

BOSSONOMICS: HOW CAN FIRMS AND NATIONS RAISE PRODUCTIVITY?

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CENTRE *for* ECONOMIC
P E R F O R M A N C E

OUTLINE

1. What is productivity & why should we care?

2. International Comparisons: How is Singapore doing?

3. Why is there a productivity gap?

- Technological Innovation
- The role of management

1. The drivers of better management

2. What can we do to improve things?

WHAT IS PRODUCTIVITY AND WHY SHOULD WE CARE?

- *“Productivity isn’t everything, but in the long run it is almost everything” (Paul Krugman)*
- *“There are three main ways to get a worker to produce more. The first, and most important, is better management” (Dr. Goh Keng Swee, 1978)*
- **Productivity growth**
 - Drives growth of real wages
 - Can facilitate redistribution
 - Helps finance government expenditure

DOWNSIDERS TO PRODUCTIVITY GROWTH?

- **Poverty?**

- absolute poverty tends to fall with growth
- No evidence that faster productivity growth means more inequality

- **Happiness?**

- Growth doesn't guarantee happiness
- Wellbeing not all about consumption
- But falls in consumption create misery

WHAT IS LABOUR PRODUCTIVITY?

Basic "welfare" measure

$$\frac{GDP}{Population} = \frac{GDP}{hours} \times \frac{hours}{workers} \times \frac{workers}{population}$$

Choice?

Labour productivity

Voluntary and involuntary.
Unemployment and inactivity

*US has higher GDP/pop than EU, but more similar GDP/hour

This has changed a lot over time via catch up

MEASURING PRODUCTIVITY

- Output per hour depends on:
 - Inputs per hour (physical and human capital, materials, energy, etc.)
 - “Total Factor Productivity” (technology, management, etc.) Also known as the “Solow residual”. Accounts for most of long-term growth

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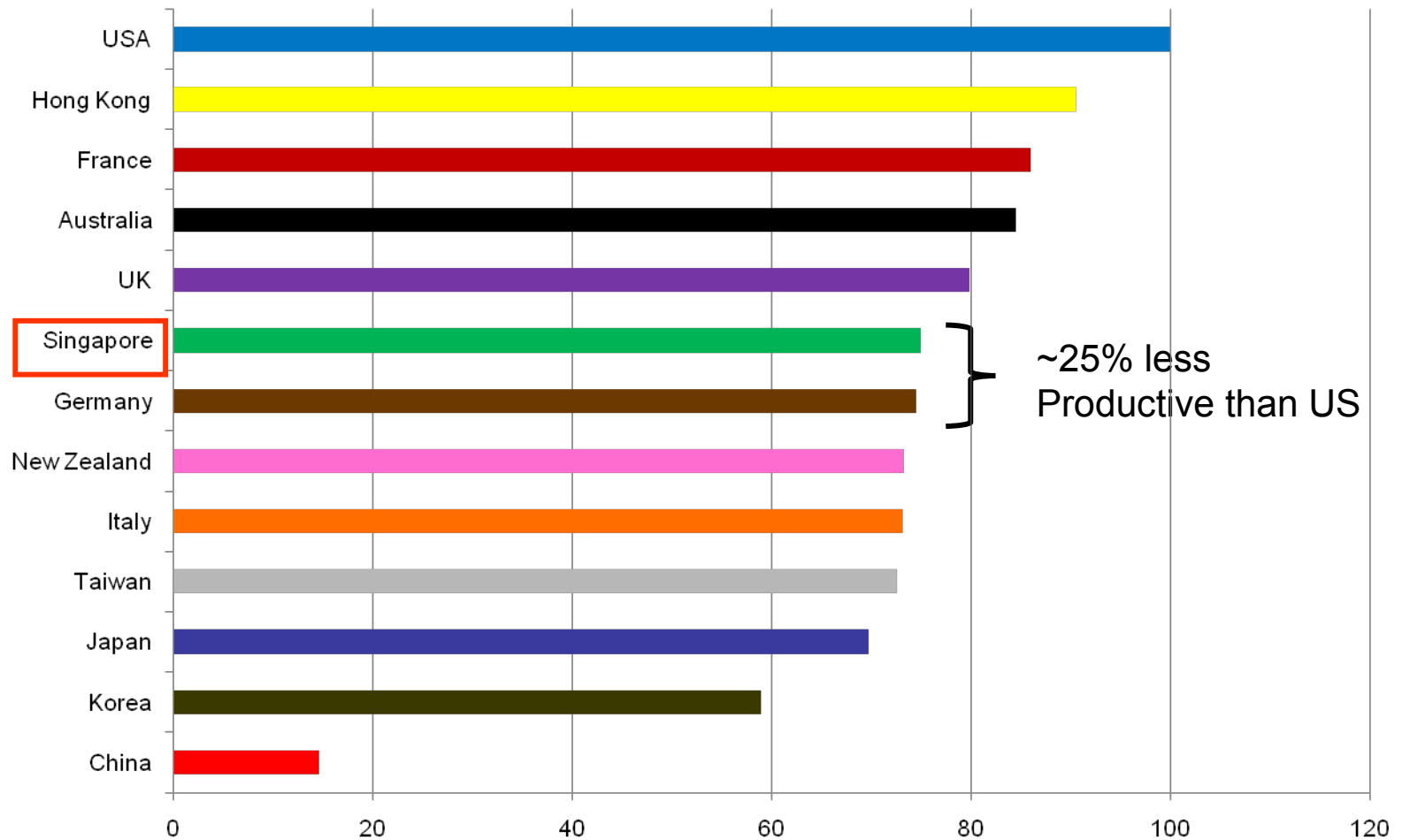
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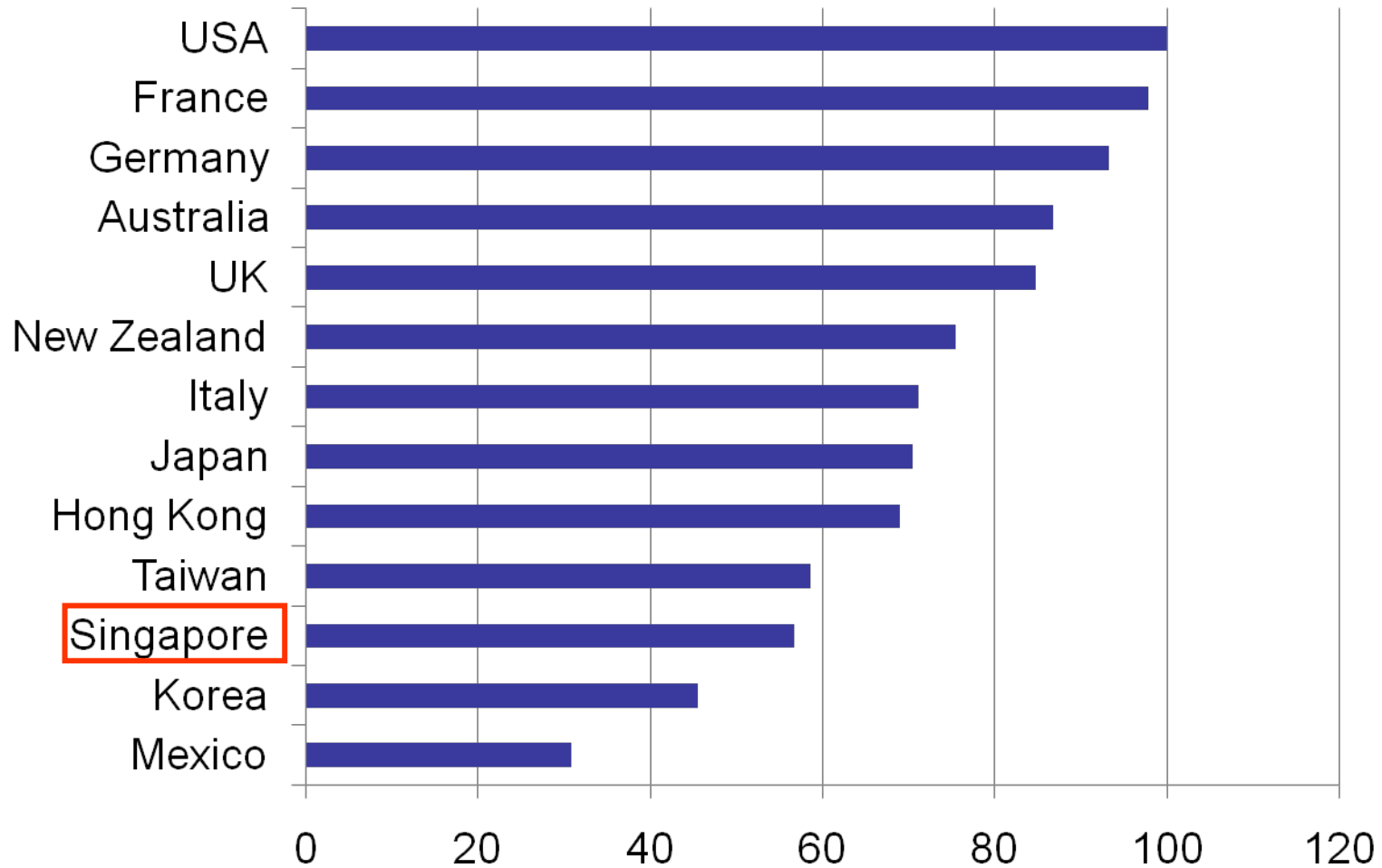
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RELATIVE LABOUR PRODUCTIVITY (GDP PER WORKER) IN 2009, US=100



