World Higher Education Database
business school locations (N=5,724)
### EFFECT OF DISTANCE TO UNIVERSITY ON MANAGEMENT AND SKILLS

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Manage</th>
<th>Manage</th>
<th>% firm employees with degree</th>
<th>Manage</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OLS</td>
<td>OLS</td>
<td>OLS</td>
<td>OLS</td>
<td>OLS</td>
</tr>
<tr>
<td>Distance (drive time to nearest university)</td>
<td>-0.070*** (0.018)</td>
<td>-0.049*** (0.019)</td>
<td>-2.267*** (0.403)</td>
<td>-1.534*** (0.423)</td>
<td>0.789*** (0.082)</td>
</tr>
<tr>
<td>% employees with Degree in firm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>6,406</td>
<td>6,406</td>
<td>6,406</td>
<td>6,406</td>
<td>6,406</td>
</tr>
</tbody>
</table>

**Source:** Feng (2013)

**Notes:** Clustered by 313 regions. In final column proportion skilled is instrumented with distance to university.
Empirics

- Management effect on Performance
- Management and Reallocation
- Management and Competition
- **Extensions**
  - Endogenous management
  - **Information**
INFORMATION: ARE FIRMS AWARE OF THEIR MANAGEMENT PRACTICES BEING GOOD/BAD?

We asked:

“Excluding yourself, how well managed would you say your firm is on a scale of 1 to 10, where 1 is worst practice, 5 is average and 10 is best practice”

We also asked them to give themselves scores on operations and people management separately
* Insignificant 0.03 correlation with labor productivity, cf. management score has a 0.295
Empirics

- Management effect on Performance
- Management and Reallocation
- Management and Competition
- Extensions
  - Endogenous management
  - Information
CONCLUSIONS

• Heterogeneity in firm productivity linked to management
  – ~25% of cross-country TFP gap (reallocation 1/3)

• Management as a “technology”
  – Management improves firm performance
  – Reallocation stronger in US
    • Linked to trade & labor regulations
    • Stronger in Great Recession
  – Competition improves average management quality

• Next Steps:
  – Management & managers (German IAB)
  – Dynamics & spillovers (US MOPs)
  – Other determinants of PPDs (co-ordination a la Gibbons and Henderson, 2012)