

Finding the Measure of Management:

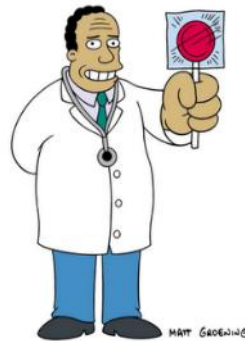
New Data for the COVID Era

John Van Reenen

ESCOE, September 18th 2020



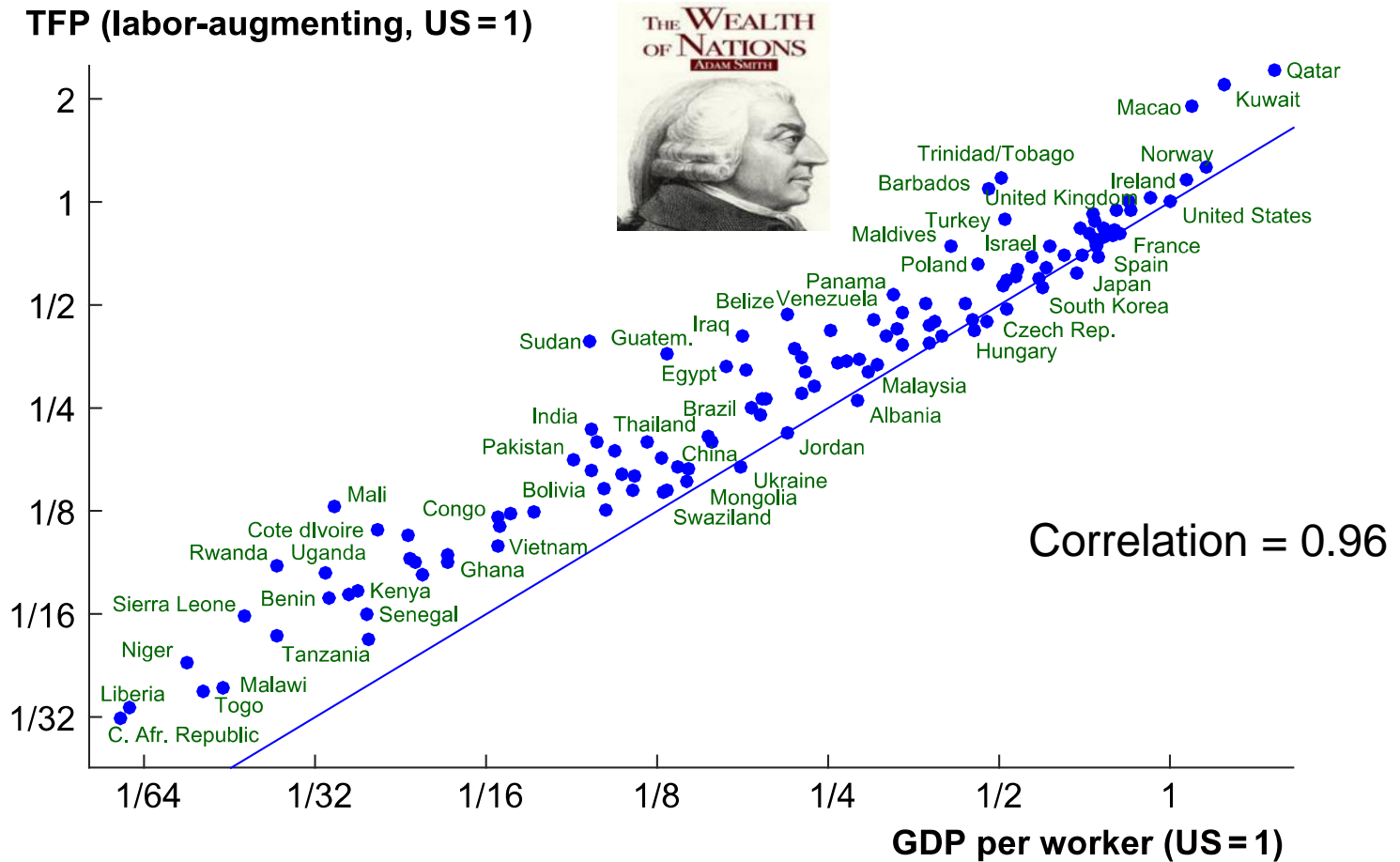
Draws extensively on work with many co-authors,
especially Nick Bloom and Raffaella Sadun



Introduction

- Data increasingly important to our lives
- COVID has highlighted the importance of data in monitoring and responding to the challenge of Pandemic
 - Huge differences in response and performance across countries
 - What determines whether firms will survive the Pandemic or go under?
- Lessons from BCE (“Before Covid Epidemic”)
 - International firm level data on management and organization coming on-stream, often working closely with national statistical agencies like ONS

Big spread of productivity between countries



Notes: 2010 data; Total Factor Productivity ($\alpha=1/3$);

Source: Penn World Tables 8.0; Jones (2015)

Big productivity spread across firms within countries

- Also big productivity differences within countries across firms
 - In typical US SIC4 industry an establishment at 90th percentile four times as productive as one at 10th percentile
 - Even after controlling for capital, etc. TFPR differences still about two to one (Syverson, 2004, 2011)
 - And larger in most other countries (Hsieh and Klenow, 2009; Bartelsman et al, 2013)
- **Are these differences due to management?**
 - Management practices as a form of intangible/organizational capital rather than only a contingent style

But there is still a wide debate on whether management practices really matter

“No potential driving factor of productivity has seen a higher ratio of speculation to empirical study”.

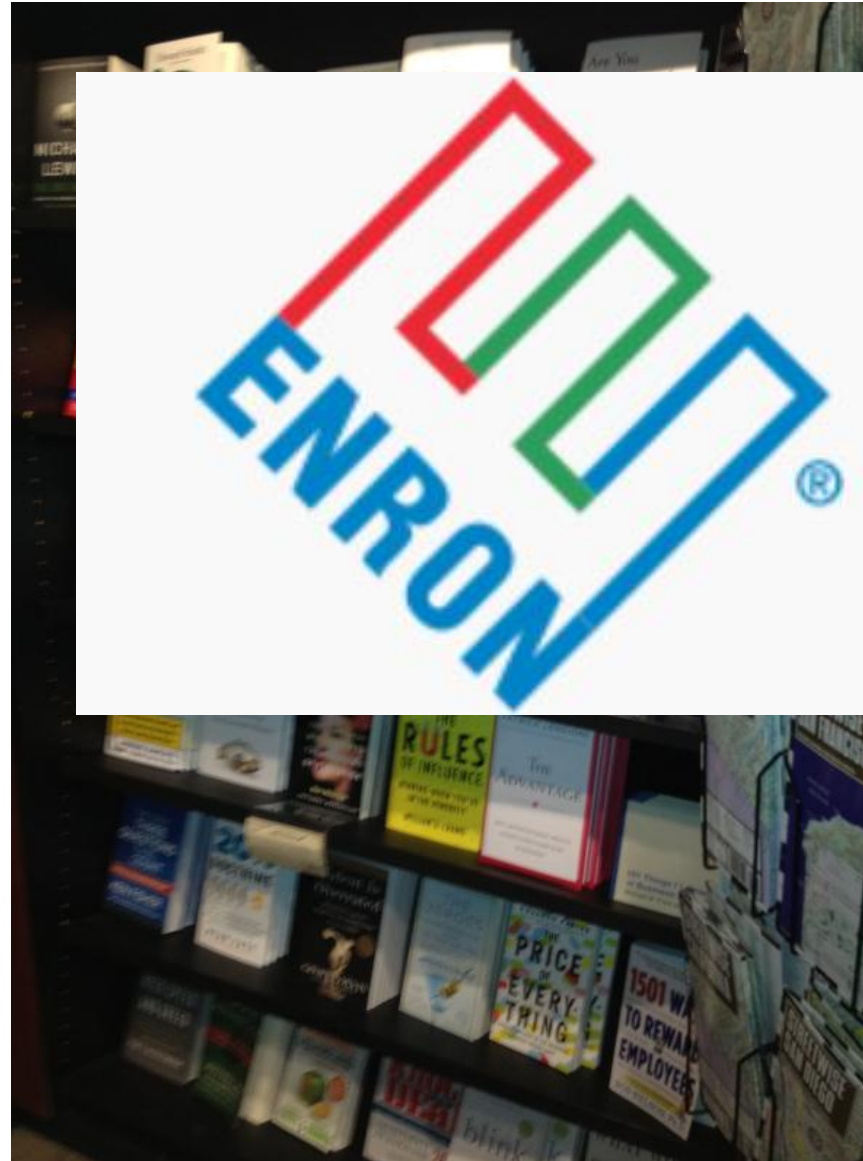
Chad Syverson (2011, *Journal of Economic Literature*)



But there is still a wide debate on whether management practices really matter

“No potential driving factor of productivity has seen a higher ratio of speculation to empirical study”.

Chad Syverson (2011,
Journal of Economic Literature)



But there is still a wide debate on whether management practices really matter



Enron ex-CEO, Jeff Skilling



But there is still a wide debate on whether management practices really matter



16 years of research

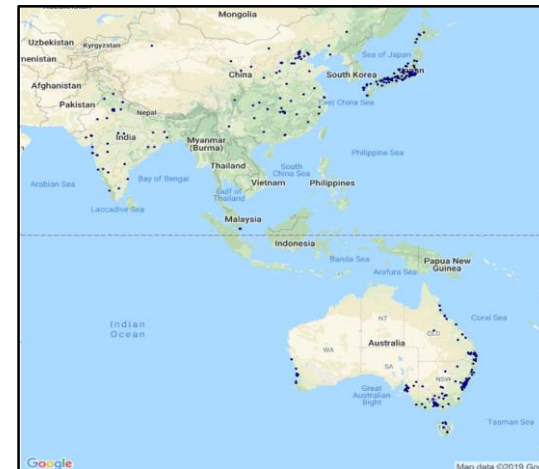
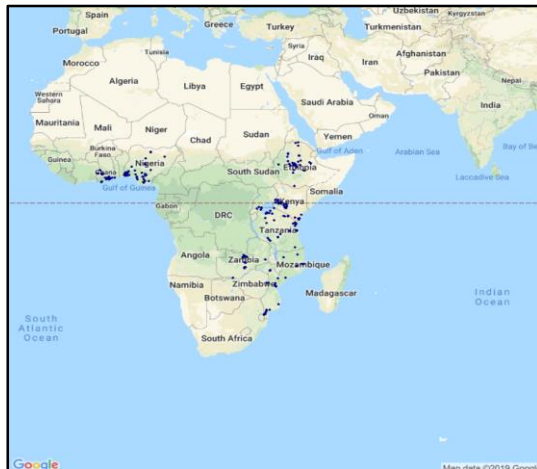
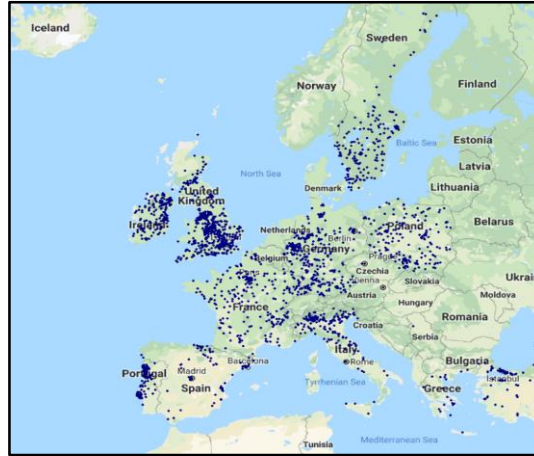
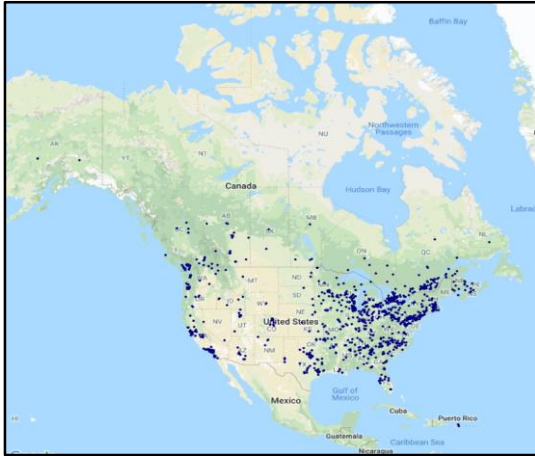
1) Measuring management

2) Impact of management on performance

3) Drivers and policy



World Management Survey has covered >20,000 firms in 35 countries



More research, benchmarking tool, policy briefs & media available here
www.worldmanagementsurvey.org

Survey methodology (Bloom & Van Reenen, 2007, QJE)

1) Developing management questions

- Scorecard for 18 **monitoring, targets & people** management practices ≈45 minute phone interview of plant managers

2) Getting firms to participate in the interview

- Introduced as “Lean-manufacturing” interview, no financials
- Official Endorsement: Bundesbank, RBI, World Bank, BOJ etc.

3) Obtaining unbiased comparable responses, “Double-blind”

- Interviewers do not know the company’s performance
- Managers are not informed (in advance) they are scored

Survey methodology (Bloom & Van Reenen, 2007, QJE)

1) Developing management questions

- Scorecard for 18 monitoring, targets & people management practices ≈45 minute phone interview of plant managers

2) Getting firms to participate in the interview

- Introduced as “Lean-manufacturing” interview, no financials
- Official Endorsement: Bundesbank, RBI, World Bank etc.

