Economic and Social Research Council

Management and the Wealth of Nations

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Digital Fellow, MIT

Nottingham, 28th June 2023

THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

poid Programme on Innovation and Diffusion

ADAM SMITH 300 YEAR ANNIVERSARY

Events

Throughout 2023, to mark Adam Smith's tercentenary, the University of Glasgow, along with key partners in the UK and internationally, will be hosting a series of events:

→ Explore our events

→ Smith around the world

Find out more

→ Get involved

→ Newsletter

Introduction

- Enormous difference in productivity between firms – “Persistent Performance Differences” (PPDs)
- Management practices long thought to be an important reason for PPDs (Smith, 1776; Walker, 1887)
- Last 20 years has seen huge progress in getting better measures & analyzing management practices
- These have important macro-economic consequences

Measurement

Natural Laws

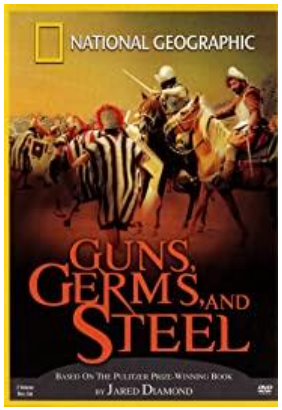
Technology

Models and Mergers

Drivers

Understanding Growth: Three fundamental sources

- **Innovation:** *Frontier Productivity Growth*
  - Ideas that are new to the world



- **Diffusion:** *Catching up to frontier*
  - The spread of these ideas

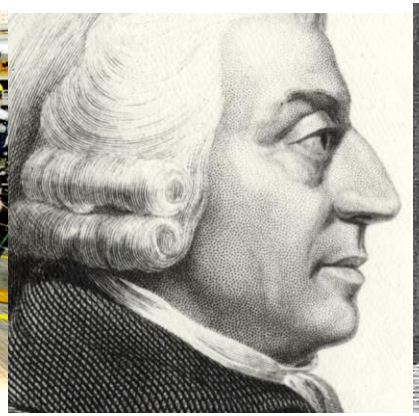
- **Reallocation** important part of process: innovative & more productive firms displace less efficient ("creative destruction")

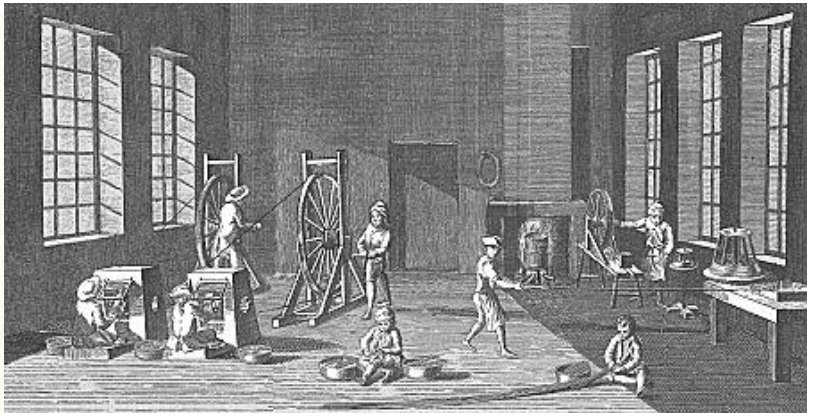
- All get reflected in Total Factor Productivity (TFP)

TFP is not just “hard technologies”: Management practices also productivity driver

In Glasgow Uni Archives: 1st edition Wealth of Nations!

Toyota Plant

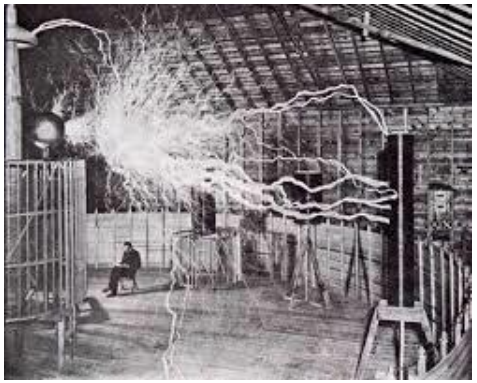




Adam Smith and the Pin Factory

Not by technology alone….

- **Innovations in management,**
  - —Fordist Mass production (1920s)
  - —Alfred Sloan's M-form firm (1930s)
  - —Toyota Lean Manufacturing System (1970s)
  - – 2000s? Global Value Chains; Gig economy



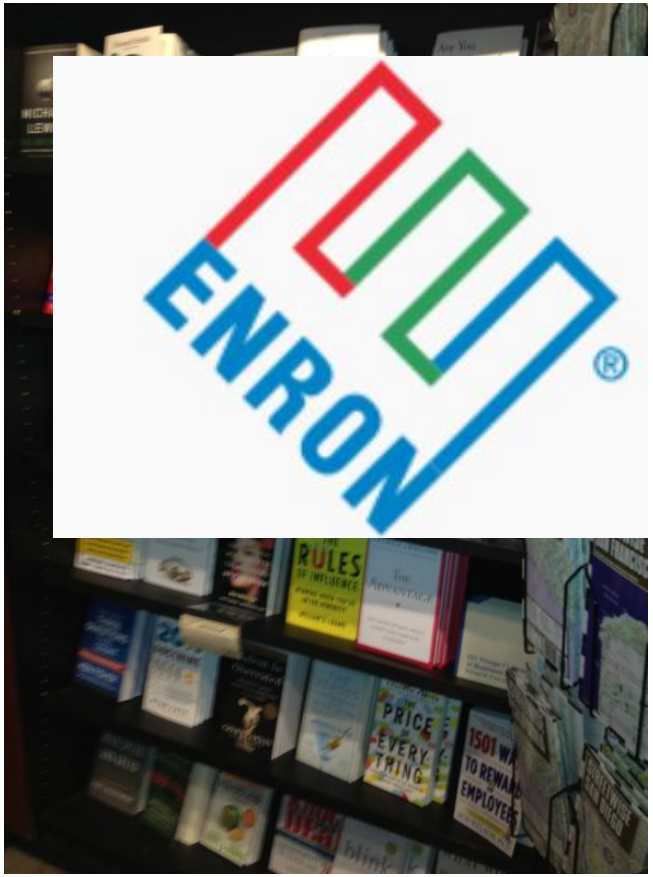
- Need to change organization of work to make best use of innovation (electricity, computers, AI, …)
  - – Firms can spend a lot of money on tech to little effect

But there is still 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 (*Journal of Economic Literature*)

But there is still debate on whether management practices really matter

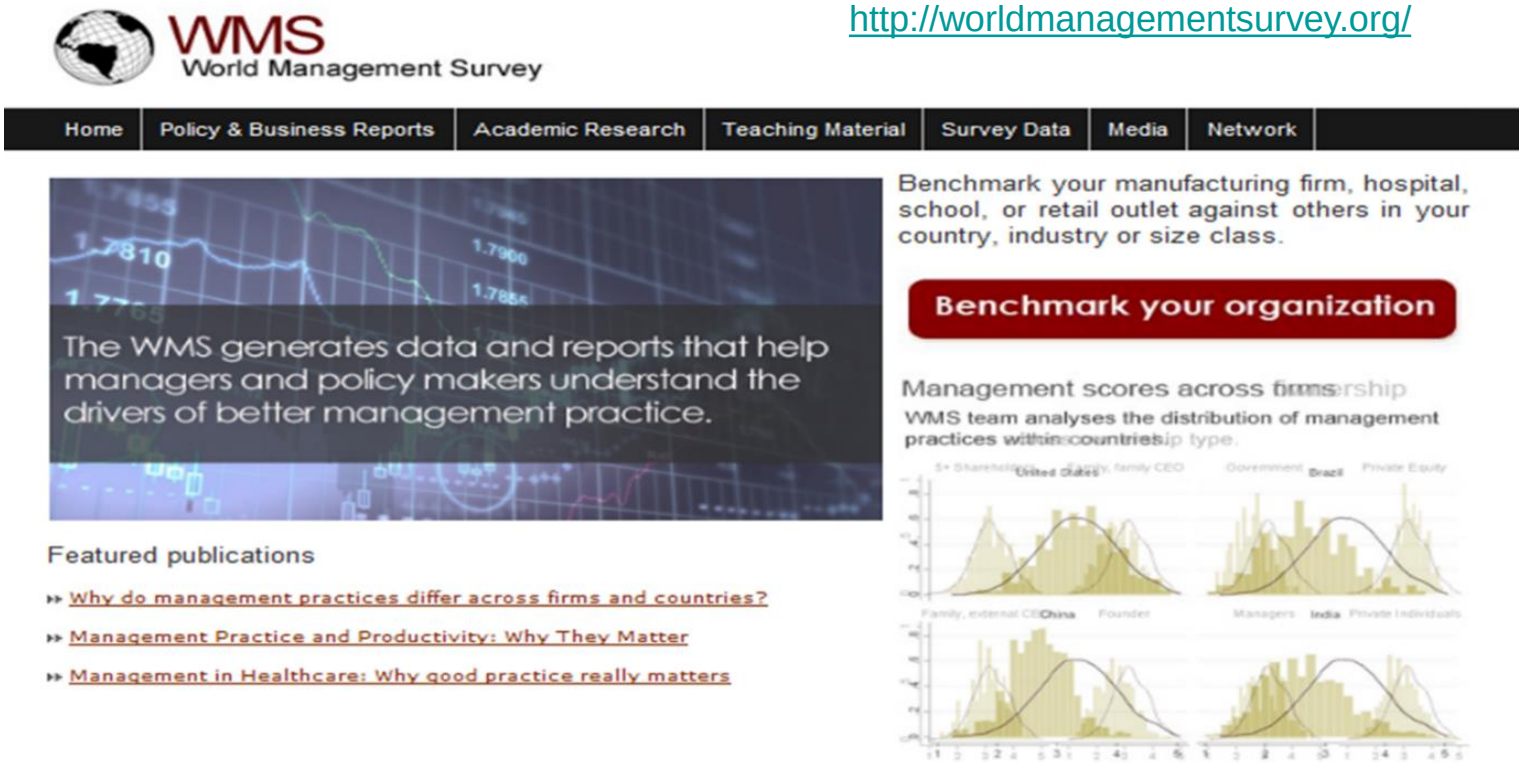


But there is still debate on whether management practices really matter

Enron ex-CEO, Jeff Skilling

But there is still debate on whether management practices really matter

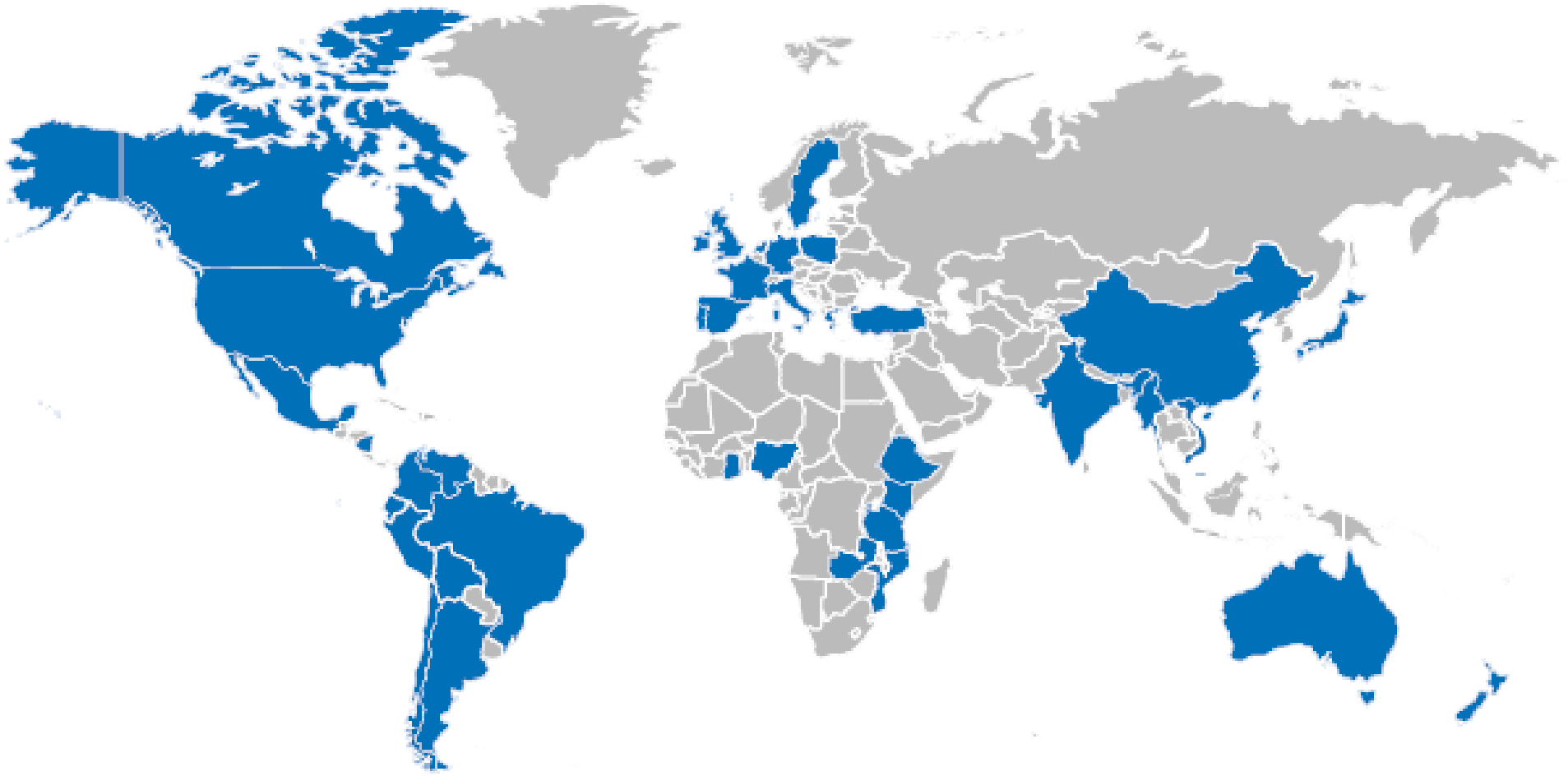
World Management Survey (~25k interviews since 2004, 39 countries)



Medium sized manufacturing firms (50-5,000 workers, median≈250)

Now extended to Hospitals, Retail, Schools, etc.

FIGURE 1: GEOGRAPHIC SCOPE OF THE PROJECT

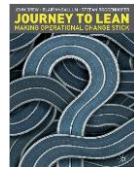


Note: WMS coverage 2004-2022

WORLD MANAGEMENT SURVEY (WMS); BLOOM & VAN REENEN (2007)

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

3) Getting firms to participate in the interview

- Official Endorsement: Bundesbank, Bank of England, RBI, etc.
- Run by 200 MBA types (loud, assertive & business experience)

MY FAVOURITE QUOTES:

The difficulties of defining ownership in Europe

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

Interviewer:

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Americans on geography

Interviewer: "How many production sites do you have abroad?

Manager in Indiana, US:

MY FAVOURITE QUOTES:

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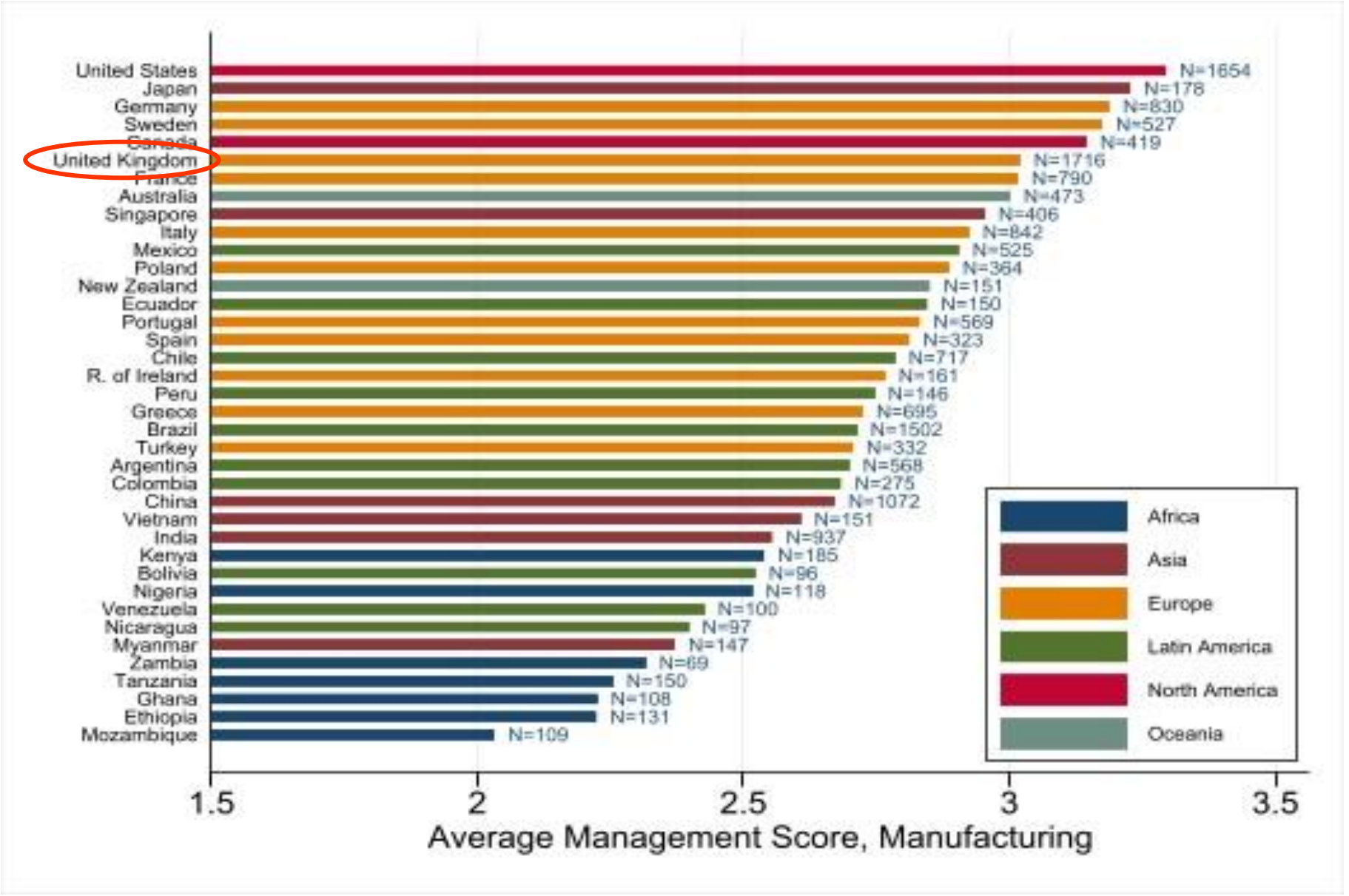
Americans on geography

