



Programme on
Innovation and Diffusion

The Natural Laws of Management

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Empirical Management Conference, IFC

December 15th 2022

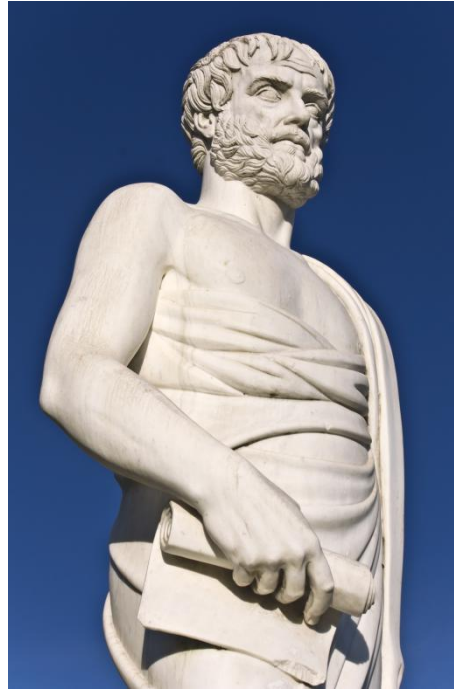


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Major thinkers about Natural Laws



Hobbes

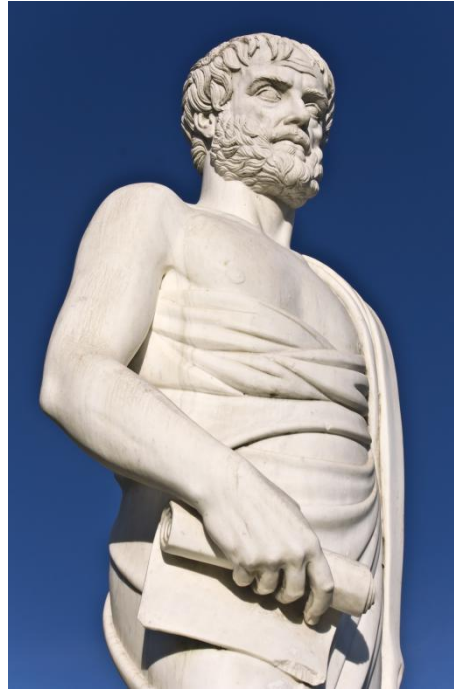


Aristotle



Aquinas

Major thinkers about Natural Laws??



Introduction

- Are there robust stylized facts (“natural laws”) about management across firms and countries?
- World Management Survey (WMS) first major wave in 2004
 - Aim was to design methodology & create robust data on management practices to address academic and policy questions
 - But expensive to run.....

Introduction

- Are there robust stylized facts (“natural laws”) about management across firms and countries?
- World Management Survey (WMS) first major wave in 2004
 - Aim was to design methodology & create robust data on management practices to address academic and policy questions
 - But expensive to run.....
- Management and Organizational Practices Survey (MOPS) is an attempt to “scale up” WMS using a more traditional survey approach
 - Started in US in partnership with Census Bureau
 - Subsequently adopted in many other countries.
 - Objective: a key part of statistical data infrastructure?

Summary of Paper

- Remarkably consistent set of “stylized facts” across all countries using MOPS.
- Within each country:
 - I. Huge **variation** of management scores within each country
 - II. Positive relationship between **firm size and management** score
 - Suggestive evidence that this reallocation effect weaker in countries with more frictions
 - III. Positive relationship between **firm performance and management** score. Performance measures:
 - Productivity
 - Profitability
 - Exporting