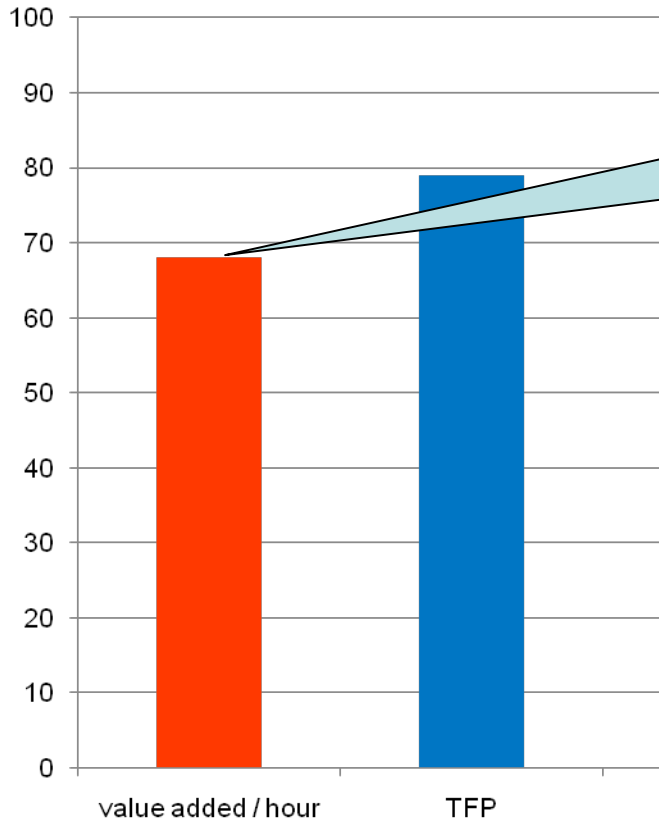
Source: Conference Board (2010)

RELATIVE LABOUR PRODUCTIVITY (GDP PER HOUR) IN 2009, US=100



THE US-EU GAP IS MAINLY TO DO WITH TFP (~2/3 TFP AND 1/3 OTHER INPUTS)