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

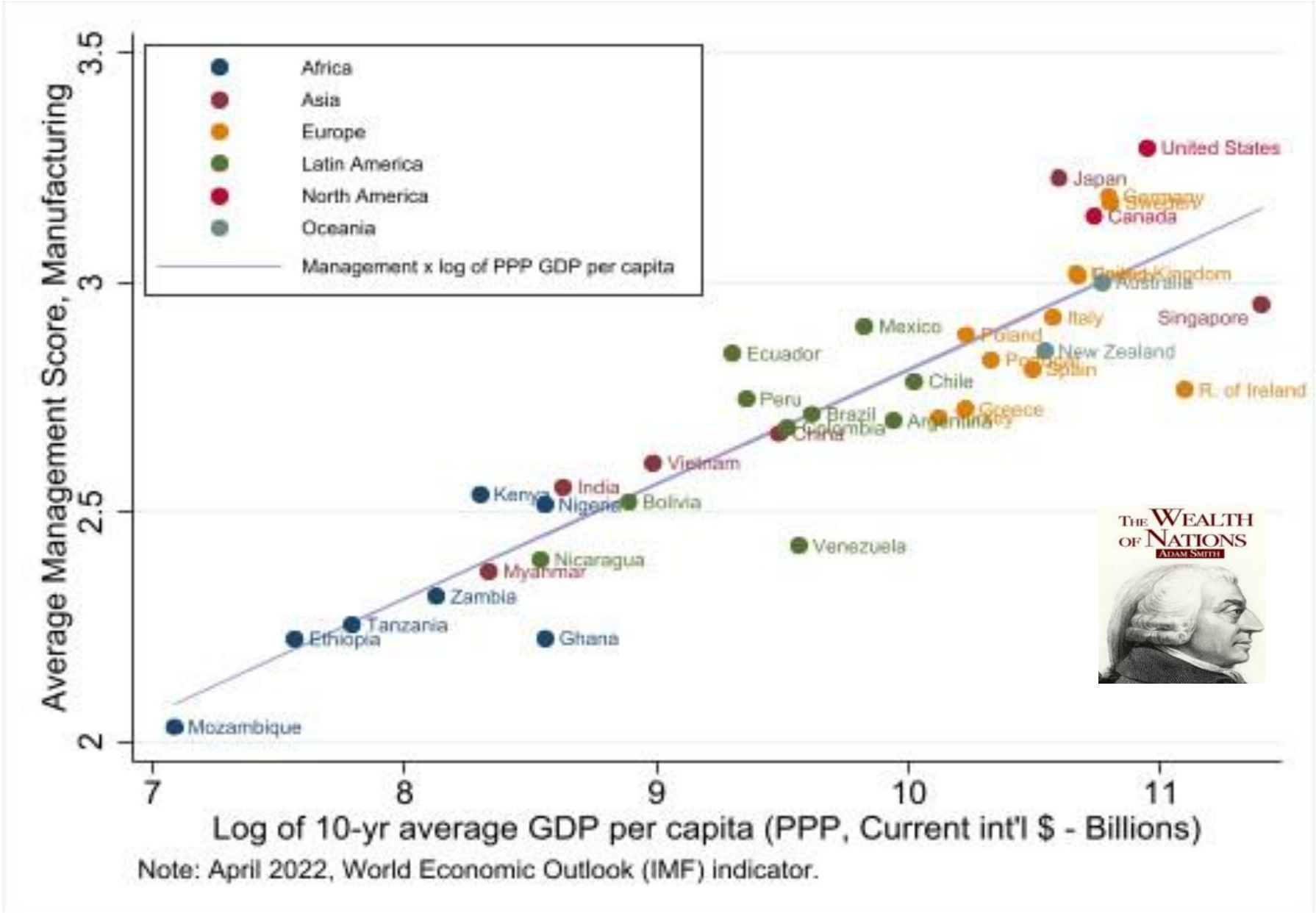
Manager in Indiana, US: “Well…we have one in Texas…”

WMS Management Scores across Countries

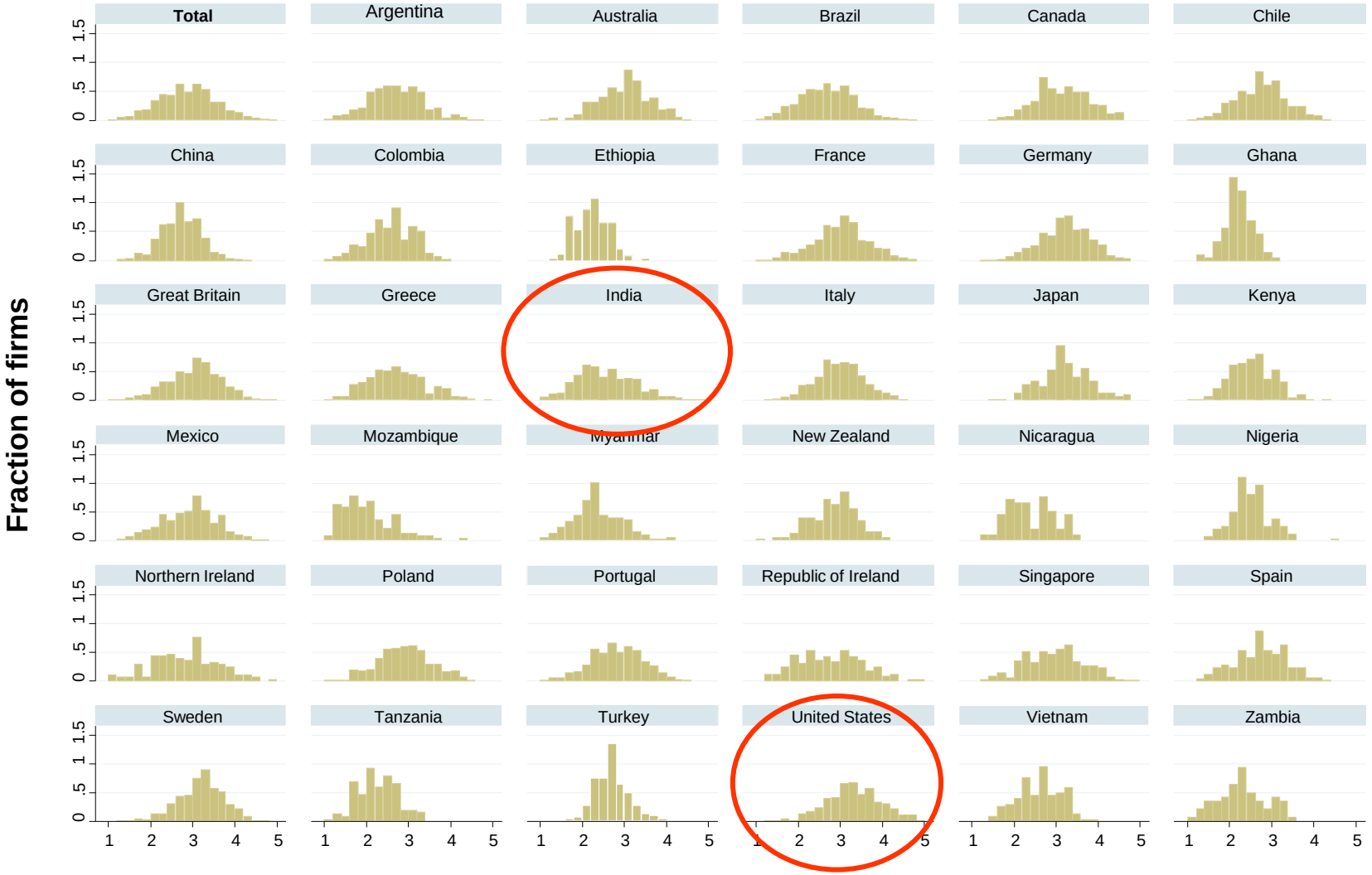


Note: Unweighted average management scores; # interviews in right column (total = 17,783); all waves pooled (2004-2022)

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

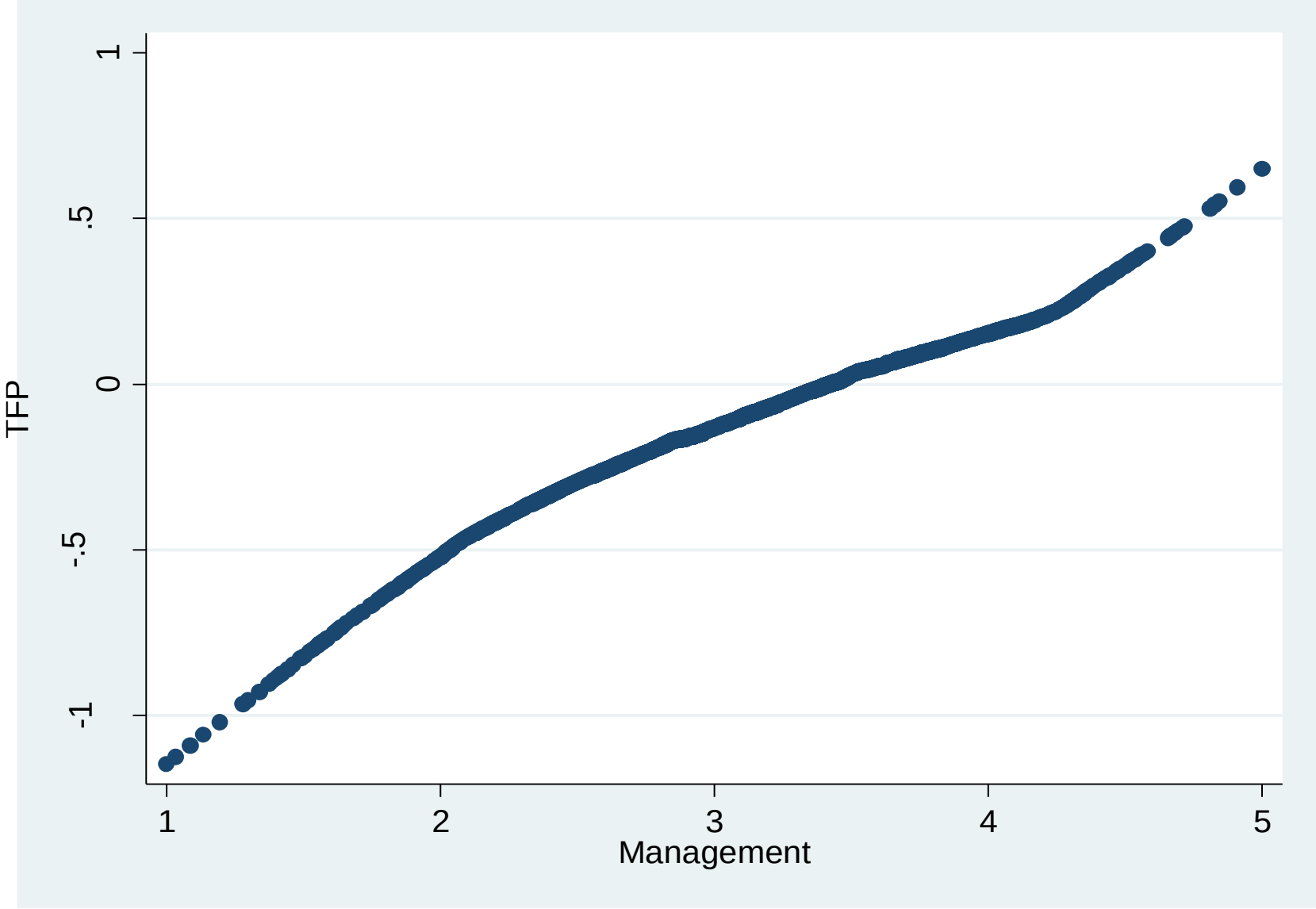


Management also varies heavily within countries



Source: Scur et al (2023)

Productivity is increasing in management



Management is an average of all 18 questions (set to sd=1). TFP residuals of sales on capital, labor, skills controls plus a full set of SIC-3 industry, country and year dummies controls. N=8314

Measurement

“Natural Laws”

Technology

Models and Mergers

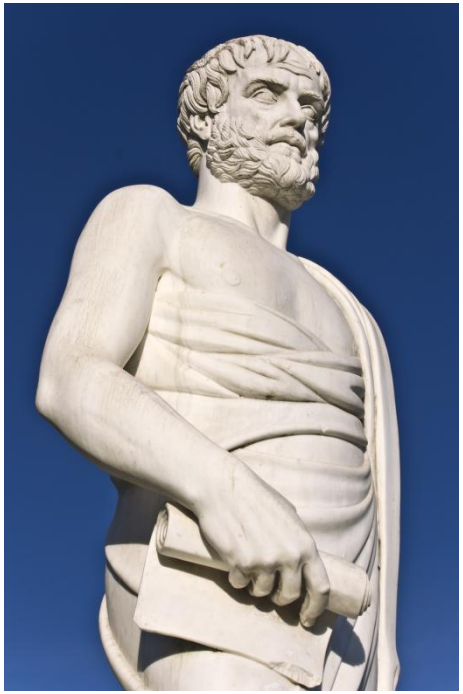
Drivers

The Natural Laws of Management

Daniela Scur, Scott Ohlmacher, et al.

Major thinkers about Natural Laws

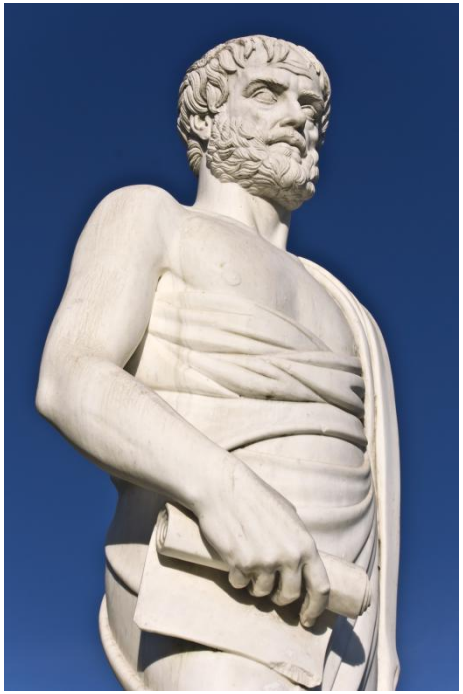
Hobbes



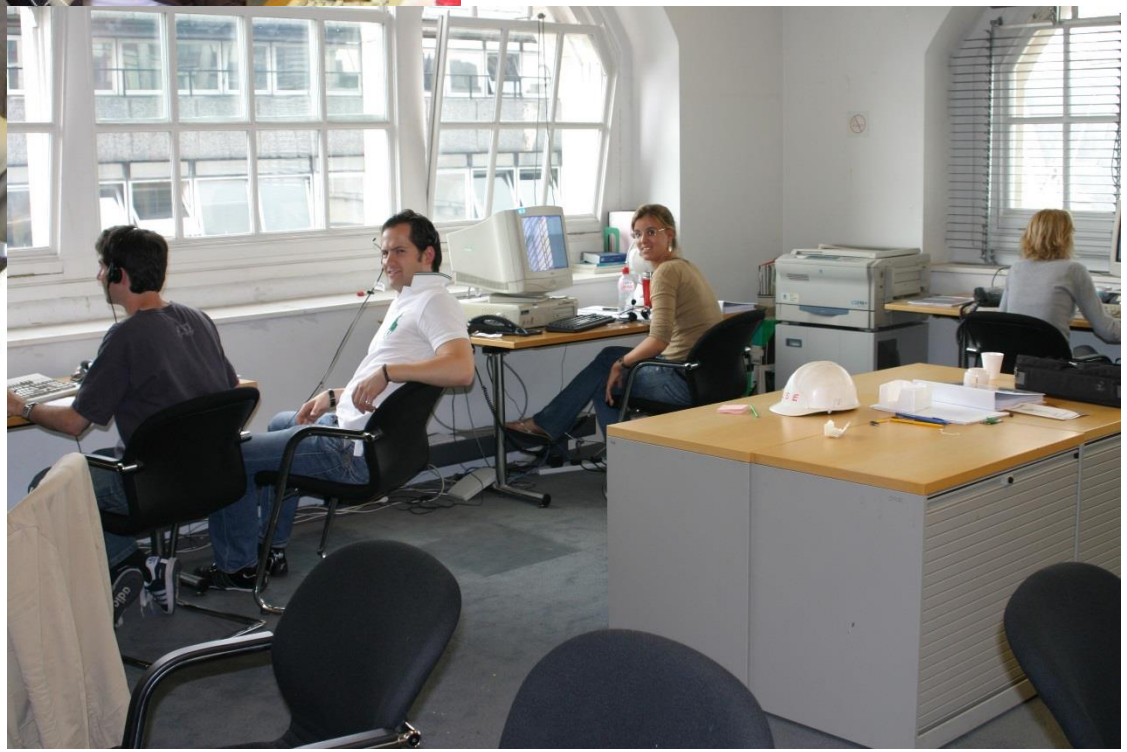
Aristotle

Aquinas

Major thinkers about Natural Laws??



One Problem with WMS is scale – we've collected ~25k interviews over ~20 years like this…



To get 35k in one quick wave we'd need this

Survey run with the US Census Bureau (MOPS)

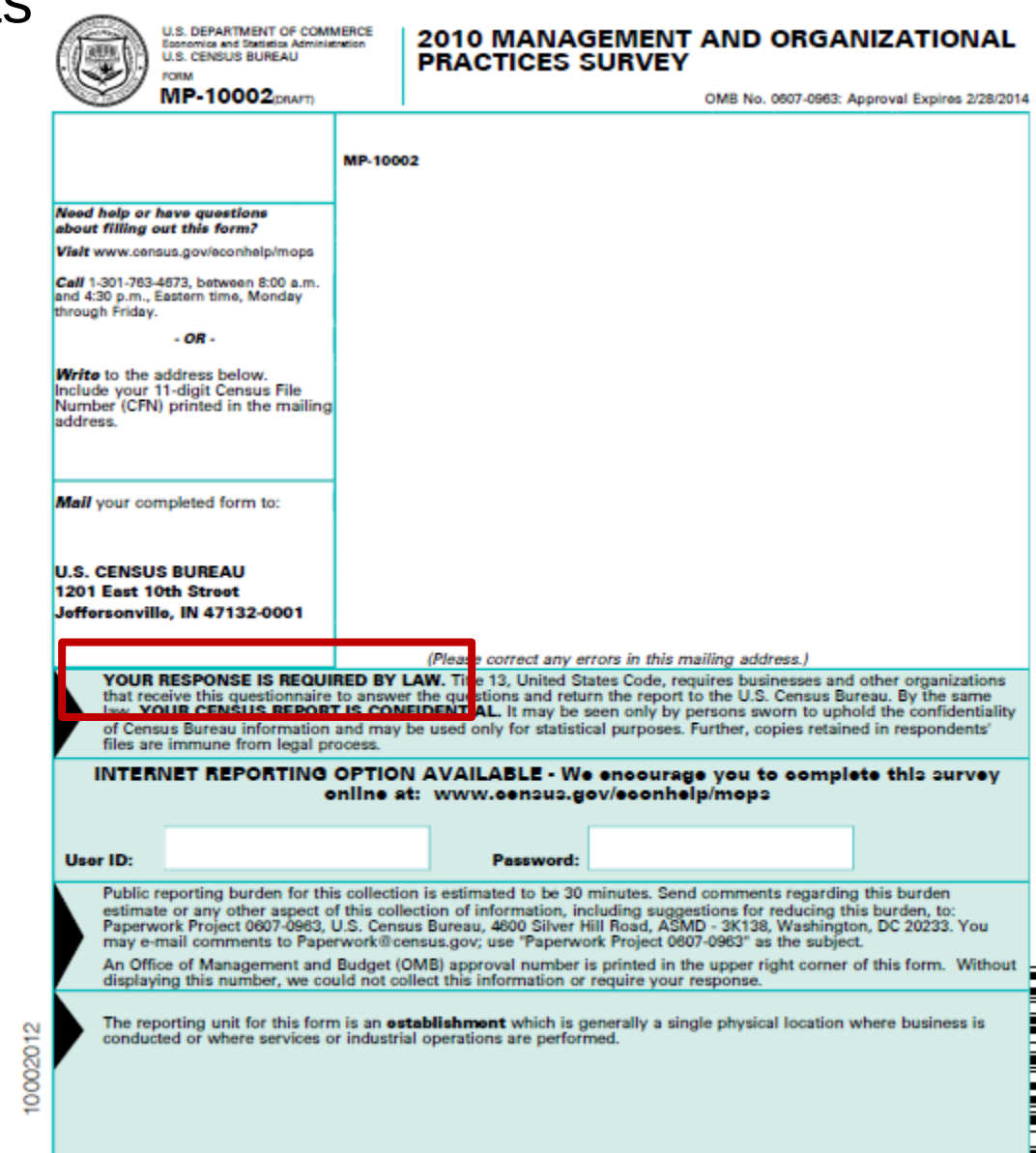
1st Wave delivered in 2011 to ~50k manufacturing plants (US ASM) asks about practices in 2010 and 2005.

2nd Wave covers 2015 & 2010 practices

3rd Wave covers 2021 practices.

