



Programme on  
Innovation and Diffusion

# Management Data Update: WMS and MOPS

*Empirical Management Conference, Stanford*

**December 14<sup>th</sup> 2023**



Any opinions and conclusions expressed herein are those of the authors and do not represent the views of the U.S. Census Bureau or the Board of Governors of the Federal Reserve System or its staff. The Census Bureau has reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release. Data Management System (DMS) number: P-6000719. DRB Approval Number: CBDRB-FY22-CES008-004."

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  - Open questions, double blind, etc.
  - But expensive to run.....

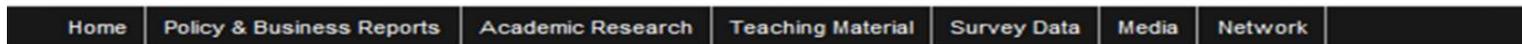
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- Management and Organizational Practices Survey (MOPS) attempt to scale up WMS using more traditional “closed” question survey approach
  - Started with US Census Bureau & subsequently adopted in many other countries.

# World Management Survey (~25k interviews since 2002, 38 countries)



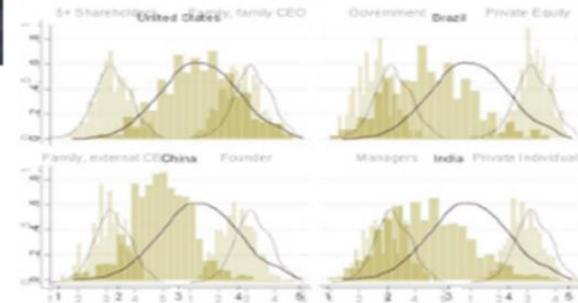
<http://worldmanagementsurvey.org/>



Benchmark your manufacturing firm, hospital, school, or retail outlet against others in your country, industry or size class.

**Benchmark your organization**

Management scores across firms  
WMS team analyses the distribution of management practices within countries by type.

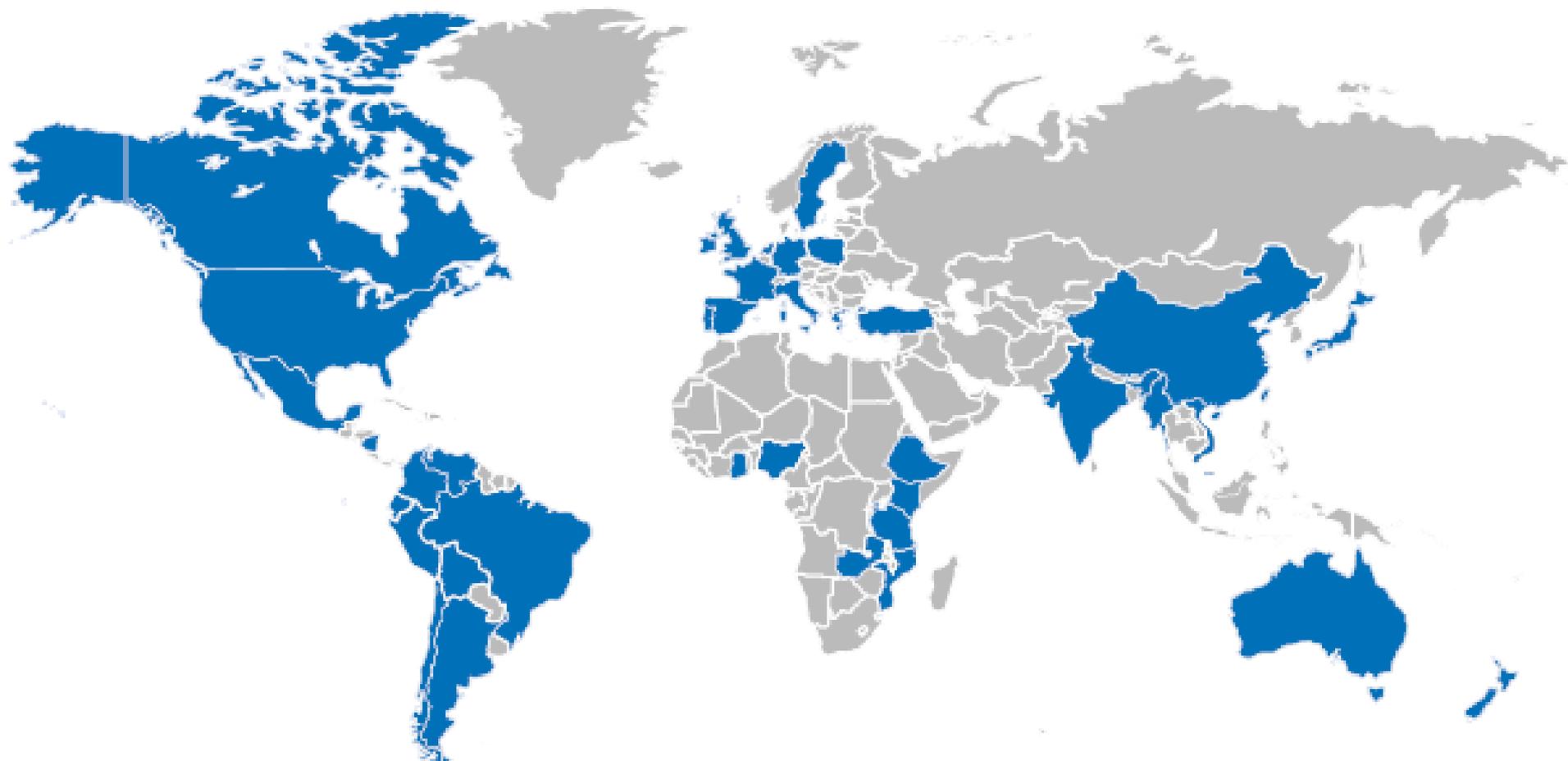


## Featured publications

- [Why do management practices differ across firms and countries?](#)
- [Management Practice and Productivity: Why They Matter](#)
- [Management in Healthcare: Why good practice really matters](#)

- Medium sized manufacturing firms (50-5,000 workers, median≈250)
- Now extended to Retail, Hospitals, Schools, Universities, Government, etc.
- 5 major waves: 2004, 2006, 2009/10, 2013/14; **2022**