EU-15, MARKET ECONOMY, 2005, US=100

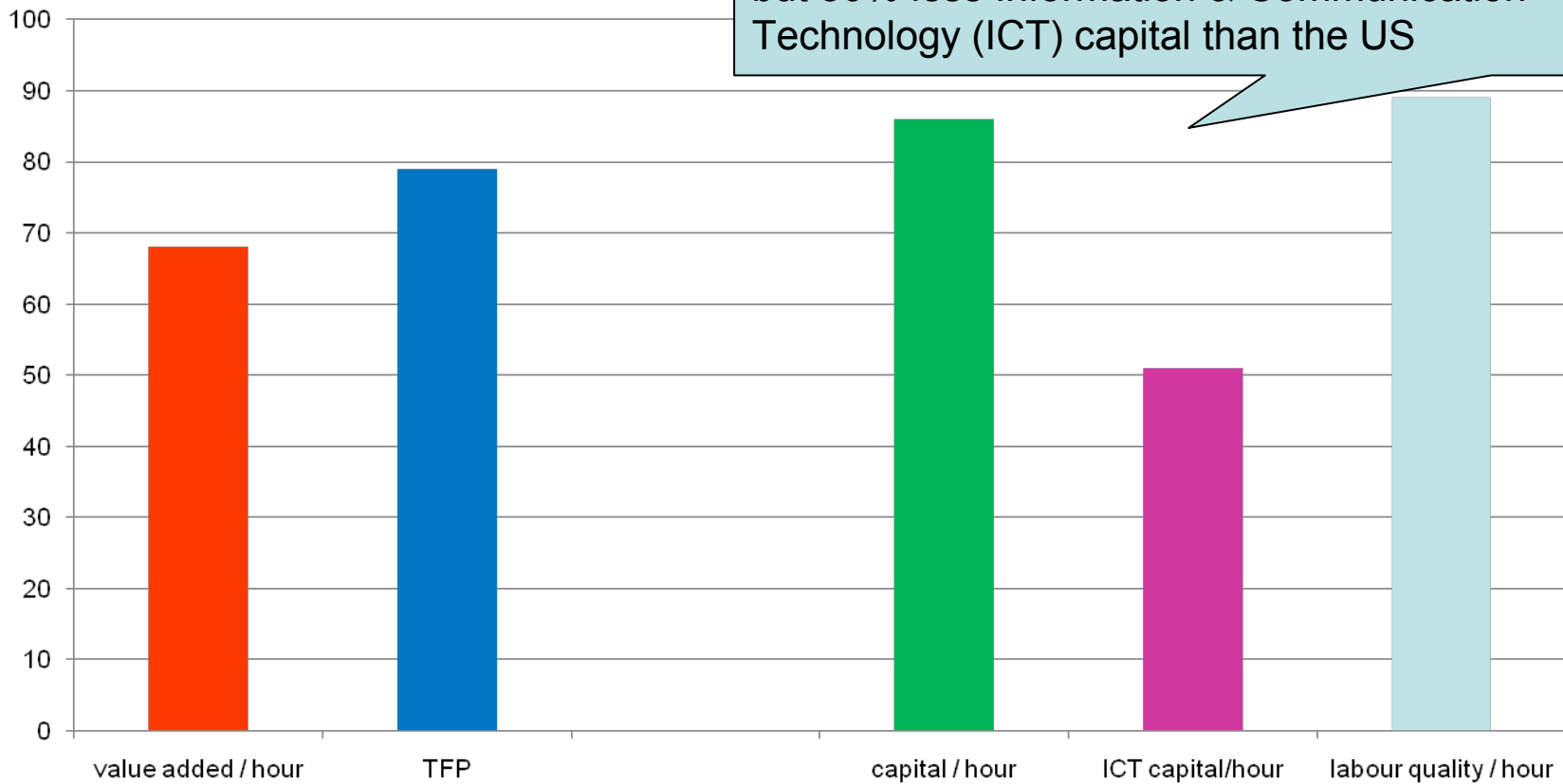


EU's 32% productivity gap with US falls to 21% when we take lower inputs of capital and skills into account

THE US-EU GAP IS MAINLY TO DO WITH TFP (1/3 OTHER INPUTS – EU ICT INPUTS VERY LOW)