Quick to fill out - and mandatory - so ~70-80% of plants responded

Extensive cognitive tests



U.S. DEPARTMENT OF COMMERCE
Economics 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

MOPS asks similar questions to WMS on monitoring, targeting, and incentives practices. For example, performance monitoring

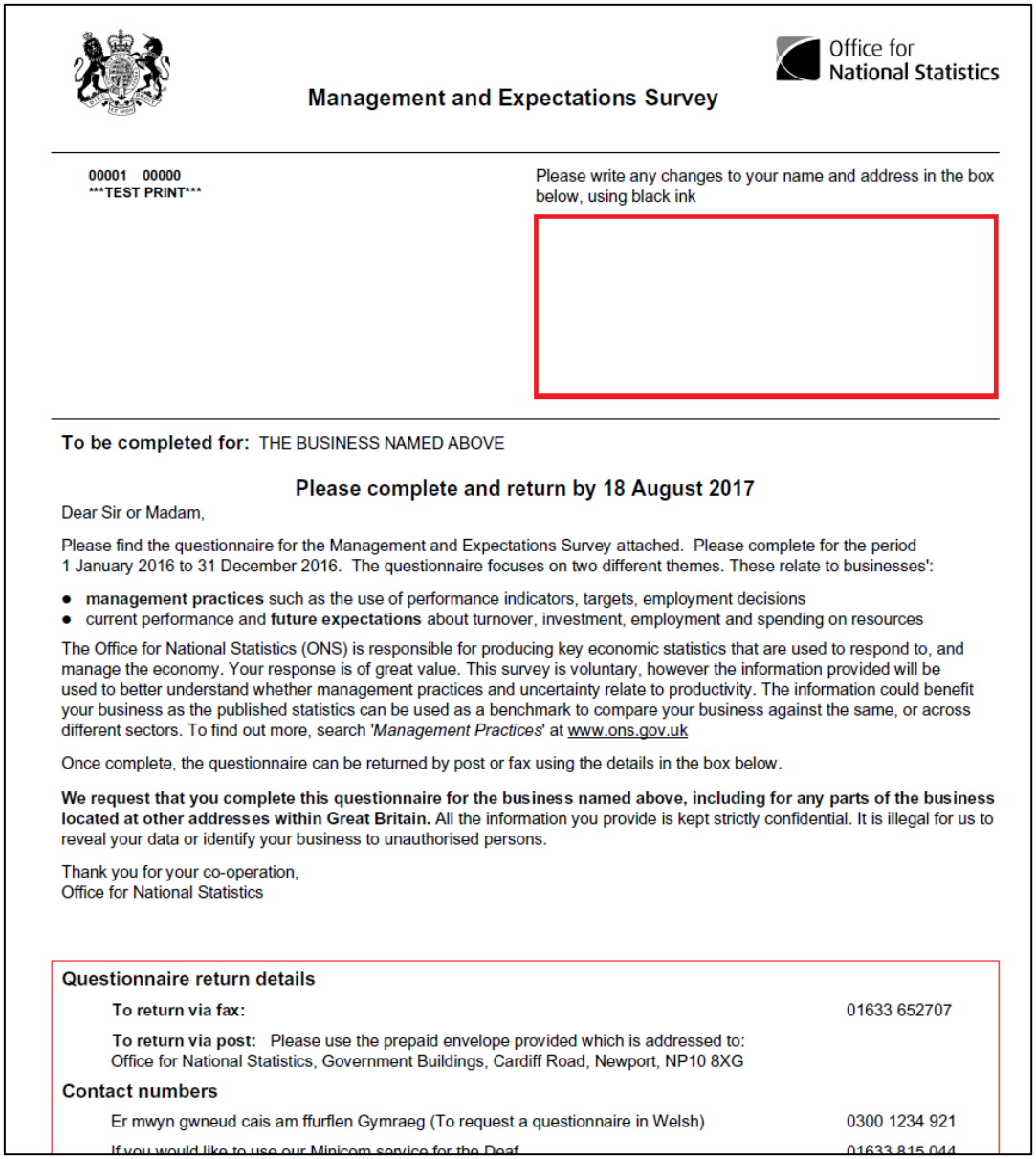
2 In 2005 and 2010, how many key performance indicators were monitored at this establishment?

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	☐	☐
3-9 key performance indicators	☐	☐
10 or more key performance indicators	☐	☐
No key performance indicators (If no key performance indicators in both years, SKIP to **6**)	☐	☐

MOPS UK version (MES) run with ONS

- 2017 surveys of ~25k firms regarding 2016 practices (**includes non-manufacturing**)
- Questions same as US MOPS for comparability
- Also run in 2021 (about 2020 practices)
- Another planned for 2023



Office for National Statistics

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

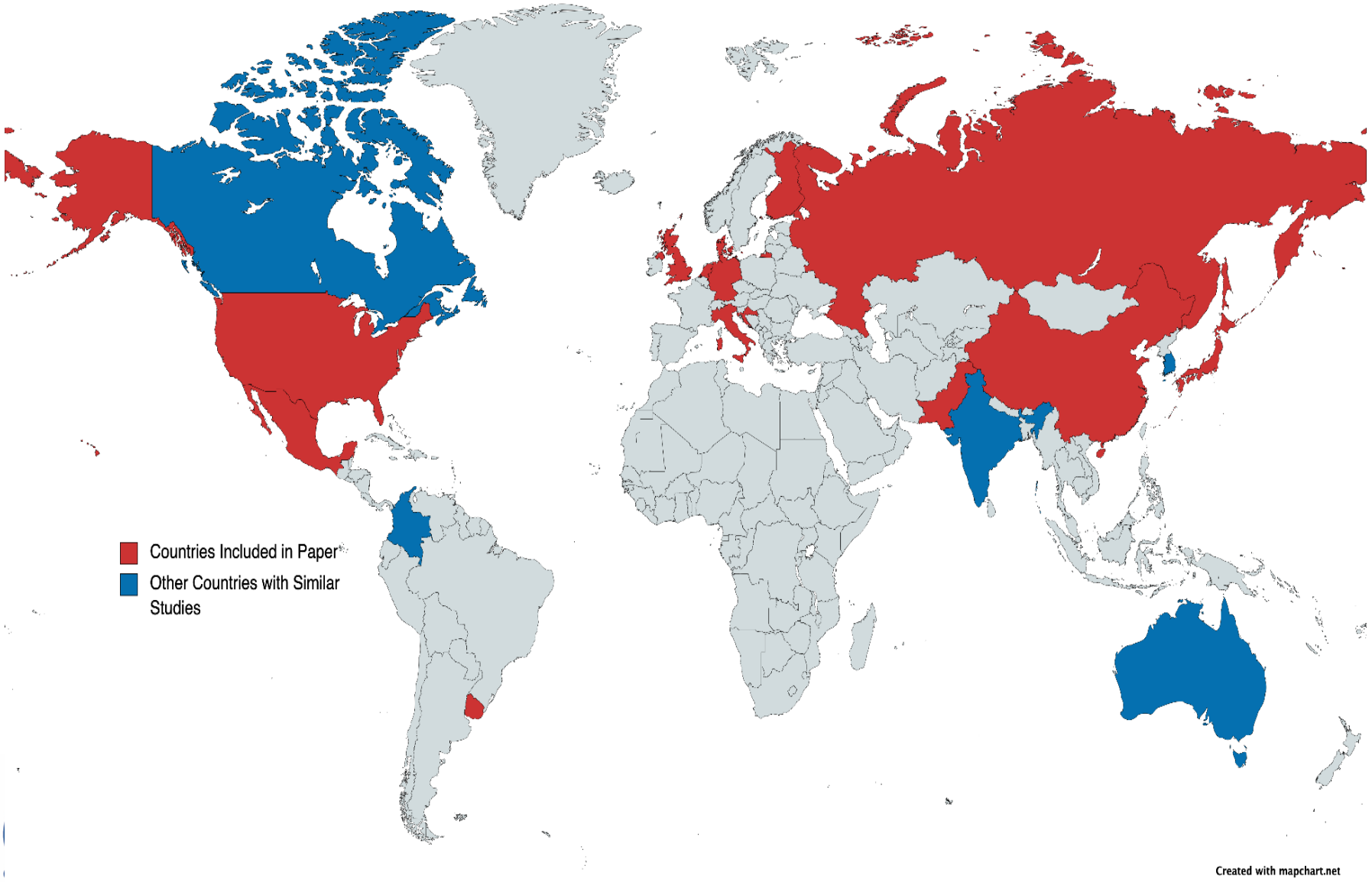
To return via post: Please use the prepaid envelope provided which is addressed to:
Office for National Statistics, Government Buildings, Cardiff Road, Newport, NP10 8XG

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 815 044

Coverage of MOPS across countries



Methods

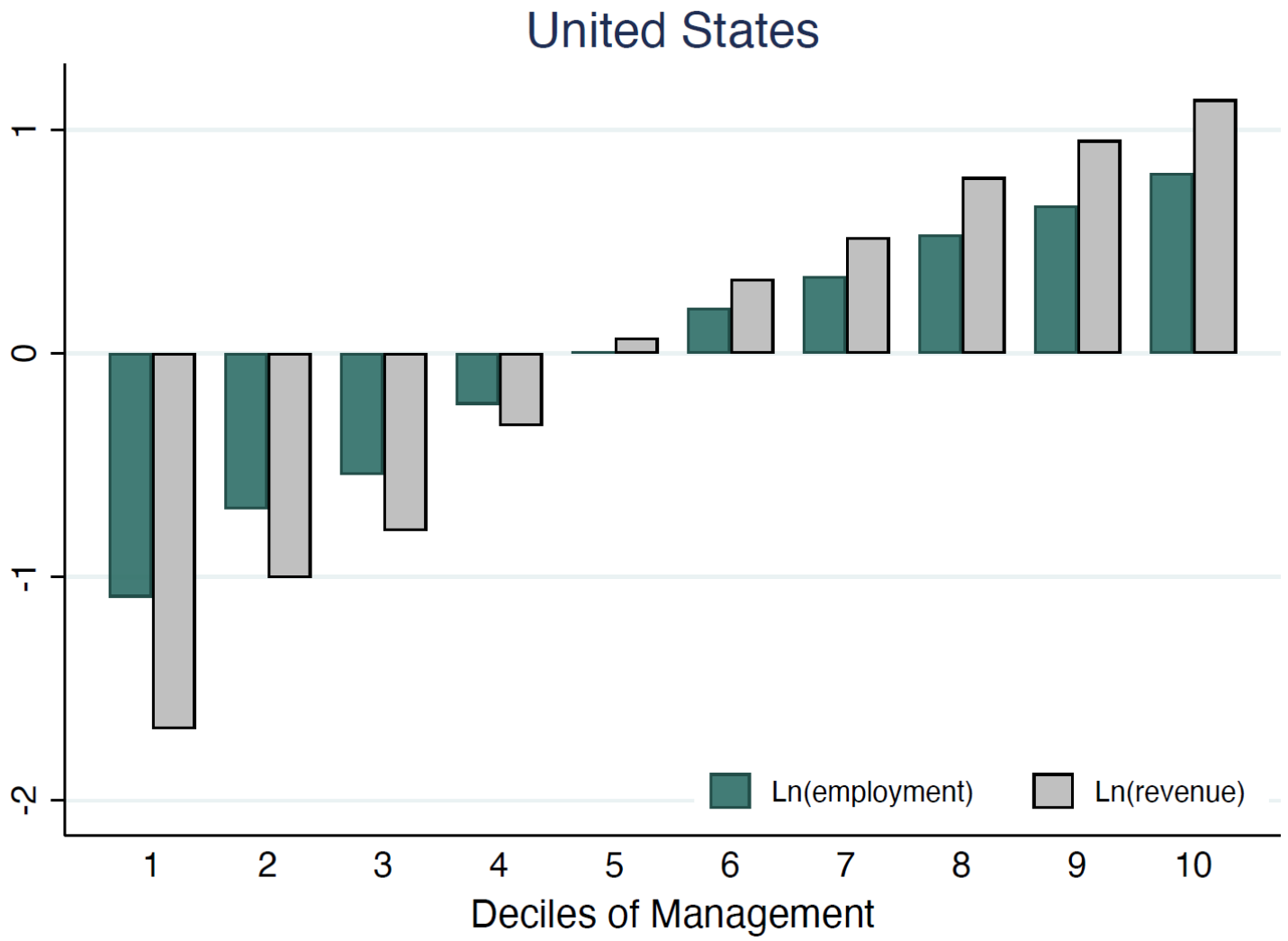
- Broadly, a common set of core management questions and identical scoring (following the US template)

- We focus on a common core sample to aid comparability
  - Manufacturing sector, 2015-19 period

Like WMS, huge variation in management scores (deviation from country mean)

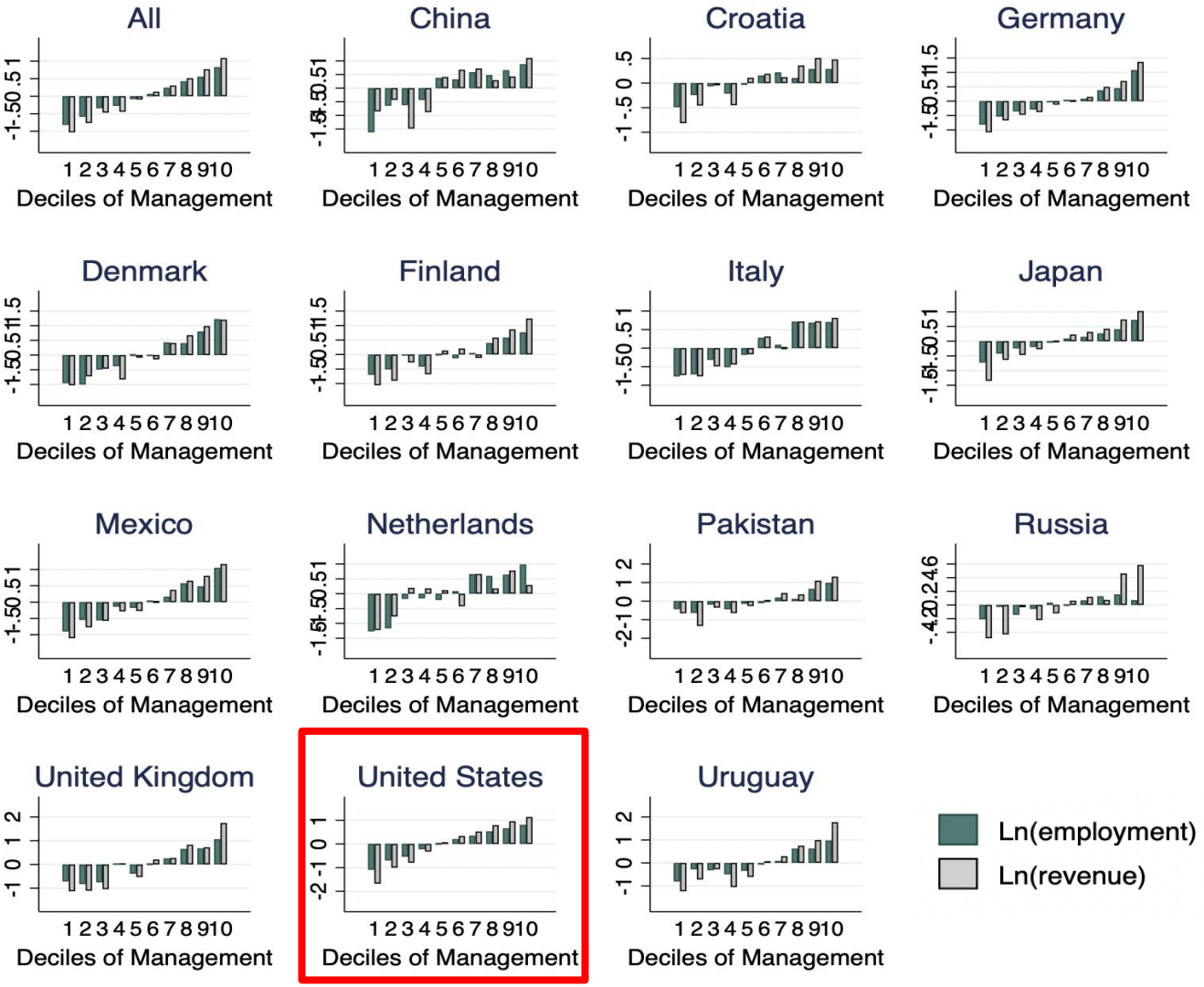
Notes: Histograms centered on the same scale. Number of observations for each country in the original datasets (manufacturing sector only): China = 1,986; Croatia = 314; Denmark = 743; Finland = 582; Germany = 1,927; Italy = 1,122; Japan = 10,081; Mexico = 3,729; Netherlands = 377; Pakistan = 11,159; Russia = 978; UK = 1,329; US = 35,000; Uruguay = 550.

Businesses with higher MOPS scores are larger (both more jobs and higher sales): Example of USA



Notes: The x-axis divides firms into deciles of their management score. The vertical axis gives the natural logarithm of the mean level of employment (and of revenue) in each of these bins relative to overall country specific mean. Number of observations about 35,000

Businesses with higher MOPS scores are larger (both more jobs and higher sales): International



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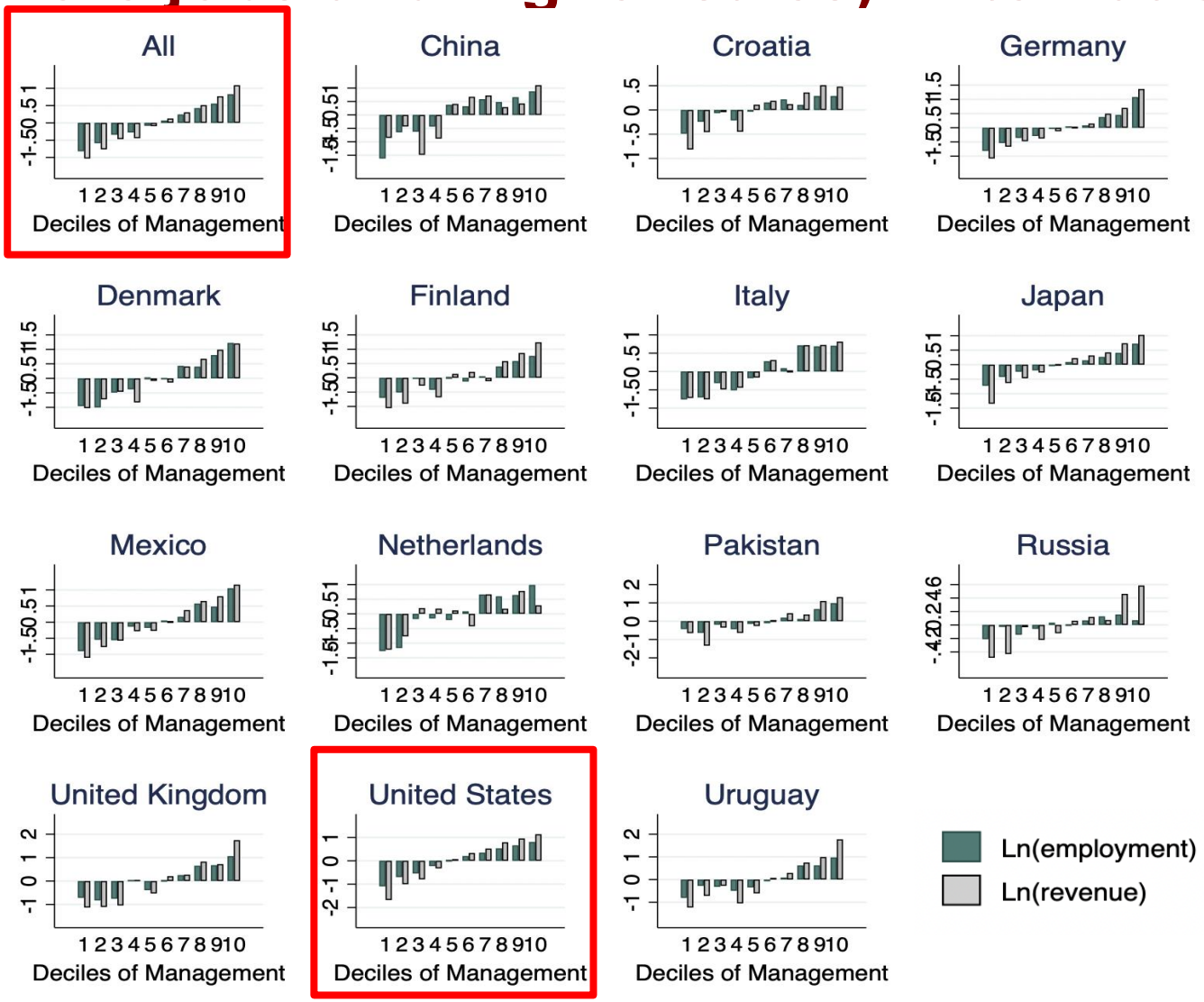