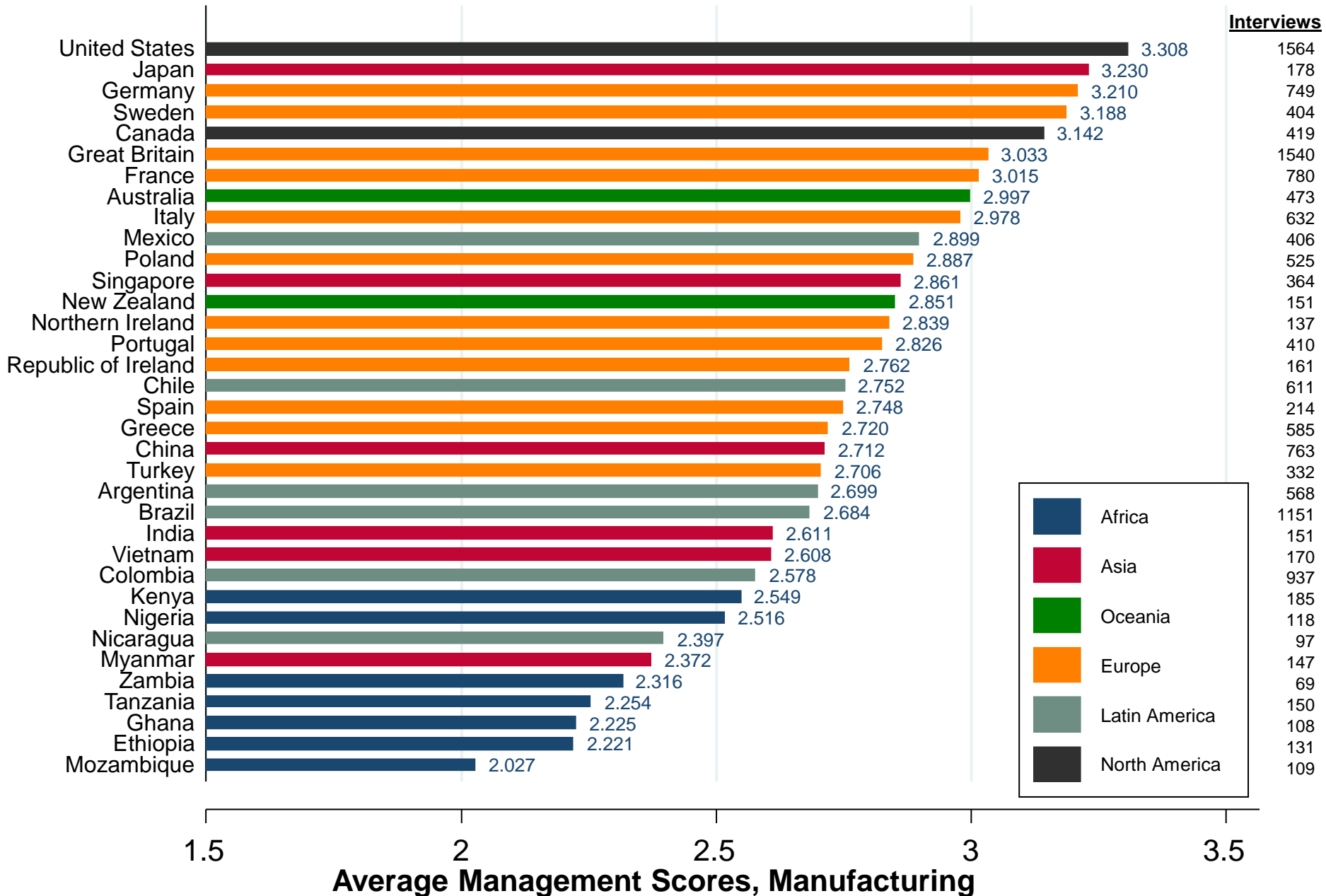
Background

Methods

Results

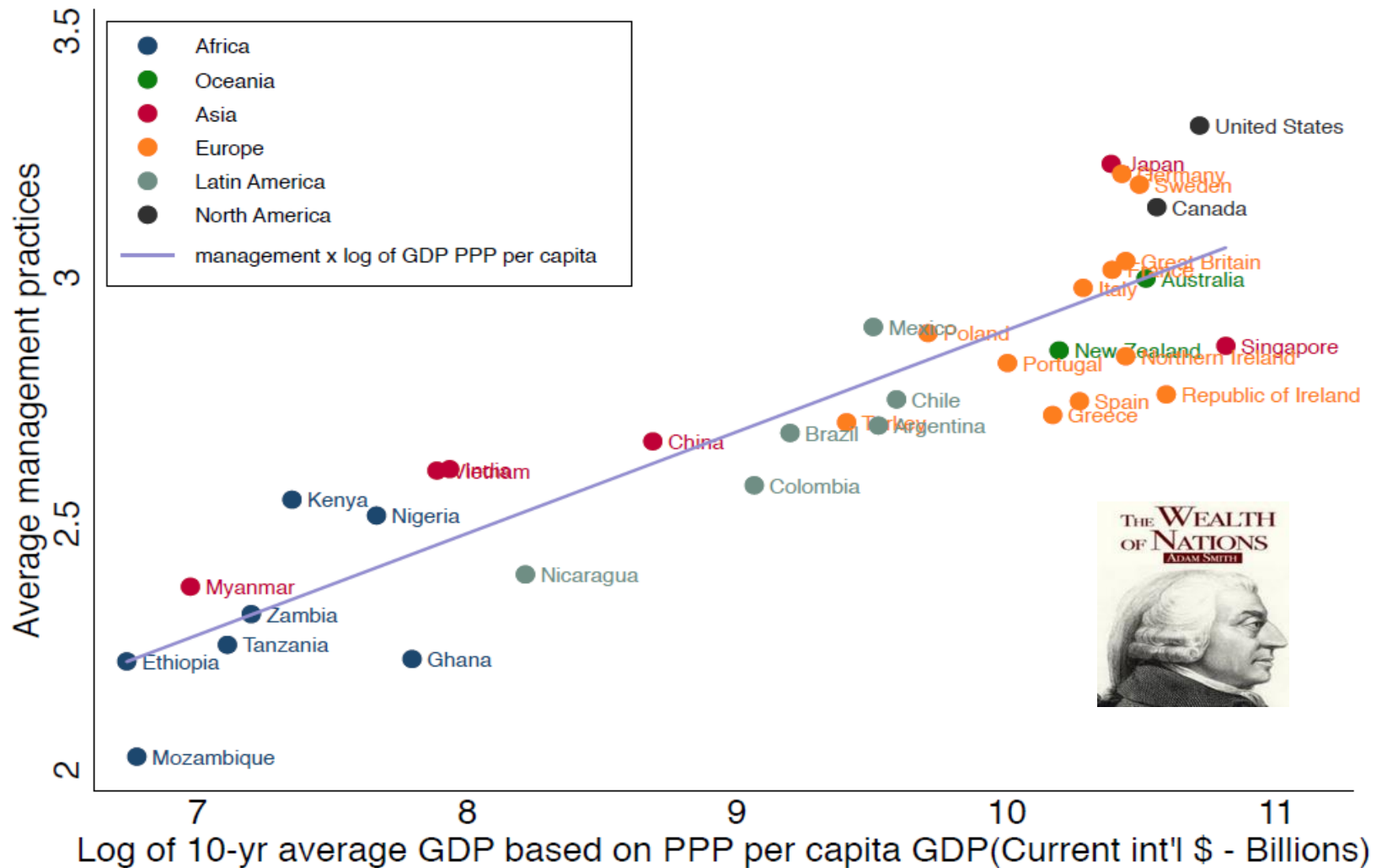
Conclusions & Next steps

WMS: Management Scores across Countries



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



Note: Data from April 2013, World Economic Outlook (IMF) indicator

One Problem with WMS is scale – 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
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.

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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; 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 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

- 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



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

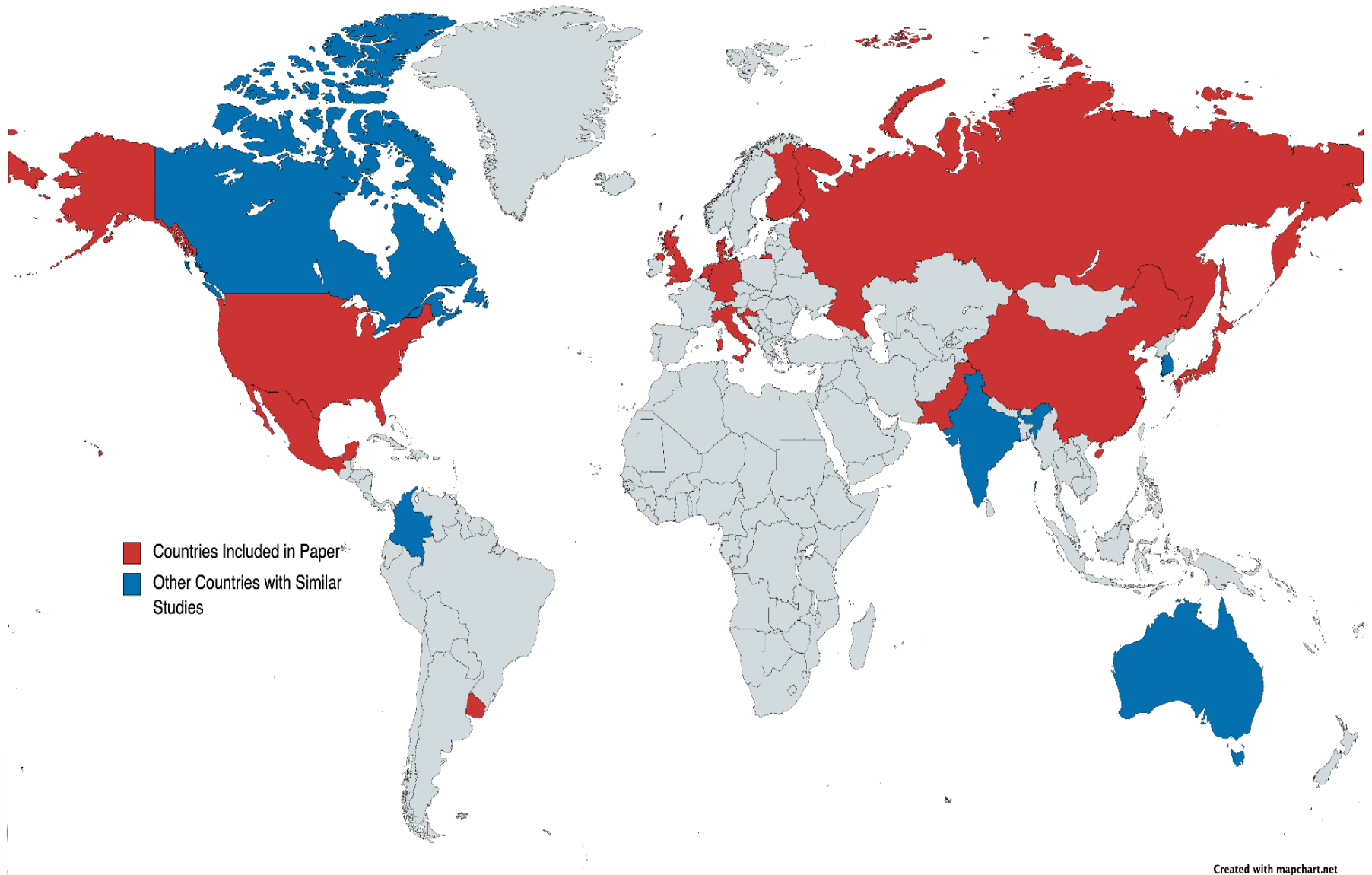
To return via post: Please use the prepaid envelope provided which is addressed to:
Office for National Statistics, Government Buildings, Cardiff Road, Newport, NP10 8XG

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 MOPS across countries



Background

Methods

Results

Conclusions & Next steps

Methods

- MOPS generally run independently in each country rather than centrally (as in WMS)
 - So currently use WMS for cross country comparisons and for now, focus on MOPS for within country comparison
- Broadly, a common set of core management questions and identical scoring (following the US template)
 - but exact details of survey differ
- We focus on a common core sample to aid comparability
 - Manufacturing sector (was initial US focus, & now expanded to hospitals; many other countries covered whole economy)
 - 2015-2019 period
 - Others differences summarized in Table A2 (over)
 - Robustness checks ongoing: will need your help!