3) Obtaining unbiased comparable responses, “Double-blind”

- Interviewers do not know the company’s performance
- Managers are not informed (in advance) they are scored

Example monitoring question, scored based on a number of questions starting with “*How is performance tracked?*”

Score	(1): Measures tracked do not indicate directly if overall business objectives are being met. Many 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
--------------	--	---	---

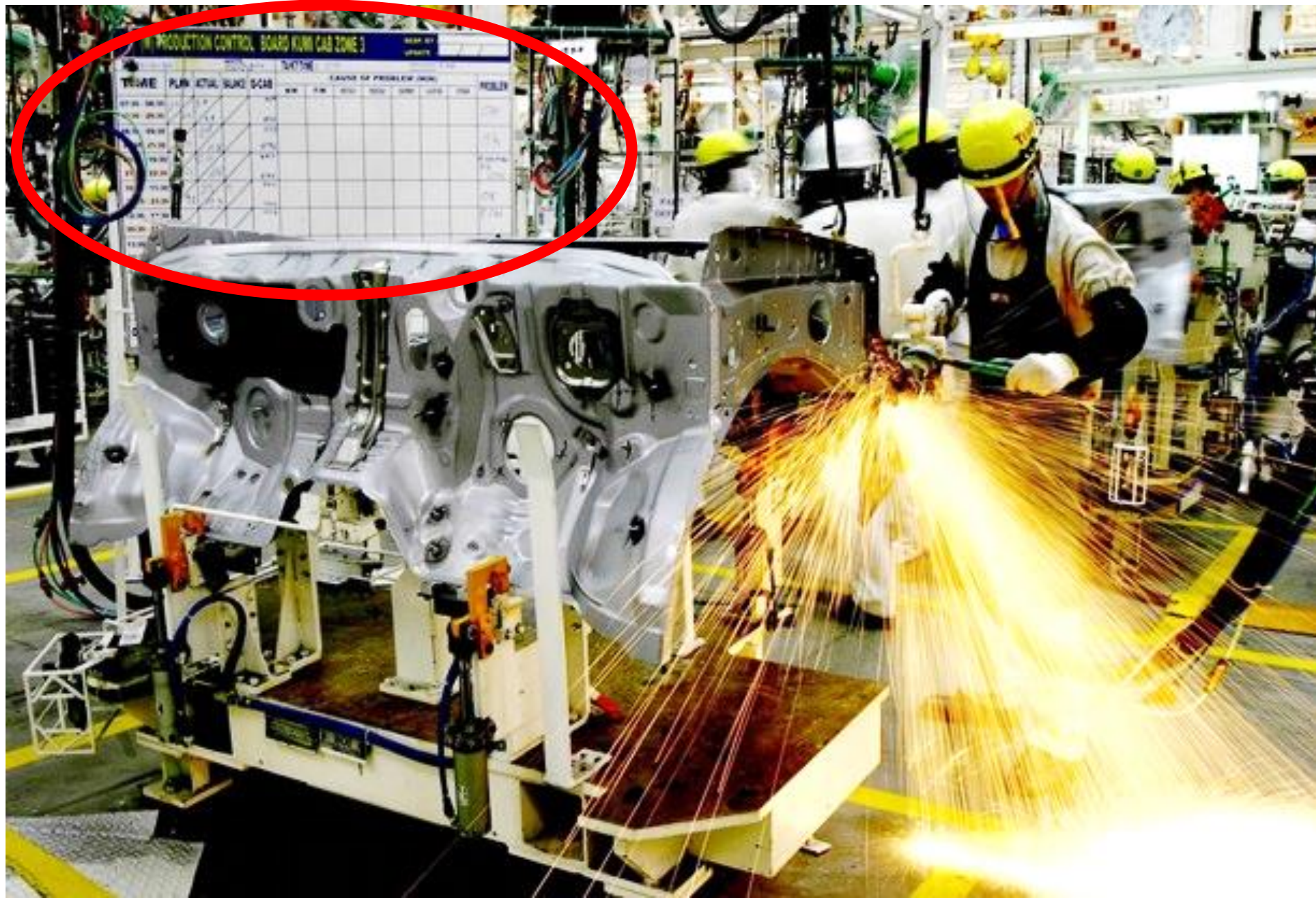
Note: All 18 questions & 50+ examples in <http://worldmanagementsurvey.org/>

Example monitoring question, scored based on a number of questions starting with “*How is performance tracked?*”

Score	(1): Measures tracked do not indicate directly if overall business objectives are being met. Many 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 & 50+ examples in <http://worldmanagementsurvey.org/>

Examples of performance metrics – Car Plant



Examples of a performance metrics – Hospital



Example incentives question, scored based on questions starting with “*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 & 50+ examples in <http://worldmanagementsurvey.org/>

Example incentives question, scored based on questions starting with “*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 & 50+ examples in <http://worldmanagementsurvey.org/>

MY FAVOURITE QUOTES:

The difficulties of defining ownership in Europe

MY FAVOURITE QUOTES:

The difficulties of defining ownership in Europe

Production Manager: "We're owned by the Mafia"

Interviewer: "I think that's the "Other" category.....although I guess I could put you down as an "Italian multinational" ?"

Americans on geography

MY FAVOURITE QUOTES:

The difficulties of defining ownership in Europe

Production Manager: “We’re owned by the Mafia”

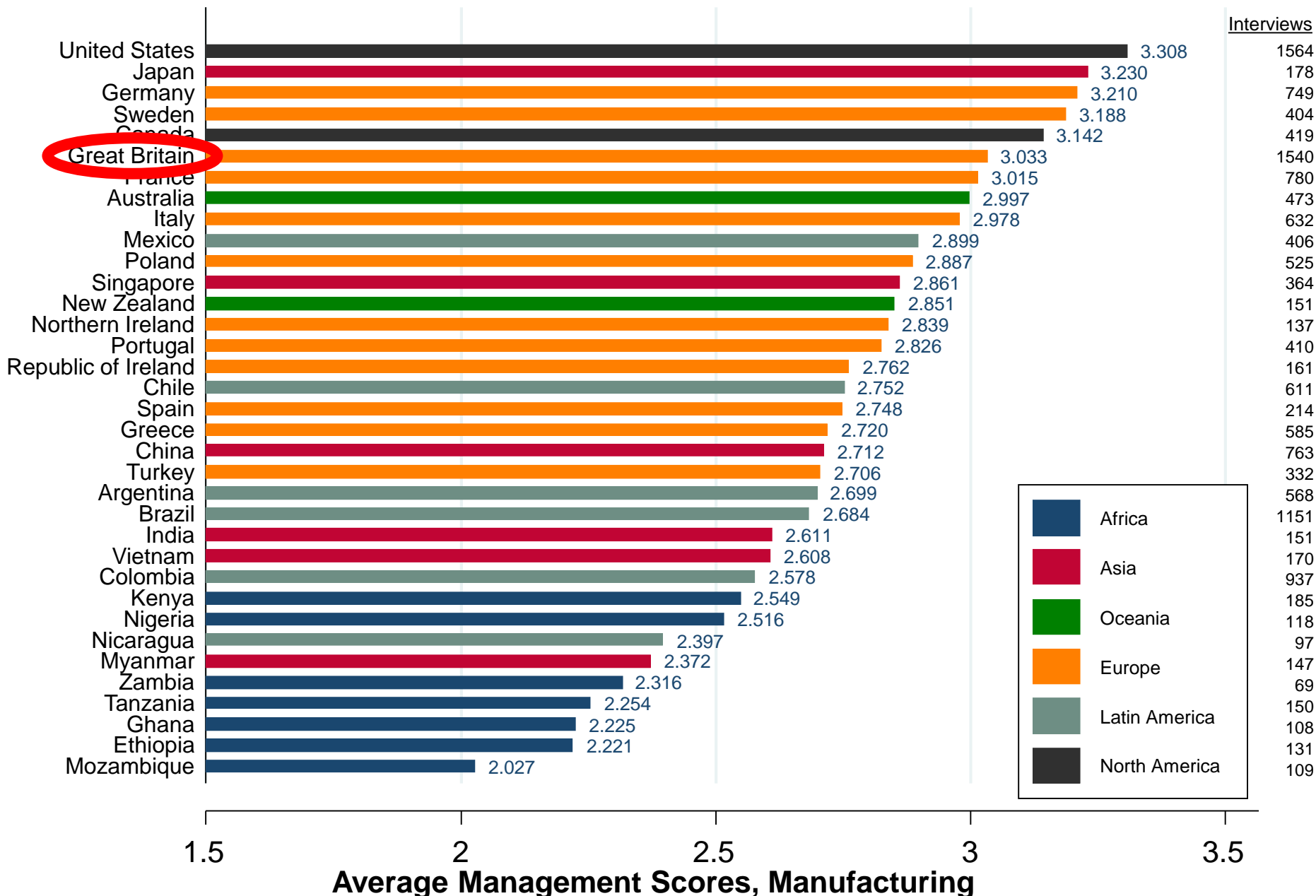
Interviewer: “I think that’s the “*Other*” category.....although I guess I could put you down as an “*Italian multinational*” ?”

Americans on geography

Interviewer: “How many production sites do you have abroad?”

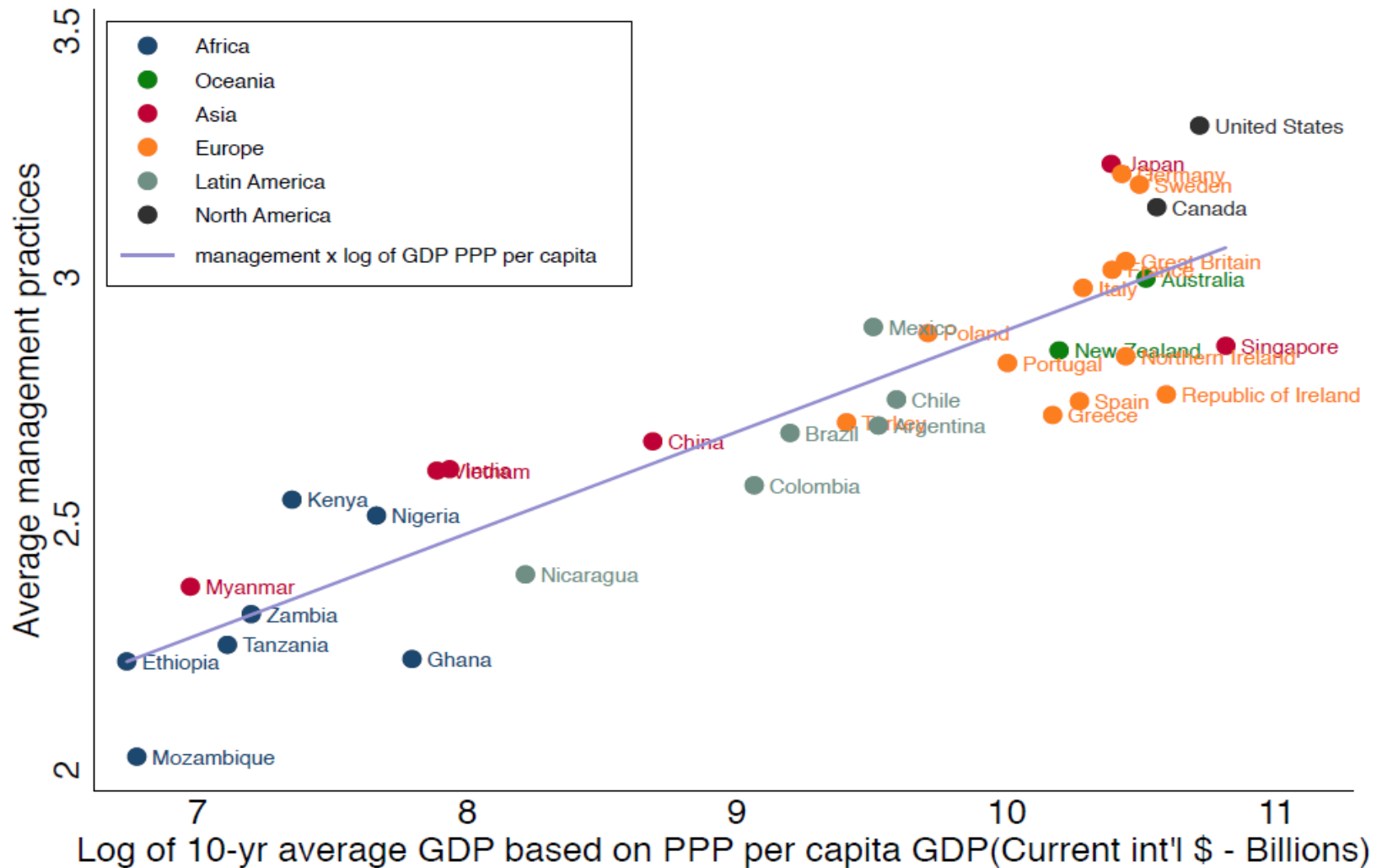
Manager in Indiana, US: “Well...we have one in Texas...”

Average Management Scores by Country

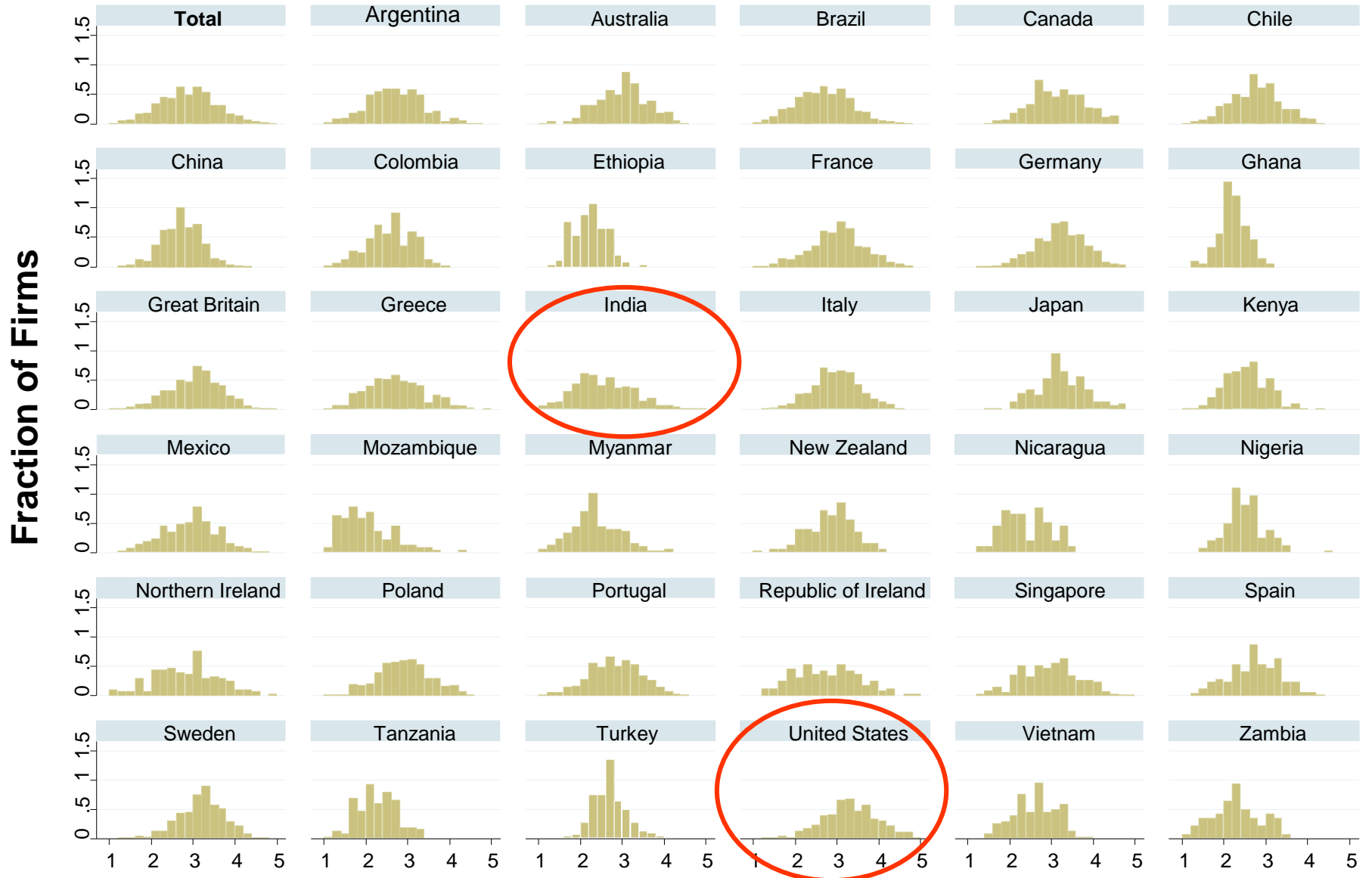


Note: Unweighted average management scores; # interviews in right column (total = 15,489); all waves pooled (2004-2014)

Average management scores across countries are strongly correlated with GDP per capita



Management also varies heavily within countries



Firm level average management scores, 1 (worst practice) to 5 (best practice)

One Problem with WMS is scale – we've collected 20,000 interviews over 16 years like this



To get 40,000 in one quick wave we'd need this!