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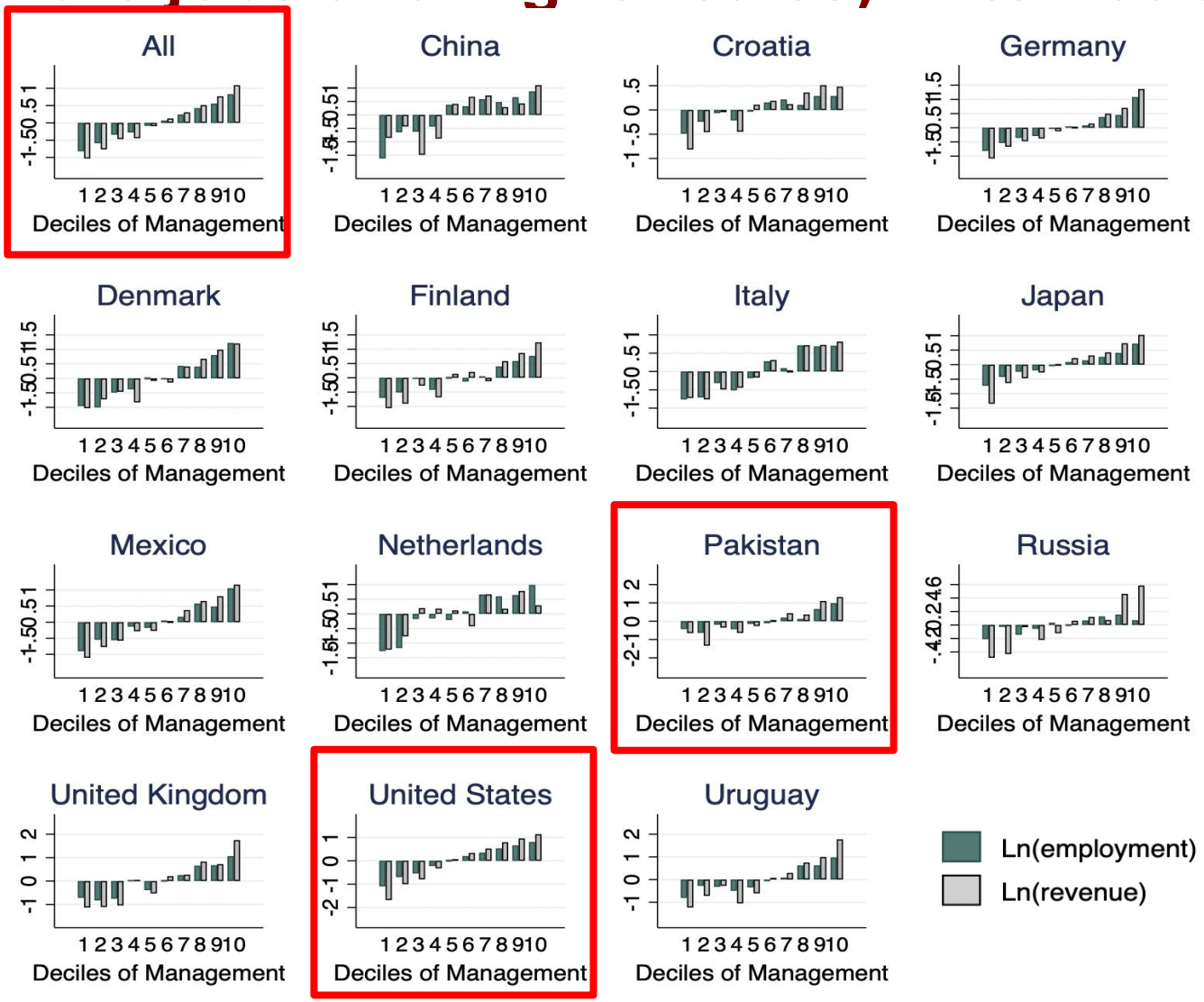

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Better managed find it harder to achieve scale in many countries (e.g. Denmark vs. Pakistan)

Notes: Each circle is the coefficient on a country specific OLS regression of log firm employment size on management. The regression was run on 20 observations per country, using the average employment and average management score within each vingtile. 95% confidence bands are also shown. Number of observations for each country in the original datasets (manufacturing sector only): China = 1,986; Croatia = 314; Denmark = 743; Finland = 582; Germany = 1,927; Italy = 1,122; Japan = 10,081; Mexico = 3,729; Netherlands = 377; Pakistan = 11,159; Russia = 978; UK = 1,329; US = 35,000; Uruguay = 550.

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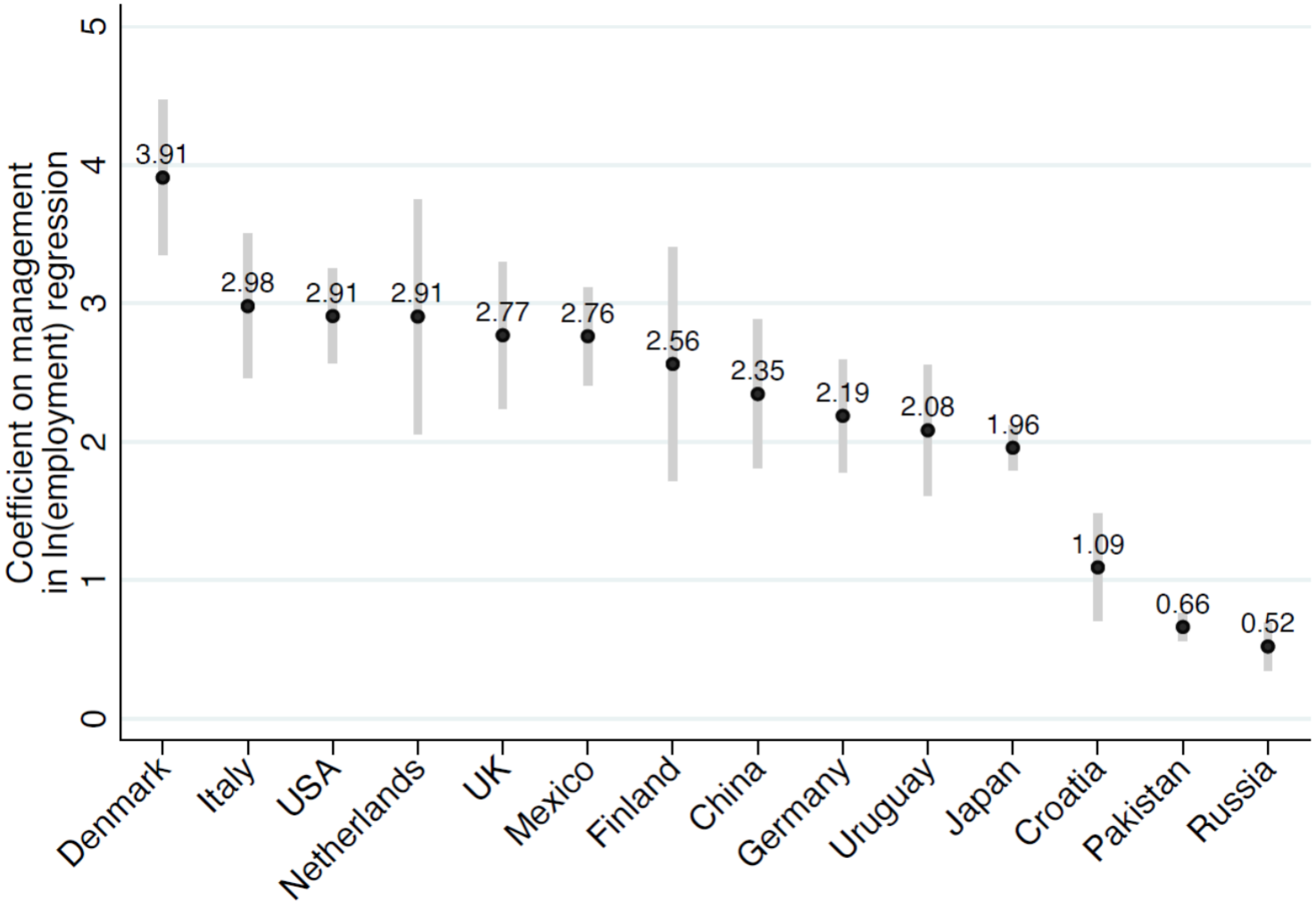

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Measurement

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Models and Mergers

Drivers

Technology, management & complementarities

- Case studies show that many organizations can invest heavily in technology (e.g. IT in UK NHS) & make little/no return

- Econometric work on impact of digital technologies on firm performance also show very heterogeneous impacts (e.g. Stiroh, 2010; Draca et al, 2007 survey; Bronsoler et al., 2022)

- Evidence of technology & managerial practice complementarity in productivity. Examples:
  - Bresnahan et al. (2002) US; Atkin et al. (2017); Pakistan; Bloom et al. (2012) EU; Giorcelli (2019)..

Measurement

Natural Laws

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Models and Mergers

Drivers

Example of Structural Management Model

- Bloom, Schuh, Sadun & Van Reenen (2023, WiP) "Management and Mergers" Using WMS and MOPS data
- Allow for:
  - Endogenous investment in managerial capital
  - Heterogeneous firm productivity
  - M&A (reallocation mechanism)
- Firms can grow (or shrink) in 3 ways:
  - Organically (plant investment)
  - Starting up greenfield plants
  - Acquiring brownfield plants
- Use to study counterfactual policy changes (e.g on competition and M&A activity)

Structural Management Model

Production Function: $Y = C_j[AK^{\alpha}L^{\beta}M^{\gamma}]_i$

C = Firm *j* management (e.g. CEO talent) which spreads across plants *i* in the firm; Plant: ***M*** = management capital, ***K*** = non-management capital, ***L*** = labor

Invest in *M* which depreciates (like *K)*, but unlike *K*, firms draw an *M* endowment at entry (Melitz, 2003).

Other key assumptions:

a) Changing *M* & *K* involves adjustment costs (*L* flexible)

b) *A* also drawn at entry & plants have ongoing *A* shocks

c) Monopolistic competition (Iso-elastic demand,ρ)

d) Sunk entry cost (κ) & fixed per period operating cost (*F*)

Mergers & Acquisitions (M&A)

- In addition to de novo entry, incumbent firms stochastically spawn new plants (organic growth)
- Firms can also dispose of & acquire new plants in M&A market
- Disposed plants get a new random ***A*** draw and are re-allocated to firm who bids highest
- Plants who receive no positive bids exit
- High ***C*** firms have lower M&A costs

Timing of decisions

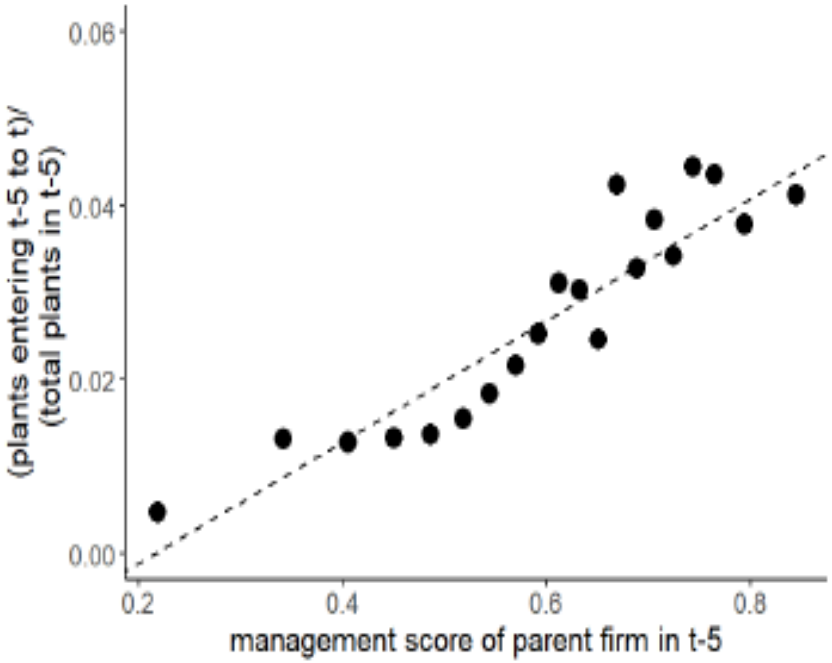
1. Entrants pay a sunk cost κ for a draw on (A,M). Free entry condition determines number of firms
2. Firms give birth to new plants
3. Each incumbent plant gets TFP shock, ε_{it}; $\ln A_{it} = \rho \ln A_{ti-1} + \varepsilon_{it}$
4. M&A market – plants go on M&A market and sold to highest bidder
5. Plants pay fixed operating cost F per period
6. Invest in M & K (investment "price" + quadratic adjust cost)
7. Choose labor (fully flexible)

Calibrate some parameters and estimate others

- Estimate by Simulated Method of Moments adjustment costs for ***M*** and ***K*** and depreciation rate for ***M***
- Calibrate other parameters
- Simulate draws of 10,000 plants for 200 periods (steady state)
- Observe composite management (***C*M***) in the data and compare with (untargeted) simulation moments

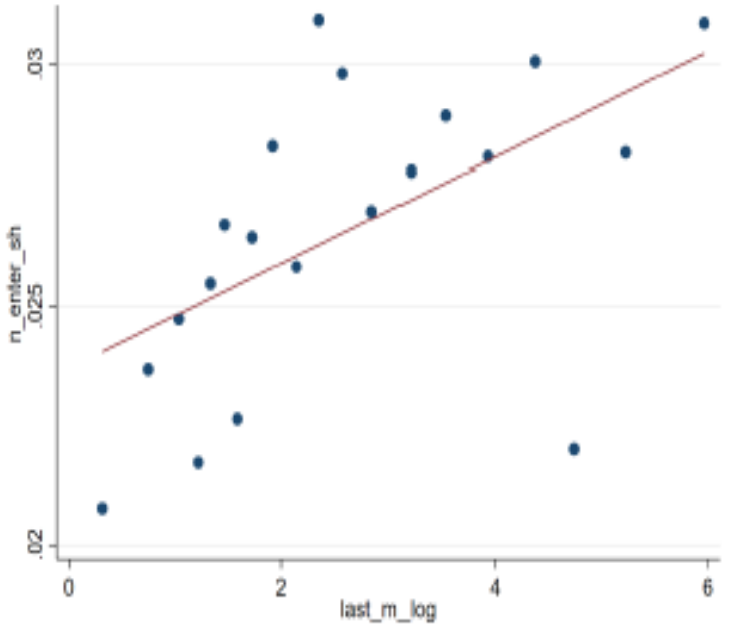
High management firms create more plants

A. Data (MOPS)



(a) Data

B. Simulation



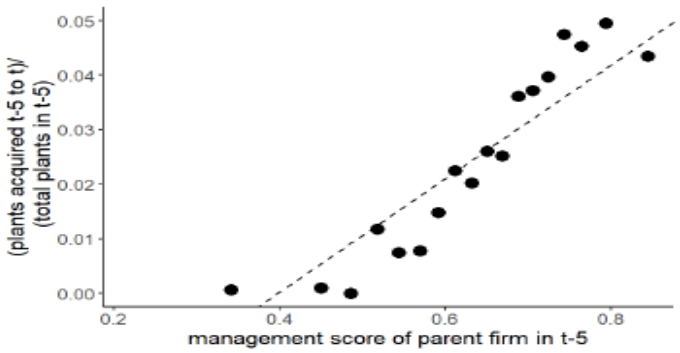
(b) Model

Figure 4: Share of Entering Plants vs. Lagged Management

Source: Bloom, Sadun, Schuh and Van Reenen (2023)

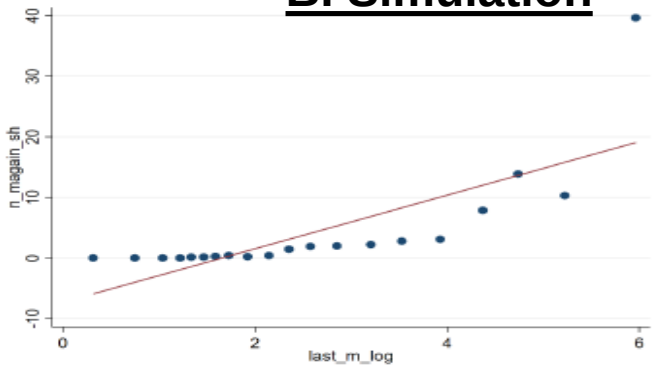
High management firms acquire & dispose of more plants

A. Data (MOPS)



(a) MOPS Data

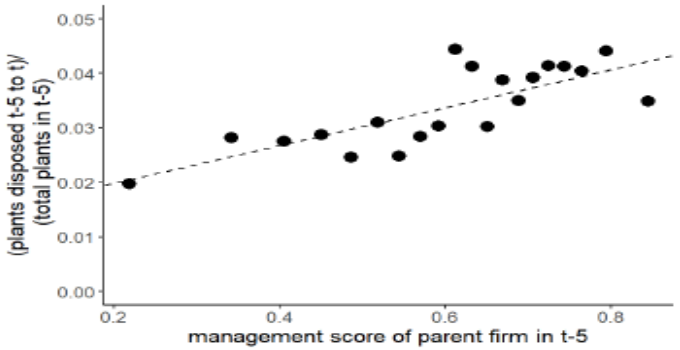
B. Simulation



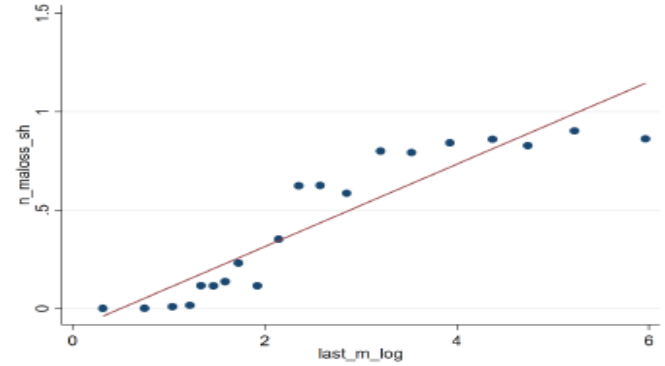
(b) Model

Acquisition Rate

Figure 7: Share of Acquired Plants vs. Lagged Firm Management



(a) MOPS Data



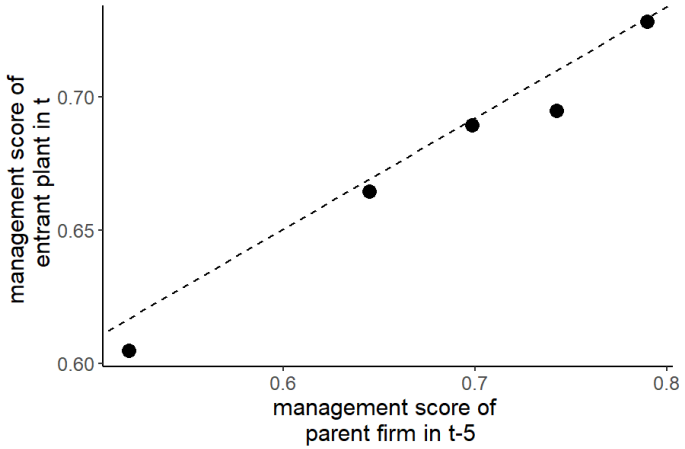
(b) Model

Disposal Rate

Figure 8: Share of Disposed Plants vs. Lagged Firm Management

Plants born to well managed firms (left) or taken over by well managed firms (right) have higher management scores

A. Management score of plants Born to firms



Notes: Panel A (left) is sample of all plants that entered between 2015 and 2010 whose parent firm had at least one plant in the MOPS in 2010. An entrant plant is defined as a plant that appeared in the LBD between 2015 and 2010 and who had a management score from MOPS 2015.