**FIGURE 1: GEOGRAPHIC SCOPE OF THE PROJECT**

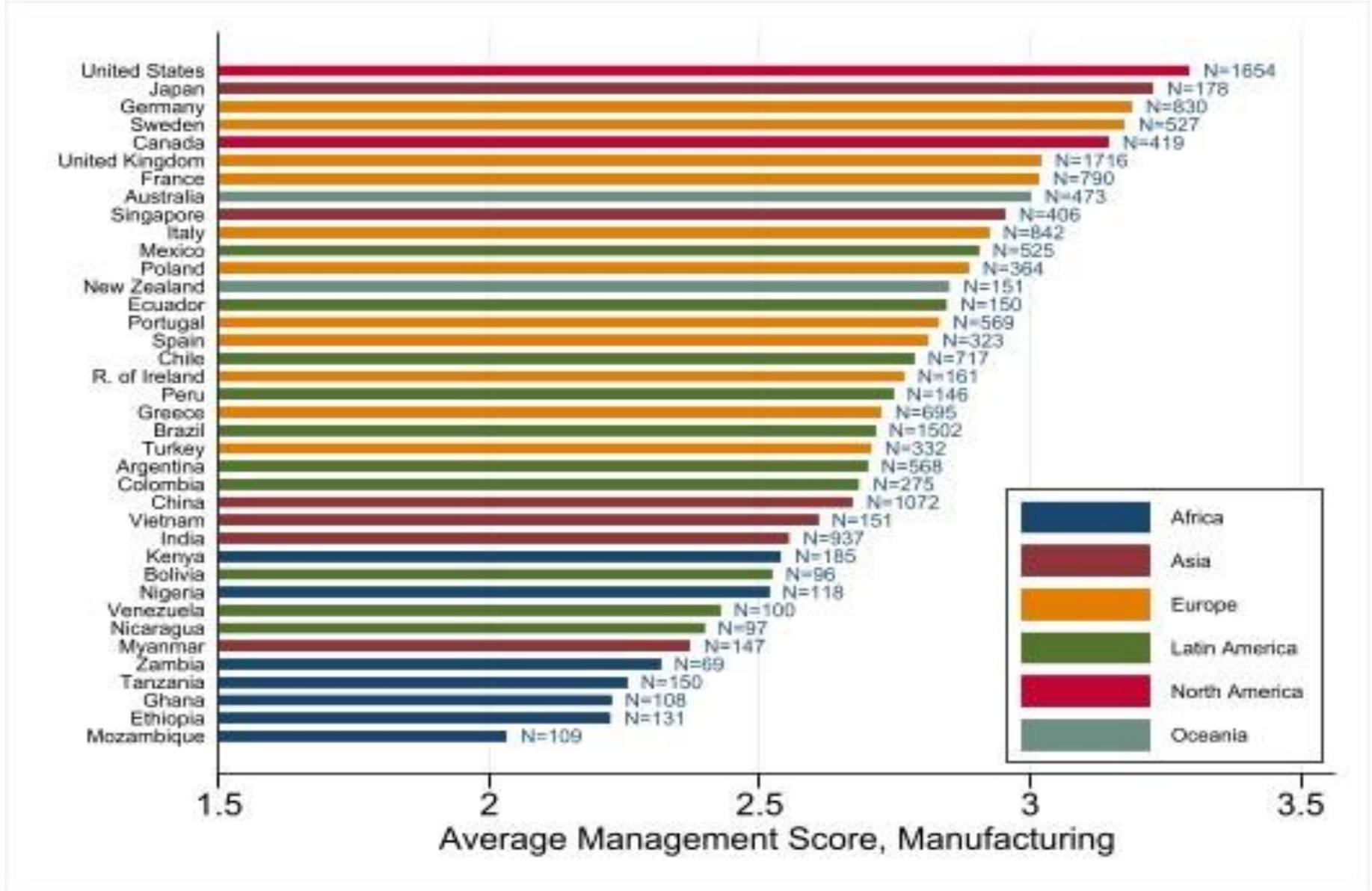


**Note:** WMS coverage 2004-2022

# Latest 2022 Wave of WMS

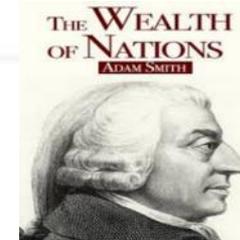
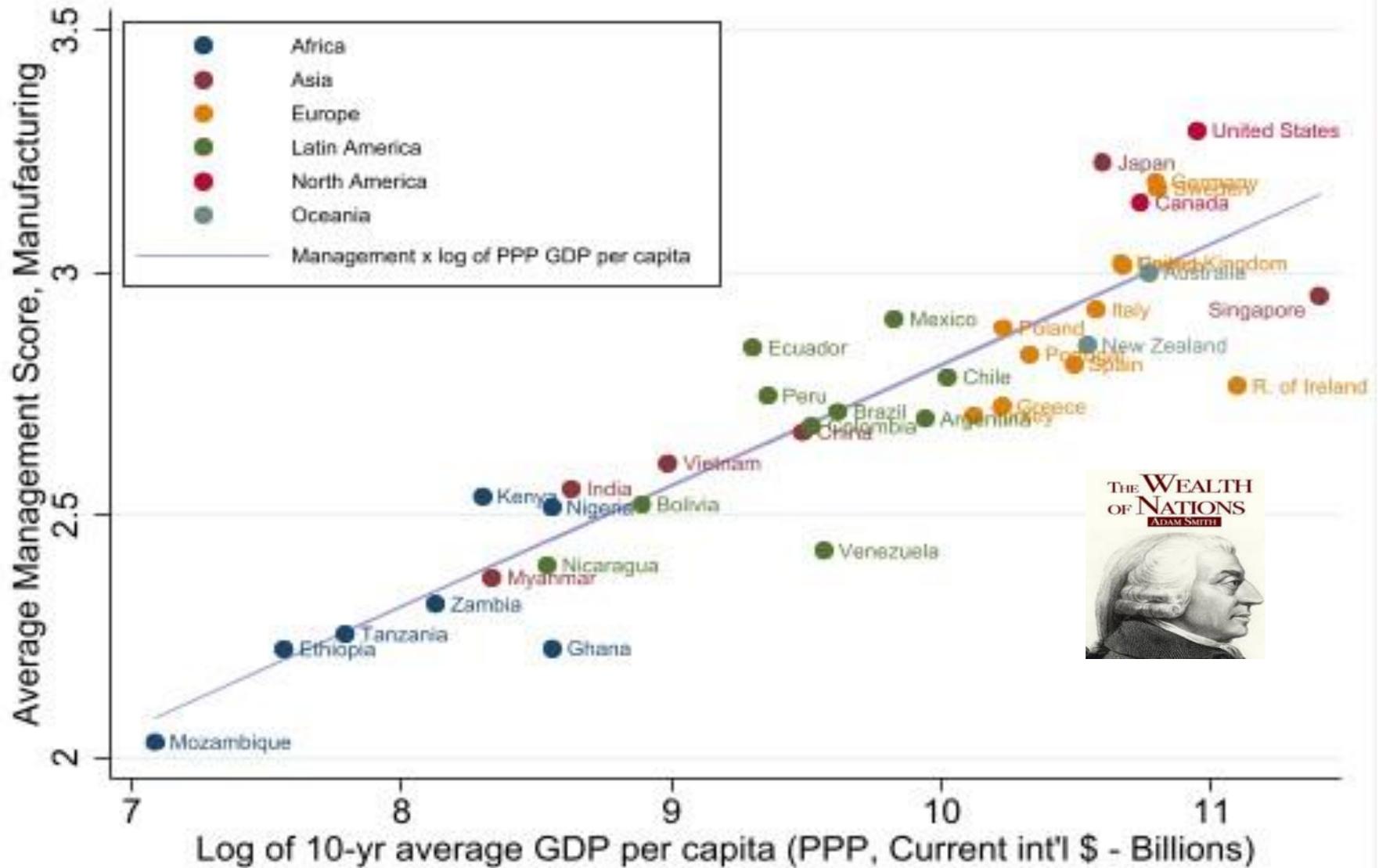
- About 1,500 firms (mixture of panel and cross section)
  - 12 countries (Brazil, Chile, Colombia, France, Germany, Greece, Italy, Portugal, Spain, Sweden, UK, US)
- New modules:
  - **Climate Change** awareness, adaption, mitigation (Norris-Keiller & Van Reenen, 2023, tomorrow)
  - **Supply Chain Management:** Strategy, KPIs, Decision making, Visibility, Flexibility

# 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

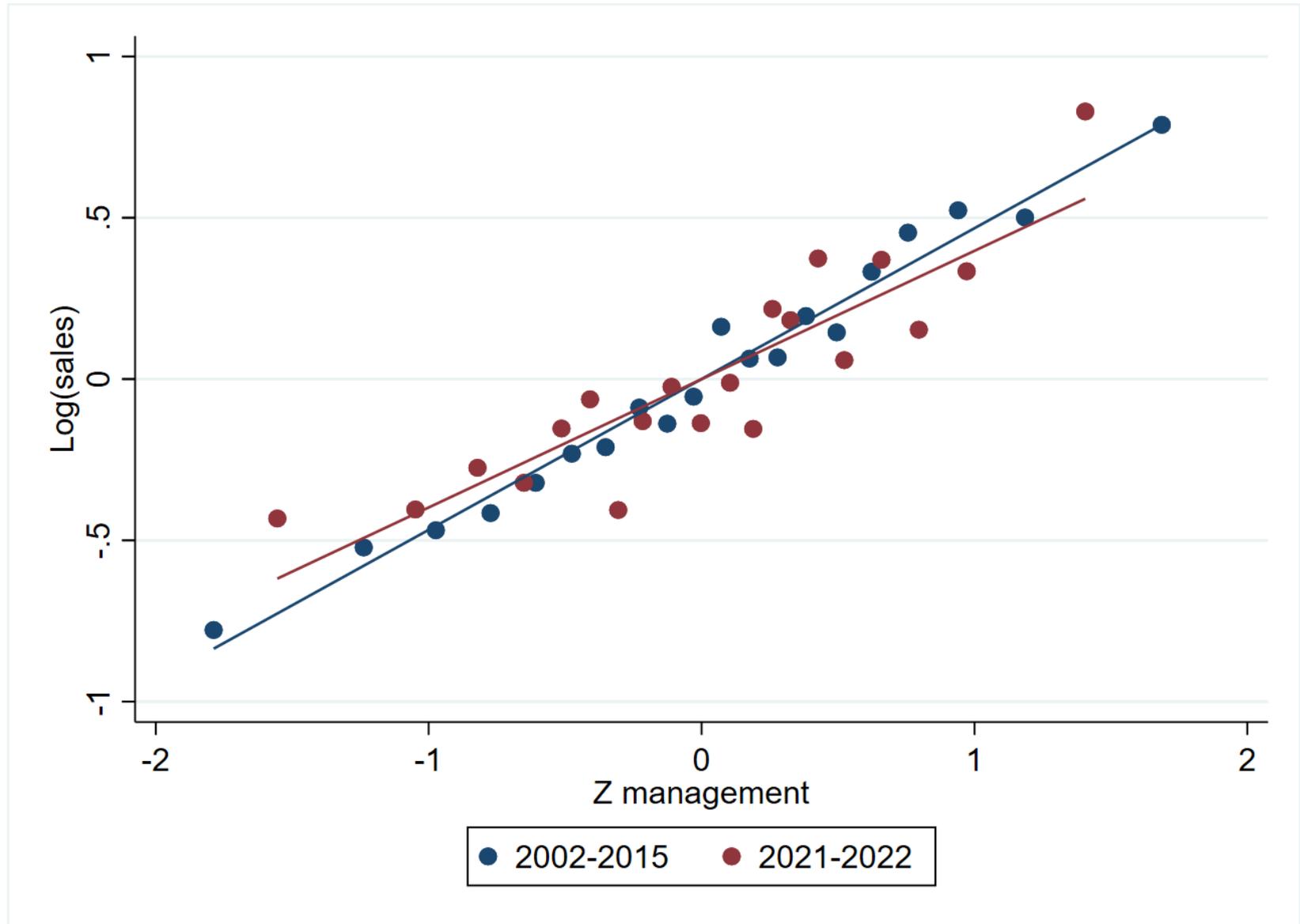


Note: April 2022, World Economic Outlook (IMF) indicator.

# Latest 2022 Wave of WMS

- Initial results comparable to earlier waves: robust results of standard findings in the new data. Examples:
  - Association of performance with management
  - Drivers of management (skills, FDI, family firms, etc.)
- Planning London Event summer 2024 to launch early results

# Correlation of management with size (log sales) is very similar across old and new waves



# WMS Production functions look stable over time

Dependent var:	Ln(sales)	Ln(sales)	Ln(sales)
	Old Waves	New Wave (2022)	Pooled
<b>Management</b>	0.152***	0.114**	0.150***
	(0.014)	(0.045)	(0.013)
<b>Ln(Labor)</b>	0.605***	0.663***	0.609***
	(0.027)	(0.086)	(0.026)
<b>Ln(Capital)</b>	0.333***	0.312***	0.331***
	(0.019)	(0.068)	(0.018)
<b>Obs</b>	6,821	813	7,634

**Note:** OLS Levels regressions, SE clustered by firm, country, year and industry dummies included

**One Problem with WMS is scalability: we've collected ~18k interviews over 18 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  
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](http://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.