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	35,000	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_q3wtFStrRqHR6Cj18hQX4E/

Methods

- MOPS generally run independently in each country rather than centrally (as in WMS)
- Broadly, a common set of core management questions and identical scoring (following the US template)
 - but exact details of survey differ, posing challenges
- We focus on a common core sample to aid comparability
 - Manufacturing sector (was initial US focus, & now expanded to hospitals; many other countries covered whole economy)
 - Others in spreadsheet (robustness checks ongoing)
- Within this, obtained 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. size). Look within country deciles of management score

Background

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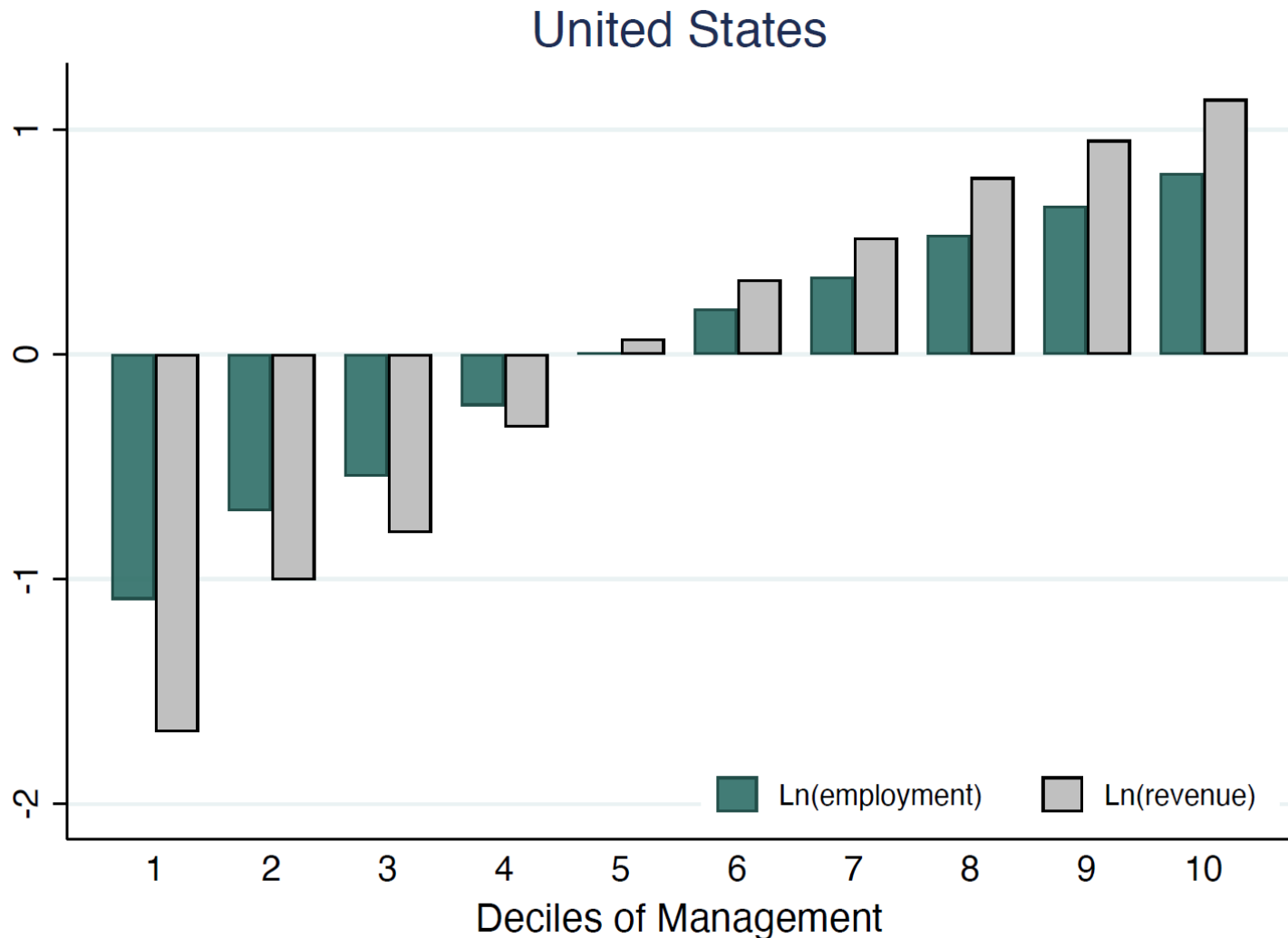
Conclusions & Next steps

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 = 1,986; 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.

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



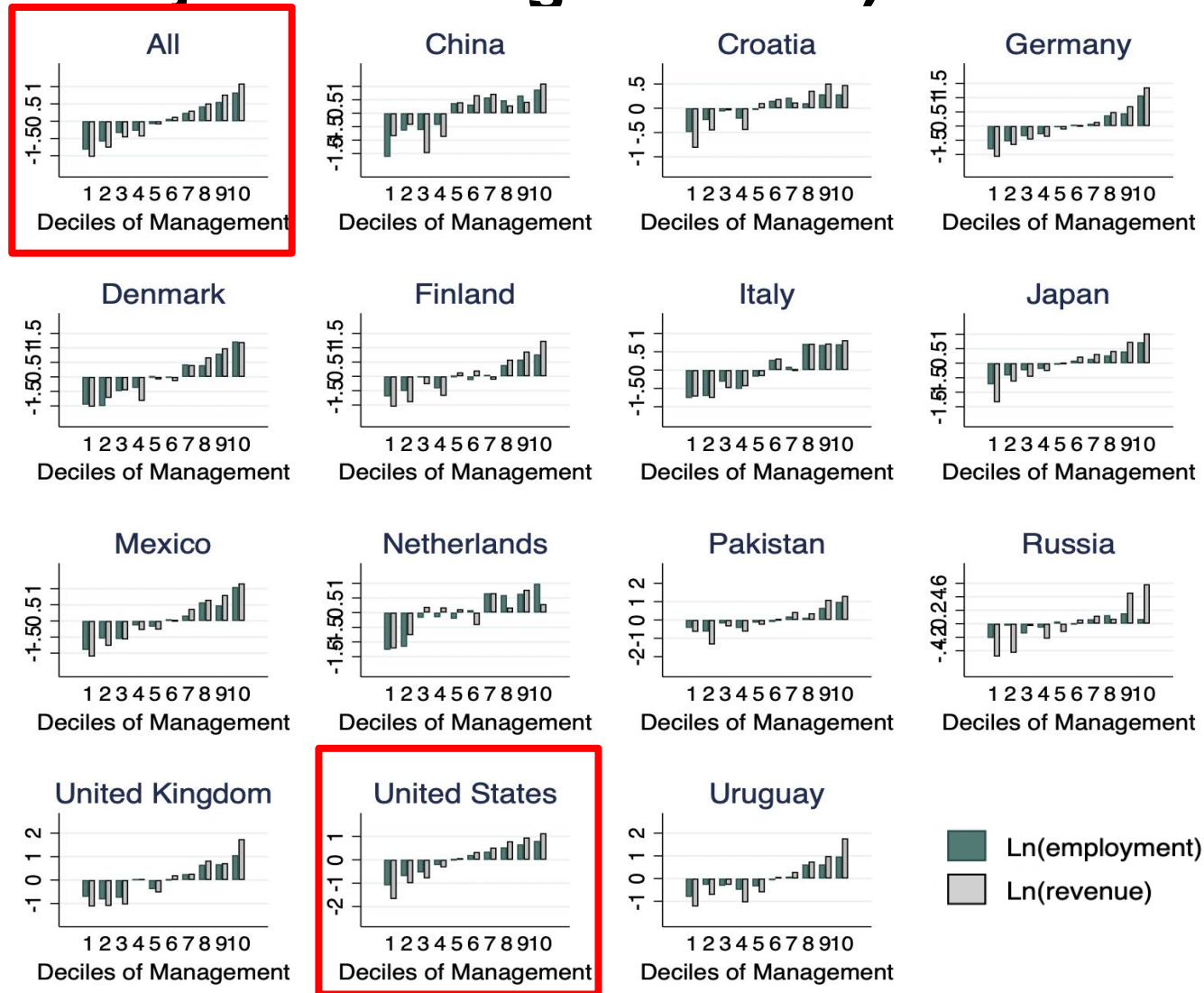
Notes: The x-axis divides firms into deciles of their management score. The vertical axis gives the natural logarithm of the mean level of employment (and of revenue) in each of these bins relative to overall country specific mean. Number of observations about 35,000