B. Change in Management of target Establishment (MOPS data)

Table 2: Change in Plant Management on Adoptive-Birth Firm M

	(1) d_m_comp_future	(2) d_m_comp_future
diff_adopt_parent	0.817***	
	(16.45)	
diff_adopt_parent_lo		0.868***
		(15.65)
_cons	54.28*	63.29*
	(2.25)	(2.54)
N	384	341

t statistics in parentheses

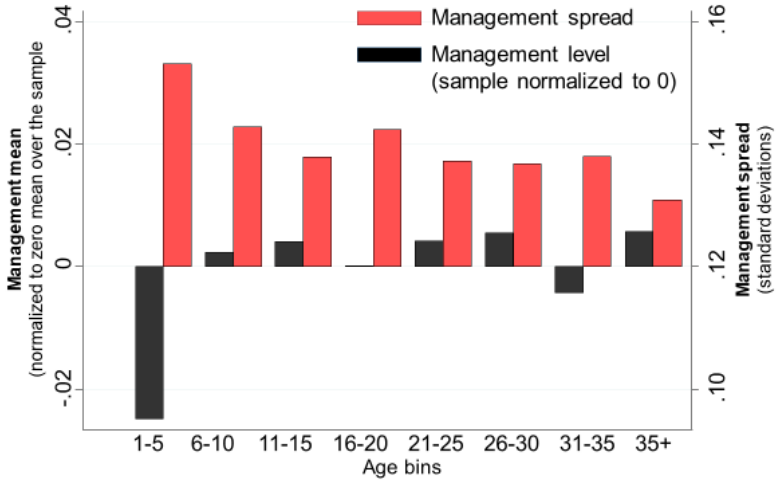
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes: Change in management of a plant before vs. after being taken as a function of the difference in the management score of the acquiring ("adopting") firm's management vs. previous parent's management ("donor"). Plant management in z-scores.

Source: Bloom, Sadun, Schuh and Van Reenen (2023)

Average management score increases (and variance decreases) as a cohort ages

A. Data (MOPS)



B. Simulation

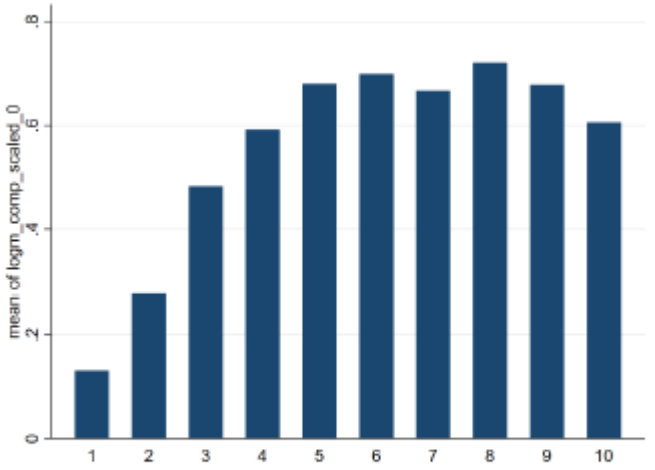
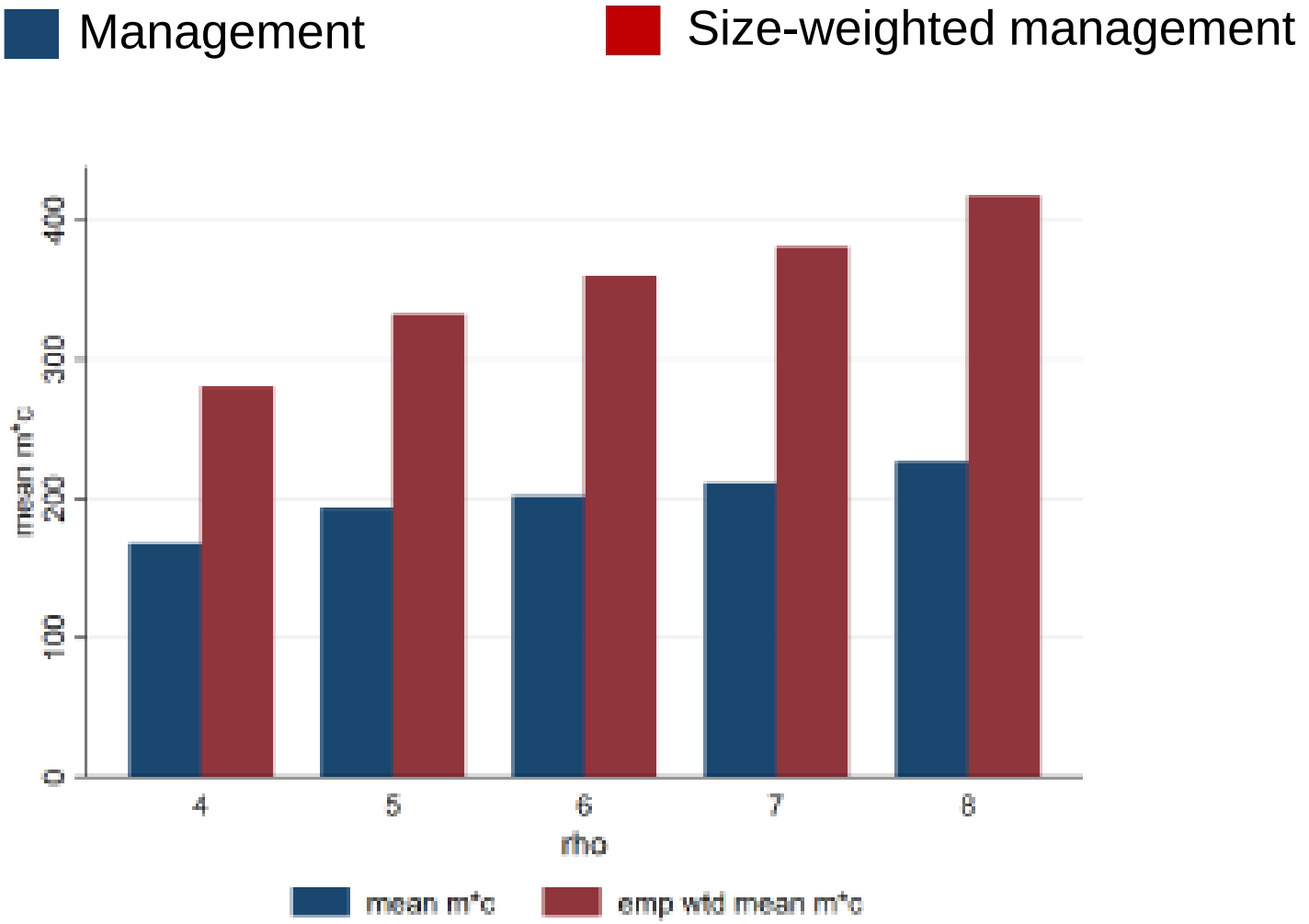


Figure 12: Management and Plant Age

Source: Bloom, Sadun, Schuh and Van Reenen (2023)

Notes: Data in panel A from 31,793 MOPS plants. Mean management in deviations from the sample mean. Panel B is simulated data of the mean management score

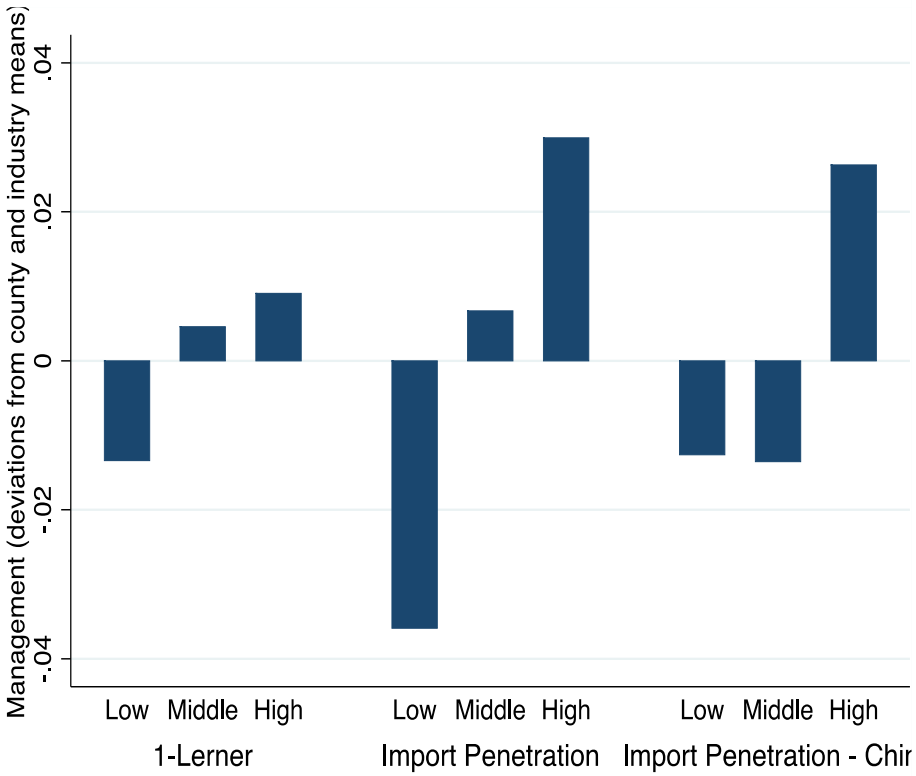
Equilibrium: Management is higher in more competitive environments - Simulations



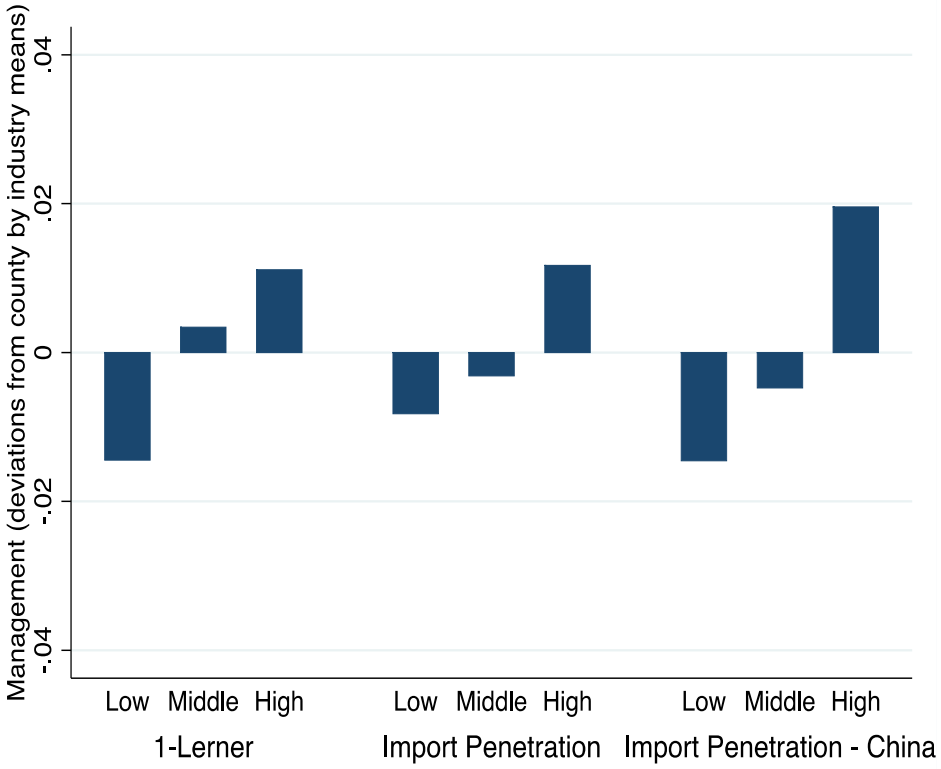
Notes: Results from using our estimated model to simulate 5,000 firms per year in the steady state. Plots management (M*C) in the simulation data. Competition is index by demand elasticity with higher values indicating greater competition (ρ=5 in baseline. Dark Blue bar is unweighted mean across firms, Light Red bar is weighted by firm size (employees).

Equilibrium: Management higher in more Competitive industries - Data

A. Management & Competition: Levels



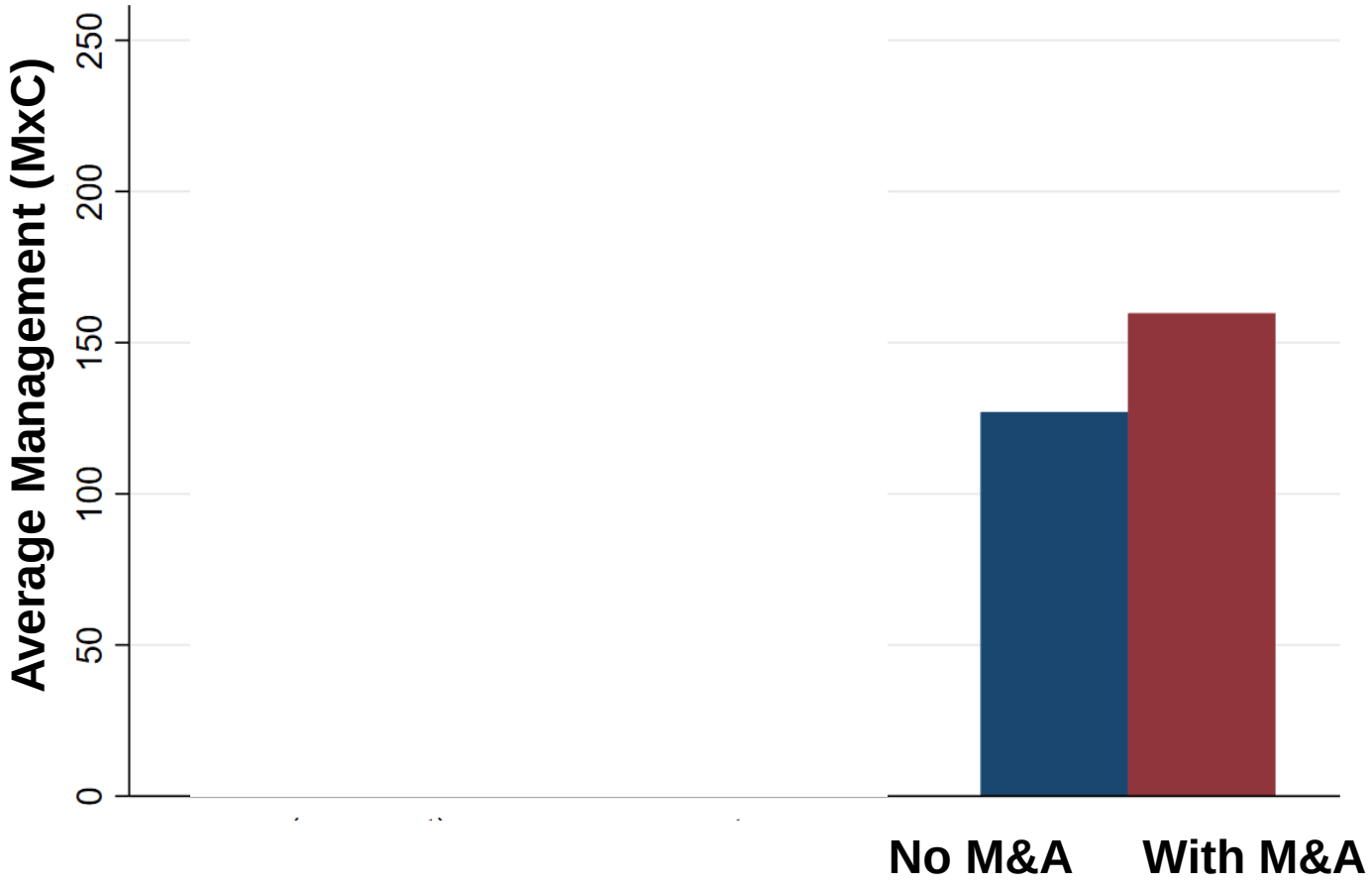
B. Management & Competition: Changes



Source: Bloom, Sadun, Schuh and Van Reenen (2023)

Notes: Competition proxies are 1-Lerner = median firm profits/sales, Imports = imports/apparent consumption, Imports China = imports from China/apparent consumption, all in an industry by country cell. In “levels” panels control for linear country & industry average. “Changes” are in deviations from time-specific country by industry dummies. WMS data.

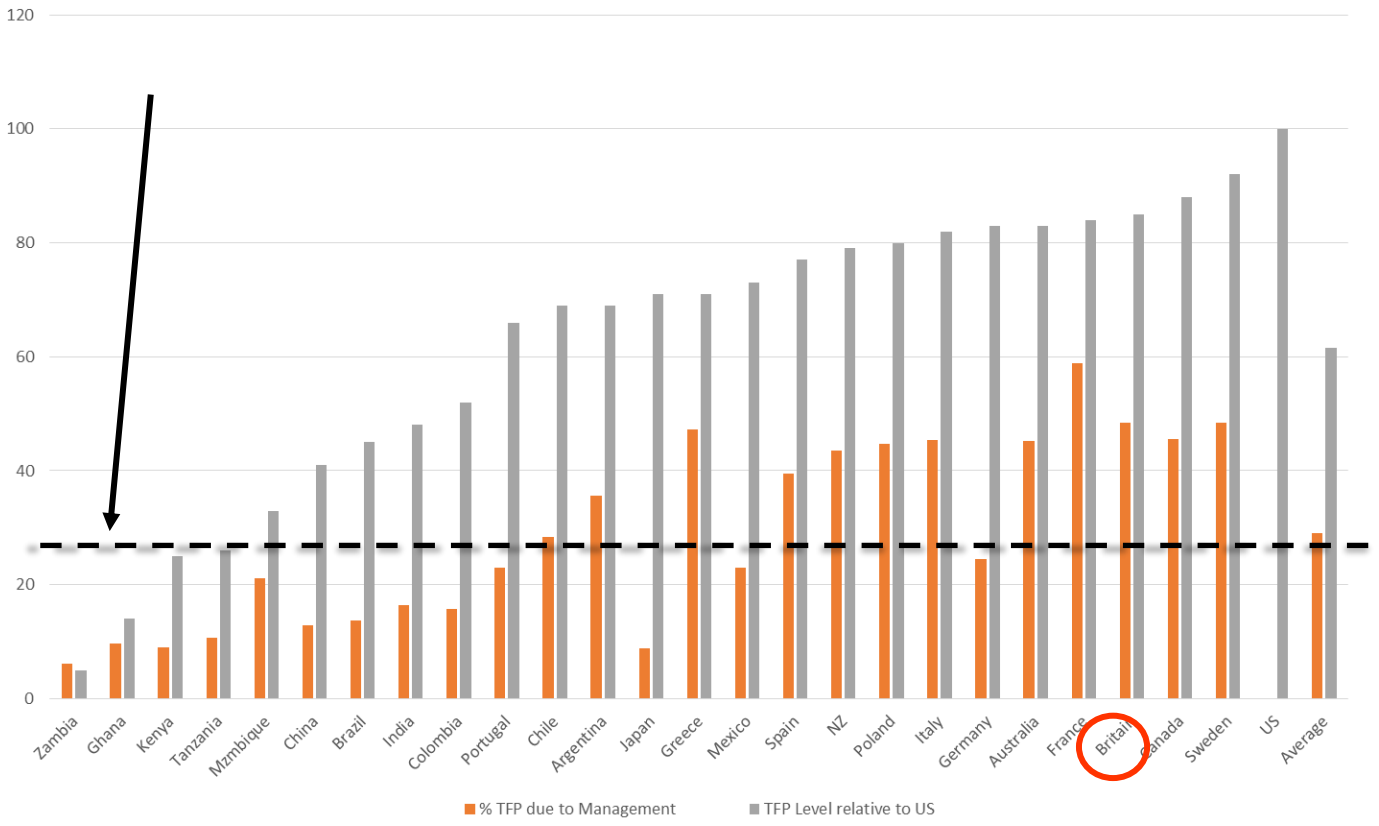
M&A increases the average level of management in the economy (by about 28%)



Notes: This is simulating an economy with and without M&A.