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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](mailto: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 . . . . .	<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 <b>6</b> ) . . . . .	<input type="checkbox"/>	<input type="checkbox"/>

# Example: MOPS UK version (MES) run with ONS

- 2017 surveys of ~25k firms regarding 2016 practices (includes non-manufacturing)
- Also run in 2021 (about 2020 practices)
- 2023 in the field now



**Management and Expectations Survey**



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00001 00000  
\*\*\*TEST PRINT\*\*\*

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

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**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](http://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

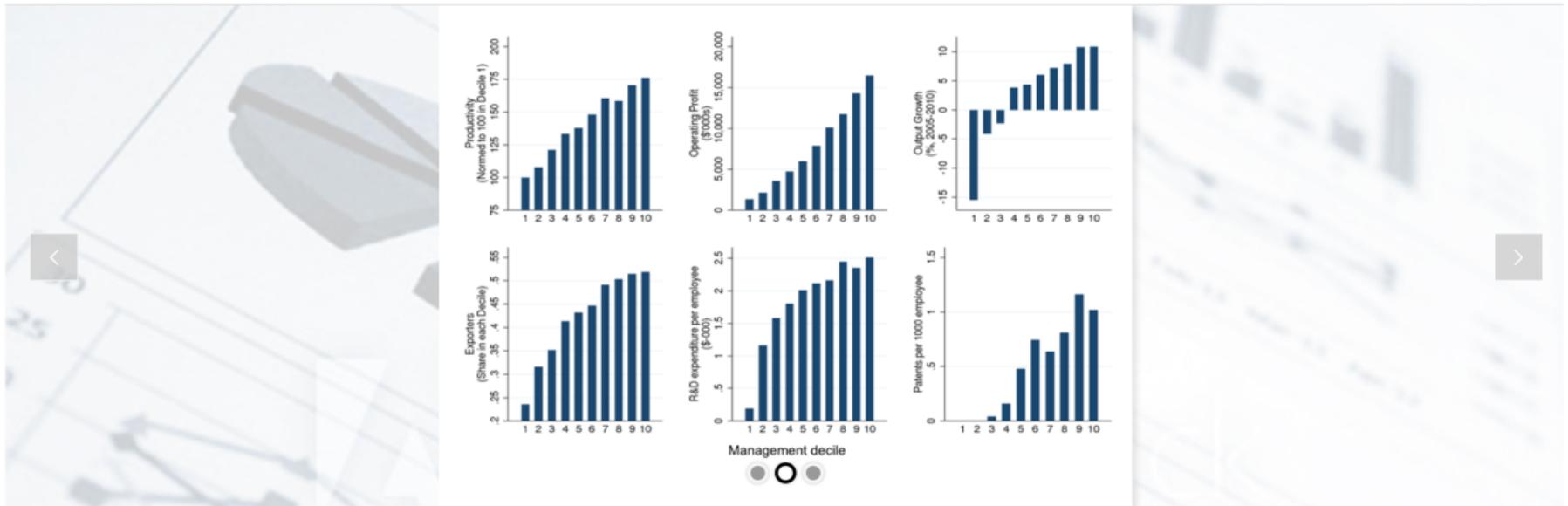
**Questionnaire return details**

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	
<b>Contact numbers</b>	
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

# MOPS Website (<https://managementresearch.com/>)



BENCHMARK RESEARCH METHODOLOGY TEAM MEDIA WMS INTERNATIONAL INDIA SURVEY



We are a team of researchers who along with the US Census Bureau studied the implementation of structured management practices in a US-wide establishment level survey. We discovered large variation in the use of structured management practices across establishments of which a large share can be attributed to variation across establishments within the same firm. We also find the use of structured management practices to be related to higher performance in terms of survival, growth and innovation. This project spurred a series of management surveys across the globe including in China, Finland, the UK and Pakistan.

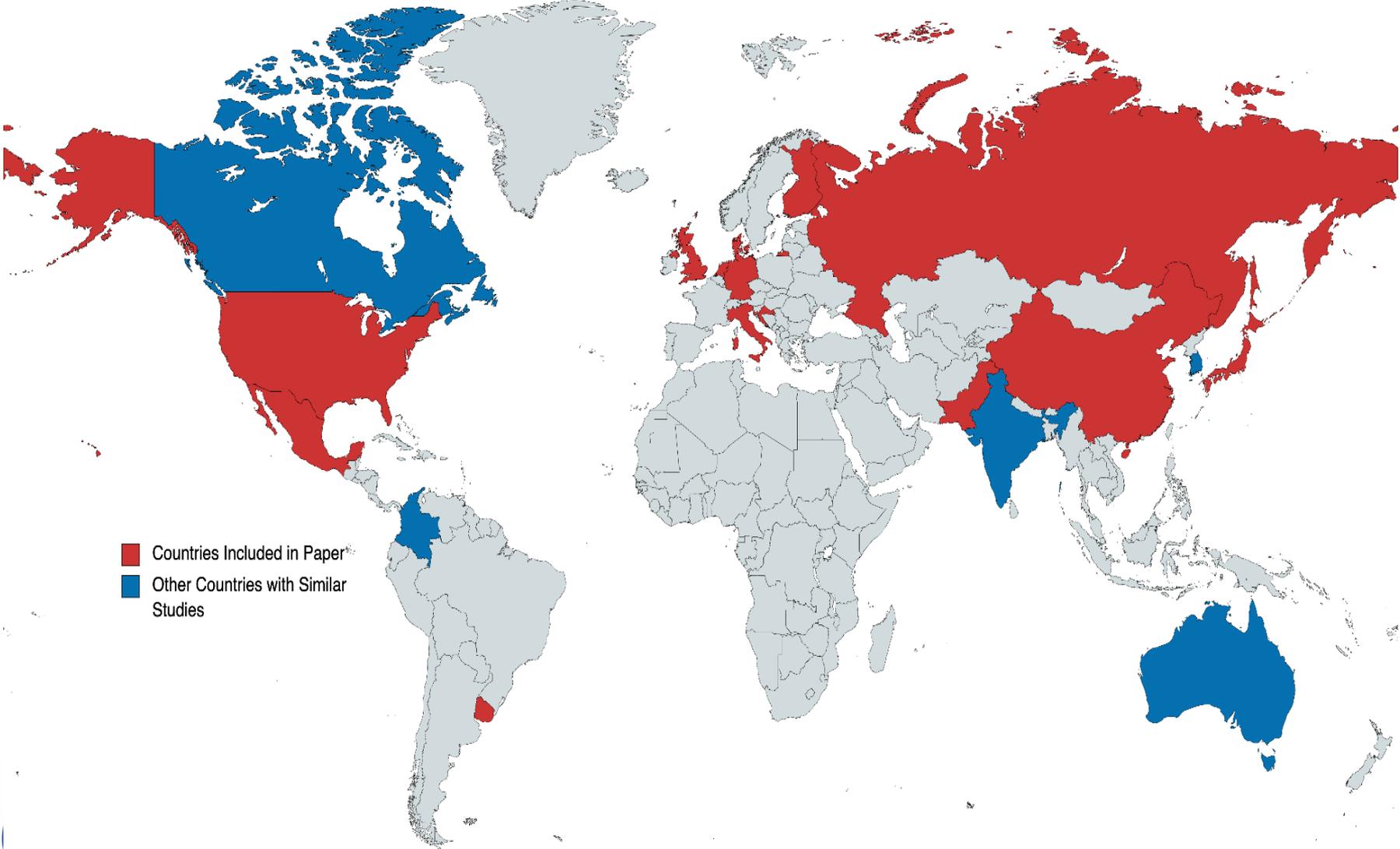
Activate Windows  
Go to Settings to activate Windows.



Data

Latest Research

# Coverage of MOPS across countries



■ Countries Included in Paper  
■ Other Countries with Similar Studies

# The Natural Laws of Management \*

Scott Ohlmacher, Daniela Scur, Morten Bennesen, Nick Bloom, Ali Choudhary,  
Lucia Foster, Jesse Groenewegen, Arti Grover, Sjoerd Hardeman, Leonardo Iacovone,  
Ryo Kambayashi, Marie-Christine Laible, Renata Lemos, Hongbin Li,  
Andrea Linarello, Mika Maliranta, Denis Medvedev, Charlotte Meng,  
John Miles Touya, Natalia Mandirola, Roope Ohlsbom, Atsushi Ohyama,  
Megha Patnaik, Mariana Peirera-López, Raffaella Sadun, Tatsuro Senga,  
John Van Reenen, Franklin Qian, and Florian Zimmermann<sup>†</sup>

December 13, 2023

## Abstract

For centuries, social scientists have tried to understand the role of management in shaping business performance<sup>1</sup>, but this has primarily been through case studies. We present the first large-scale cross-country quantitative management practice database with a common survey protocol, partnering with national statistical agencies from 14 countries. We measure structured management practices related to performance monitoring, target-setting, and performance incentives. We show major stylized facts: First, there is huge variation in management across businesses within each country. Second, businesses with more structured management practices are larger in scale, whether measured by sales or employment. Moreover, such firms also have higher labor productivity, profitability and are more likely to export. Finally, the positive relationship between structured management practices and scale is stronger in countries with more open and free markets, suggesting that such market forces help better managed firms grow faster, and so raise aggregate national income.

**Keywords:** Management, Firm performance, International micro data

**JEL codes:** E22, F14, L25, O33, D24

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<sup>1</sup>For example, Walker (1887), Smith (1776)

# Methods

- Broadly, a common set of core management questions and identical scoring (following the US template)
  - But some exact details of survey differ
- Focus on a common core sample to aid comparability
  - Manufacturing sector
  - 2015-2019 period
  - Other differences summarized in Table A2
  - Extensive robustness checks on results: firms vs. plants; non-manufacturing; size thresholds, etc.