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



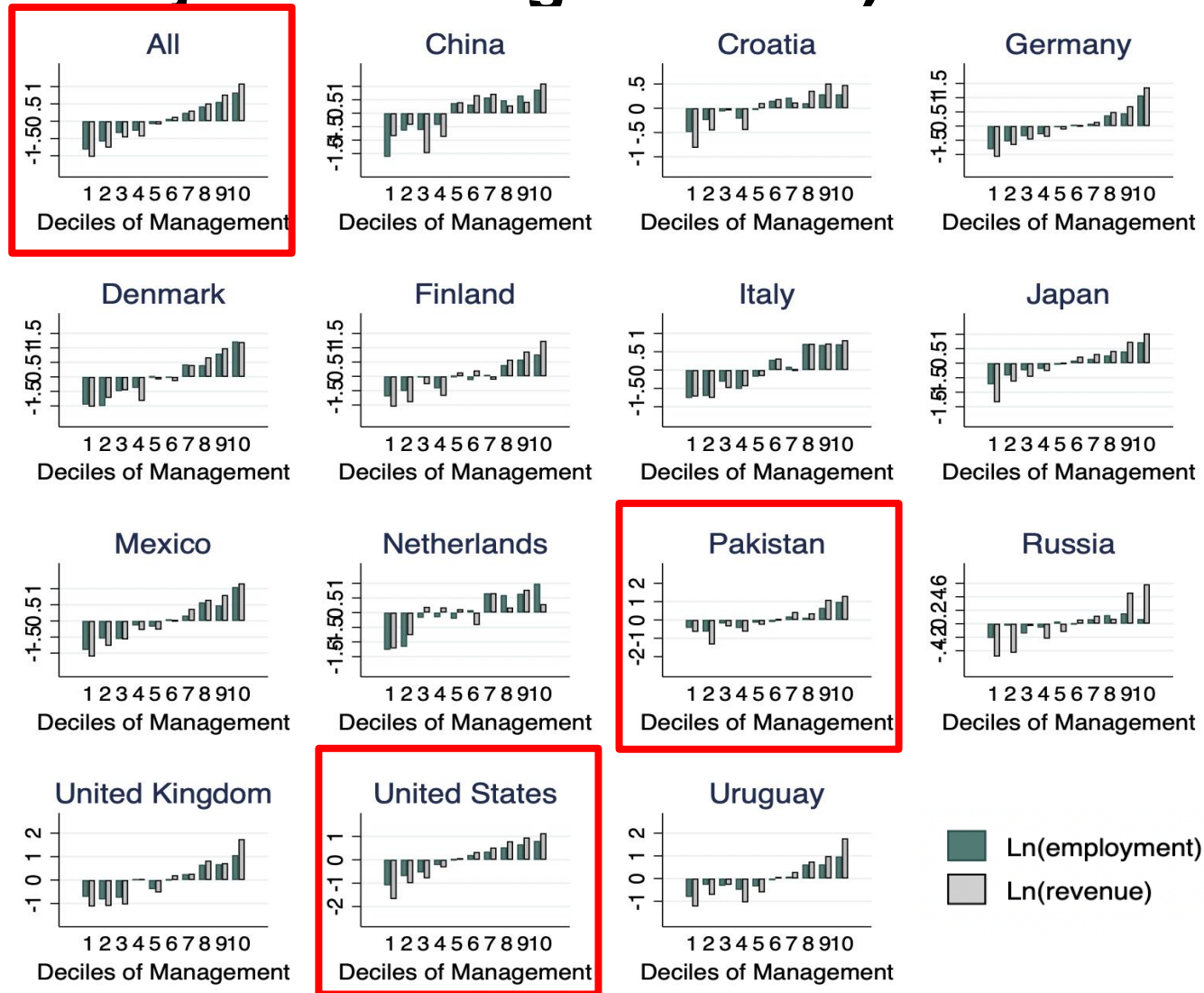
Notes: The x-axis divides firms into country-specific deciles of their management score. The vertical axis gives the natural logarithm of the mean level of employment (and of revenue) in each of these bins. Number of observations for each country in the original datasets (manufacturing sector only):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