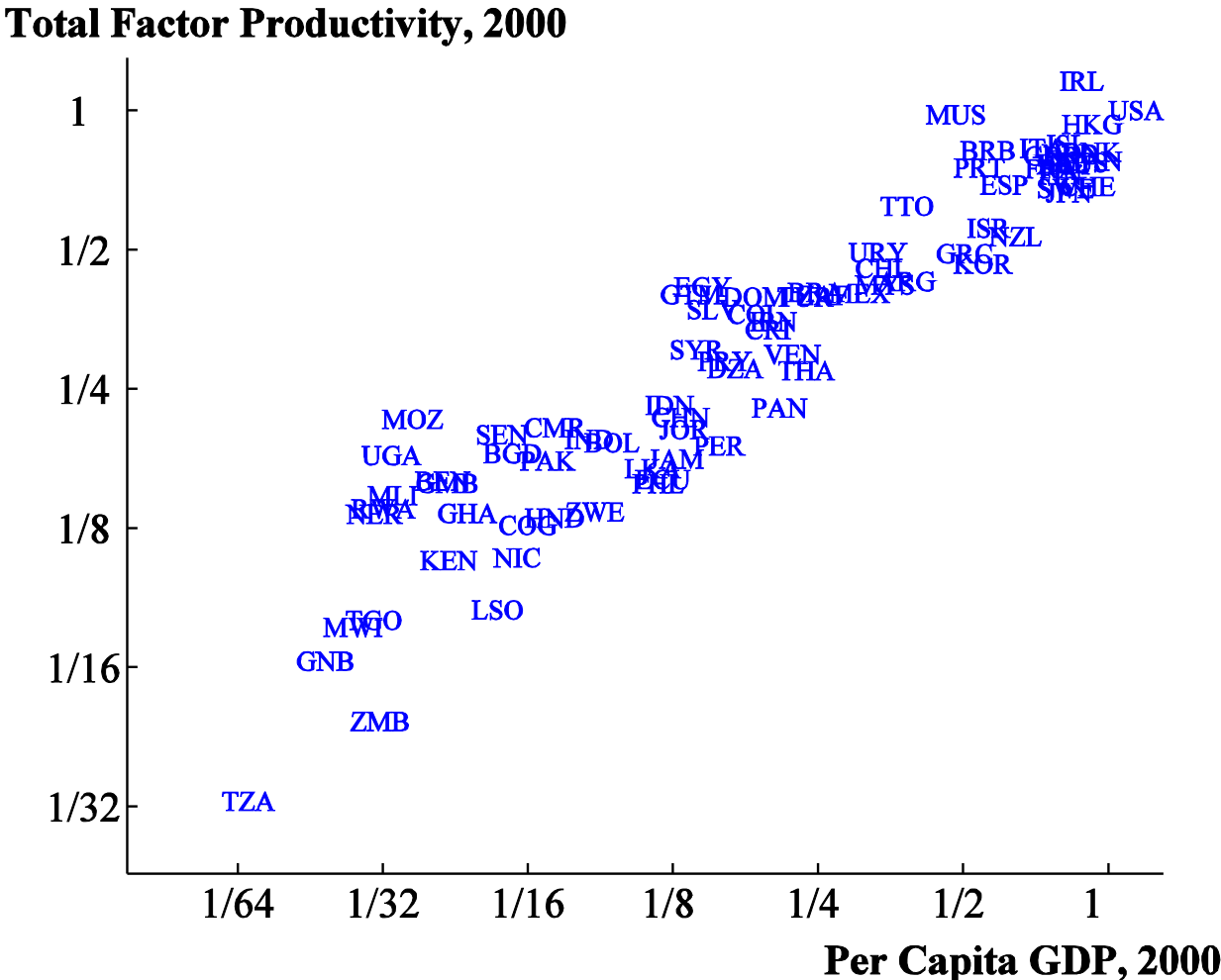
EU-15, MARKET ECONOMY,
2005, US=100

EU has 15% less total capital, 10% less skills but 50% less Information & Communication Technology (ICT) capital than the US



Source: Inklaar and Timmer (2008)

LARGE INCOME & TFP DIFFERENCES BETWEEN COUNTRIES



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

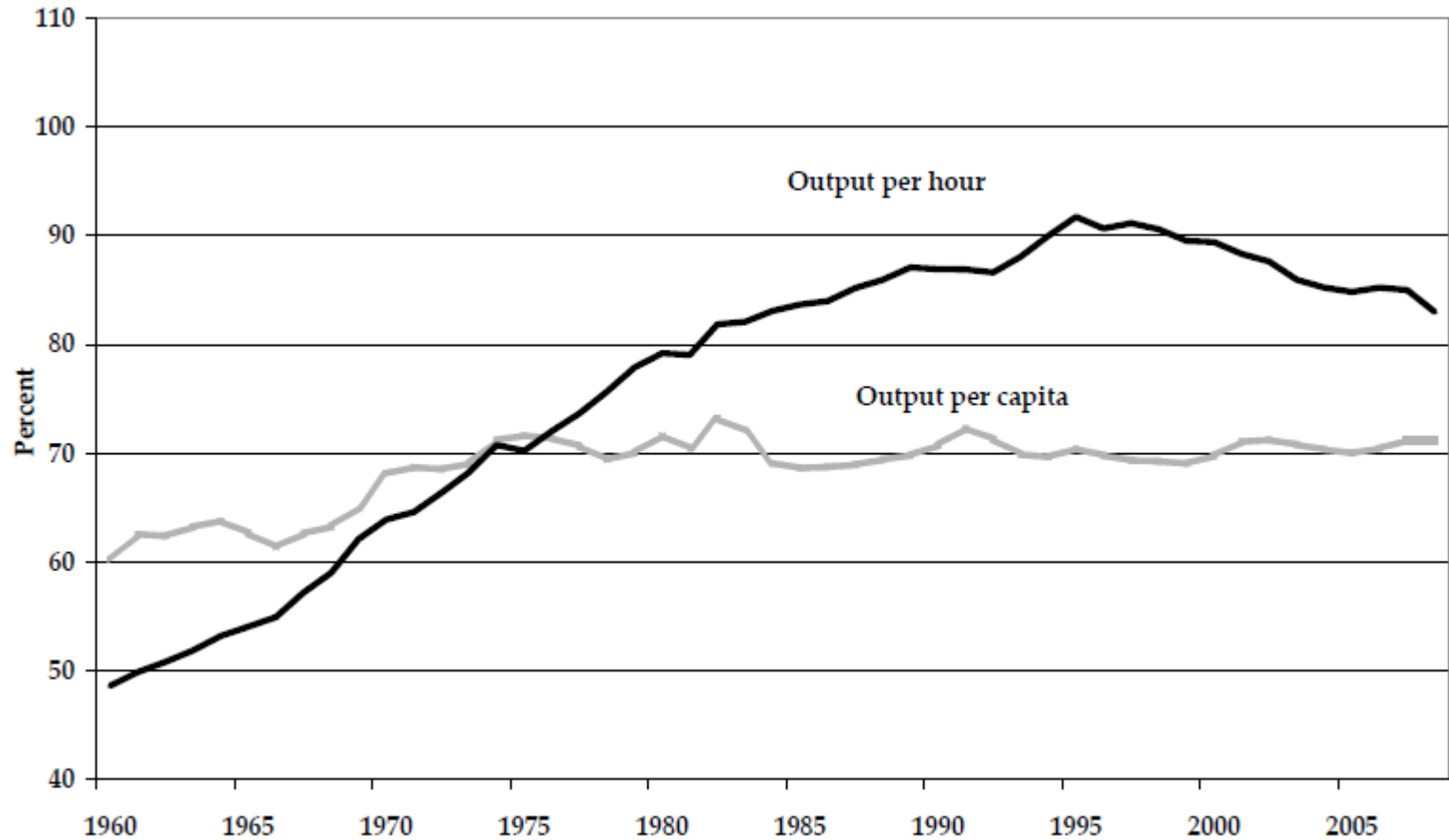
RECENT TRENDS IN PRODUCTIVITY MIRACLE

- Post-war rapid productivity growth
- After 1970s Oil Shocks a Productivity slowdown
- From mid-1990s, US productivity “miracle”
- Crisis after end 2007
- **GDP/worker annual growth (Conference Board, 2010)**