# Some Basic Features of the different MOPS surveys

Table A1: Management and Organizational Practices Surveys

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 <sup>†</sup>	Establishment	No	Mail	36,052 <sup>†</sup>	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	71%
Uruguay	All sectors	2019	Firm	Yes	Internet	4,300	79%

<sup>†</sup> 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\\_q3wtFStrRqHR6Cj18hQX4E/](https://docs.google.com/spreadsheets/d/12TzbD28eJ_q3wtFStrRqHR6Cj18hQX4E/)

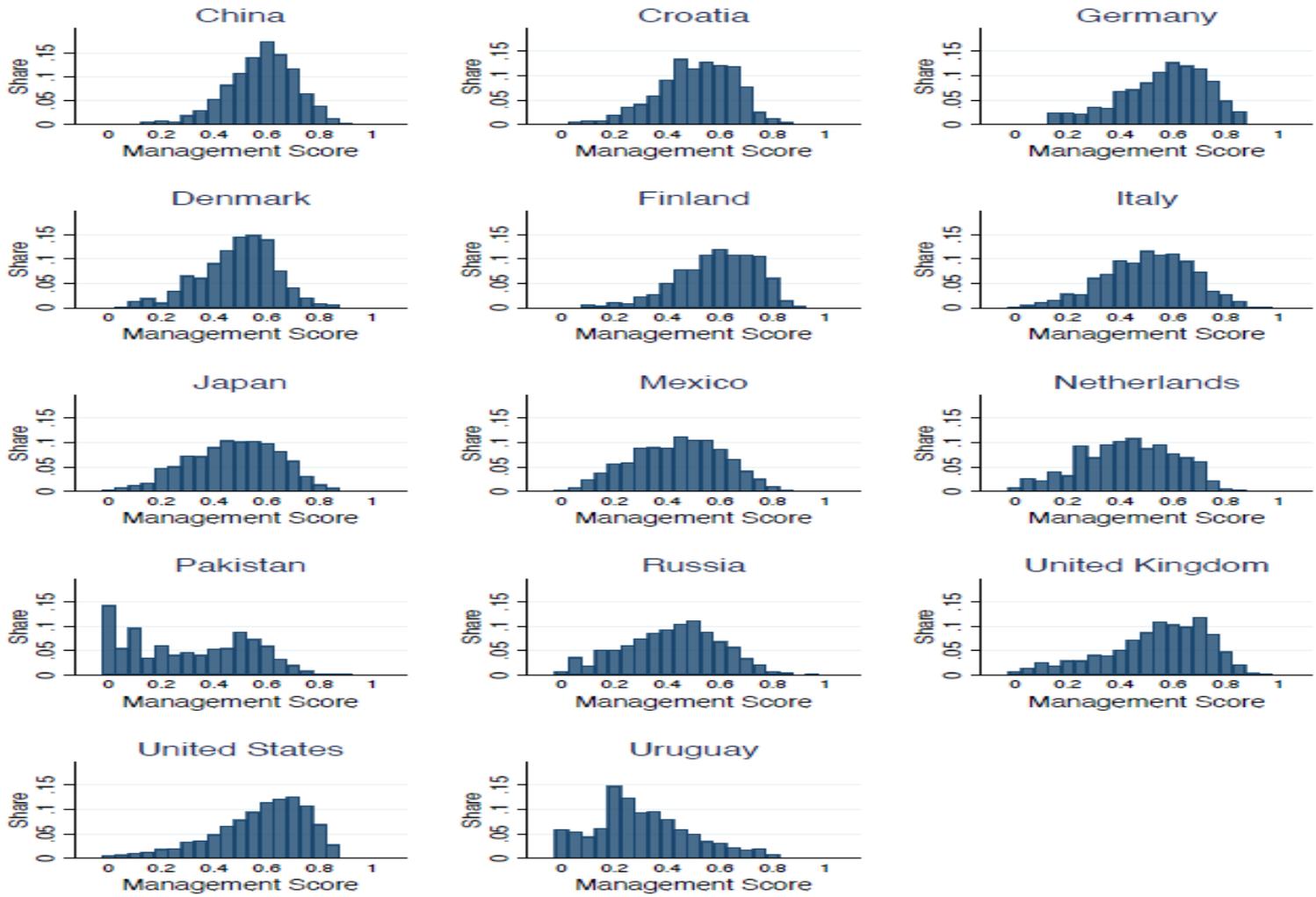
# Main Methods: Distributed Data Model

- Obtain data “moments” in same way across country teams
  - Univariate management distribution (with sampling weights) by looking at share of firms within each of 20 fixed bins
  - Correlates of management (e.g. business size). Look within country **deciles** of management score

# “Natural Laws”

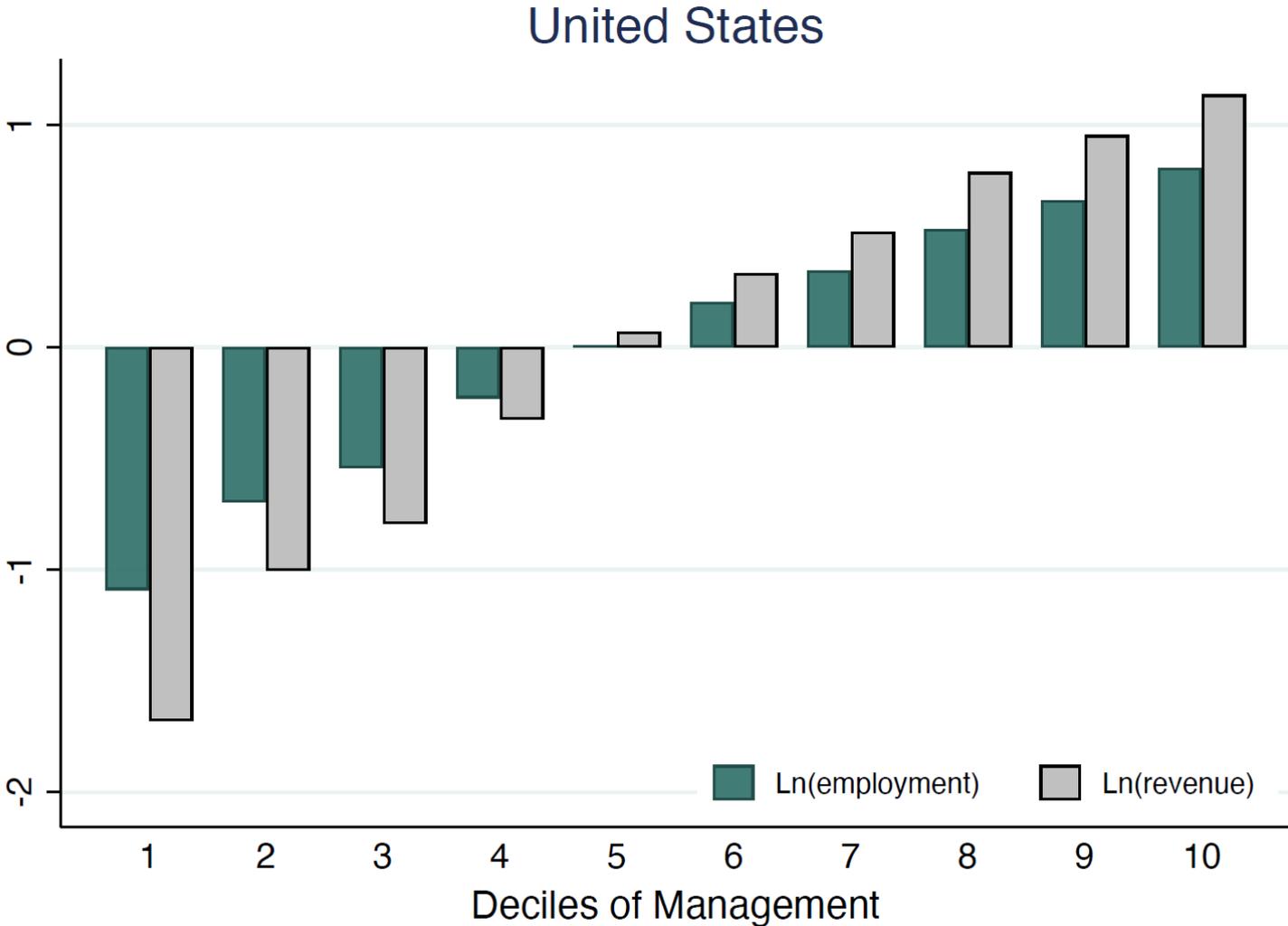
- I. Huge variation in management scores within nations
- II. Businesses with higher management scores :
  - Are larger - whether measured by inputs (jobs) or outputs (sales)
  - Have higher productivity, profits and international trade
- III. The management-size relationship is stronger in countries with less market frictions (i.e. more reallocation)

# I. Huge variation in management scores (deviation from country mean)



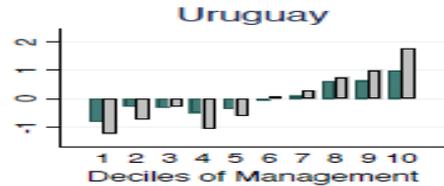
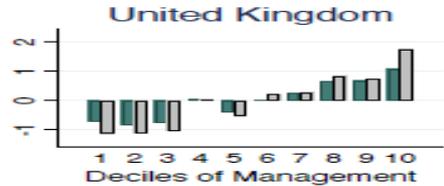
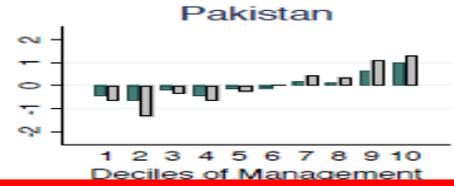
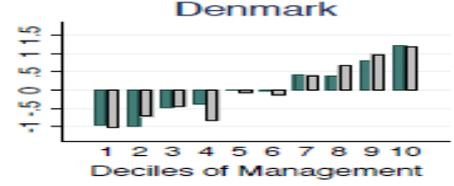
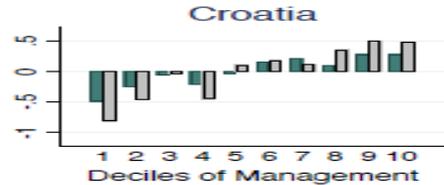
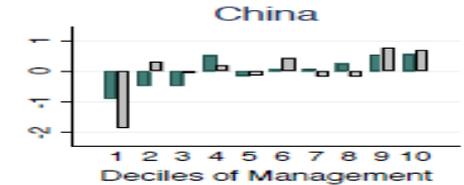
**Notes:** Histograms centered on the same scale. Number of observations for each country in the original datasets (manufacturing sector only): China = 1,320; Croatia = 314; Denmark = 743; Finland = 582; Germany = 1,927; Italy = 1,122; Japan = 10,081; Mexico = 3,729; Netherlands = 377; Pakistan = 11,159; Russia = 978; UK = 1,329; US = 35,000; Uruguay = 550.