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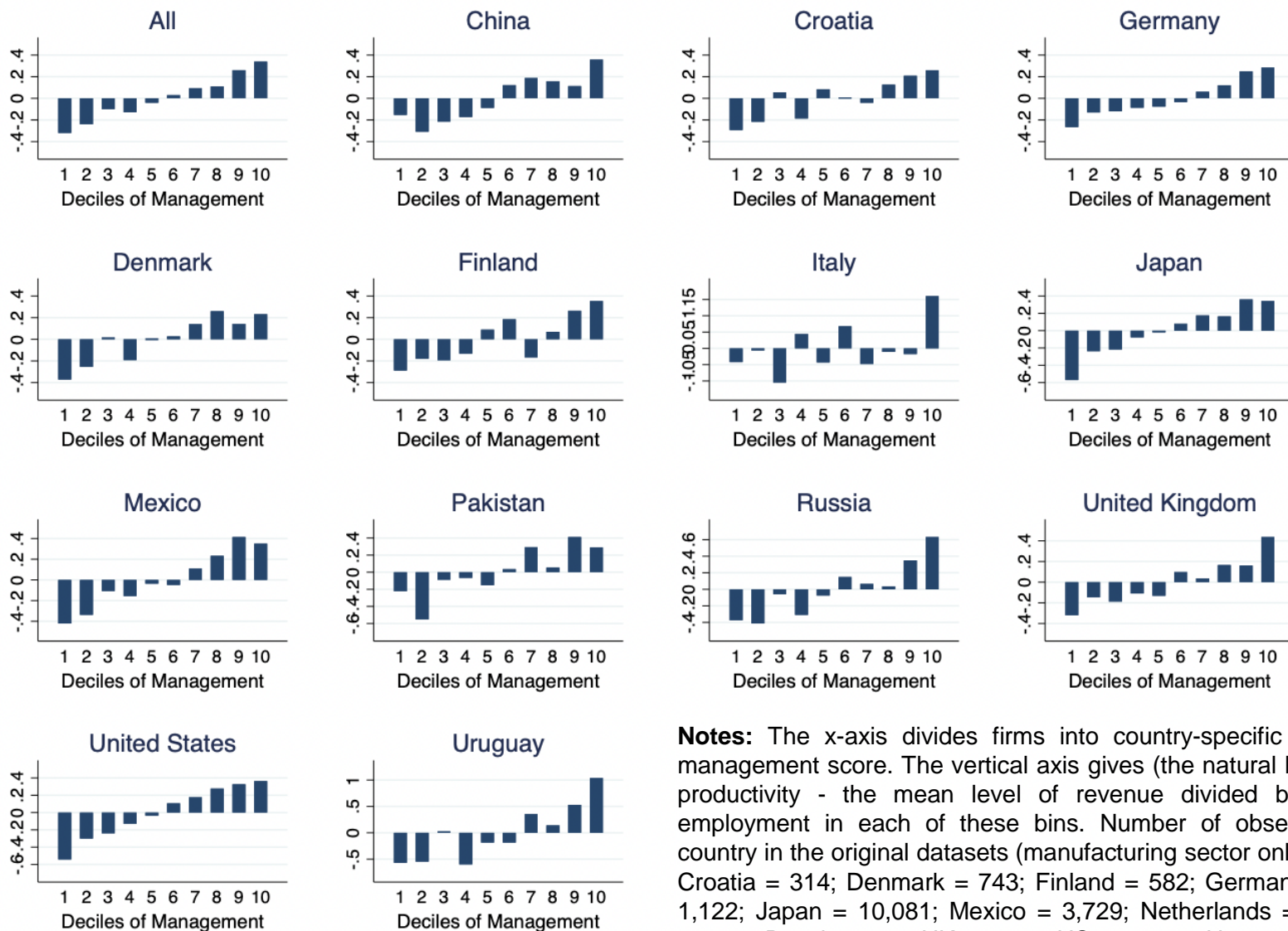
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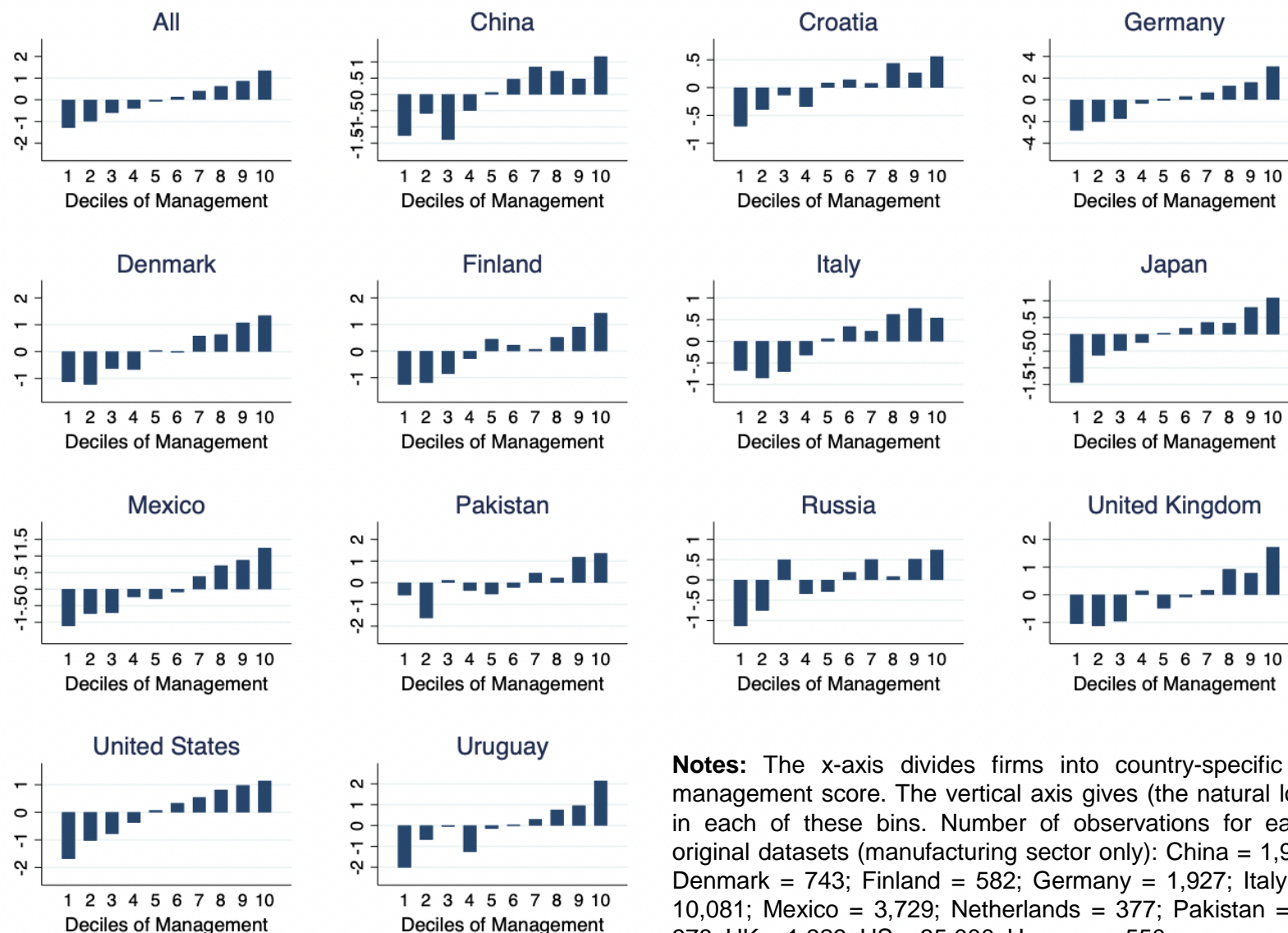
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III. Businesses with higher MOPS scores have higher productivity, log(revenue per worker)



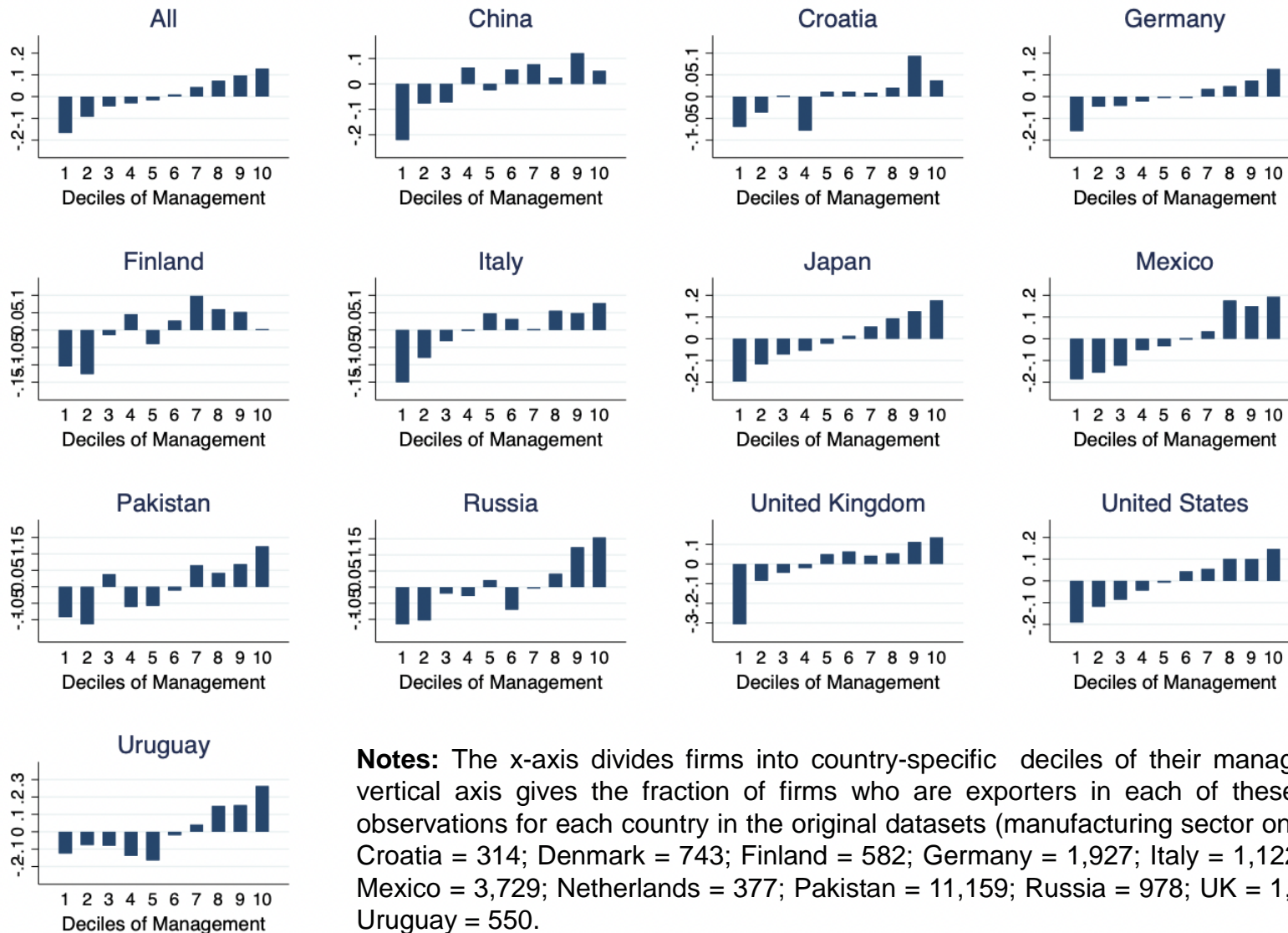
Notes: The x-axis divides firms into country-specific deciles of their management score. The vertical axis gives (the natural logarithm of) labor productivity - the mean level of revenue divided by mean level of employment in each of these bins. Number of observations for each country in the original 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)