Source: Bloom, Sadun, Schuh and Van Reenen (2023)

Across countries, management accounts for about 30% of TFP gaps (~50% in UK)



Source: Bloom, Sadun, Schuh & Van Reenen (2023)

Measurement

Natural Laws

Technology

Models and Mergers

Drivers and Policy

Some Drivers of Management

- Human Capital
- Information
- Competition
- Governance
- Regulation

Toolkit of Management policies

Policy type	Strength of evidence	Policy Net benefit (out of 5)	Ease of implementation	Time frame
Structural				
Competition	H		M	medium
Trade and FDI	H		L	medium
Education	M		M	long
Deregulation	M		L	medium
Governance	M		M/L	long
Direct				
Training - consulting	H		H	short
Training - formal classroom	M		H	medium
Information/benchmarking	L/M		H	medium

Source: [Scur, Sadun, Van Reenen, Lemos & Bloom (2021)]

L = Low; Not politically easy
M = Medium
H = Highly possible

Conclusions

- Can generate robust management measures across firms & countries & scale up to get large samples
- Stylized facts across all countries:
  - Huge variation in management scores within nations
  - Firms with higher management scores are larger
    - Frictions (e.g. low competition) reduce ability of firms to scale up
  - High management score business perform better on multiple dimensions: productivity; profits and trade
- New structural models of management
- Management matters a lot for the wealth of nations
  - and is amenable to policy influence

Thank you!

UK Labour Productivity (GDP per hour): The Great Slowdown the since 2008-09 Global Financial Crisis

Lehman's

GDP per hour (Q2 2008=100)

UK productivity would be 26% higher than we would expect from pre-crisis trends

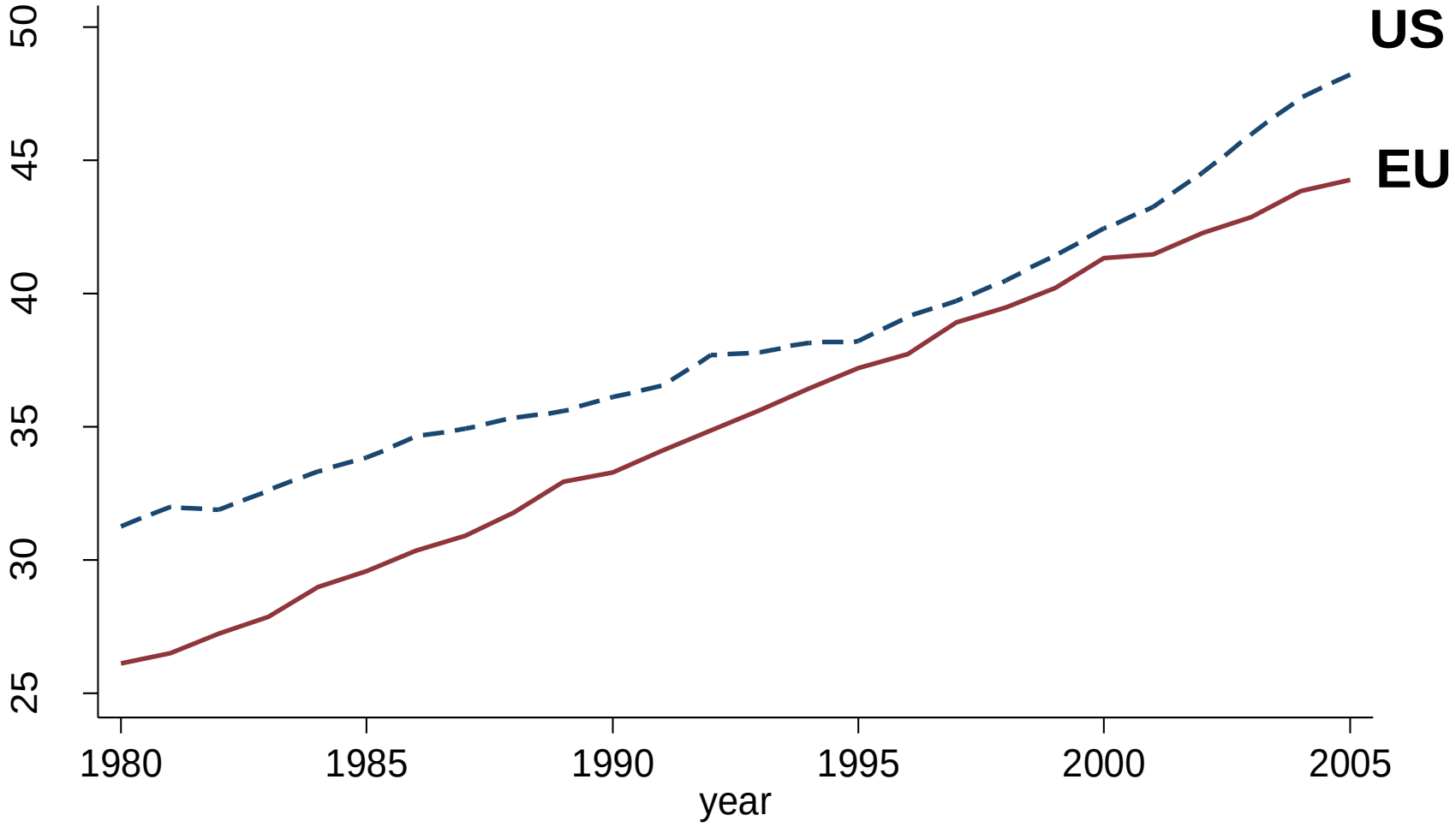
Source: ONS Output per hour worked, release date 26 April 2023, UK Whole Economy: Output per hour worked SA index (2008 Q2= 100). Note: predicted value after Q2 2008 is the dashed line calculated assuming a historical average growth rate of 2%.

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. 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

“Americans do IT better”
(Bloom, Sadun and Van Reenen, AER 2012)

Why did productivity growth accelerate in US 1995-05, but not in EU?



US productivity miracle linked to use of IT

- Prices of IT fell rapidly post 1995, and IT using sectors showed rapid TFP growth in the US

- US firms have higher scores on people management so able to use IT better. European firms low scores and struggled to adapt
- Test this by examining US multinationals in Europe. Find:
  - US multinationals much higher impact of IT on output compared to non-US multinationals
  - True even after take-overs with about a 3 year lag
  - Once control for better management in US multinationals we explain all of the US advantage in IT productivity

- US management explains ≈ 50% of faster TFP growth than EU after 1995

TABLE 6—EUROPEAN FIRM-LEVEL PANEL DATA WITH DIRECT MEASURES OF MANAGEMENT

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	$\ln(Q/L)$	$\ln(Q/L)$	$\ln(Q/L)$	$\ln(Q/L)$	$\ln(Q/L)$	$\ln(Q/L)$	$\ln(C/L)$	$\ln(C/L)$
Fixed effects	NO	NO	NO	NO	YES	YES	NO	NO
USA × $\ln(C/L)$ USA ownership × computers per employee		0.1790** (0.0733)		0.0784 (0.0720)	0.0518 (0.0713)	0.0192 (0.0785)		
MNE × $\ln(C/L)$ Non-US multinational × computers per employee		−0.0263 (0.0586)		−0.0235 (0.0553)	0.0218 (0.0547)	0.0235 (0.0550)		
People management			0.0271 (0.0219)	0.0271 (0.0219)				0.1268*** (0.0353)
People management × $\ln(C/L)$ People management × computers per employee			0.1451*** (0.0331)	0.1404*** (0.0344)	0.1284* (0.0773)	0.0994* (0.0581)		
$\ln(K/L)$ Non IT capital per employee	0.2401*** (0.0163)	0.1838*** (0.0284)	0.1782*** (0.0276)	0.1791*** (0.0276)	0.2347** (0.0926)	0.2316*** (0.0882)		
$\ln(L)$ Labor	−0.0182 (0.0162)	0.0421 (0.0360)	0.0421 (0.0344)	0.0409 (0.0349)	−0.2182 (0.2600)	−0.2347 (0.2497)		
$\ln(C/L)$ Computers per employee		0.1256*** (0.031)	0.1430*** (0.0284)	0.1463*** (0.0303)	−0.0493 (0.0596)	−0.2282 (0.1738)		
USA USA ownership	0.2548*** (0.0438)	0.0779 (0.0481)	0.1111** (0.0446)	0.0837* (0.046)			0.2601*** (0.0742)	0.2150*** (0.0732)
MNE Non-US multinational	0.1909*** (0.0304)	0.1597*** (0.0363)	0.1604*** (0.0355)	0.1618*** (0.0357)			0.0492 (0.0596)	0.0367 (0.0591)
ln(degree) Percentage employees with a college degree		0.0433** (0.0183)	0.0375** (0.0184)	0.0370** (0.0184)			0.0585** (0.0293)	0.0359 (0.0296)
ln(degree) × $\ln(C/L)$ Percentage employees with a college degree × computers per employee						0.0700 (0.0484)		
Observations	9,463	2,555	2,555	2,555	2,555	2,555	2,555	2,555
Test USA × $\ln(C/L)$ = MNE × $\ln(C/L)$, p-value		0.0189		0.2419	0.6360	0.9565		
Test USA = MNE, p-value	0.1789	0.1206	0.3094	0.1264			0.0095	0.0253

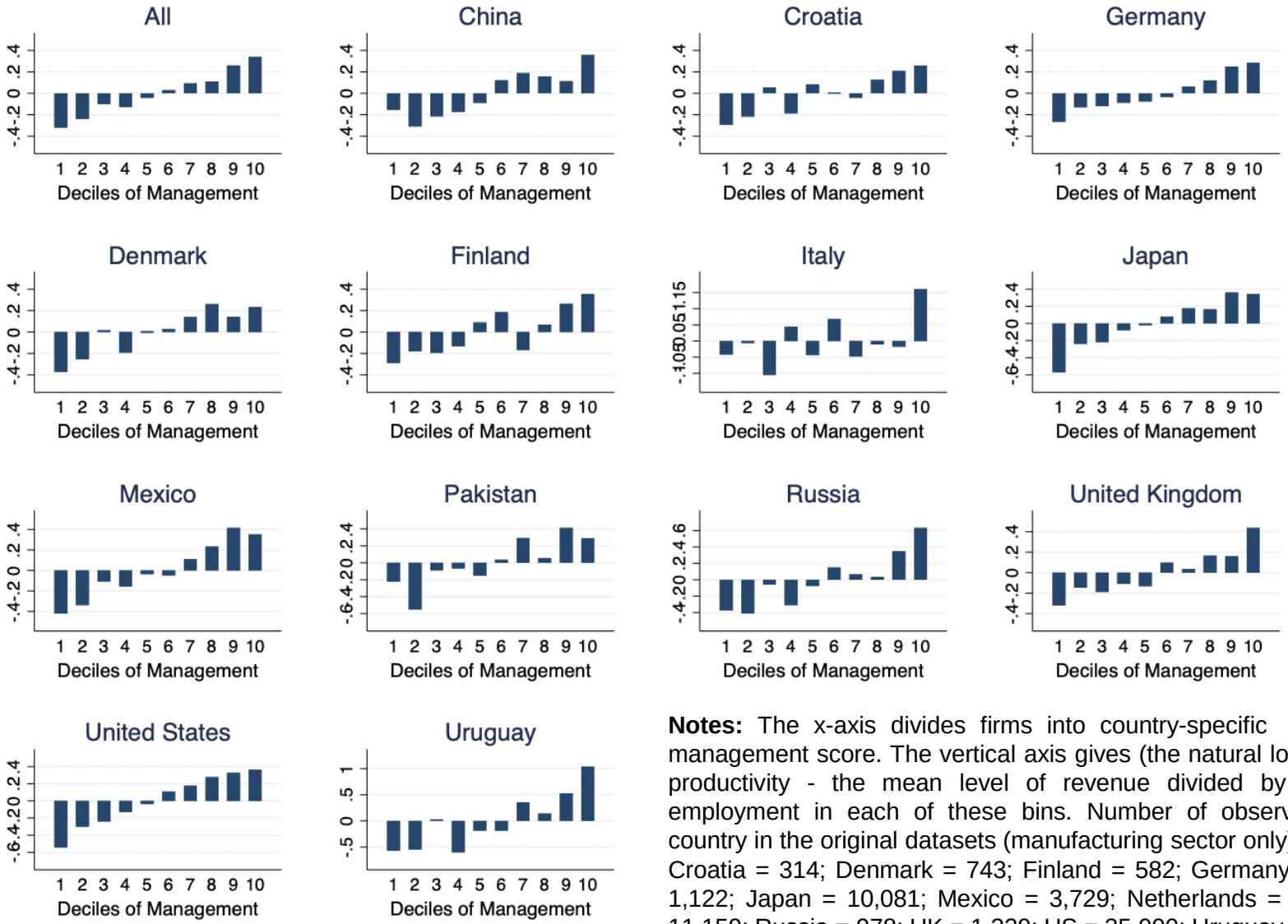
Some Basic Features of the different MOPS surveys (Table A2)

Country	Sectors Covered	Reference Year	Reporting Unit	Mandatory	Response Mode	Units Contacted (All Sectors)	Response Rate (All Sectors)
China	Manufacturing	2017	Firm	No	In-person	2,364	84%
Croatia	Manufacturing, Services	2017	Firm	No	In-person	4,307	17%
Denmark	All sectors	2017	Firm	No	Internet	26,000	17%
Finland	Manufacturing	2016	Establishment	No	Internet	2,509	25%
Germany	Manufacturing	2013	Establishment	No	Mail, Internet	35,000	6%
Italy	Manufacturing, Services	2019	Firm	No	In-person, Telephone	5,000	30%
Japan	Manufacturing, Wholesale, Selected retail and services industries	2015†	Establishment	No	Mail	36,052†	32%
Mexico	Manufacturing, Services	2014	Firm	Yes	In-person	25,456	90%
Netherlands	Manufacturing, Retail, Services	2018	Firm	No	Internet	1,708	59%
Pakistan	Manufacturing	2017-2018	Establishment	No	Hand delivery & retrieval	78,687	32%
Russia	Manufacturing	2017	Firm	No	Telephone	5,864	17%
United Kingdom	All sectors	2016	Firm	No	Mail	25,006	31%
United States	Manufacturing	2015	Establishment	Yes	Mail, Internet	50,000	70%
Uruguay	All sectors	2019	Firm	Yes	Internet	4,300	79%

† Manufacturing only.

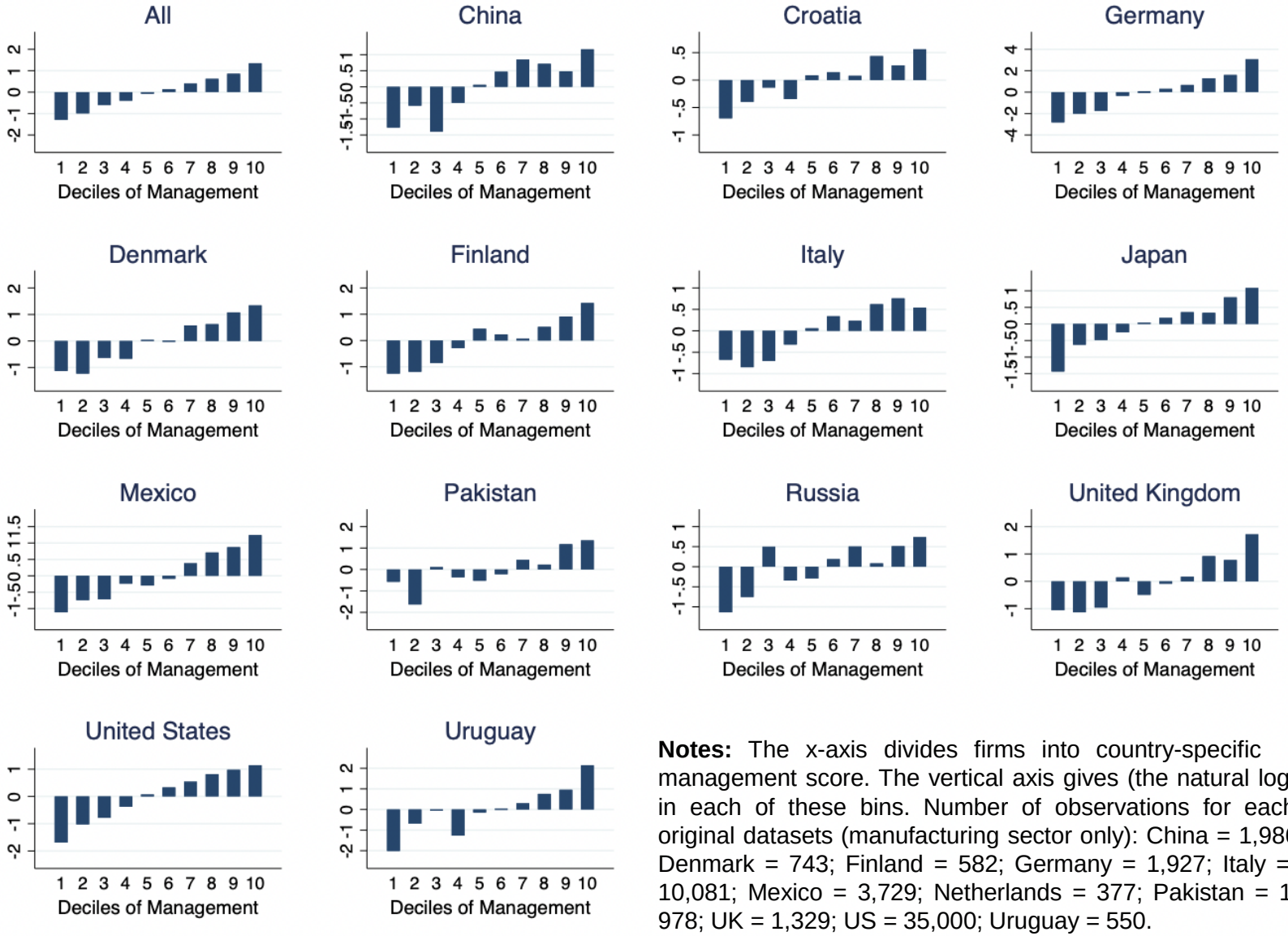
A version of this table with even more detail on the surveys can be found as at https://docs.google.com/spreadsheets/d/12TzbD28eJ_q3wtFStrRqHR6Cjl8hQX4E/

III. Businesses with higher MOPS scores have higher productivity, log(revenue per worker)



Notes: The x-axis divides firms into country-specific deciles of their management score. The vertical axis gives (the natural logarithm of) labor productivity - the mean level of revenue divided by mean level of employment in each of these bins. Number of observations for each country in the original datasets (manufacturing sector only): China = 1,986; Croatia = 314; Denmark = 743; Finland = 582; Germany = 1,927; Italy = 1,122; Japan = 10,081; Mexico = 3,729; Netherlands = 377; Pakistan = 11,159; Russia = 978; UK = 1,329; US = 35,000; Uruguay = 550.

Businesses with higher MOPS scores have higher Profits, log(gross profits, EBIDTA)



Notes: The x-axis divides firms into country-specific deciles of their management score. The vertical axis gives (the natural logarithm of) profits in each of these bins. Number of observations for each country in the original datasets (manufacturing sector only): China = 1,986; Croatia = 314; Denmark = 743; Finland = 582; Germany = 1,927; Italy = 1,122; Japan = 10,081; Mexico = 3,729; Netherlands = 377; Pakistan = 11,159; Russia = 978; UK = 1,329; US = 35,000; Uruguay = 550.