Survey run with the US Census Bureau (MOPS)

1st Wave delivered in 2011 to ~48k manufacturing plants (US ASM) asks about practices in 2010 and 2005.

2nd Wave covered 2015 & 2010 practices

3rd Wave will cover 2020 & 2019 practices (delivered in 2021). Has some COVID related questions

Quick to fill out - and mandatory - so ~80% of plants responded



U.S. DEPARTMENT OF COMMERCE
Economic and Statistics Administration
U.S. CENSUS BUREAU
FORM
MP-10002 (DRAFT)

2010 MANAGEMENT AND ORGANIZATIONAL PRACTICES SURVEY

OMB No. 0607-0963; Approval Expires 2/28/2014

MP-10002

Need help or have questions about filling out this form?
Visit www.census.gov/econhelp/mops
Call 1-301-763-4673, between 8:00 a.m. and 4:30 p.m., Eastern time, Monday through Friday.
- OR -
Write to the address below. Include your 11-digit Census File Number (CFN) printed in the mailing address.

Mail your completed form to:
U.S. CENSUS BUREAU
1201 East 10th Street
Jeffersonville, IN 47132-0001

(Please correct any errors in this mailing address.)

YOUR RESPONSE IS REQUIRED BY LAW. Title 13, United States Code, requires businesses and other organizations that receive this questionnaire to answer the questions and return the report to the U.S. Census Bureau. By the same law, **YOUR CENSUS REPORT IS CONFIDENTIAL.** It may be seen only by persons sworn to uphold the confidentiality of Census Bureau information and may be used only for statistical purposes. Further, copies retained in respondents' files are immune from legal process.

INTERNET REPORTING OPTION AVAILABLE - We encourage you to complete this survey online at: www.census.gov/econhelp/mops

User ID: Password:

Public reporting burden for this collection is estimated to be 30 minutes. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to: Paperwork Project 0607-0963, U.S. Census Bureau, 4600 Silver Hill Road, ASMD - 3K138, Washington, DC 20233. You may e-mail comments to Paperwork@census.gov; use "Paperwork Project 0607-0963" as the subject.

An Office of Management and Budget (OMB) approval number is printed in the upper right corner of this form. Without displaying this number, we could not collect this information or require your response.

The reporting unit for this form is an **establishment** which is generally a single physical location where business is conducted or where services or industrial operations are performed.

10002012

Management and Organizational Practices Survey

asks similar questions to WMS. For example, performance monitoring

2 In 2005 and 2010, how many key performance indicators were monitored at this establishment?

Examples: Metrics on production, cost, waste, quality, inventory, energy, absenteeism and deliveries on time.

Check one box for each year

	2005	2010
1-2 key performance indicators	<input type="checkbox"/>	<input type="checkbox"/>
3-9 key performance indicators	<input type="checkbox"/>	<input type="checkbox"/>
10 or more key performance indicators	<input type="checkbox"/>	<input type="checkbox"/>
No key performance indicators (If no key performance indicators in both years, SKIP to 6)	<input type="checkbox"/>	<input type="checkbox"/>

The Management and Organizational Practices survey asks about targets e.g.

8 In 2005 and 2010, who was aware of the production targets at this establishment? *Check one box for each year*



	2005	2010
Only senior managers	<input type="checkbox"/>	<input type="checkbox"/>
Most managers and some production workers	<input type="checkbox"/>	<input type="checkbox"/>
Most managers and most production workers	<input type="checkbox"/>	<input type="checkbox"/>
All managers and most production workers	<input type="checkbox"/>	<input type="checkbox"/>



MOPS UK version (MES) run with ONS & ESRC funding



- 2017 Survey of 25k firms regarding 2016 practices (includes non-manufacturing)
- Questions same as US MOPS for comparability
- Planned new wave for later this year
- Use ABS sampling frame
- Voluntary



Management and Expectations Survey

00001 00000
TEST PRINT

Please write any changes to your name and address in the box below, using black ink

To be completed for: THE BUSINESS NAMED ABOVE

Please complete and return by 18 August 2017

Dear Sir or Madam,

Please find the questionnaire for the Management and Expectations Survey attached. Please complete for the period 1 January 2016 to 31 December 2016. The questionnaire focuses on two different themes. These relate to businesses':

- **management practices** such as the use of performance indicators, targets, employment decisions
- **current performance and future expectations** about turnover, investment, employment and spending on resources

The Office for National Statistics (ONS) is responsible for producing key economic statistics that are used to respond to, and manage the economy. Your response is of great value. This survey is voluntary, however the information provided will be used to better understand whether management practices and uncertainty relate to productivity. The information could benefit your business as the published statistics can be used as a benchmark to compare your business against the same, or across different sectors. To find out more, search '*Management Practices*' at www.ons.gov.uk

Once complete, the questionnaire can be returned by post or fax using the details in the box below.

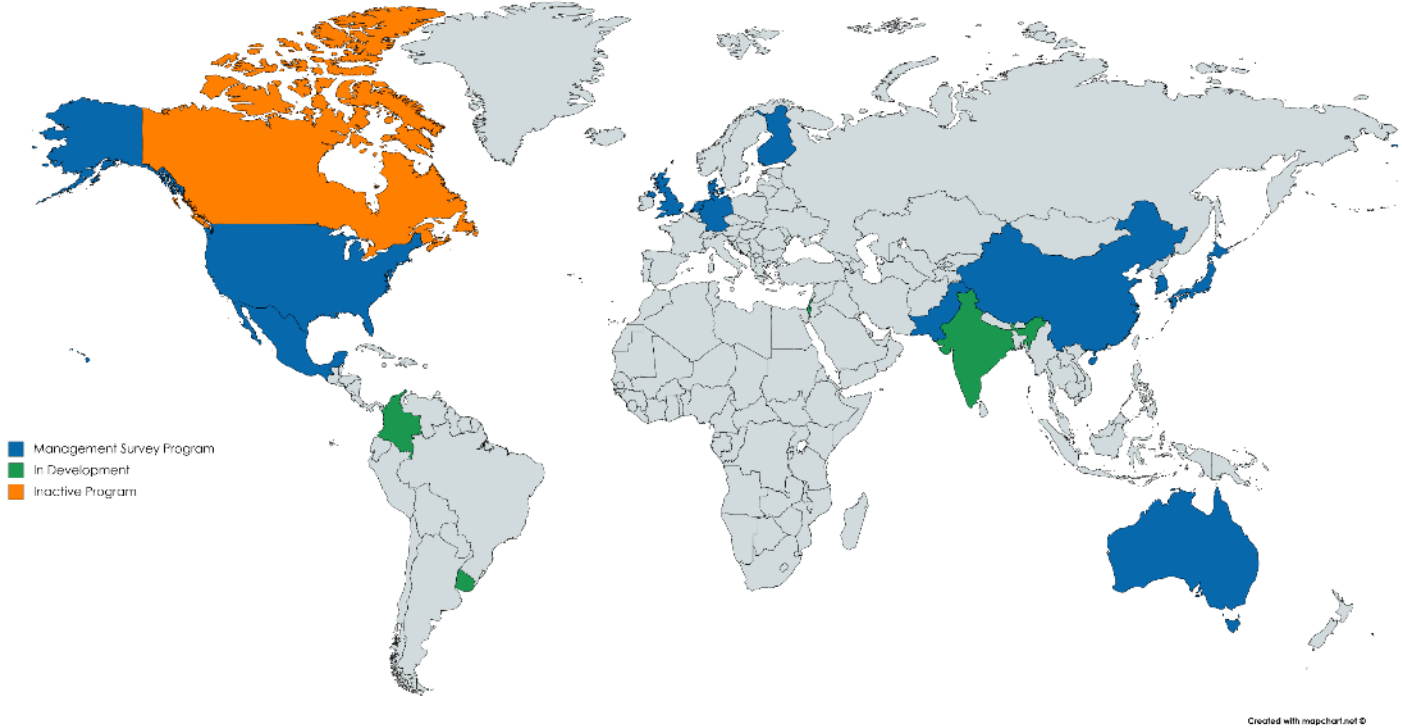
We request that you complete this questionnaire for the business named above, including for any parts of the business located at other addresses within Great Britain. All the information you provide is kept strictly confidential. It is illegal for us to reveal your data or identify your business to unauthorised persons.

Thank you for your co-operation,
Office for National Statistics

Questionnaire return details

To return via fax:	01633 652707
To return via post: Please use the prepaid envelope provided which is addressed to: Office for National Statistics, Government Buildings, Cardiff Road, Newport, NP10 8XG	
Contact numbers	
Er mwyn gwneud cais am ffurflen Gymraeg (To request a questionnaire in Welsh)	0300 1234 921
If you would like to use our Minicom service for the Deaf	01633 845 044

Coverage of International MOPS



PLUS: Related programs from EU; World Bank Enterprise Surveys; World Bank Finance, Competitiveness, and Innovation

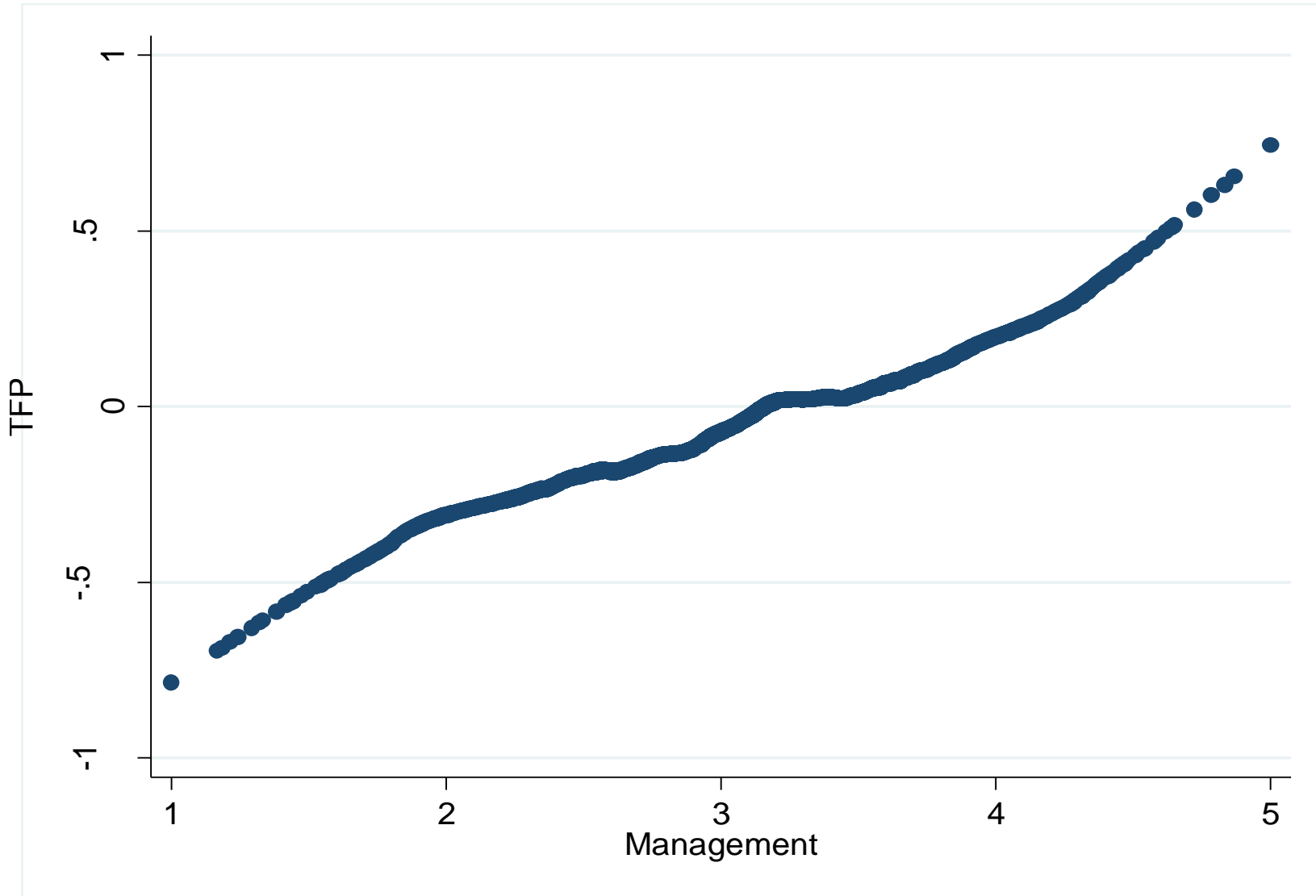
Outline

1) Measuring management

2) Impact of management on performance

3) Drivers and policy

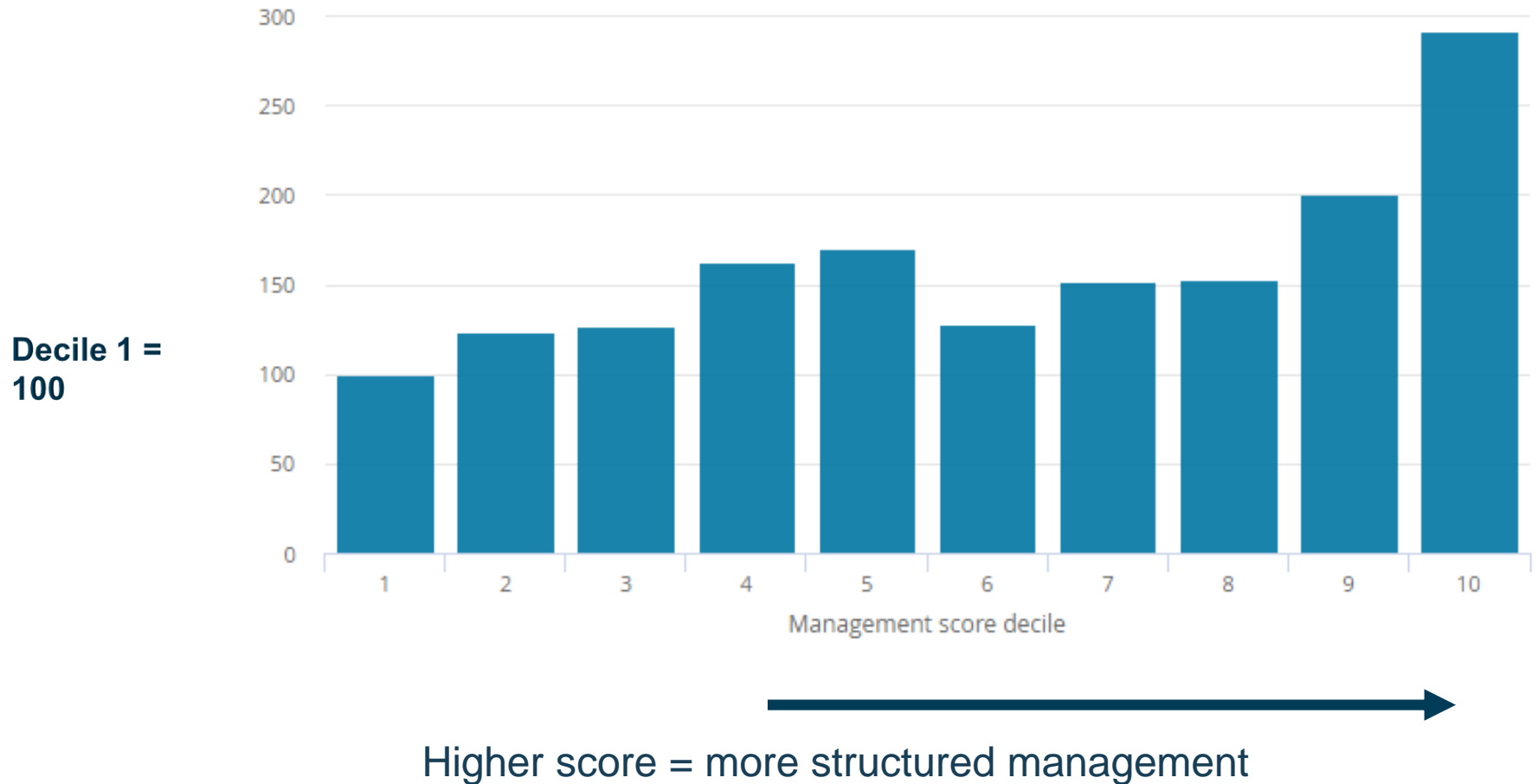
Productivity & Management (WMS) positively correlated