# II. 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 mean level of Ln(employment) and Ln(revenue) in each of these bins relative to overall country specific mean. Number of observations about 35,000

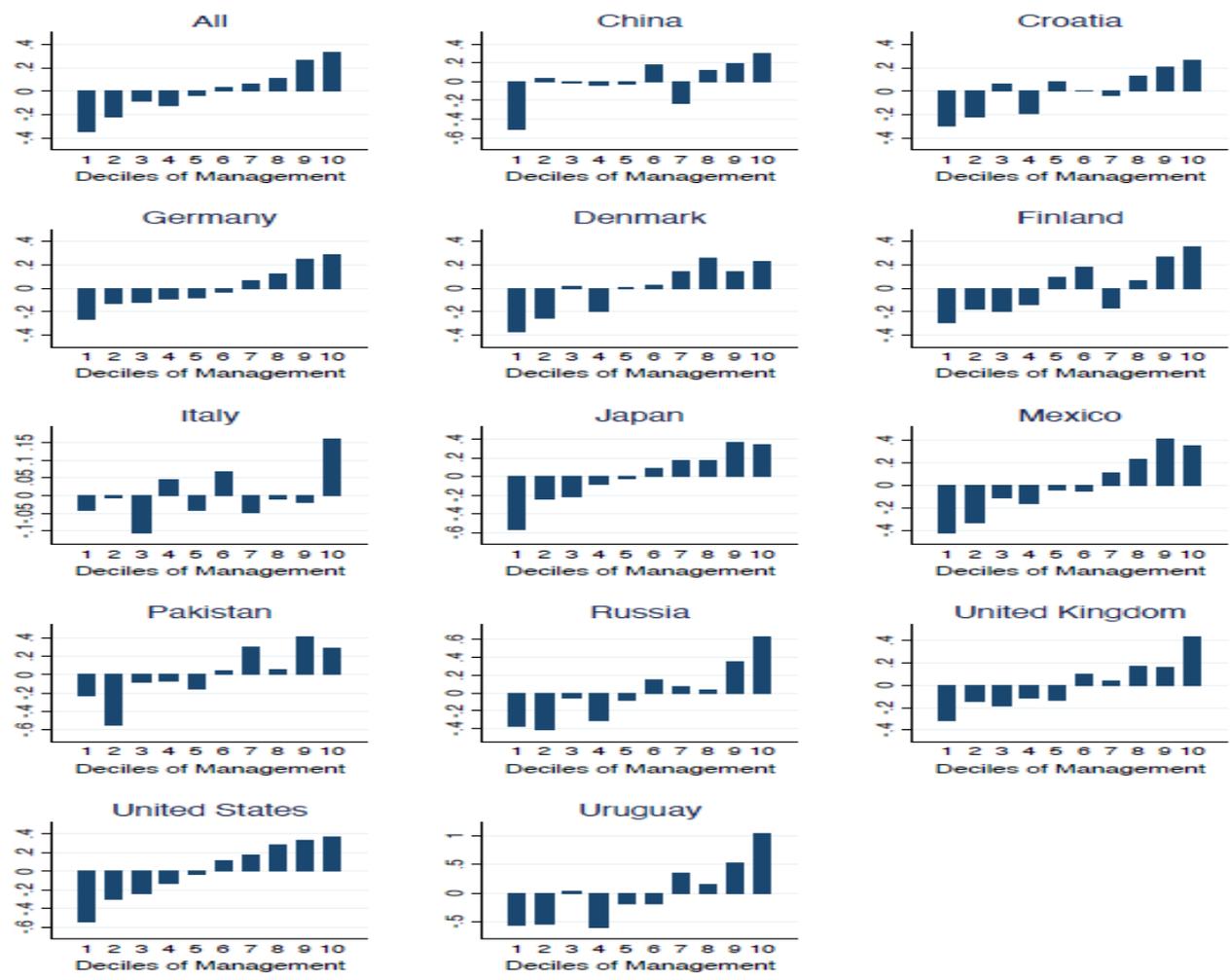
# Businesses with higher MOPS scores are larger (both more jobs and higher sales): International



Ln(employment)
  Ln(revenue)

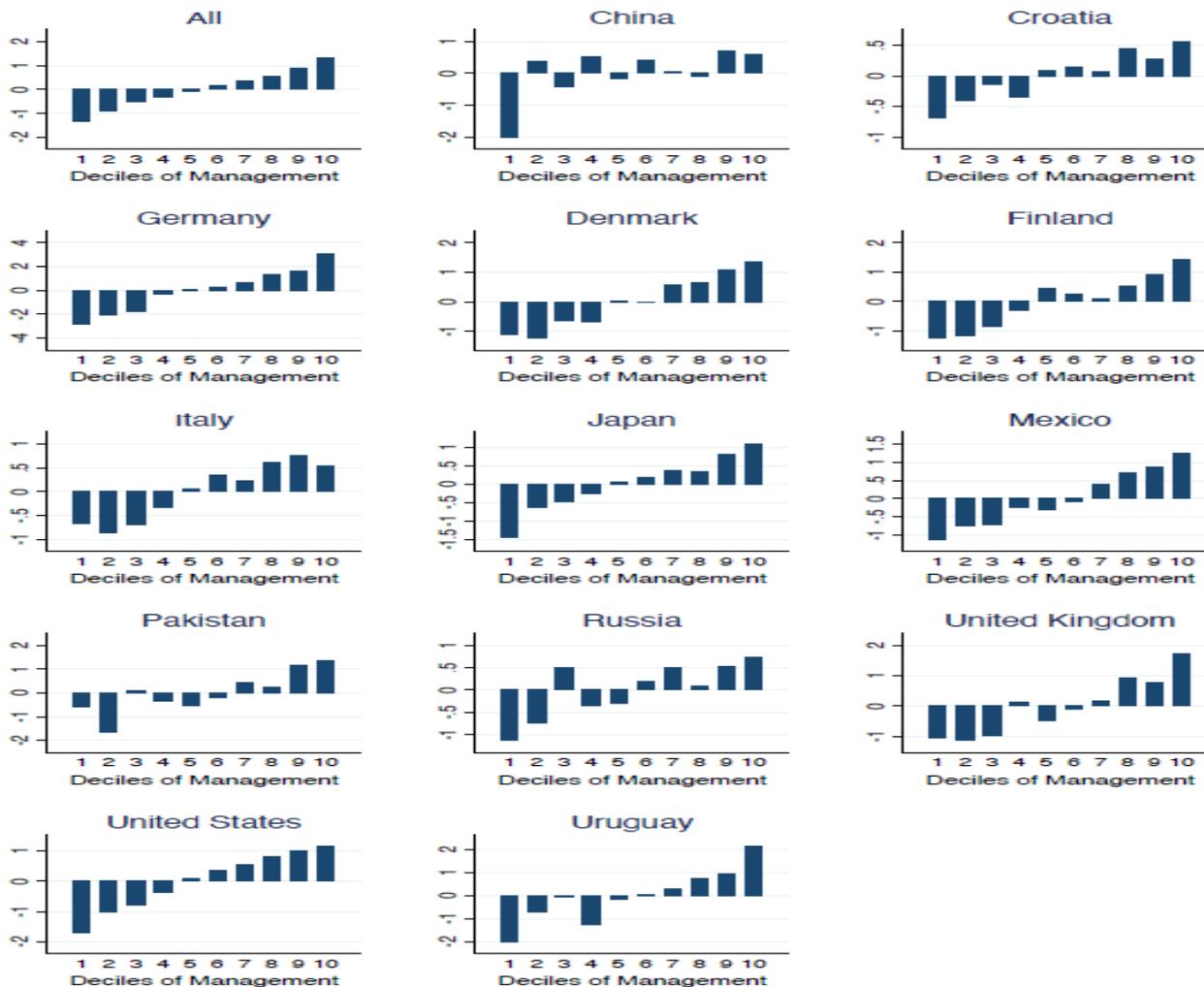
**Notes:** The x-axis divides firms into country-specific deciles of their management score. The vertical axis gives the natural logarithm of the mean level of employment in each of these bins. Number of observations for each country in the original datasets (manufacturing sector only): China = 1,320; 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 productivity, log(revenue per worker)