Tab 1: Model has 15 parameters – 9 taken from prior literature, 2 normalized (and 4 estimated by SMM)

9 Predefined parameters

Parameter		value	Rationale
Capital – output elasticity	α	0.3	NIPA factor share
Labor – output elasticity	β	0.6	NIPA factor share
Management – output	γ	0.1	Bloom et al (2013)
Demand elasticity	ρ	5	Bartelsman et al (2013)
Standard deviation of ln(TFP)	σ_A	0.31	Bloom (2009)
AR(1) parameter on ln(TFP)	ρ_A	0.89	Cooper and Haltiwanger(2006)
Discount Factor	ϕ	0.90	Standard 10% interest rate
Capital depreciation rate	δ_K	10%	Bond and Van Reenen (2007)
Capital resale loss	ϕ_K	50%	Ramey and Shapiro (2001)

Estimate the four remaining parameters by SMM

4 Structurally estimated parameter values

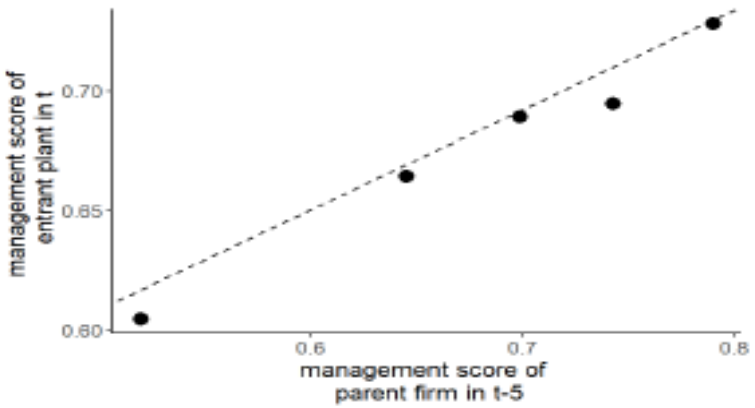
Parameter	Symbol	Value
Depreciation rate of management	δ_M	0.133 (0.055)
Adjustment cost parameter for management	γ_M	0.207 (0.065)
Adjustment cost parameter for capital	γ_K	0.189 (0.042)
Sunk cost of entry	κ	165.9 (6.78)

4 Empirical Moments used

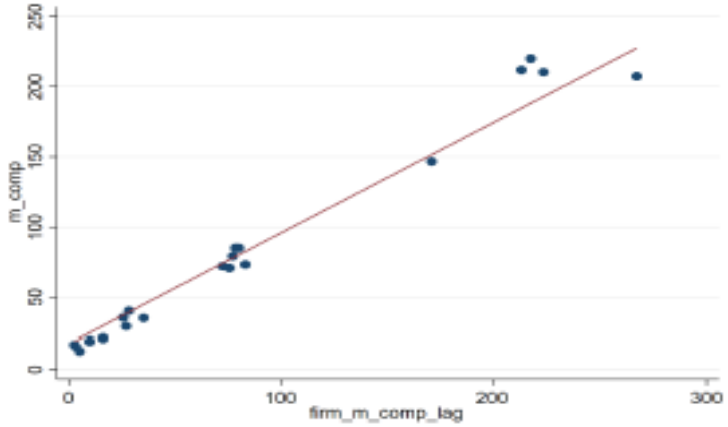
Moment	Data Value	Estimated value
Standard deviation of 5 year management growth	0.564	0.559
Standard deviation of 5 year sales growth	0.941	0.936
Standard deviation of 5 year capital growth	0.875	0.883
Annual Exit rate	3.88%	3.88%

Notes: Estimation by SMM using management panel data 2004-2014. Calibrate 11 parameters – see Table 1: 9 from literature and two normalizations (Fixed cost=100 and mean of lnA=1). Run 100 years until steady state. Keep last 10 years of data

High management firms create high management plants



(a) Data



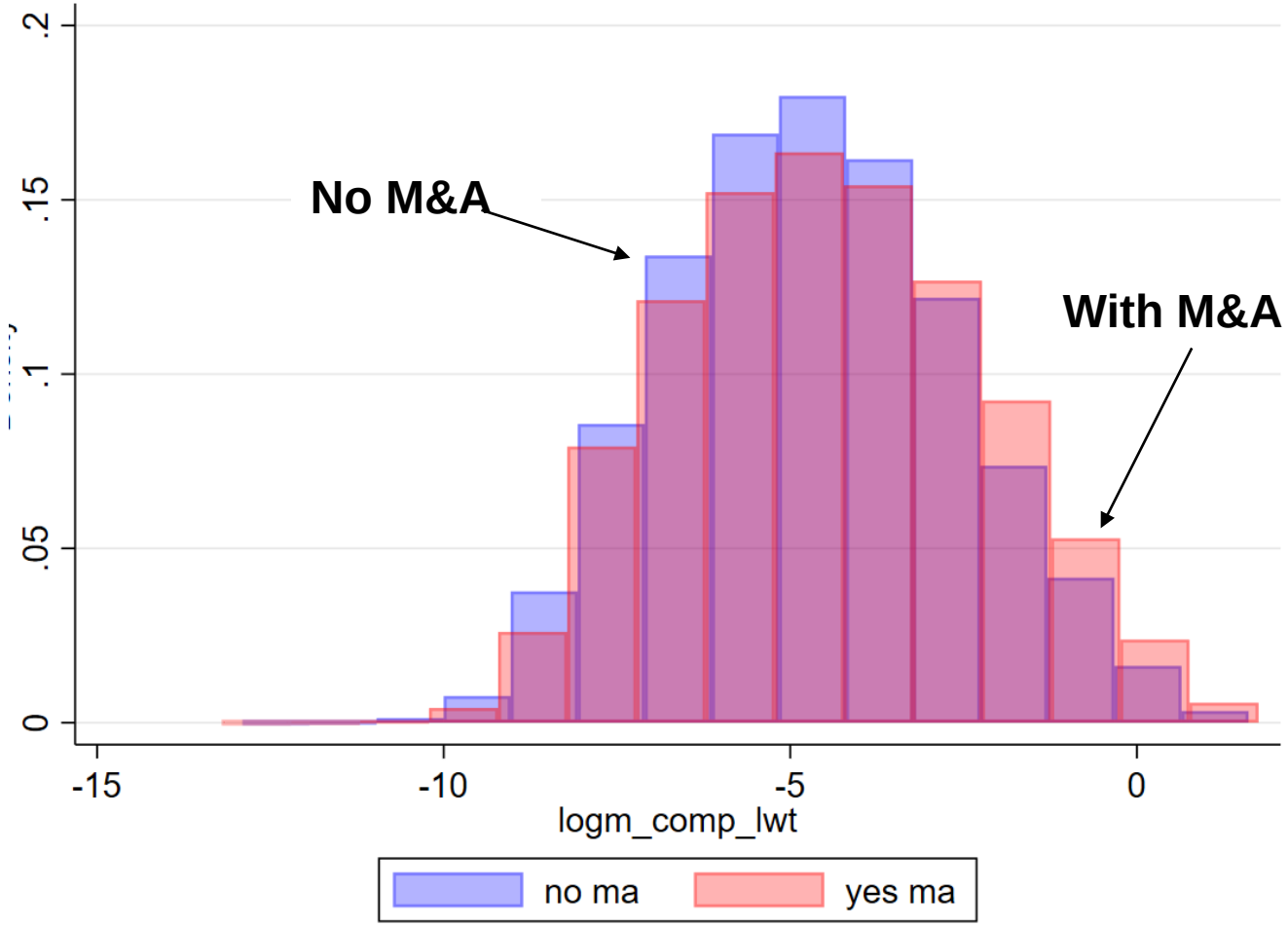
(b) Model

Plant management increases when acquired by a high management firm

Table 1: Change in Management of Acquired Plants, MOPS

	Dependent Variable: Change in Plant Management, 2010-2015					
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged Adoptive Firm Management	0.3076					
- Birth Firm Management	0.09460					
Lagged Adoptive Firm Management		0.2212	0.1846	0.2160	0.2197	
- Leave-out Birth Firm Management		0.09585	0.1170	0.09357	0.1222	
Lagged Adoptive Firm Managment						0.2900
						0.1566
Lagged Leave-out Birth Firm Management						-0.1318
						0.1152

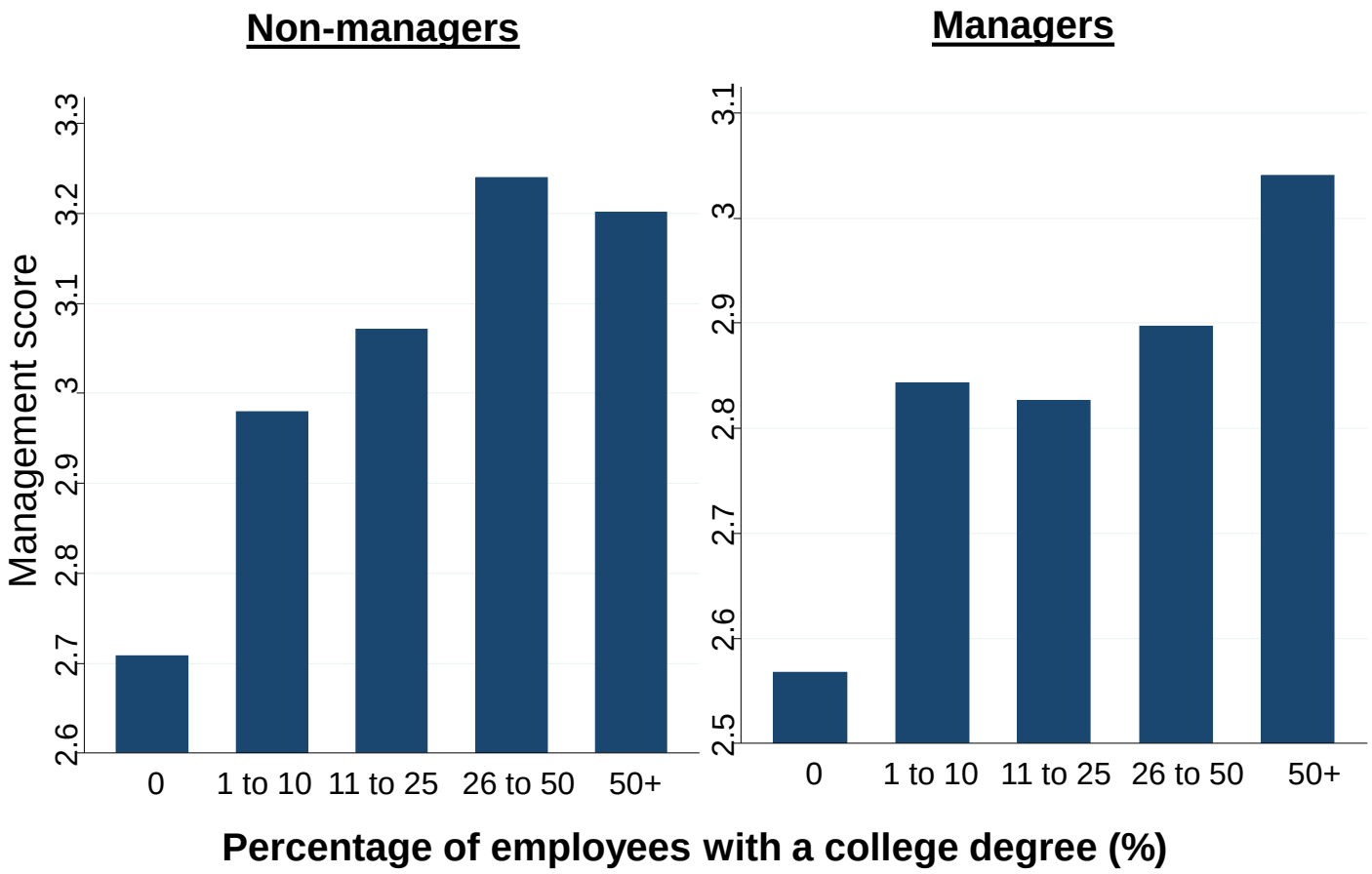
M&A Shifts distribution of management to the right



Notes: This is simulating an economy with and without M&A.

Source: Bloom, Sadun, Scur and Van Reenen (2023)

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



Sample of 8,032 manufacturing and 647 retail firms.

Some Drivers of Management

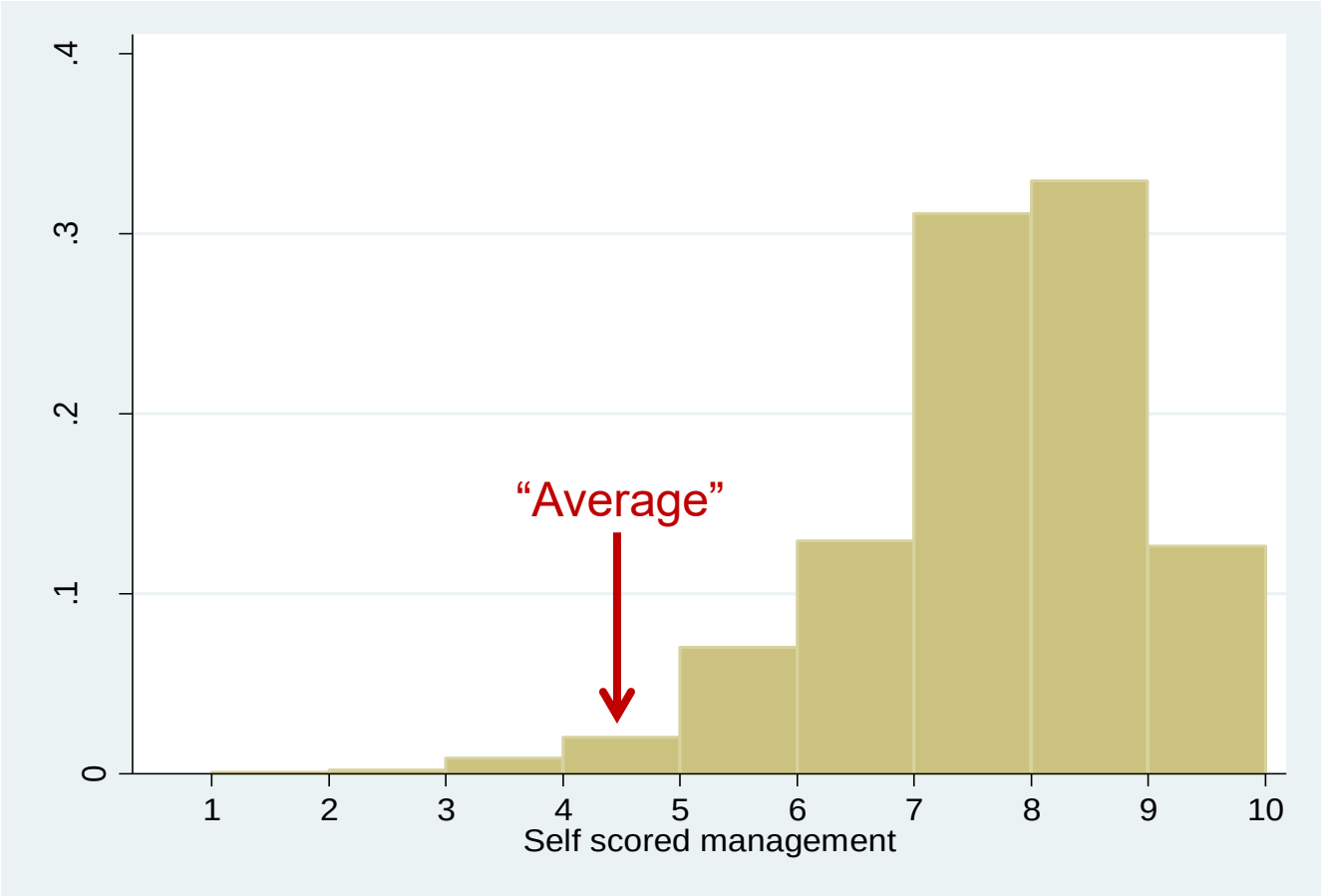
- Human Capital
- **Information**
- Competition
- Governance
- Regulation

Information – Managers bad at self assessment

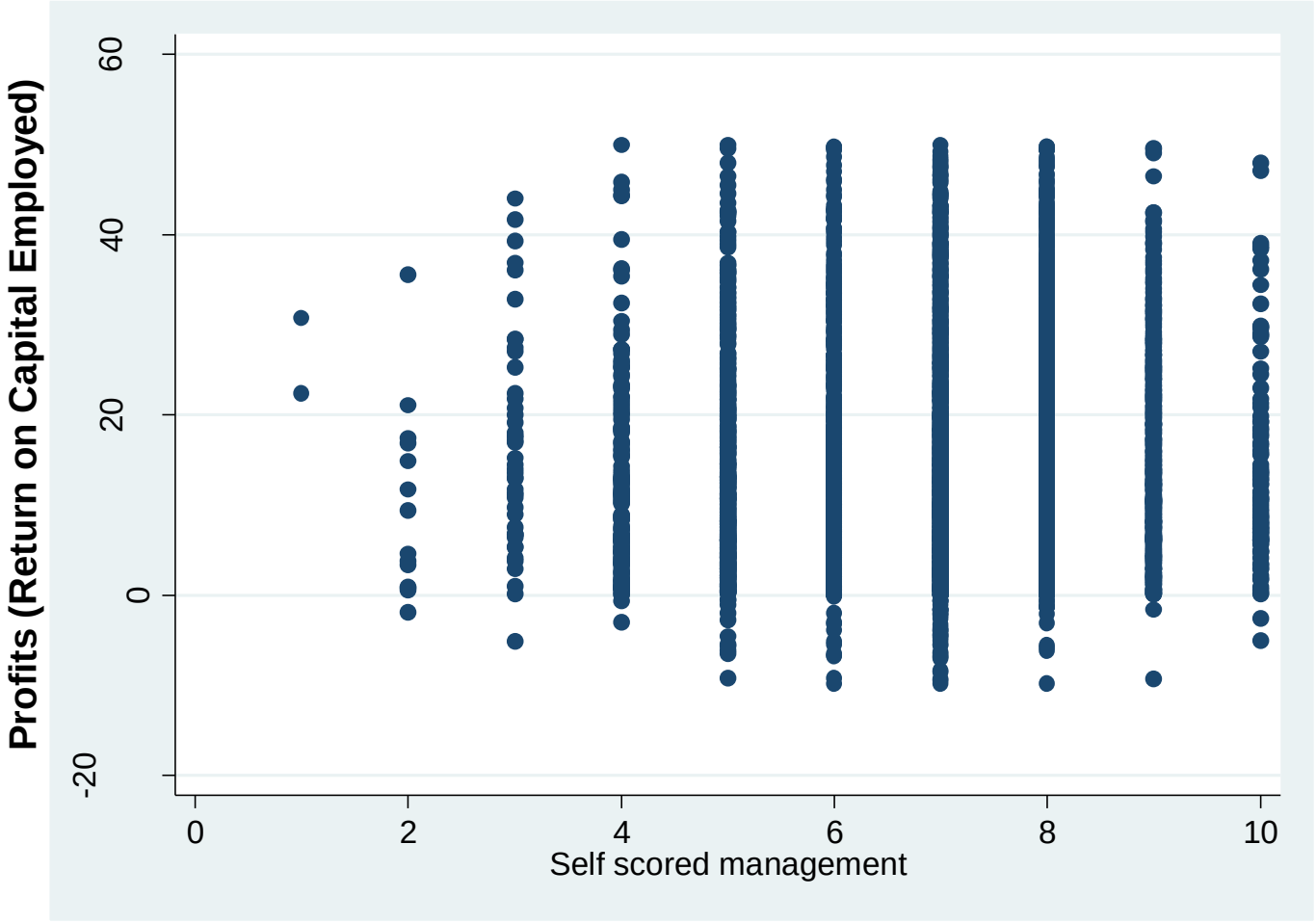
At the end of the WMS survey we asked:

"*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*"