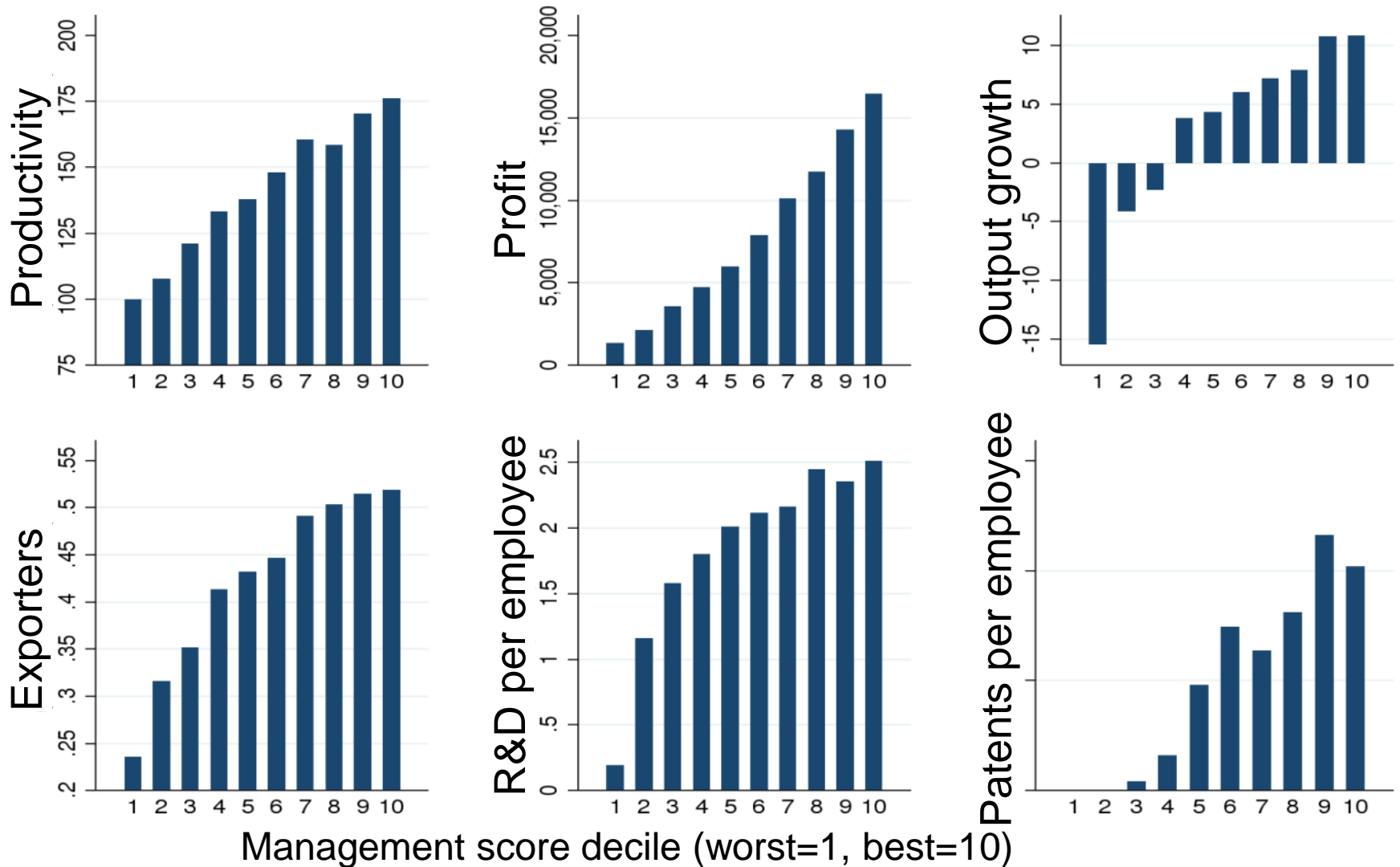
Notes: Management is an average of all 18 questions. TFP residuals of sales on capital, labor, skills controls plus a full set of SIC-3 industry, country and year dummies controls. N=10,900;

Source: Bloom, Sadun & Van Reenen “Management as a Technology”

Labour productivity also increases with the management score in the UK MOPS (MES)

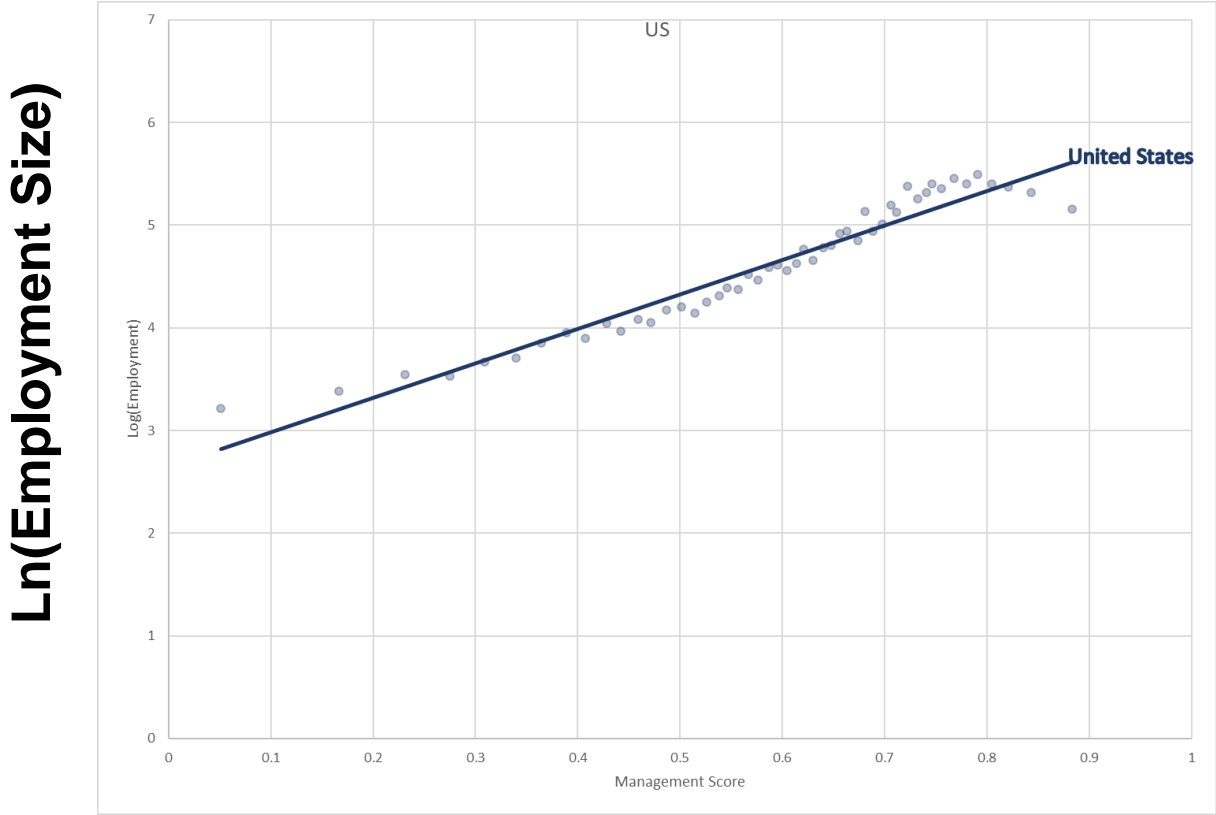


management scores positively correlated with many other measures of firm performance (US MOPS)



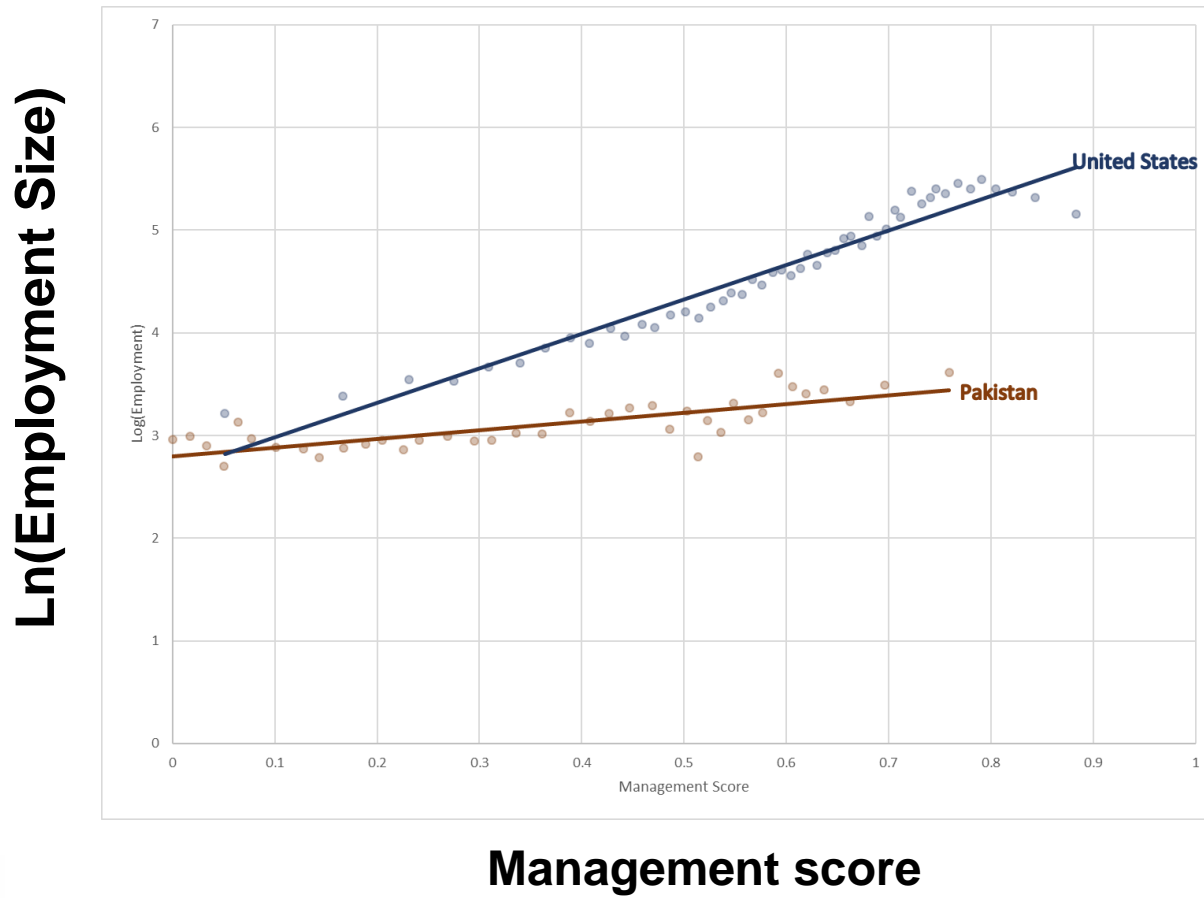
Source: Bloom, Brynjolfsson, Foster, Jarmin, Patnaik, Saporta-Eksten & Van Reenen (2019, AER) “Drivers”

Positive Relationship Between Employment size and Management and in US MOPS

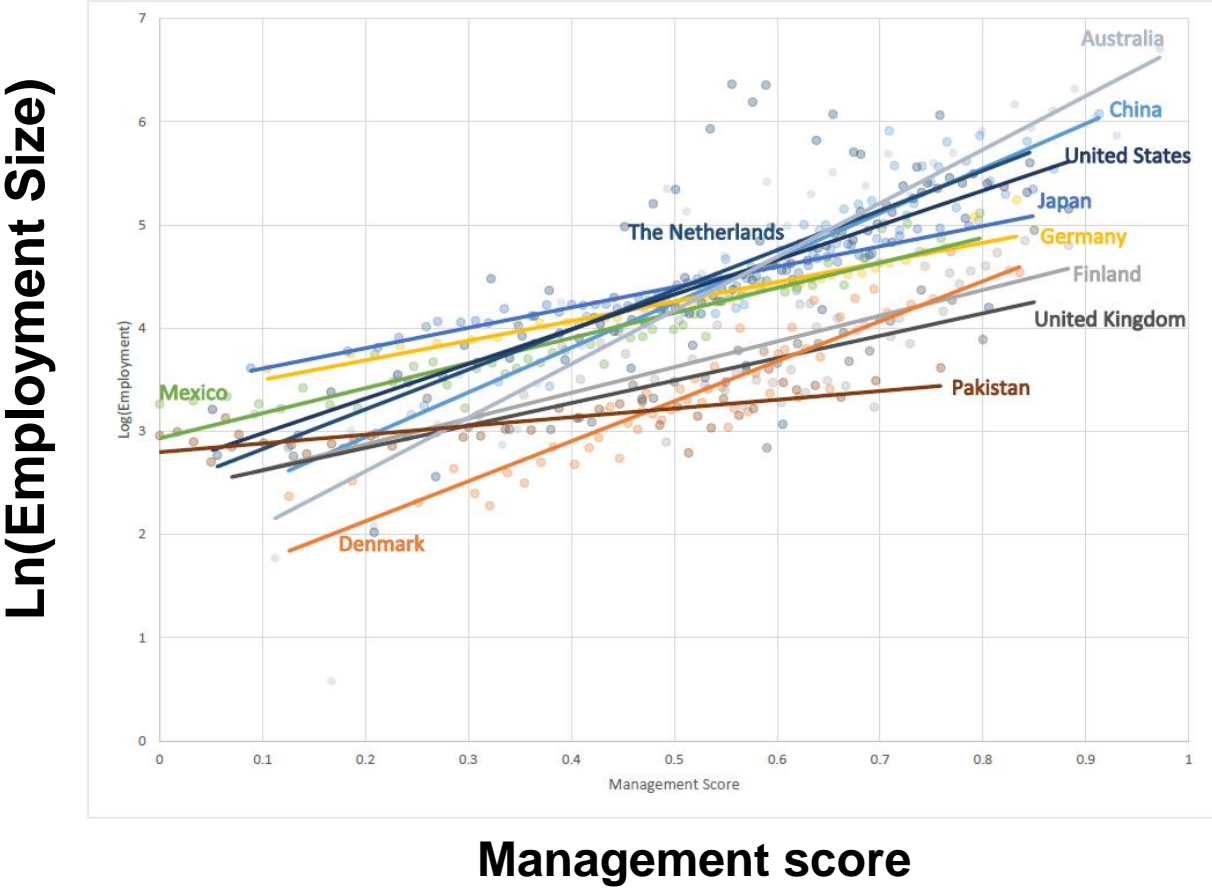


Management score

But Size-management relationship much weaker in other countries such (e.g. Pakistan). Consistent with less reallocation when more frictions



But a positive Size-management relationship firms in all countries in MOPS



Are these correlations between performance and management causal?