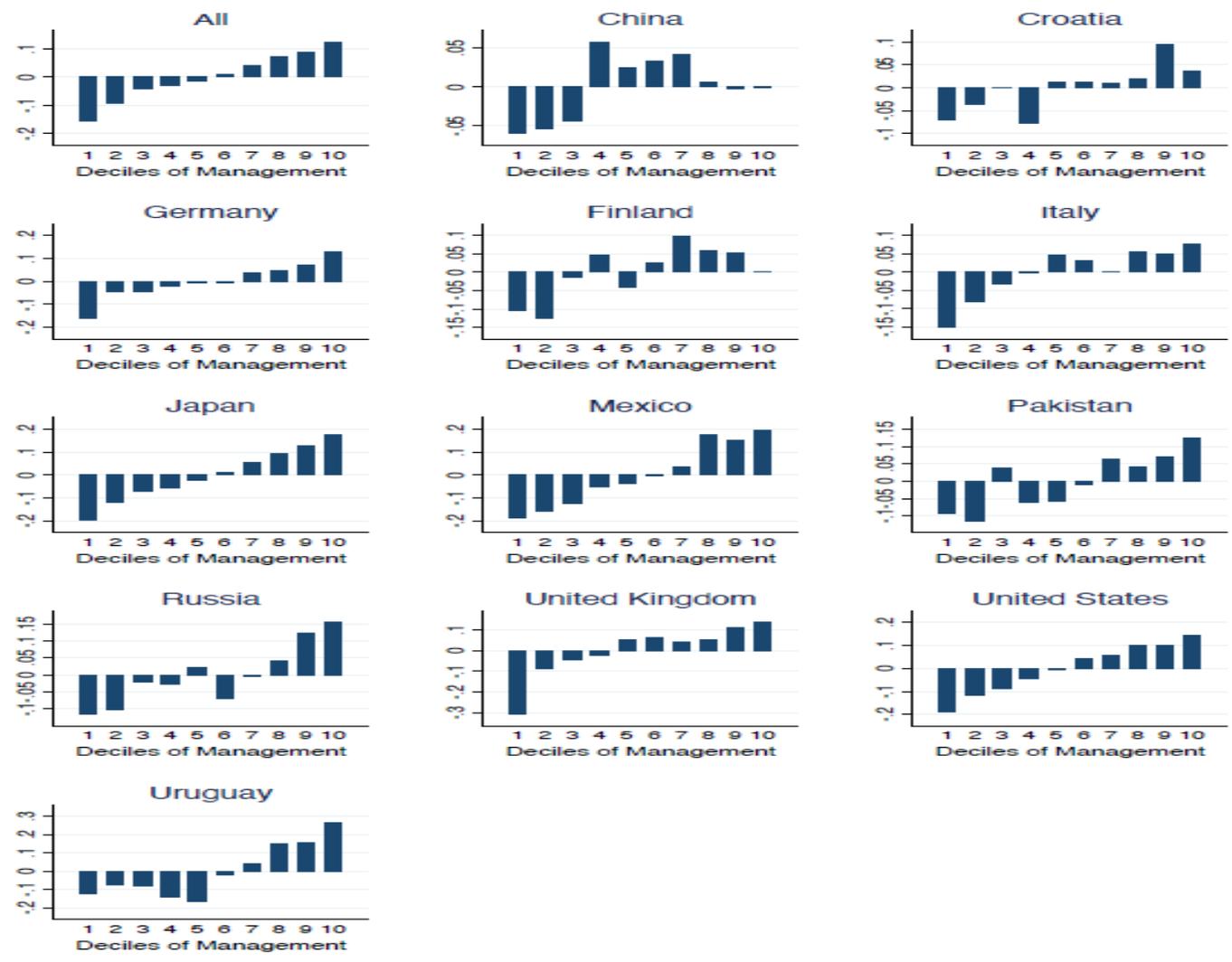
**Notes:** The x-axis divides firms into country-specific deciles of their management score. The vertical axis gives (the natural logarithm of) productivity - the mean level of revenue divided by mean level of employment in each of these bins. Number of observations for each country in the original datasets (manufacturing sector only): China = 1,320; 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 = 1,320; 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 more likely to export



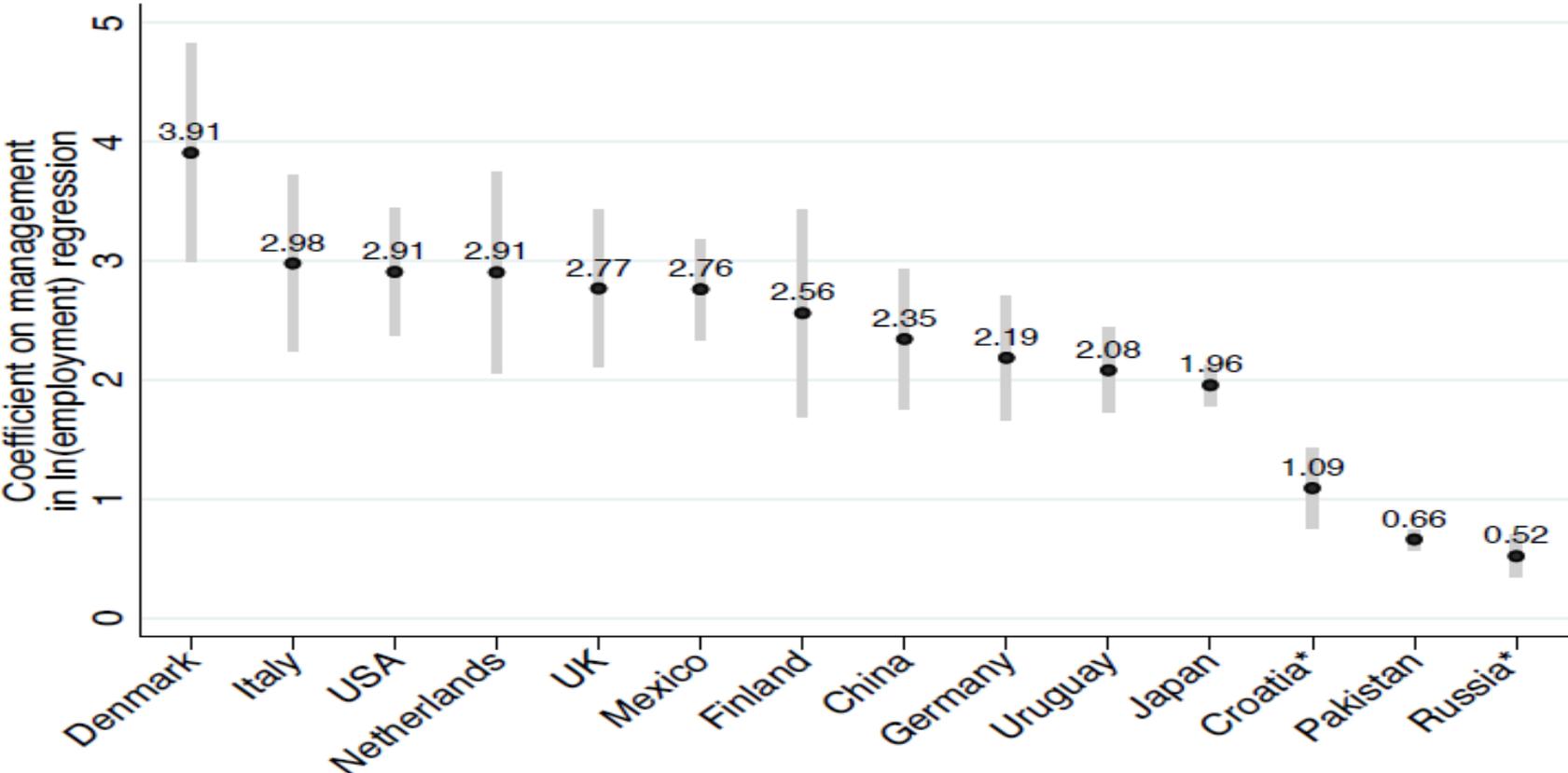
**Notes:** The x-axis divides firms into country-specific deciles of their management score. The vertical axis gives the fraction of firms who are exporters in each of these bins. Number of observations for each country in the original datasets (manufacturing sector only): China = 1,320; Croatia = 314; 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.

# III. Management association with size much weaker in some countries than other



**Notes:** The x-axis divides firms into country-specific deciles of their management score. The vertical axis gives the natural logarithm of the mean level of employment in each of these bins. Number of observations for each country in the original datasets (manufacturing sector only): China = 1,320; 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.

# Size-management relationship (reallocation) different across countries



**Notes:** Each circle is the coefficient on a country specific OLS regression of log firm employment size on management. 95% confidence bands are also shown. The regression was run on 20 observations per country, using the average employment and average management score within each vingtile. We include a table with the coefficients from the same regression using the microdata where available in Table A3. Number of observations for each country in the original datasets (manufacturing sector only): China = 1,320; 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. \* Croatia and Russia only include firms with 25-250 employees (see Appendix A for analysis with other countries following a similar restriction).

# Conclusions

- Two-decade long project to generate robust cross-firm and cross-country data
  - WMS
  - MOPS
- Make methods and data as open source as possible
- Complementary types of data, useful for analysis of multiple issues
- Part of statistical architecture in many countries as intangible capital becomes more important