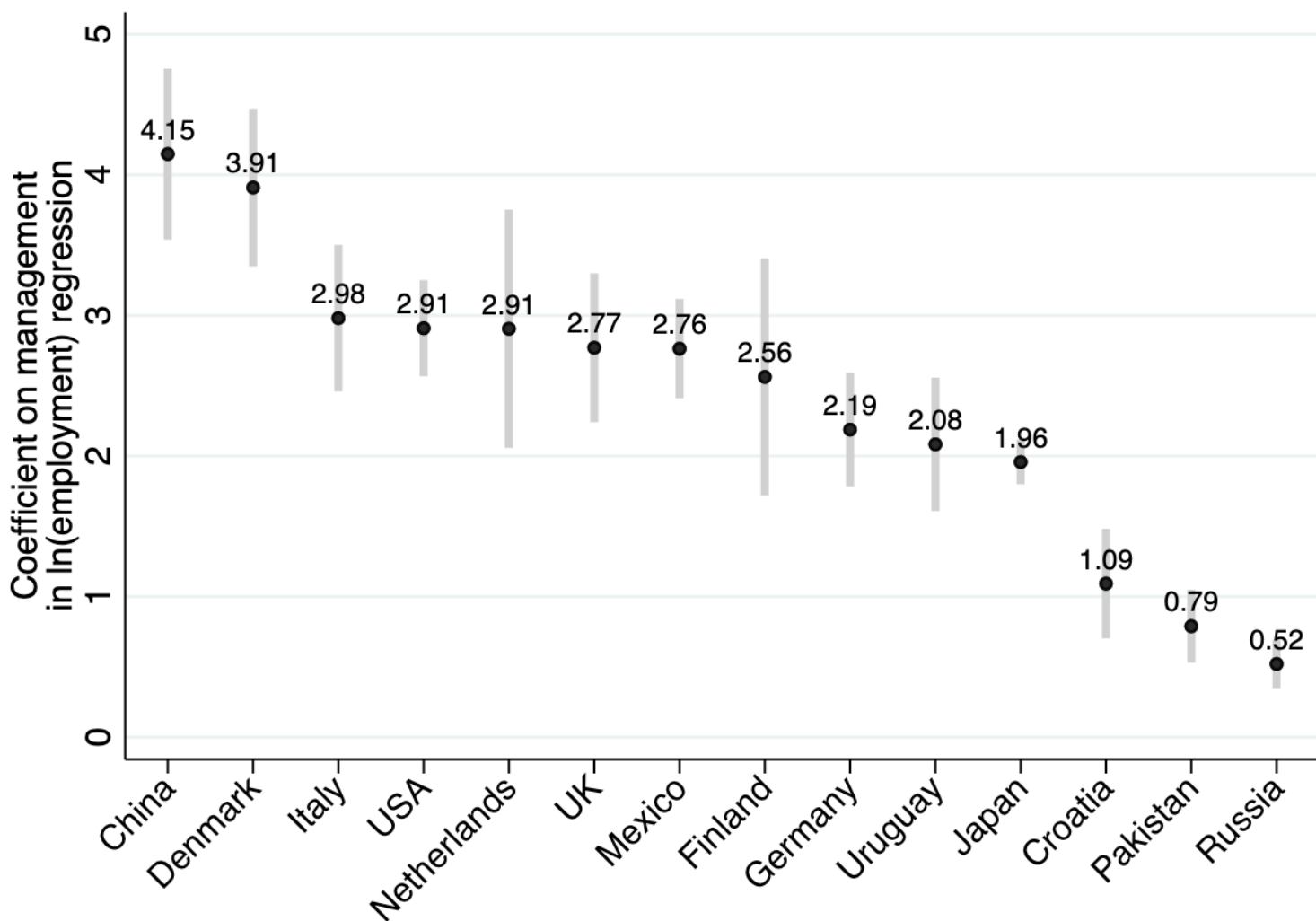
Notes: The x-axis divides firms into country-specific deciles of their management score. The vertical axis gives (the natural logarithm of) profits in each of these bins. Number of observations for each country in the original datasets (manufacturing sector only): China = 1,986; Croatia = 314; Denmark = 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.

Businesses with higher MOPS scores are more likely to export



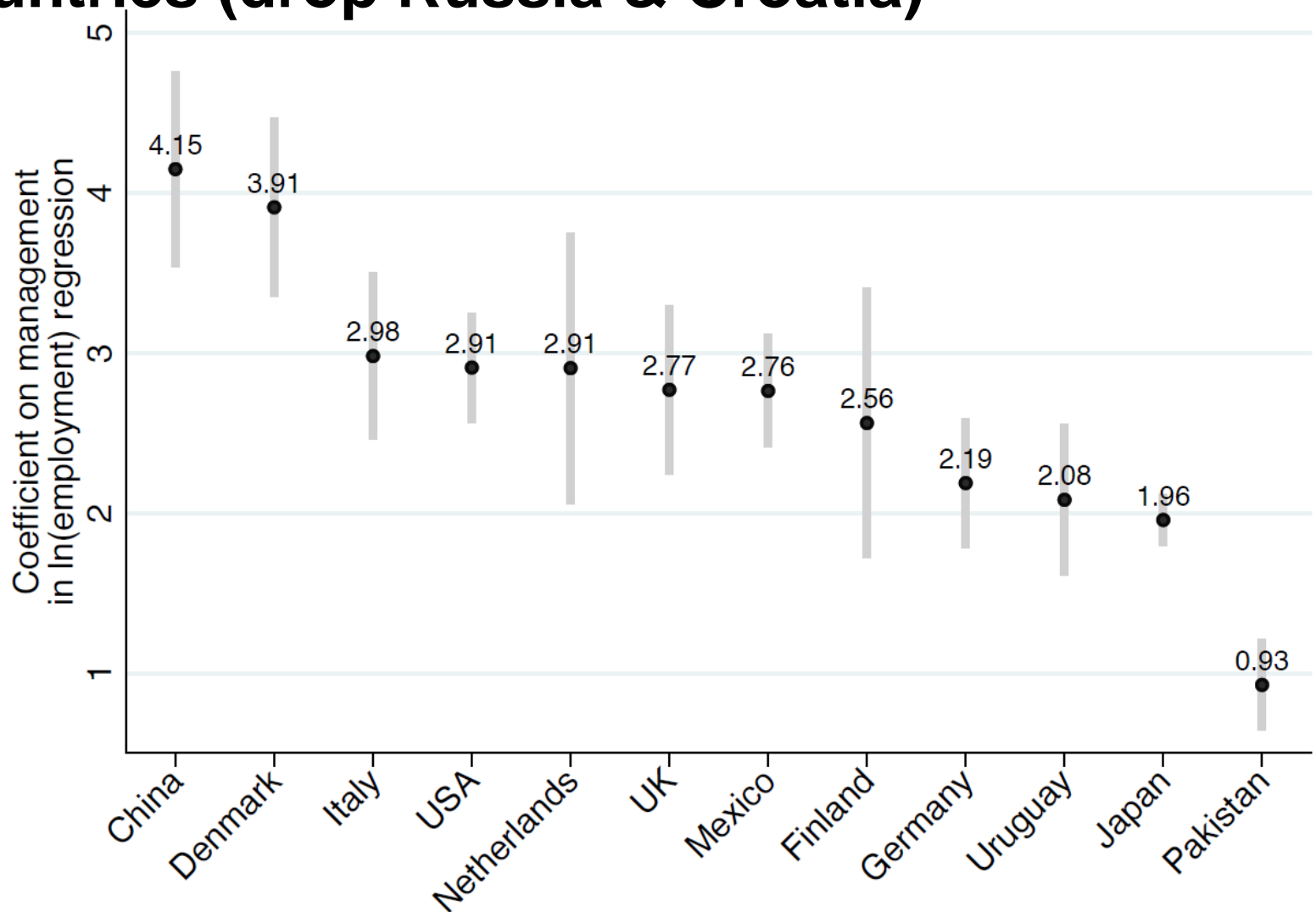
Notes: The x-axis divides firms into country-specific deciles of their management score. The vertical axis gives the fraction of firms who are exporters in each of these bins. Number of observations for each country in the original datasets (manufacturing sector only): China = 1,986; Croatia = 314; Denmark = 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.