- Many Management Practices have an important causal effect on firm performance
 - **Quasi-experiments** (e.g. Giorcelli, 2018; Huber et al, 2020; Bandiera et al, 2005, 2007)
 - **Randomized Control Trials:** e.g. Blader et al (2019), Bloom et al (2013, 2019); Brooks et al (2018); Bruhn et al, (2018); Fryer (2017); Iacovone et al (2019); Karlan et al (2015); Cai & Szeidl (2018); Higuchi et al (2019); Gosnell et al (2019); Bandiera et al (2017) meta-study.

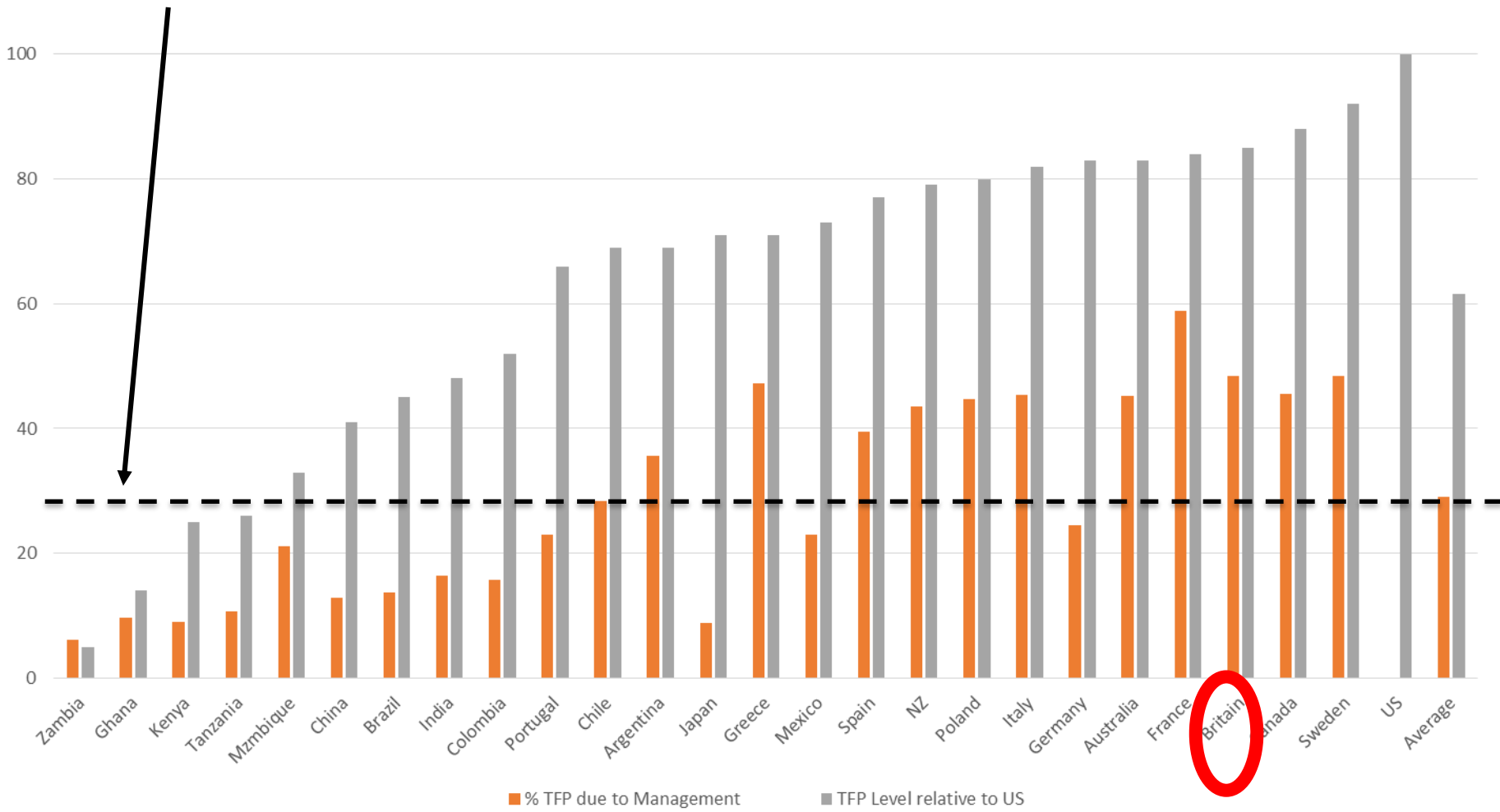


We can use WMS data to estimate the contribution of management to cross-country TFP differences

1. Estimate country differences in size weighted management
2. Impute impact of size weighted management on TFP

Requires many assumptions so rough magnitude calculation (in spirit of Development Accounting, Caselli, 2005).

Management accounts for ~30% of TFP Gap with US (~10pp is reallocation to better managed firms)



Source: Bloom, Sadun & Van Reenen “Management as a Technology”

Notes: TFP gaps from Penn World Tables; fraction accounted for by management uses the weighted average management scores and an assumed 10% impact of management on TFP

Outline

- 1) Measuring management
- 2) Impact of management on performance
 - Regression results
 - Field experiments
- 3) Drivers and policy**

General perspective on why seemingly beneficial management practices are not adopted (Jan Rivkin, 2000)

- Not knowing firm has poor management practices (**information**)

General perspective on why seemingly beneficial management practices are not adopted (Jan Rivkin, 2000)

- Not knowing firm has poor management practices (**information**)
- Knowing that management is poor, but not knowing how to change (**human capital**)

General perspective on why seemingly beneficial management practices are not adopted (Jan Rivkin, 2000)

- Not knowing firm has poor management practices (**information**)
- Knowing that management is poor, but not knowing how to change (**human capital**)
- Knowing firm is poorly managed & what do, but weak incentives to change (economics focus: **competition & governance**)

General perspective on why seemingly beneficial management practices are not adopted (Jan Rivkin, 2000)

- Not knowing firm has poor management practices (**information**)
- Knowing that management is poor, but not knowing how to change (**human capital**)
- Knowing firm is poorly managed & what do, but weak incentives to change (economics focus: **competition & governance**)
- Knowledge & strong incentives but political problems within firm (**relational contracts**)

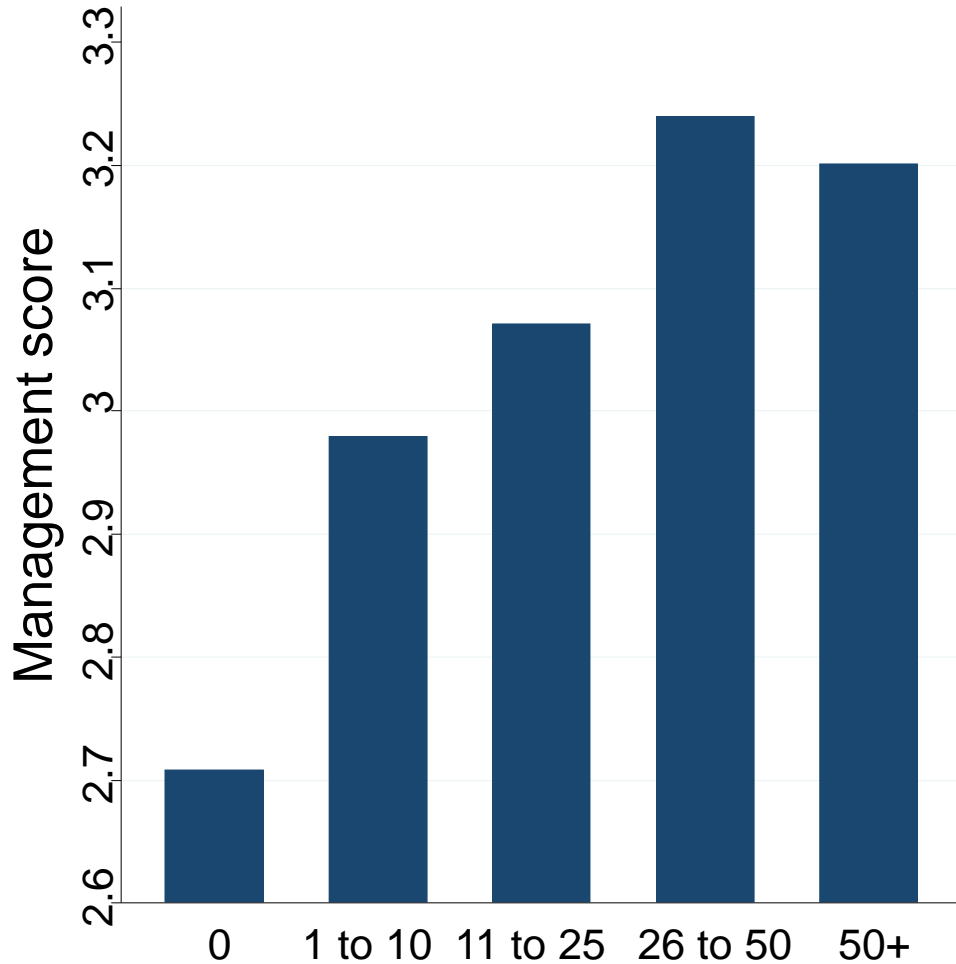
Some Drivers of Management

- **Human Capital**

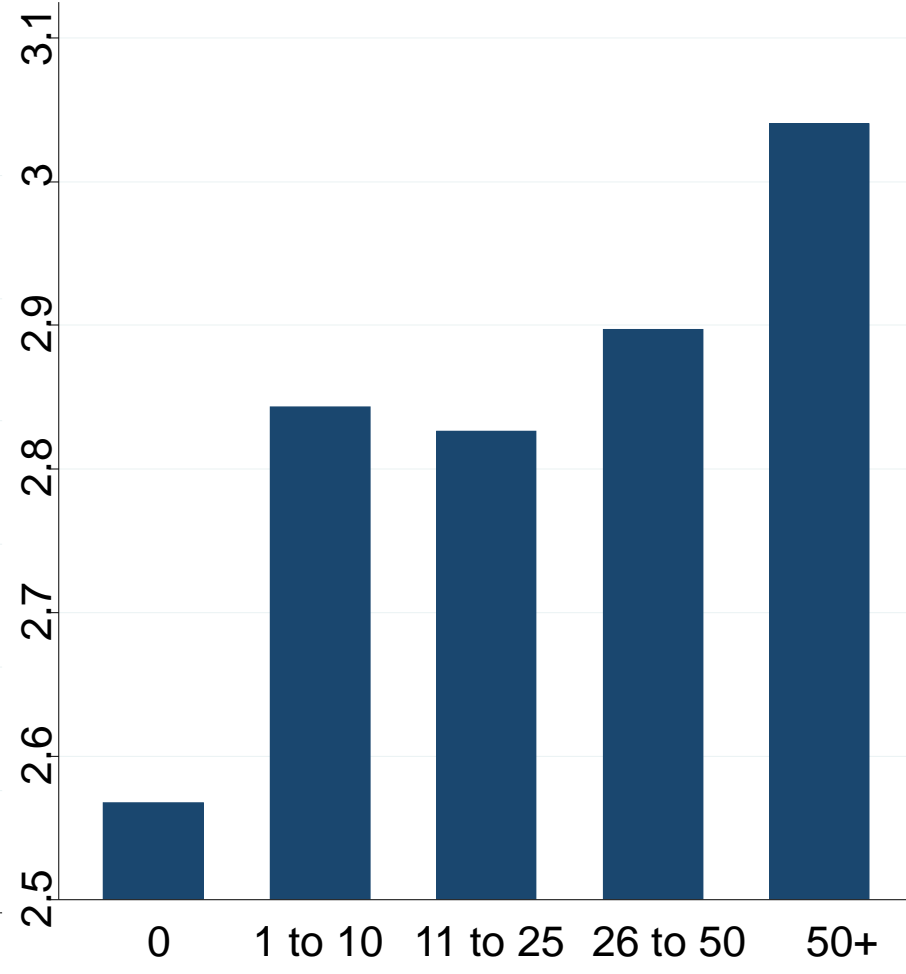
- Information
- Competition
- Governance
- Regulation

EDUCATION FOR NON-MANAGERS AND MANAGERS APPEAR LINKED TO BETTER MANAGEMENT

Non-managers



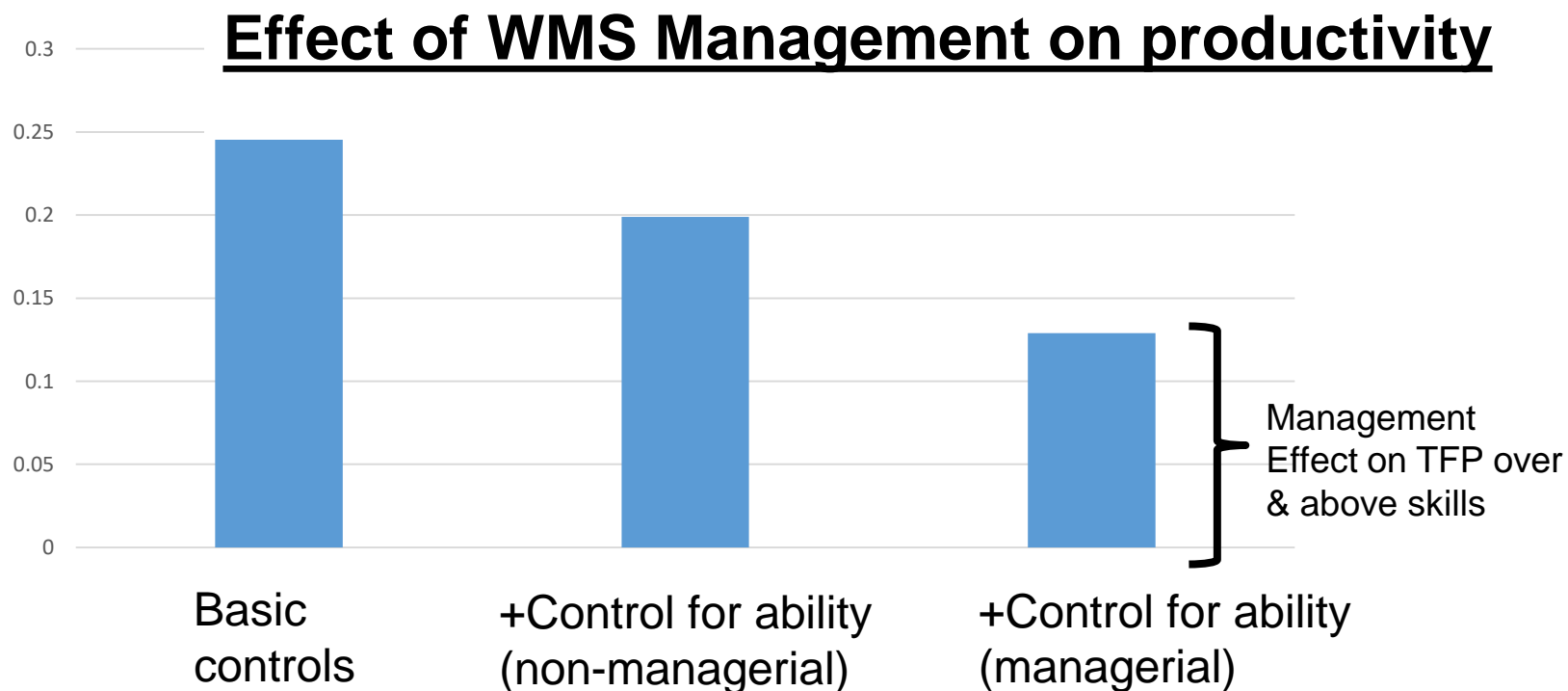
Managers



Percentage of employees with a college degree (%)

Management practices are not just about skills....