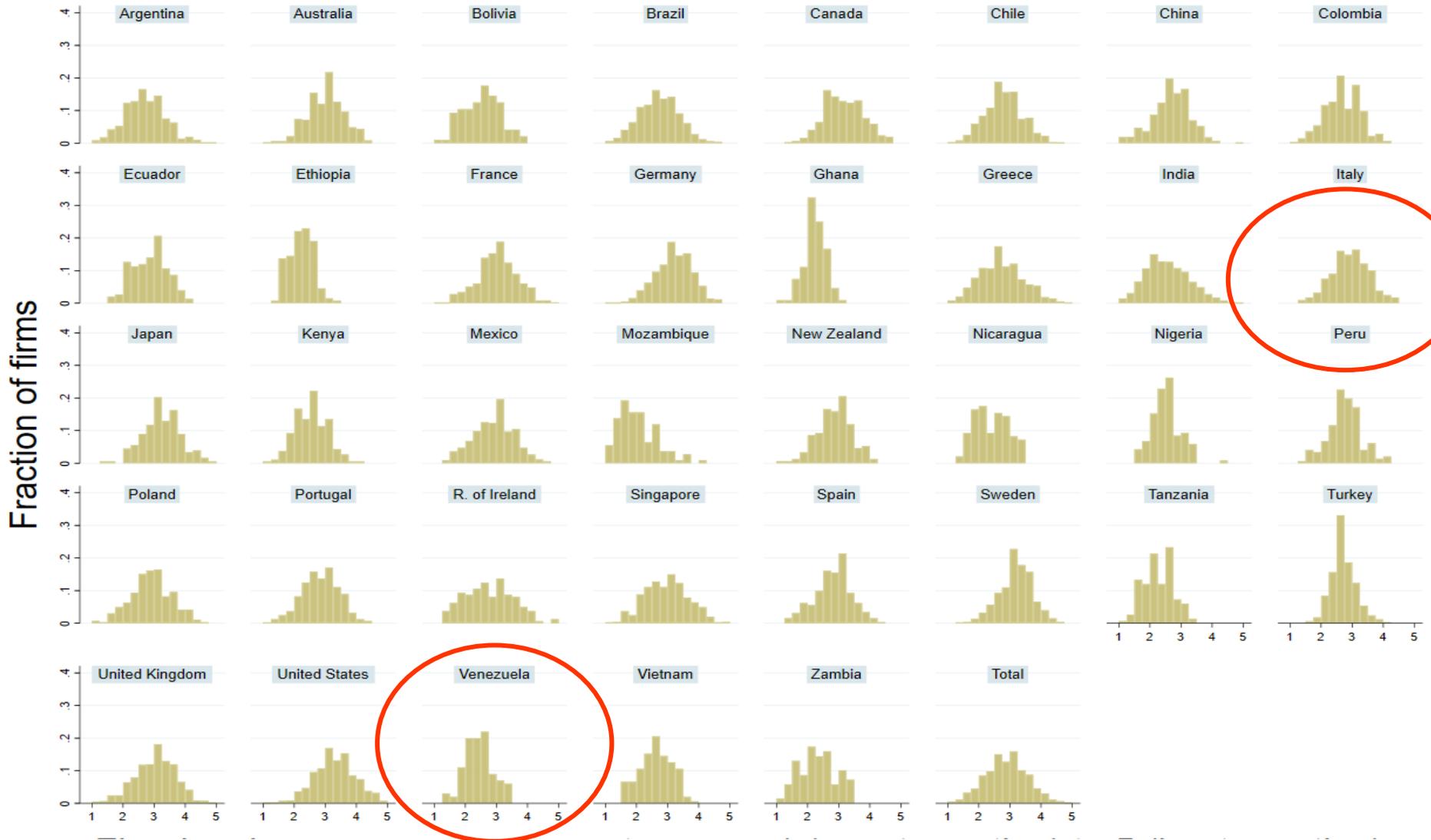
**Thank you!**

# Supply chain

1. **Strategy.** Does your company have a supply chain strategy or vision at all? If yes, could you tell me how that works?
2. **KPIs.** How is the supply-chain strategy operationalized? What KPIs (if any) are used?
3. **Decision making.** What is the decision-making process for your supply chain decisions? How do you account for supply risks/decisions that affect other elements of the supply chain?
4. **Visibility.** How much visibility of the supply chain does your company have? Has it achieved end-to-end visibility?
5. **Flexibility.** How flexible or adaptable is your supply chain in terms of being able to shift operations quickly, or move materials, or adapt the manufacturing processes?



# Management also varies heavily within countries

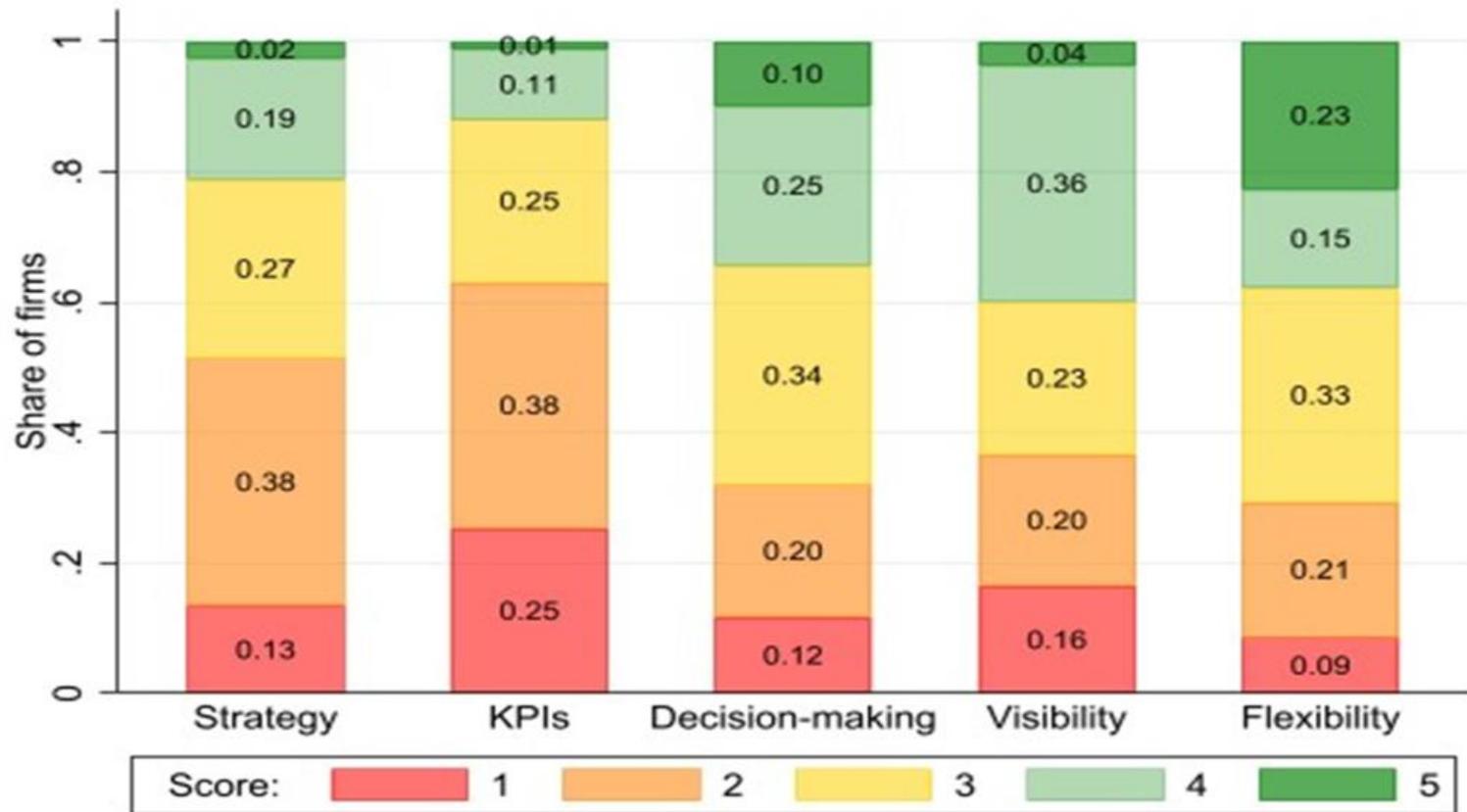


Source: Scur et al (2023)

Table 2: Merge rates by country

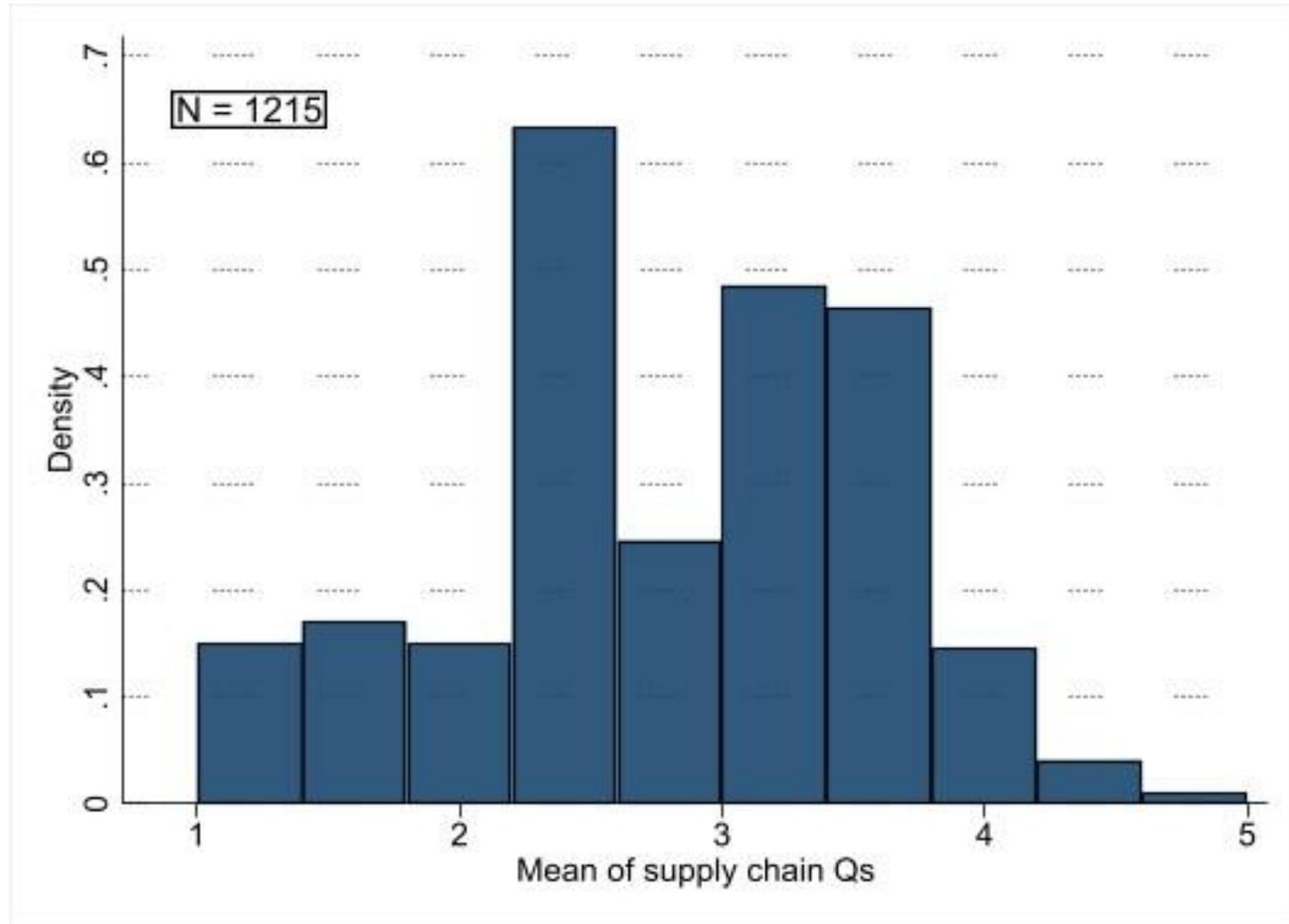
	Firms in WMS	% merged w Orbis	% w Orbis financials	% w legacy financials
Argentina	568	100	5	52
Australia	473	100	53	34
Bolivia	96	100	0	0
Brazil	1502	100	33	55
Canada	419	100	5	59
Chile	717	99	20	23
China	1072	100	84	52
Colombia	275	100	28	58
Ecuador	150	100	0	0
Ethiopia	131	100	1	1
France	790	100	94	88
Germany	830	100	84	84
Ghana	108	100	8	17
Greece	695	100	76	78
India	937	96	36	27
Italy	842	100	99	69
Japan	178	100	79	68
Kenya	185	100	3	26
Mexico	525	100	34	39
Mozambique	109	100	2	7
Myanmar	147	100	0	0
New Zealand	151	100	15	17
Nicaragua	97	100	1	4
Nigeria	118	100	11	10
Peru	146	100	0	0
Poland	364	100	93	90
Portugal	569	100	99	69
R. Of Ireland	161	100	96	90
Singapore	406	100	42	22
Spain	323	100	99	64
Sweden	527	100	94	73
Tanzania	150	100	1	16
Turkey	332	100	71	58
United Kingdom	1716	100	98	92
United States	1654	100	10	38
Venezuela	100	100	0	0
Vietnam	151	100	78	38
Zambia	69	100	3	23