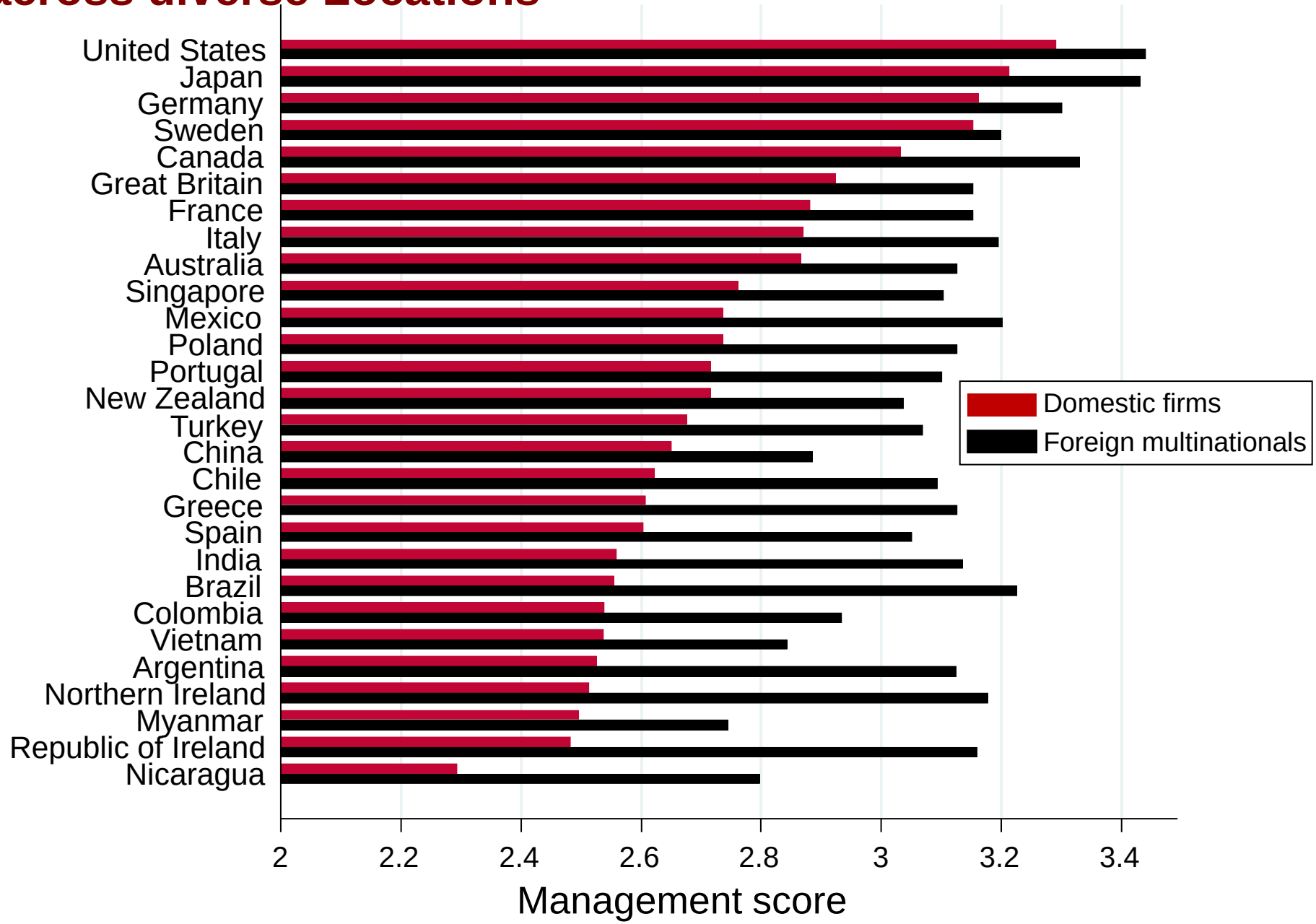
…and found firms are too optimistic on management



…and self-scores show no link to performance



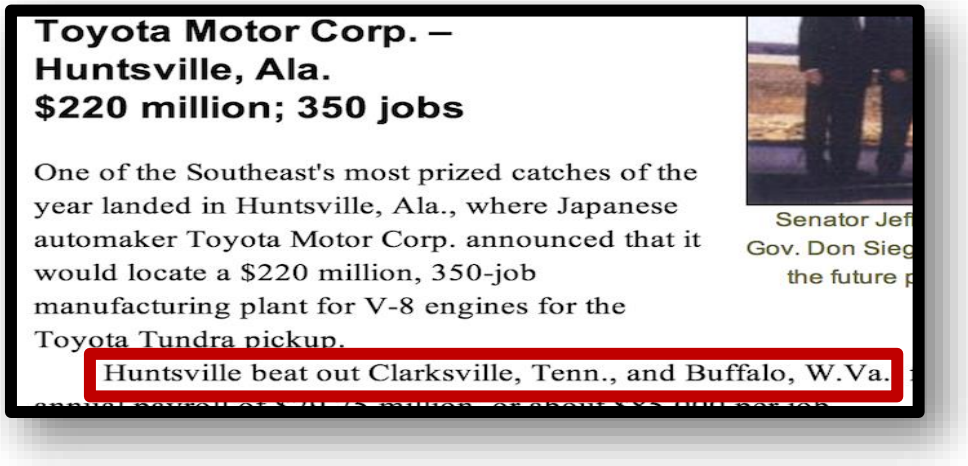
Foreign Multinationals obtain high Management acores across diverse Locations



<u>Testing Informational Spillovers</u> - 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



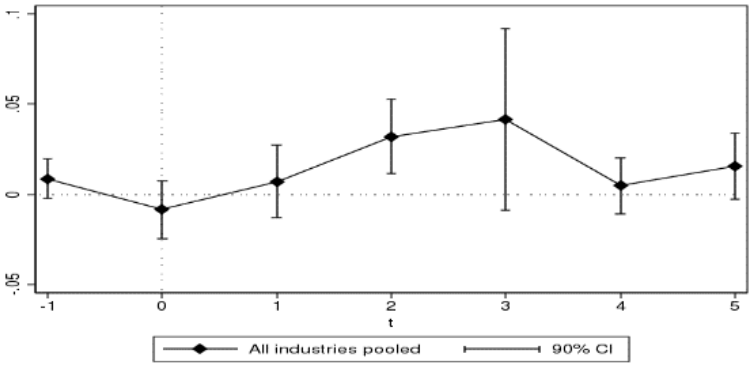
Toyota Motor Corp. –
Huntsville, Ala.
$220 million; 350 jobs

One of the Southeast's most prized catches of the year landed in Huntsville, Ala., where Japanese automaker Toyota Motor Corp. announced that it would locate a $220 million, 350-job manufacturing plant for V-8 engines for the Toyota Tundra pickup.

Huntsville beat out Clarksville, Tenn., and Buffalo, W.Va.

Senator Jef
Gov. Don Sieg
the future p

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



Panel A:
Overall Treatment Effect

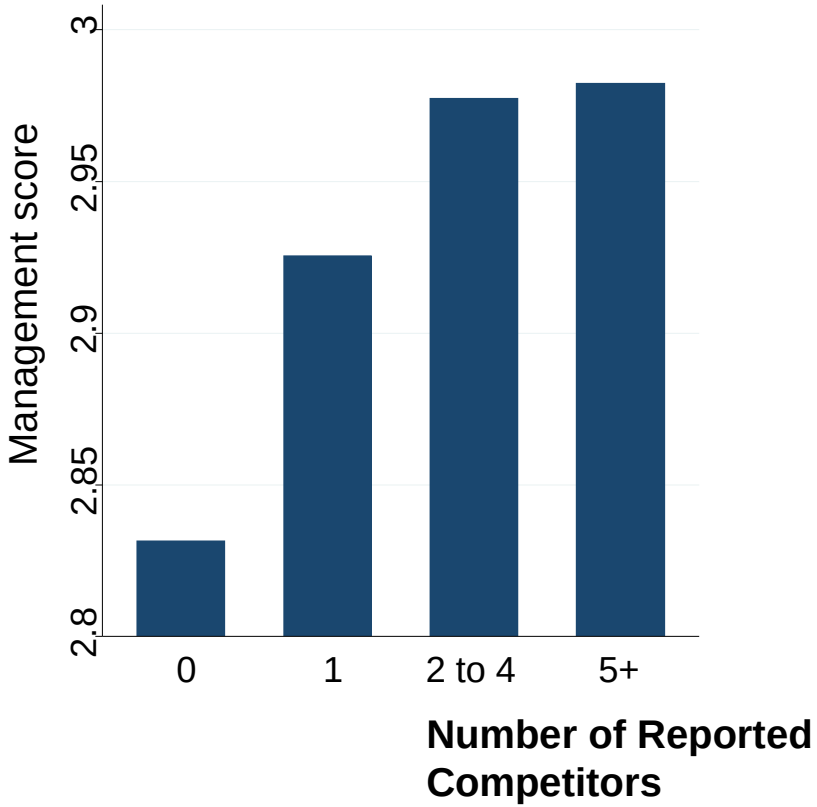
Source: Bloom, Brynjolfsson, Foster, Jarmin, Patnaik, Saporta-Eksten & Van Reenen (2019, AER) "Drivers"

Some Drivers of Management

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

COMPETITION ASSOCIATED WITH BETTER MANAGEMENT

Manufacturing and Retail

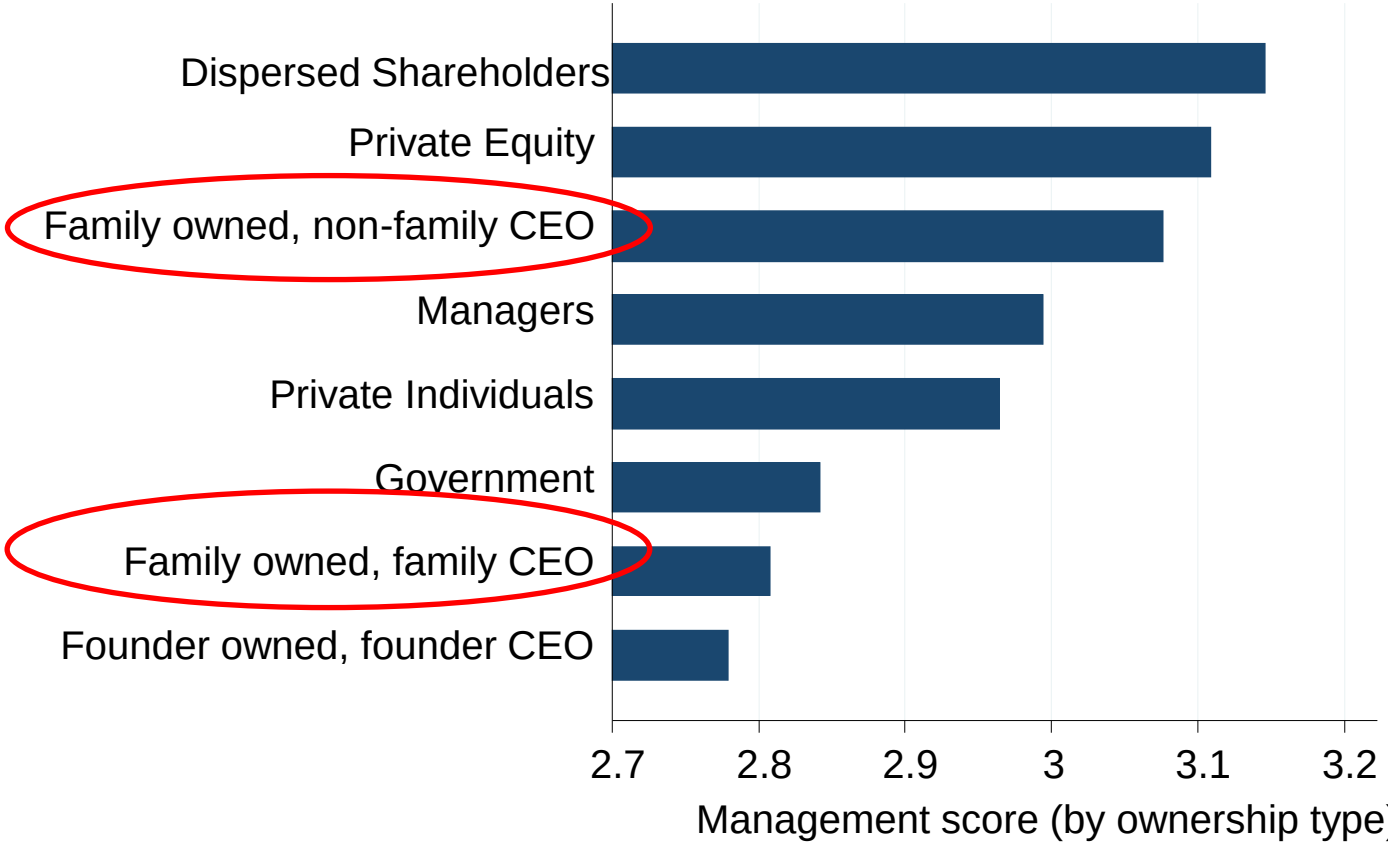


Sample of 9469 manufacturing and 661 retail firms (private sector panel) Reported competitors defined from the response to the question “How many competitors does your [organization] face?”

Some Drivers of Management

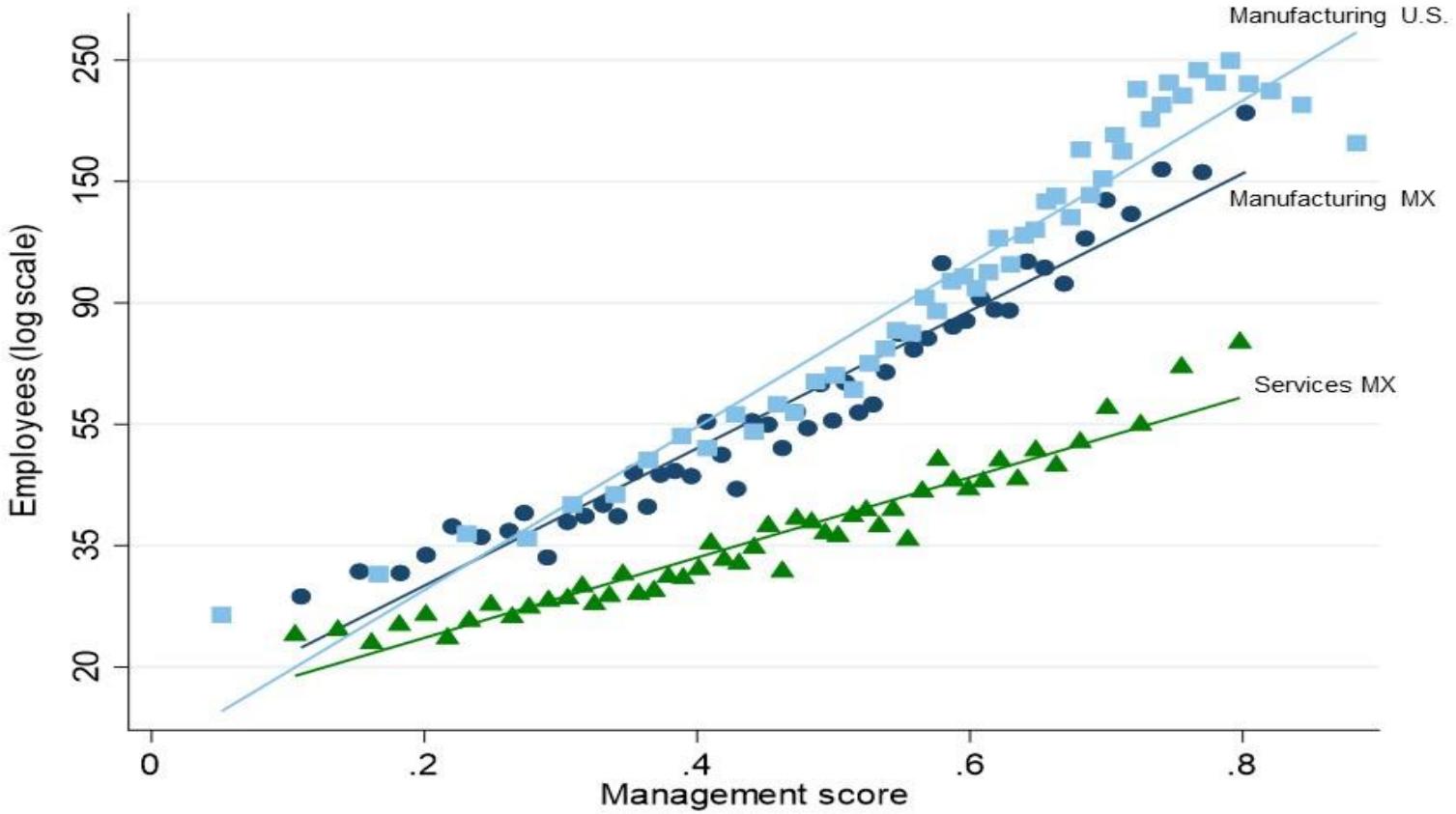
- Human Capital
- Information
- Competition
- **Governance**
- Regulation

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.

Firm Size increases in management but much less in Mexico than US, and much less in services than manufacturing

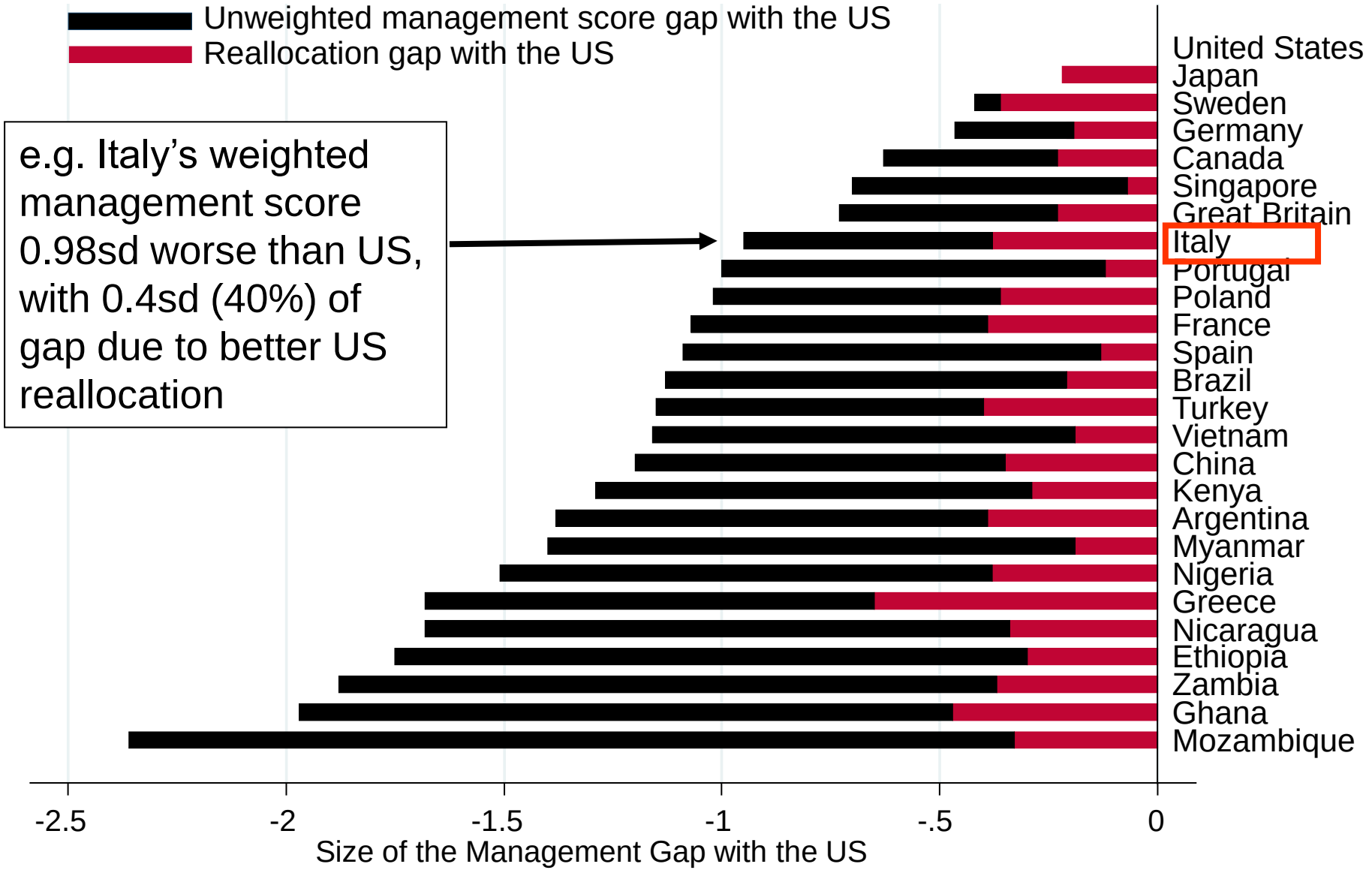


Slope
2.752***
(0.0837)
1.621***
(0.0475)
3.360***
(0.123)

Notes: Results from Bin scatter with 50 quantiles from Mexican and U.S. firm-level Census management data. U.S data described in Bloom et al. (2018). Regression results reported for log(employment) on management score across the 50 bins. Samples 3,707 Mexican manufacturing plants in 2014 and 2,936 in 2017; 10,175 Mexican services firms in 2014 and 7,509 in 2017; and 32,000 US manufacturing plants which have been aggregated into 18,000 firms for this analysis.

Source: Bloom, Iacovone, Pereira-López & Van Reenen (2022)

Management and Reallocation by Country



Notes: Share-weighted management score differences relative to the US (in terms of management score standard deviations). Length of bar shows total deficit, composed of the sum of the (i) the unweighted average management scores (black bar) and the Olley-Pakes reallocation effect (red bar). Domestic firms only with management scores corrected for sampling selection bias.