- Bender et al (2018) use WMS in Germany & calculate skills using AKM methods. Document a strong correlation between unobserved ability & management
- But only **half** of the productivity vs management relationship is explained by ability of managerial & non-managerial employees



Some Drivers of Management

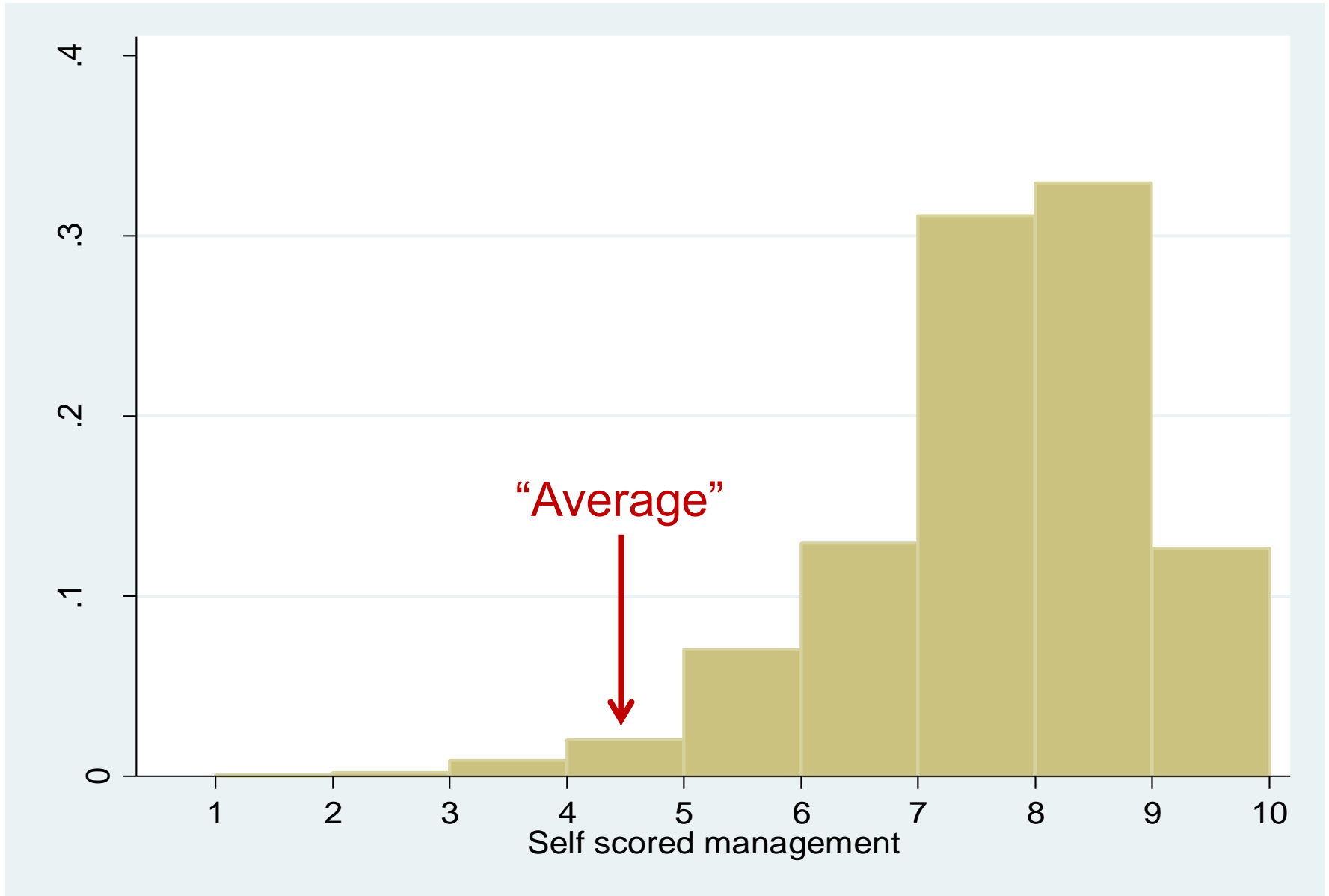
- Human Capital
- **Information**
- Competition
- Governance
- Regulation

Information – Managers bad at self assessment

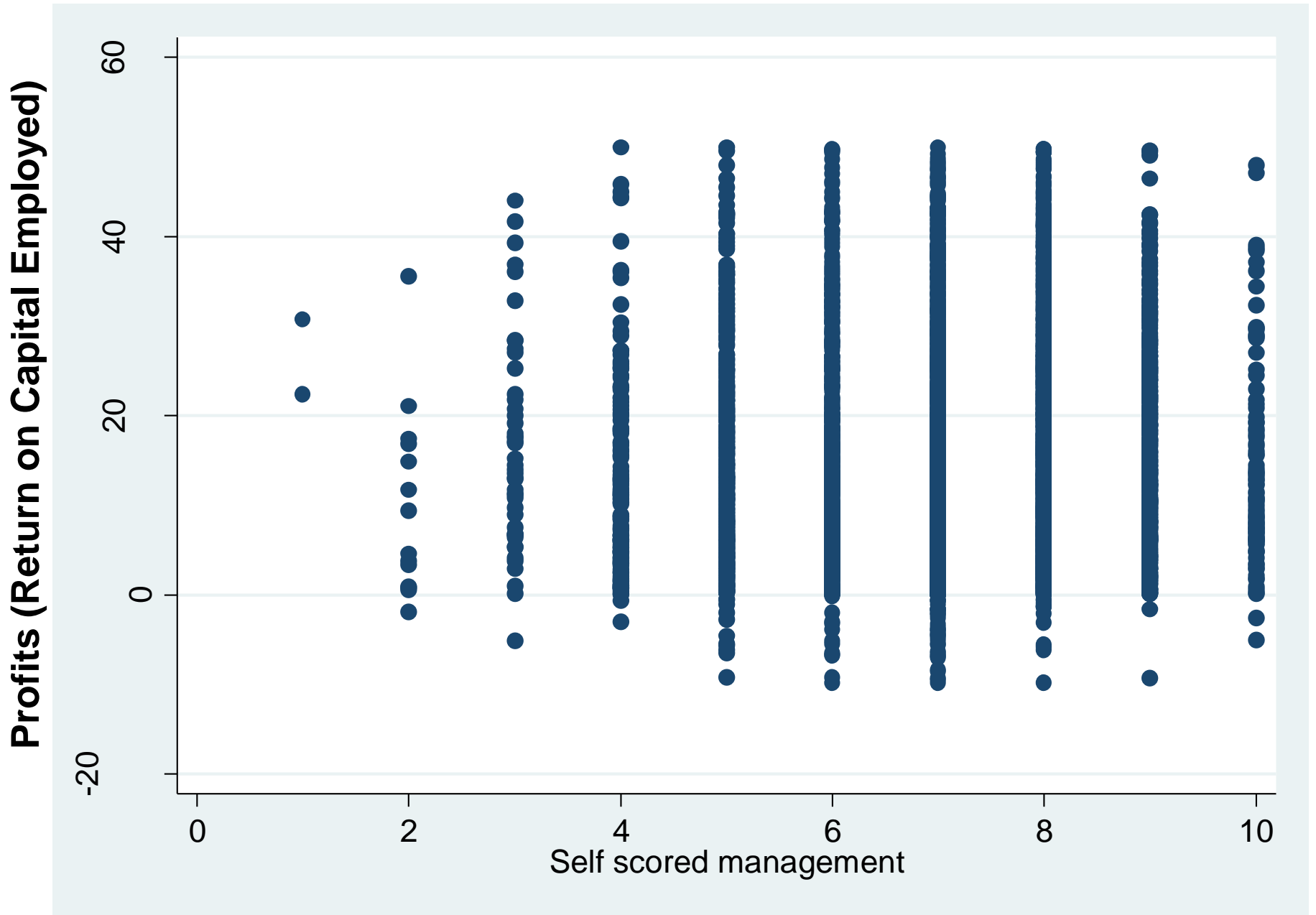
At the end of the WMS survey we asked:

“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”

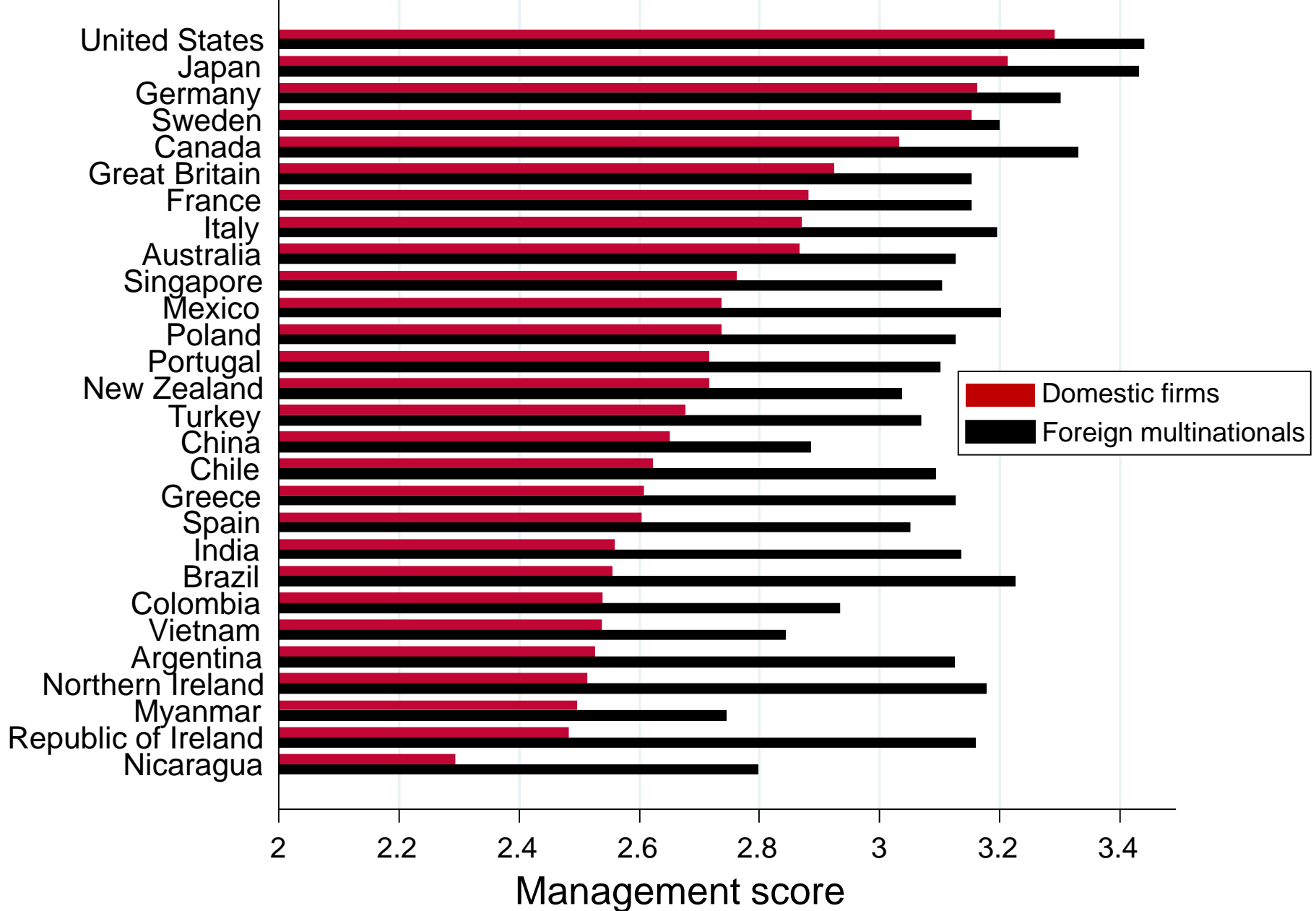
...and found firms are too optimistic on management



...and self-scores show no link to performance



MULTINATIONALS ACHIEVE HIGH MANAGEMENT SCORES WHEREVER THEY LOCATE

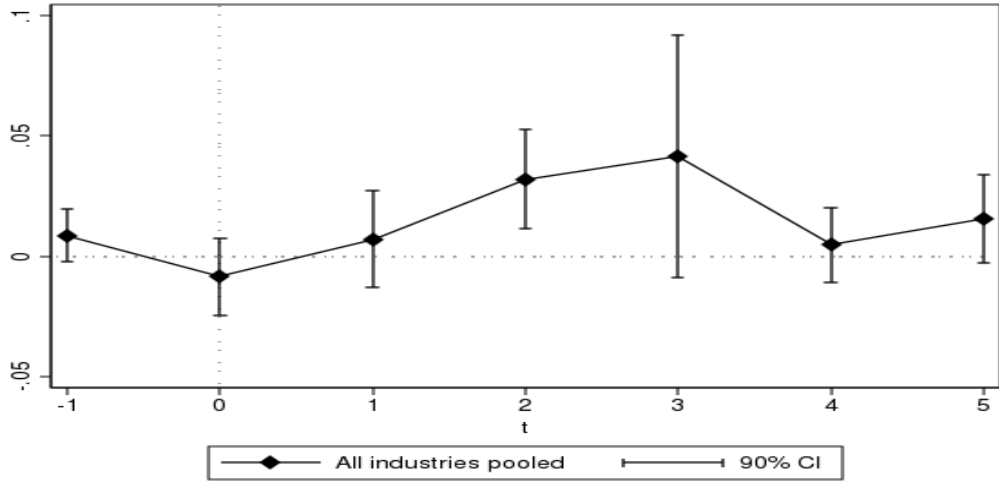


Testing Informational Spillovers - Look at impact on incumbent plants in a county which wins a “Million Dollar Plant” (MDP) versus plants in runner up counties