# Supply Chain Management Questions

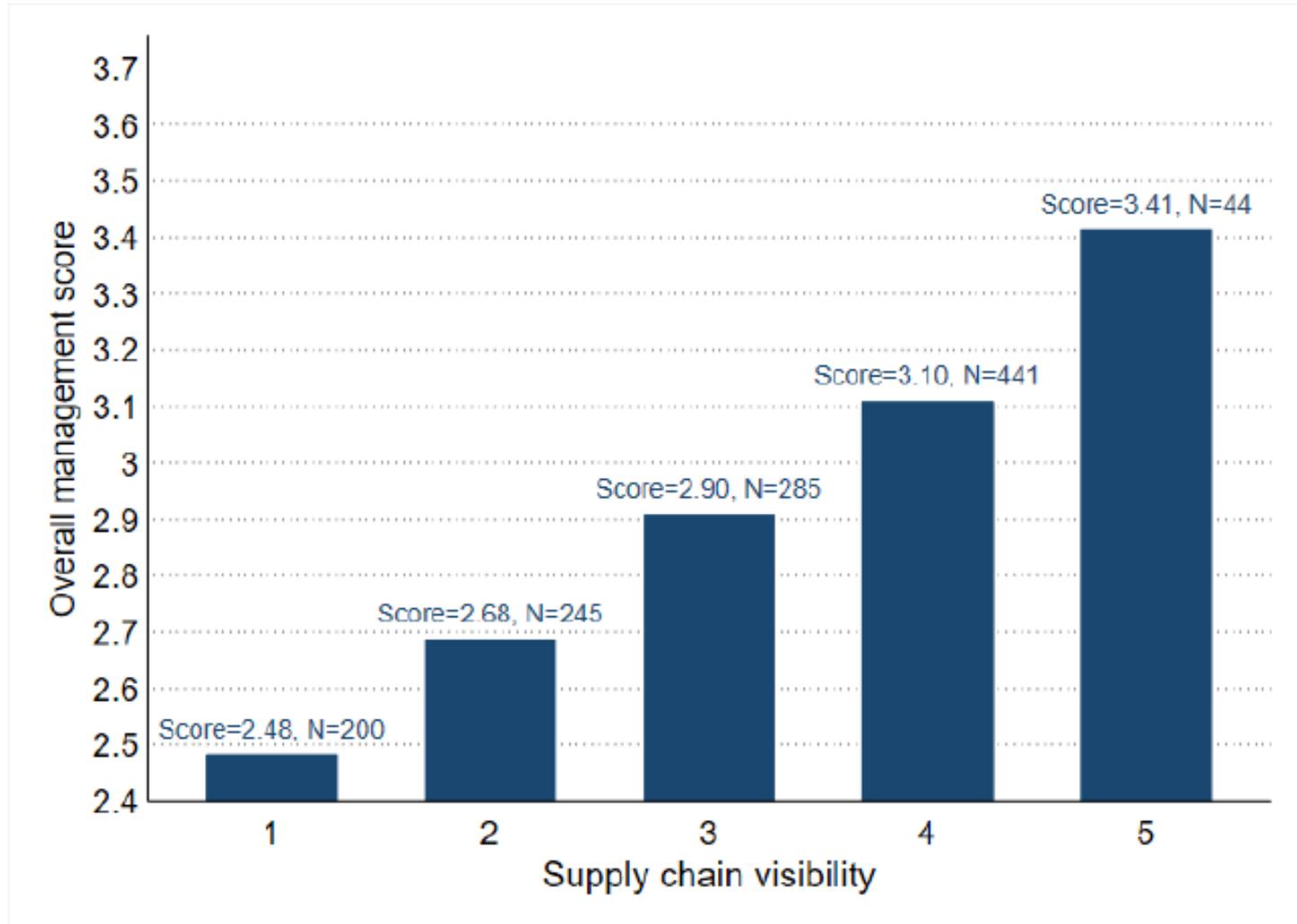


Note: total number of firms = 1215.

# Distribution of Supply Chain Management



# High Supply Chain Management firms have better overall management



# Drivers of management similar (firm age more important)

	(1)	(2)	(3)
	2002-2015	2021-2022	2002-2022
MNE	0.394*** (0.018)	0.516*** (0.052)	0.415*** (0.017)
Exporter	0.00178*** (0.000)	0.00257*** (0.001)	0.00195*** (0.000)
Firm age	-0.0000277 (0.000)	0.00136*** (0.000)	0.000115 (0.000)
Family firm	-0.207*** (0.018)	-0.197*** (0.054)	-0.212*** (0.017)
N competitors	0.00411* (0.002)	0.00118 (0.006)	0.00240 (0.002)
Outsourced %	-0.000879* (0.000)	-0.00145 (0.001)	-0.00103** (0.000)
Union %	0.00103*** (0.000)	0.00167** (0.001)	0.00103*** (0.000)
Workforce degree %	0.00808*** (0.000)	0.00522*** (0.001)	0.00800*** (0.000)
Country dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
N obs.	13827	1449	15276
N firms	10401	1435	11302

Standard errors in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Note: all specifications include survey noise controls (tenure of the manager who responded, the duration of the interview, the day of week the interview was conducted and an indicator of the reliability of the information as coded by the interviewer).

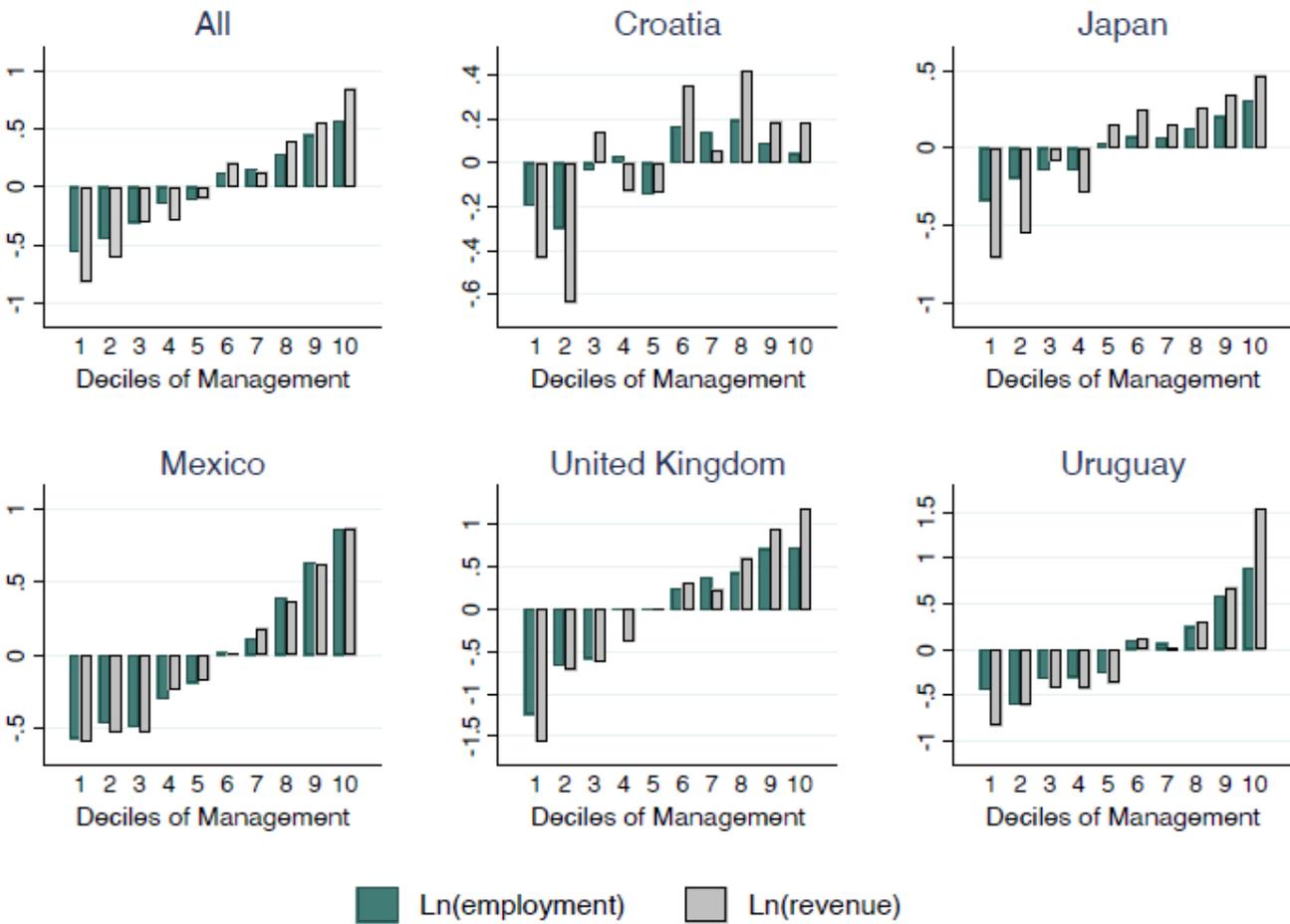
# The Management and Organizational Practices survey asks about targets e.g.

**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"/>



# Natural Laws hold in Non-Manufacturing sectors



**Notes:** Not all countries have data for non-manufacturing industries. Here we replicate the basic results in the manufacturing-focused paper for the subset of industries that are available in other countries. The industries are as follows: wholesale (Japan), services (Croatia, Mexico and Uruguay) and 'non-manufacturing' (UK).