	US	East Asia & Pacific	Singapore	UK
1995-2005	2.1%	3.3%	2.3%	1.8
2005-2009	0.9%	4.7%	-5.2%	0.3

Note: TFP growth in Singapore 1995-2005 = 0.6% pa
– same as E Asia & Pacific (0.6%)

THE US PRODUCTIVITY MIRACLE HASN'T BEEN SEEN IN EU: GDP/HOUR EU-15 RELATIVE TO THE US, 1960-2008



Source: Gordon (2010) based on EU-KLEMS

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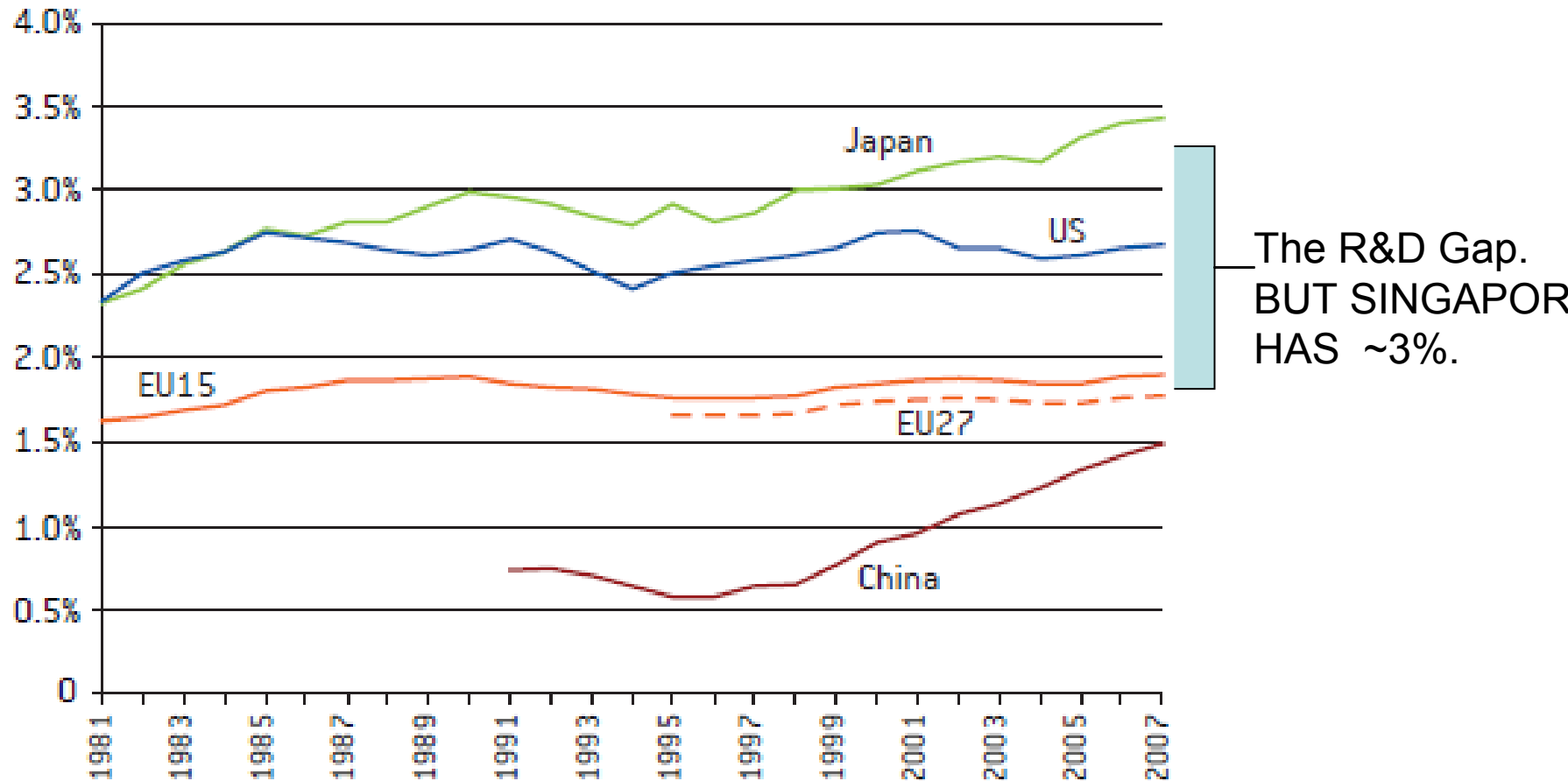
- 3. Why is there a productivity gap?**
 - **Technological Innovation**
 - **The role of management**

1. The drivers of better management
2. What can we do to improve things?

INNOVATION A CAUSE OF US PRODUCTIVITY GAP?

- **Sapir Report (2003):** Some countries in Europe & Asia caught up with US technology “frontier” by mid 1990s & needs to innovate. Existing set of institutions designed for adoption & imitation rather than innovation
- **Partially correct.** Singapore & EU has innovation deficit:
 - Universities/basic science
 - Research & Development (R&D), Patenting, etc.

GENERAL RESEARCH & DEVELOPMENT (R&D/GDP)



Source: OECD, MSTI

INNOVATION A CAUSE OF PRODUCTIVITY GAP?

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- **Partially correct.** Singapore & EU has innovation deficit:
 - Universities/basic science
 - Research & Development (R&D), Patenting, etc.
- **But problem is not just “hard” technologies. Also problems with the way firms are managed.**
 - Firms response to challenges & opportunities: Crisis, technology & globalization

MANAGEMENT A CAUSE OF PRODUCTIVITY GAP?

- Technologies available globally - why do some countries/firms not use?
- Large variation in productivity between firms as well as countries
- But how to measure, quantify and compare across firms and countries?
- My Research Program with Nick Bloom (Stanford) & CEP/LSE team over last 7 years
 - Why should management practices vary?
 - Measuring management across firms & countries
 - Describing management
 - Drivers of better management

WHY SHOULD MANAGEMENT PRACTICES VARY?