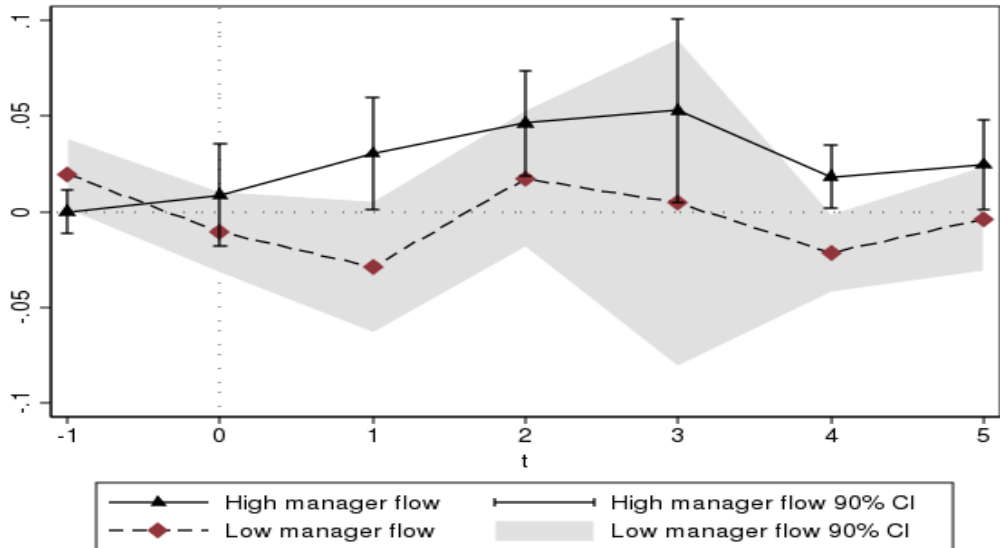
Following Greenstone, Hornbeck & Morretti (2010) use Site Selection magazine to look at impact of winning an MDP

Magazine has monthly stories about winning county and runner up counties, which we supplement with news coverage

Multinational Plants' information spills over to other incumbent local plants' MOPS management



Panel A:
Overall Treatment Effect



Panel B:
Bigger effects on plants in industries where we (ex ante) predict managerial information flow higher

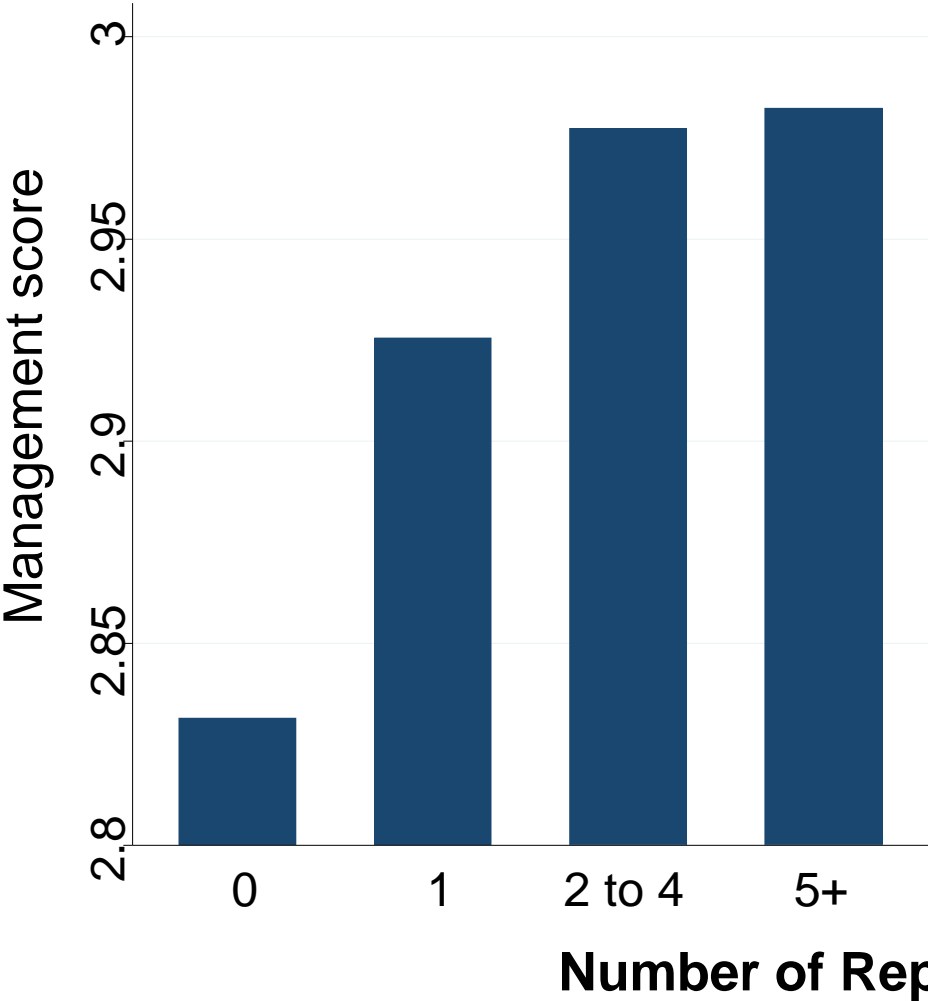
Source: Bloom, Brynjolfsson, Foster, Jarmin, Patnaik, Saporta-Eksten & Van Reenen (2019, AER) "Drivers"

Some Drivers of Management

- Human Capital
- Information
- **Competition**
- Governance
- Regulation

COMPETITION ASSOCIATED WITH BETTER MANAGEMENT

Manufacturing and Retail

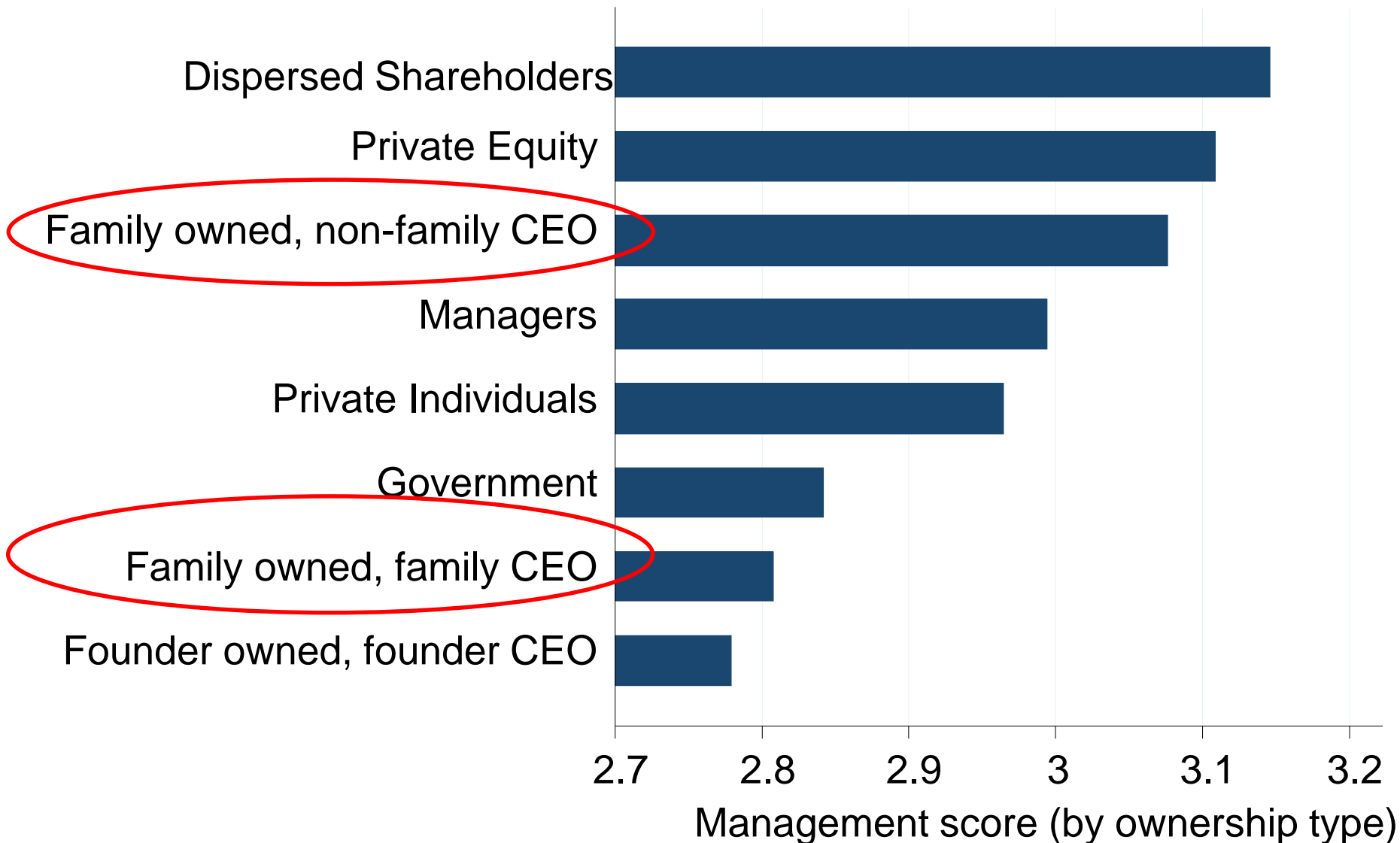


Sample of 9469 manufacturing and 661 retail firms (private sector panel) Reported competitors defined from the response to the question "How many competitors does your [organization] face?"

Some Drivers of Management

- Human Capital
- Information
- Competition
- **Governance**
- Regulation

GOVERNANCE: FAMILY-RUN AND GOVERNMENT FIRMS TYPICALLY HAVE VERY POOR 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.

Discussion of family firms

- Negative correlation of management with family-run (*Primogeniture*) consistent with work showing negative impact of family firms on performance
- **Lemos and Scur (2019)** use the gender composition (# male children controlling for family size) of founders' children. Find family firms significantly reduce WMS scores with this IV.

Some Drivers of Management

- Human Capital
- Information
- Competition
- Governance
- **Regulation**

Will better managed firms survive the COVID shock?

- We do not know yet!
- Evidence that structured management makes better use of positive opportunities from new technologies (organization-ICT complementarity)
 - Lessons for disappointing productivity effects of AI
 - Important for hospitals as users of new technology

Will better managed firms survive the COVID shock?

- We do not know yet!
- Evidence that structured management makes better use of positive opportunities from new technologies (organization-ICT complementarity)
 - Lessons for disappointing productivity effects of AI
 - Important for hospitals as users of new technology
- But what about big **negative** shocks like COVID?
- Evidence here is that firms who are more are better able to cope with large unexpected downturns in demand (Aghion et al, 2020).
 - Better managed firms tend to be more decentralized (but not always)
 - So a live research question

Other areas for Future Research

- **Policy**

- ***Structural***: Competition policy; trade; FDI; tax structures on inheritance. Current trends in wrong direction (e.g. Brexit & Trump trade wars)
- ***Direct***: Management training and information
- **Research**: Which policies work in a cost-effective way?

- **Theory**

- Frameworks to integrate different perspectives (e.g. Dessein and Pratt, 2019)

- **Empirics**

- Improving data
- Combining moments from experiments and data with well specified structural models (e.g. Akcigit et al, 2019; Bloom, Sadun and Van Reenen, 2019)

Conclusions

- Some core **management** practices can be measured: international firm databases e.g. MOPS/MES, WMS
 - Can be used to capture deep & rich info on firms
- Management **matters** at micro and macro level (e.g. accounts for ~1/3 of cross-country productivity spread)
- Some key **drivers** appear to be: Human Capital; Information, Competition, Governance, Regulation
- Good news is that main drivers can be influenced by government & business **policy**
- Rich agenda for future research, esp COVID impact

MY FAVOURITE QUOTES:

Don't get sick in Britain

Interviewer : “Do staff sometimes end up doing the wrong sort of work for their skills?”

NHS Manager: “You mean like doctors doing nurses jobs, and nurses doing porter jobs? Yeah, all the time. Last week, we had to get the healthier patients to push around the beds for the sicker patients”

Don't do Business in Indian hospitals

Interviewer: “Is this hospital for profit or not for profit”

Hospital Manager: “Oh no, this hospital is only for loss making”

MY FAVOURITE QUOTES:

Don't get sick in India

Interviewer : “Do you offer acute care?”

Switchboard: “Yes ma'am we do”

Interviewer : “Do you have an orthopaedic department?”

Switchboard: “Yes ma'am we do”

Interviewer : “What about a cardiology department?”

Switchboard: “Yes ma'am”

Interviewer : “Great – can you connect me to the ortho department”

Switchboard?: “Sorry ma'am – I'm a patient here”

MY FAVOURITE QUOTES:

The traditional Indian Chat-Up

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”

Some Key papers:

Summary of the work (Harvard Business Review):

https://hbr.org/2017/09/why-do-we-undervalue-competent-management?utm_campaign=hbr&utm_source=twitter&utm_medium=social

Survey paper (JEEA):

<http://cep.lse.ac.uk/pubs/download/occasional/op041.pdf>

Measuring management (QJE):

http://cep.lse.ac.uk/textonly/_new/staff/vanreenen/pdf/management_qje.pdf

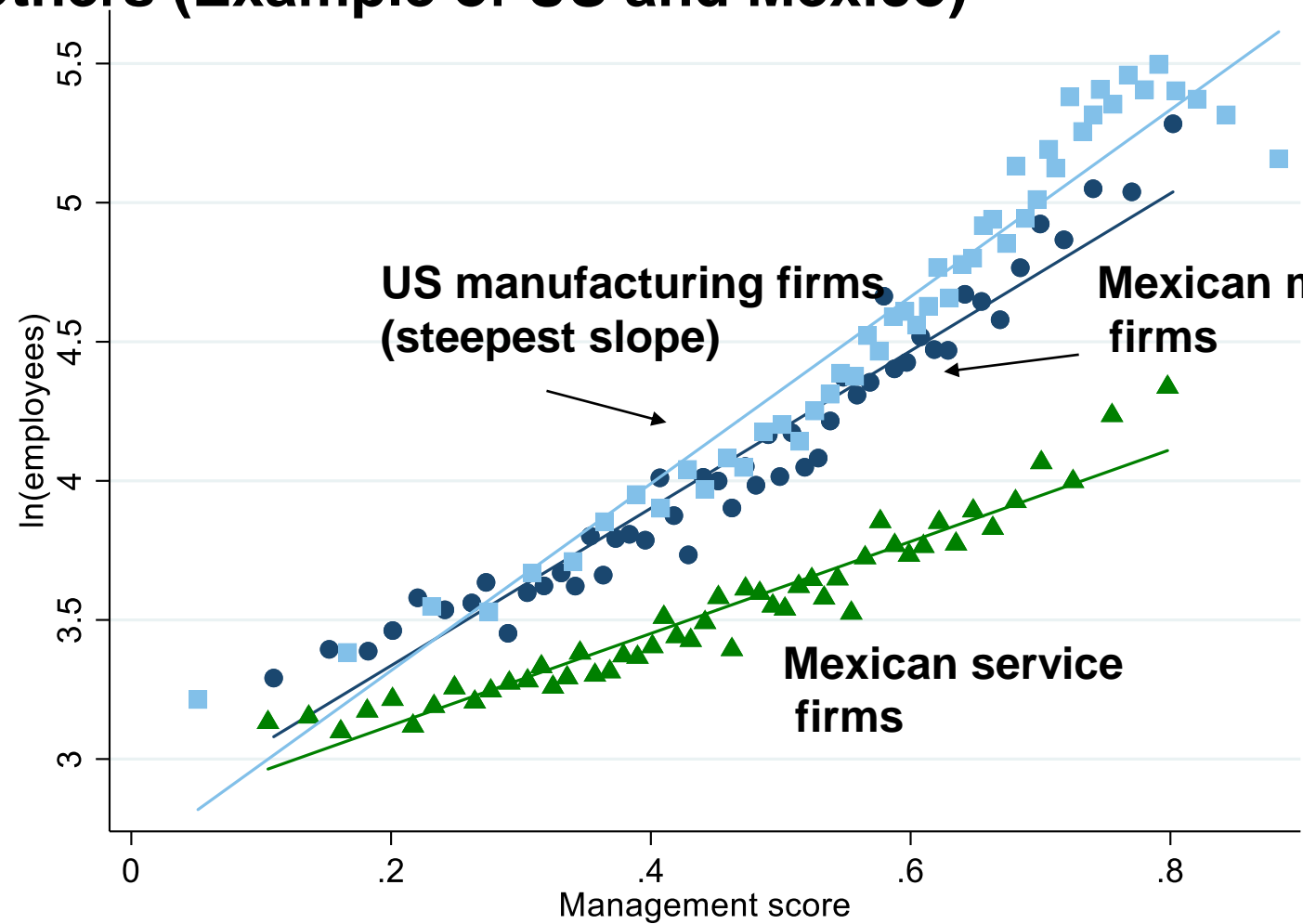
What Drives Differences in Management (AER)