Size-management relationship (reallocation) across countries



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.

Size-management relationship (reallocation) across countries (drop Russia & Croatia)



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Conclusions

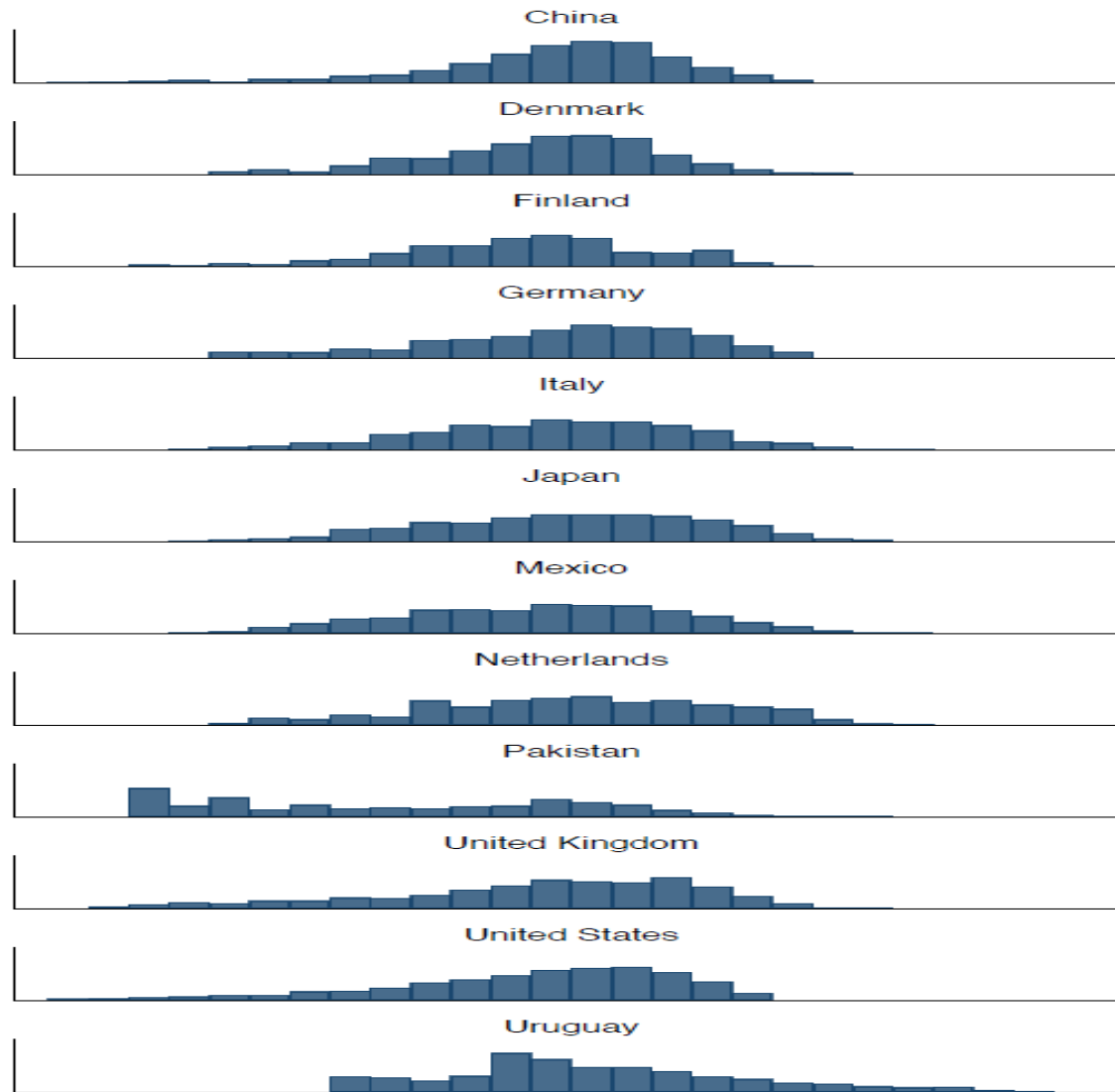
- Proof of concept: possible to generate robust management across firms and countries using standard methods
 - And to scale it up to get much larger samples
- Robust findings emerge across all countries:
 - I. Huge variation in management scores within nations
 - II. Businesses with higher management scores are larger whether measured by inputs (jobs) or outputs (sales)
 - III. Businesses with higher management scores perform better on multiple dimensions: productivity; profits and trade

Some Next steps:

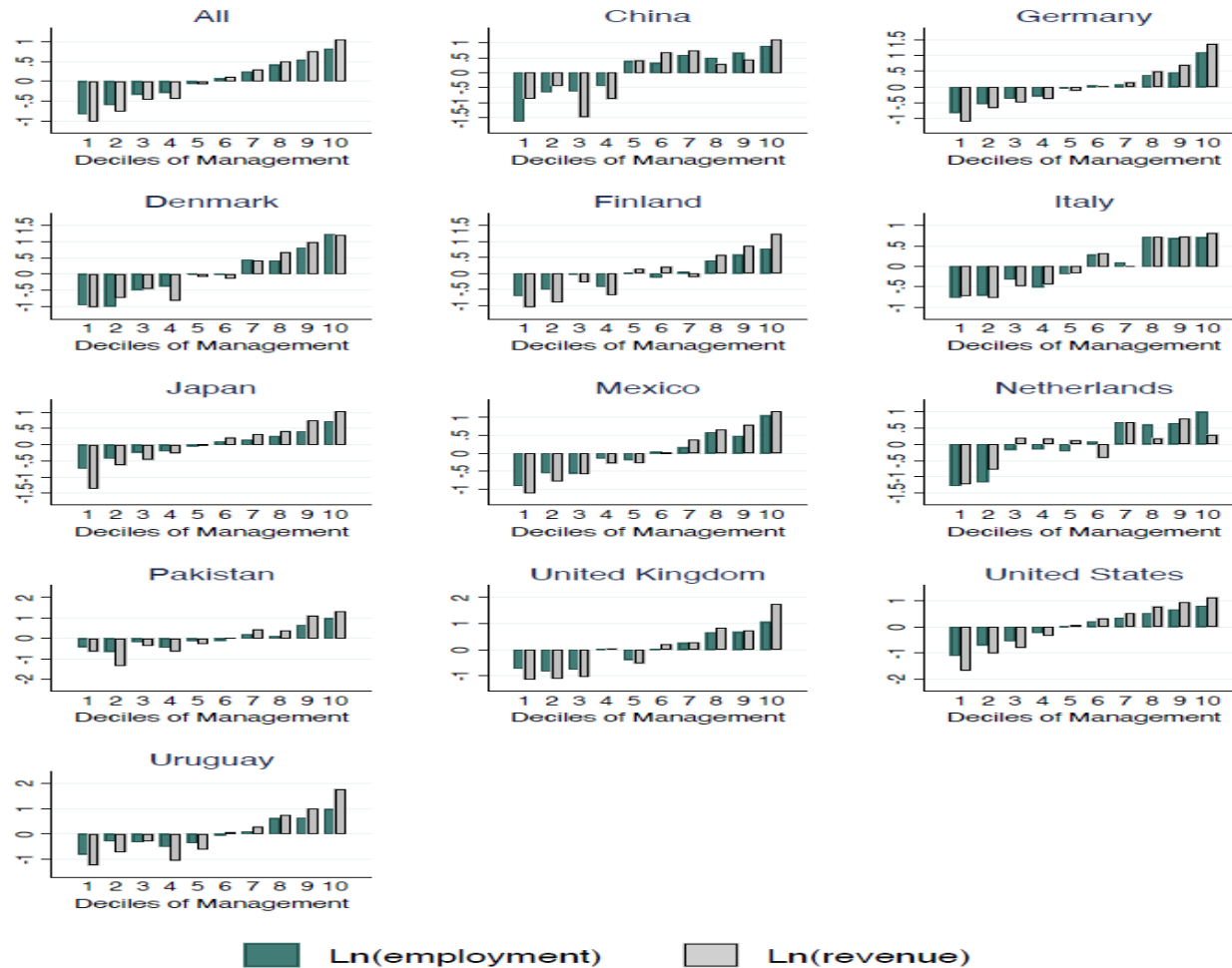
- Robustness of results as we improve comparability
 - e.g. firms vs. establishments; size thresholds
- Developing and testing models
- Developing and evaluating policies
- Expanding countries
- Using as part of national data infrastructure

Thank you!