Two broad models - not mutually exclusive

- “Optimal choice of management practices”
 - Another factor of production (like fixed capital)
 - No “better” or “worse” style of management – depends on firm’s circumstances

- “Managerial inefficiency”
 - Strictly “better” or “worse” styles of management
 - Part of a firm’s overall productivity

Empirically we find some support for both – today focus on “managerial inefficiency” evidence due to time constraints

THE SURVEY METHODOLOGY

1) Developing management questions

- Scorecard for 18 monitoring, targets and people
- ≈45 minute phone interview of manufacturing plant managers

2) Obtaining unbiased comparable responses (“Double-blind”)

- Interviewers do not know the company’s performance
- Managers are not informed (in advance) they are scored
- Run from LSE, with same training and country rotation

3) Getting firms to participate in the interview

- Introduced as “Lean-manufacturing” interview, no financials
- Official Endorsement: Bundesbank, PBC, RBI, etc.
- Run by 55 MBA types (loud, assertive & business experience)

MONITORING – e.g. *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

INCENTIVES - e.g. “HOW DOES THE PROMOTION SYSTEM WORK?”

Score

(1) People are promoted primarily upon the basis of tenure

(3) People are promoted upon the basis of performance

(5) We actively identify, develop and promote our top performers

Note: All 18 dimensions and over 50 examples in Bloom & VanReenen (2006).

TARGETS - e.g. "HOW TOUGH ARE TARGETS?"

Score	(1) Goals are either too easy or impossible to achieve; managers low-ball estimates to ensure easy goals	(3) In most areas, top management pushes for aggressive goals based on solid economic rationale. There are a few "sacred cows" not held to the same rigorous standard	(5) Goals are genuinely demanding for all divisions. They are grounded in solid, solid economic rational
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Note: All 18 dimensions and over 50 examples in Bloom & VanReenen (2006).

MANAGEMENT SURVEY SAMPLE

- Interviewed over 6,000 firms across Americas, Asia & Europe
- Obtained 45% response rate from sampling frame (with responses uncorrelated with performance measures)

Medium sized manufacturing firms:

- Medium sized (100 - 5,000 employees, median \approx 250) because firm practices more homogeneous
- Manufacturing as easier to measure productivity
- Also examined management in Hospitals, Schools, Retail, Law Firms, nursing homes, charities, tax collection agencies