<https://people.stanford.edu/nbloom/sites/default/files/drivers.pdf>

Management as a Technology (NBER WP):

<http://mitsloan.mit.edu/shared/ods/documents/?DocumentID=2685>

Reallocation stronger in some sectors (e.g. manufacturing) than others (Example of US and Mexico)



US manufacturing firms
(steepest slope)

Mexican manufacturing firms

Mexican service firms

● Manufacturing

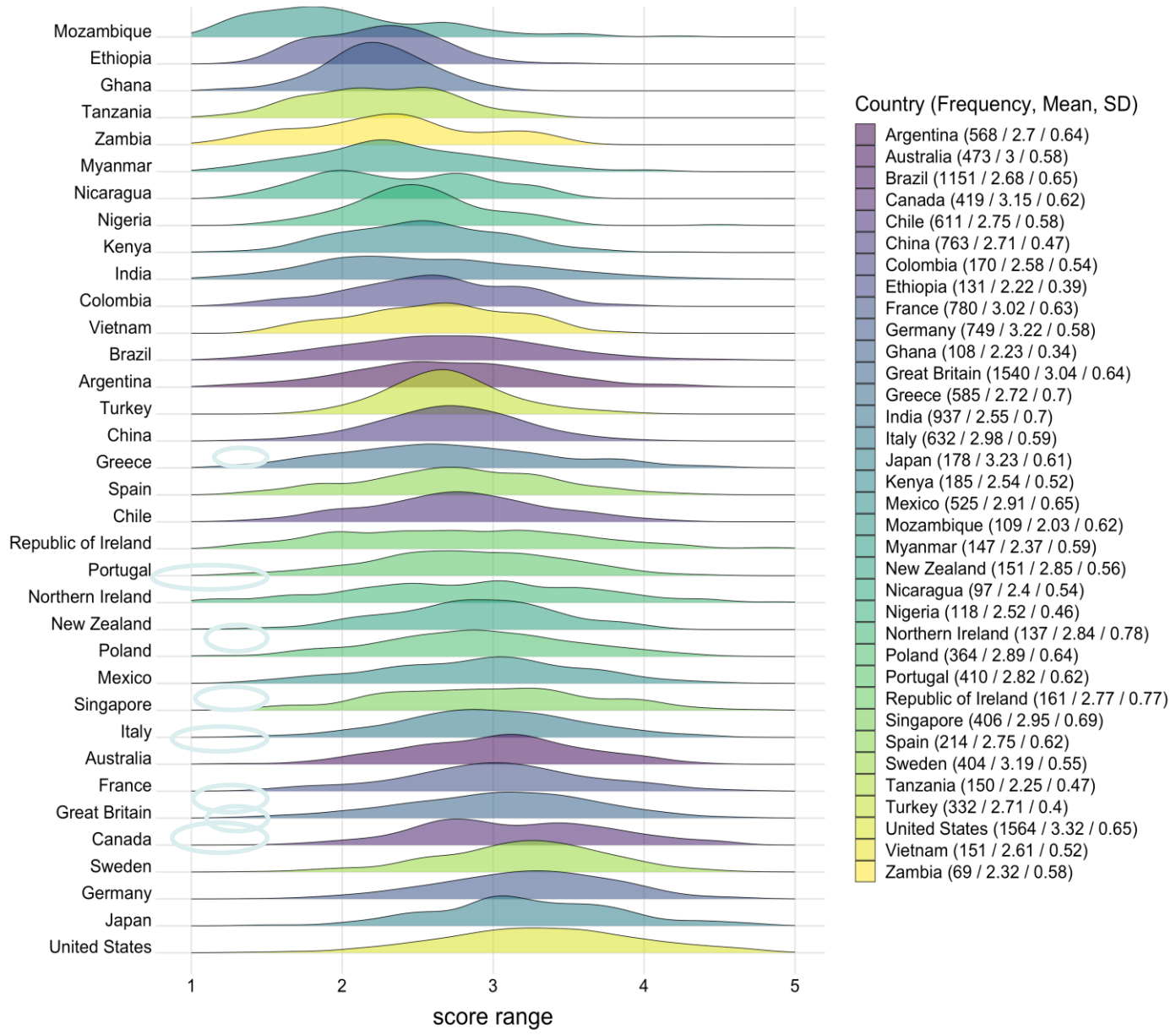
▲ Services

■ Manufacturing U.S.

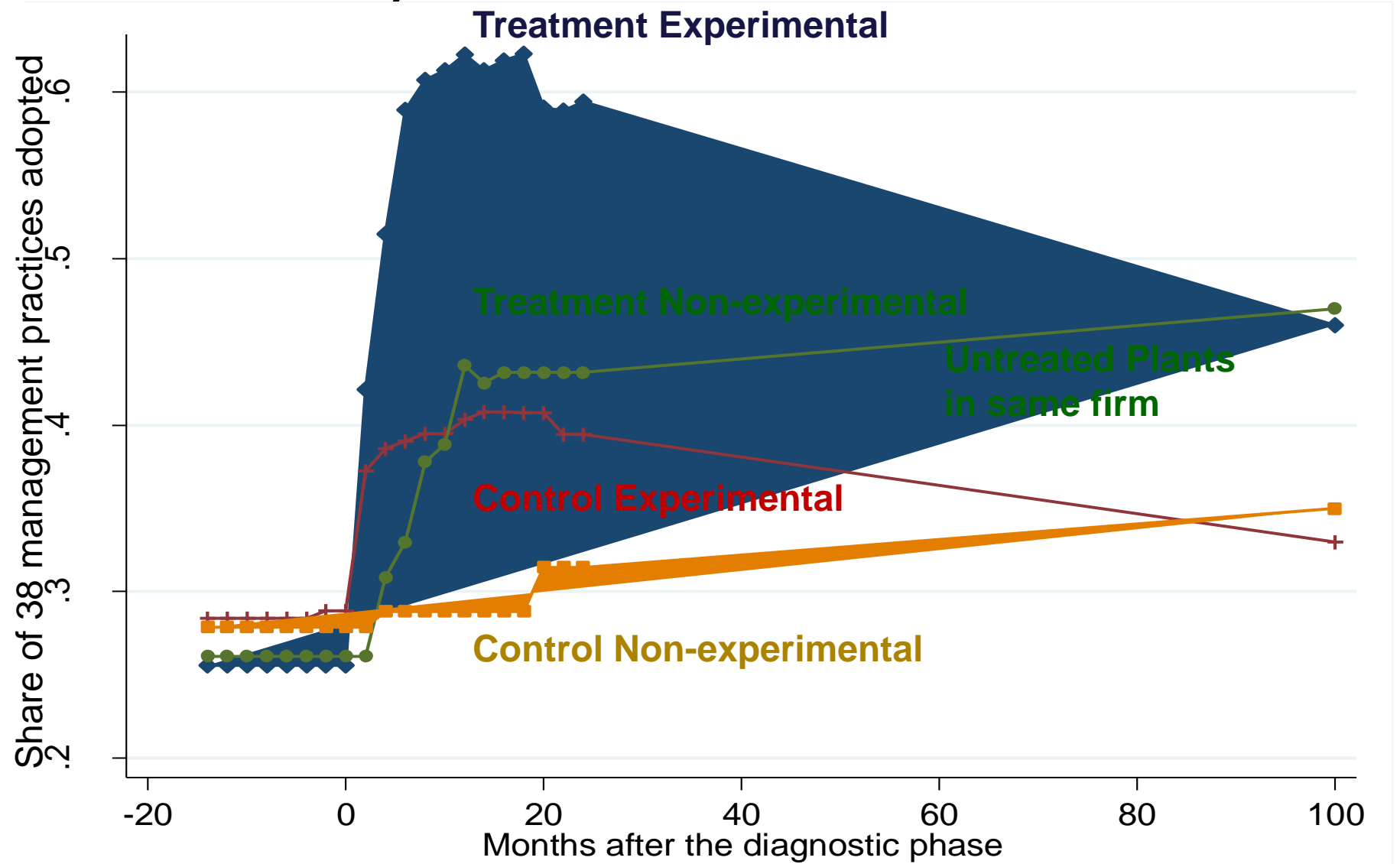
Notes: 3,707 Mexican manufacturing firms; 10,175 Mexican services firms; 18,000 US manufacturing firms.

Source: Bloom, Iacovone, Pereira-López & Van Reenen (2020)

Management Score Dispersion by Country



Indian management RCT surprisingly persistent (7 years later still effects)

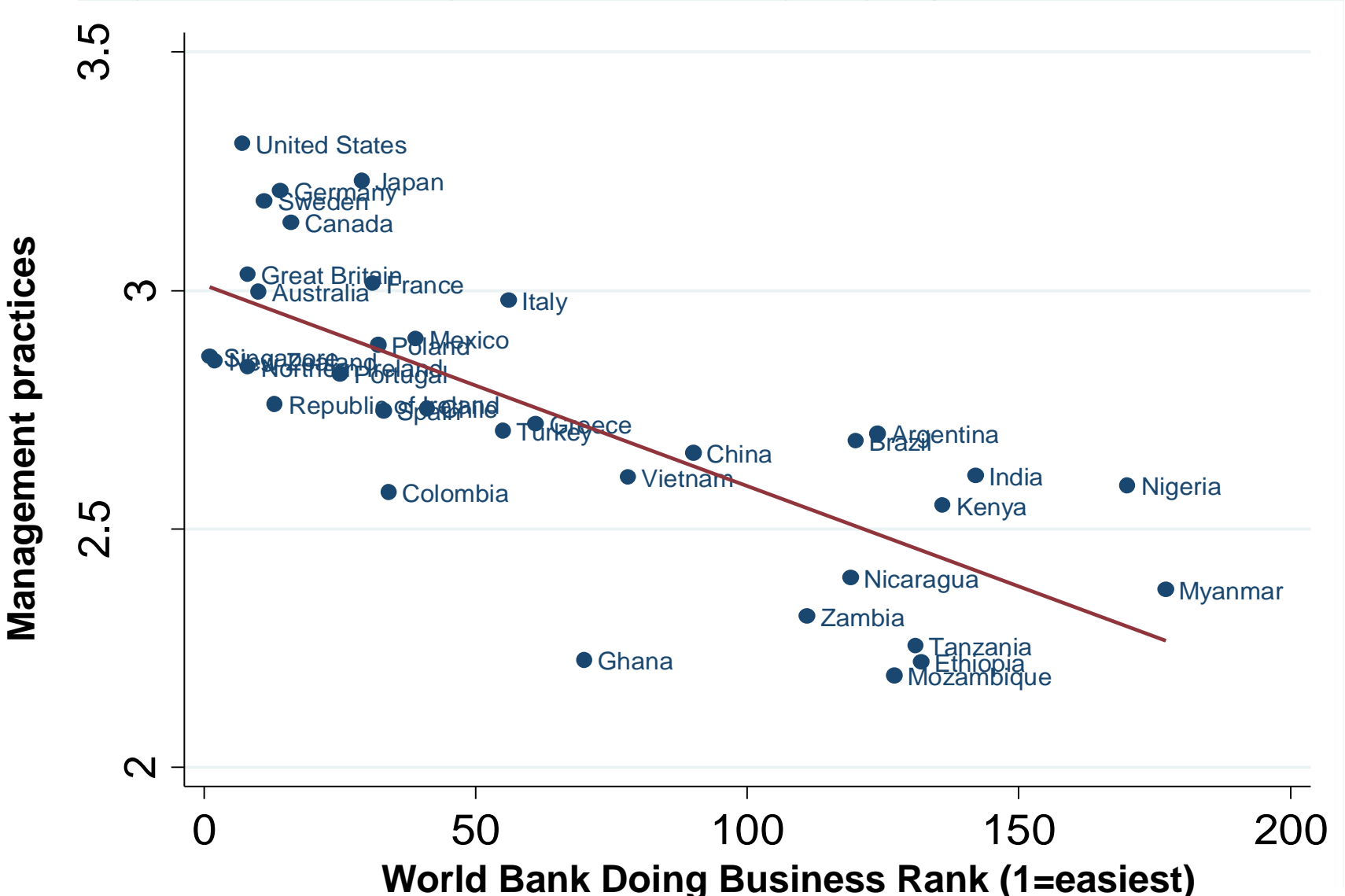


Notes: Sample comprised of the balanced panel of plants from **2008 to 2017** (11 treatment experimental, 6 treatment non-experimental, 6 control experimental and 2 control non-experimental). **Source:** Bloom et al (2019)

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 (2016, ReStud)
- **Hospital competition** in UK under Blair reforms (Bloom, Propper, Seiler & Van Reenen, 2015, ReStud)
- In both studies large improvement in management & productivity in sectors/areas with bigger competition shock

HEAVY REGULATIONS CORRELATED WITH LESS EFFECTIVE MANAGEMENT PRACTICES



Note: Management scores for the 15,454 interviews in the WMS survey plotted against the World Bank’s 2014 doing business “Ease of Doing Business” rank, where 1 is best and 189 is worst. See <http://www.doingbusiness.org/rankings>. Smaller and larger firms in China, Nigeria and Mozambique have been re-stratified in order to balance the sampling frame.

Continuous improvement

Section B: Service delivery

5. In 2016, which one of the following comes closest to the approach your business generally took when problems with your service provision arose?

Examples: Slow or late delivery of service, a piece of technology breaking down.

Please one box only

- a. We resolved them but did not take further action.....
- b. We resolved them and took action to try to ensure they did not happen again.....
- c. We resolved them and took action to make sure that they did not happen again, and had a continuous improvement process to anticipate problems like these in advance.....
- d. No action was taken.....



1001

MRW

Continuous improvement

Section B: Service delivery

5. In 2016, which one of the following comes closest to the approach your business generally took when problems with your service provision arose?

Examples: Slow or late delivery of service, a piece of technology breaking down.

Please one box only

- a. We resolved them but did not take further action..... = 1/3
- b. We resolved them and took action to try to ensure they did not happen again..... = 2/3
- c. We resolved them and took action to make sure that they did not happen again, and had a continuous improvement process to anticipate problems like these in advance..... = 1
- d. No action was taken..... = 0

MRW