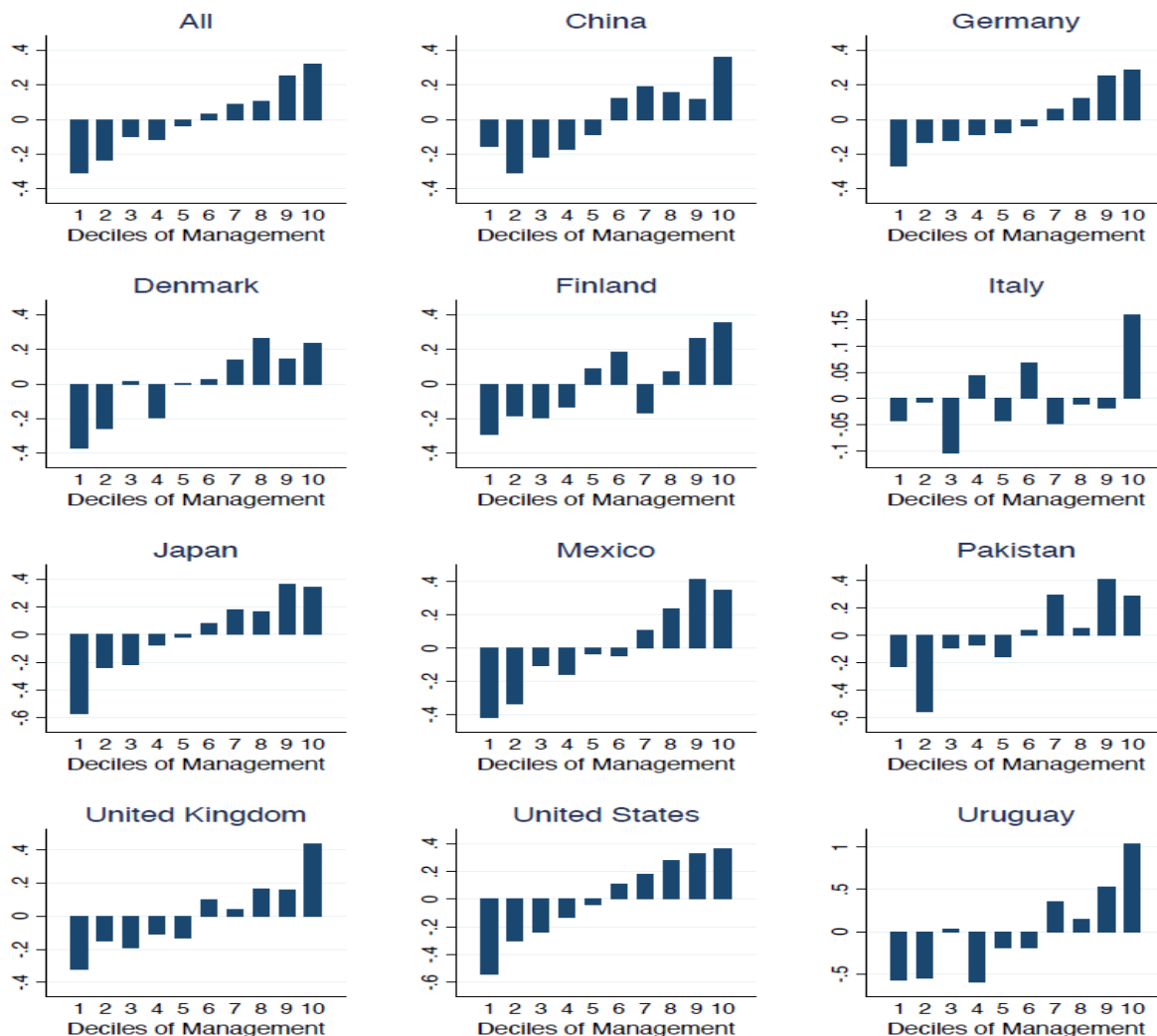
Distribution of management scores (deviation from country mean). Drop Russia and Croatia



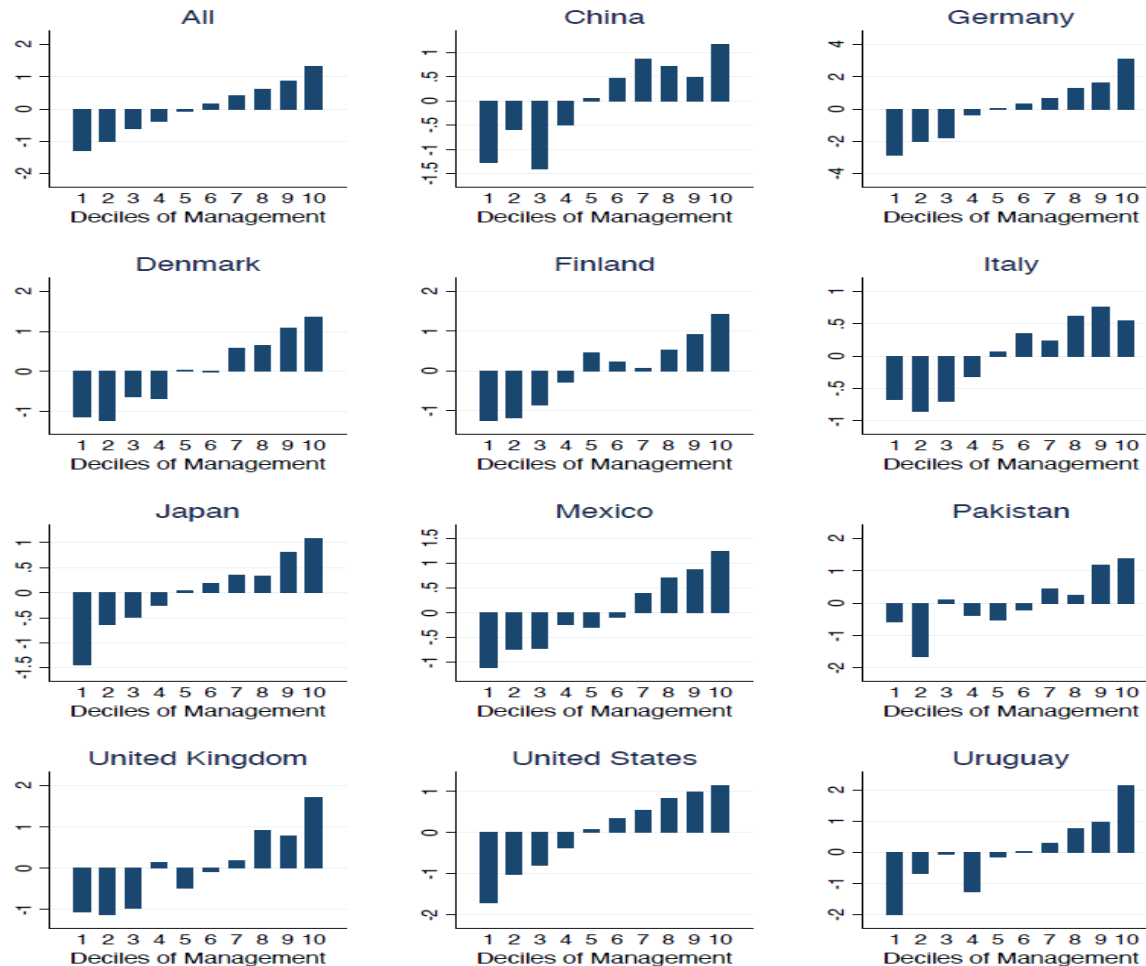
Businesses with higher MOPS scores are larger (both in jobs and sales): drop Russia and Croatia



Businesses with higher MOPS scores have higher log(labor productivity), drop Russia and Croatia



Businesses with higher MOPS scores have higher Profits, log(gross profits), drop Russia and Croatia



Businesses with higher MOPS scores are more likely to export