ADDITIONAL CONTROLS FOR BIAS & NOISE

8 INTERVIEWEE CONTROLS

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

3 INTERVIEWER CONTROLS

- Set of analyst dummies, cumulative interviews run, prior firm contacts

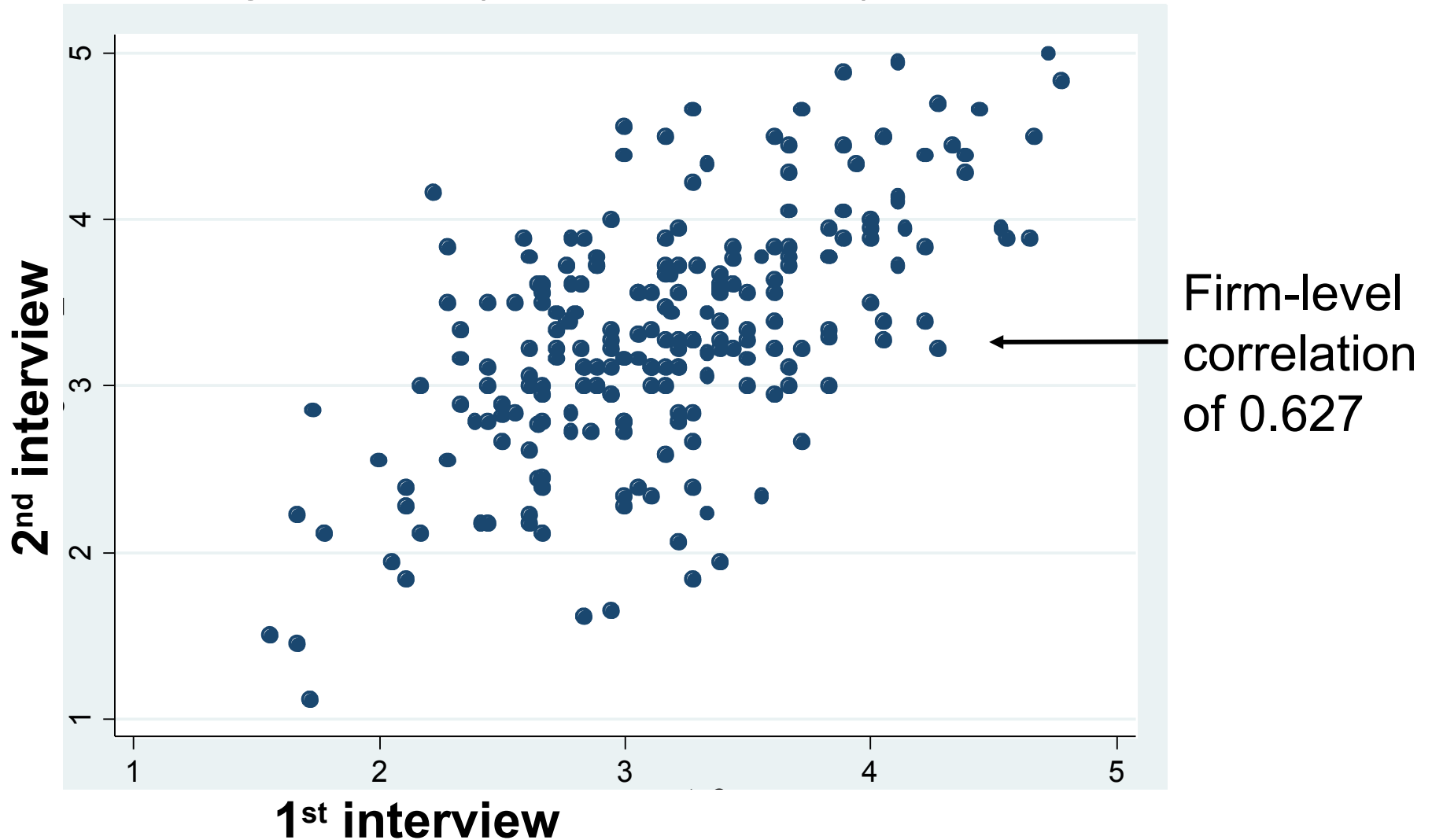
5 TIME CONTROLS

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

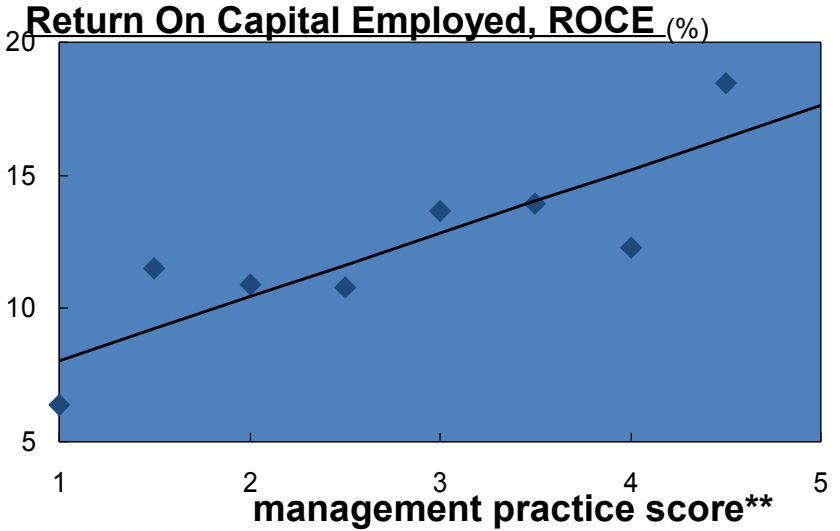
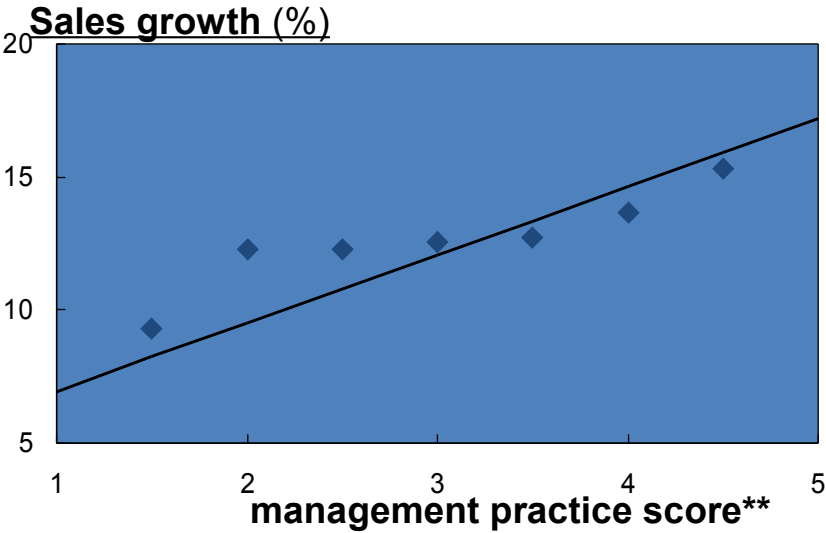
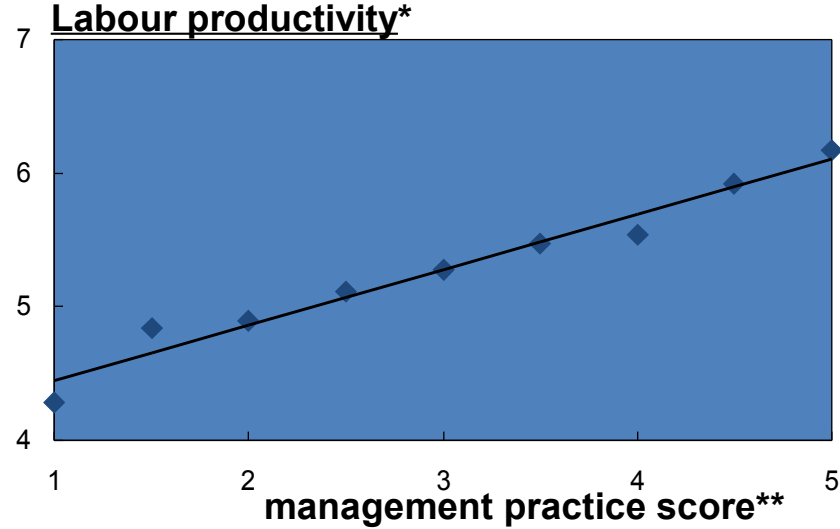
INTERVAL VALIDATION OF THE SCORING

Re-interviewed 222 firms with different interviewers & managers

Firm average scores (over 18 question)



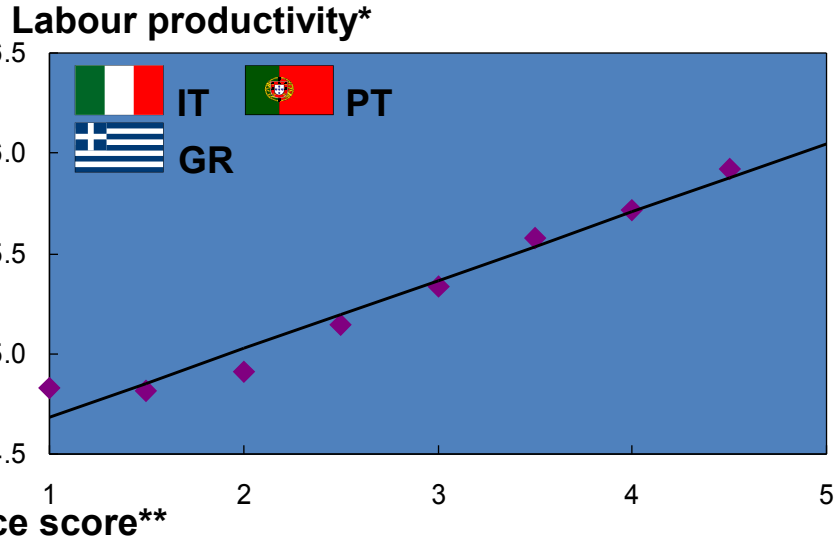
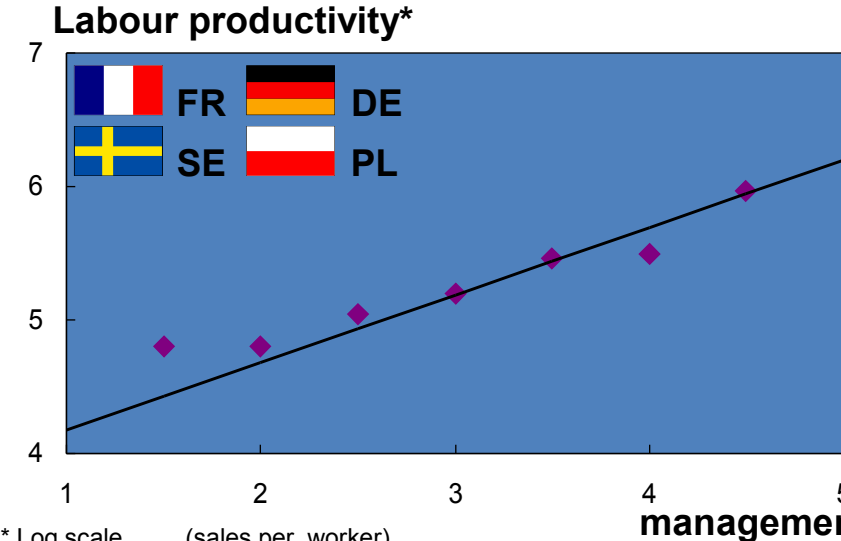
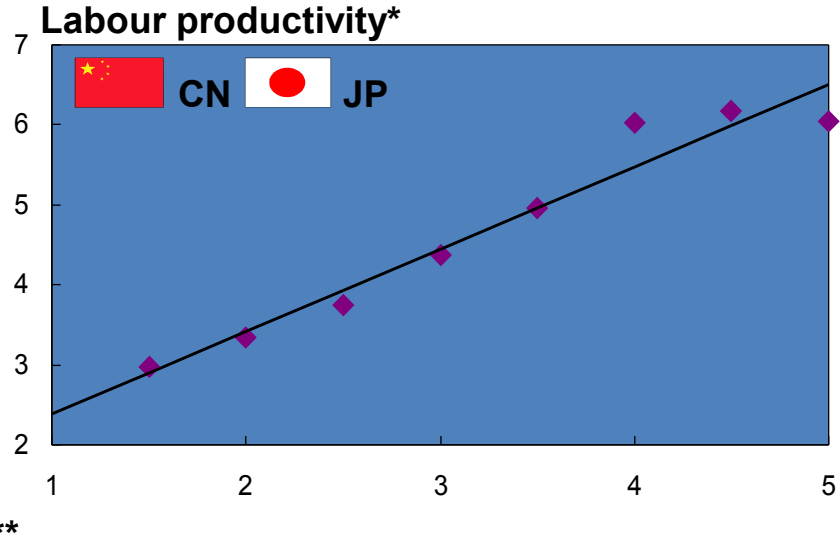
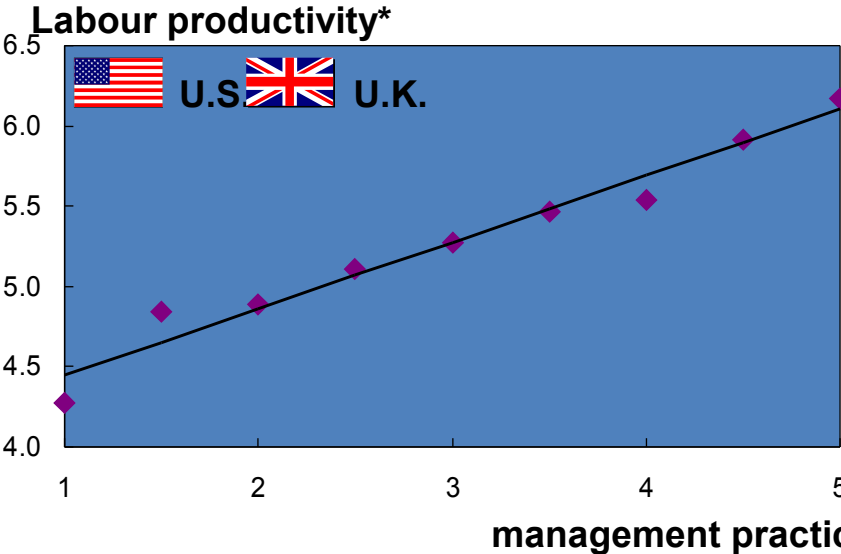
EXTERNAL VALIDATION: MANAGEMENT SCORE CORRELATES WELL WITH PERFORMANCE INDICATORS



* Log scale

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

THE LINK BETWEEN PRODUCTIVITY AND MANAGEMENT HOLDS TRUE ACROSS DIFFERENT COUNTRIES



* Log scale (sales per worker)

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

IS THERE A CAUSAL EFFECT OF MANAGEMENT ON PRODUCTIVITY?

- **YES**
- Randomized Control Trials of Indian textile firms outside Mumbai (Bloom et al, 2010)
- Firms receive diagnostic and then a randomized subgroup further in-depth management consultancy from a top firm for 6 months
- Followed these firms for ~2 years
- Large improvements in management, quality and profitability

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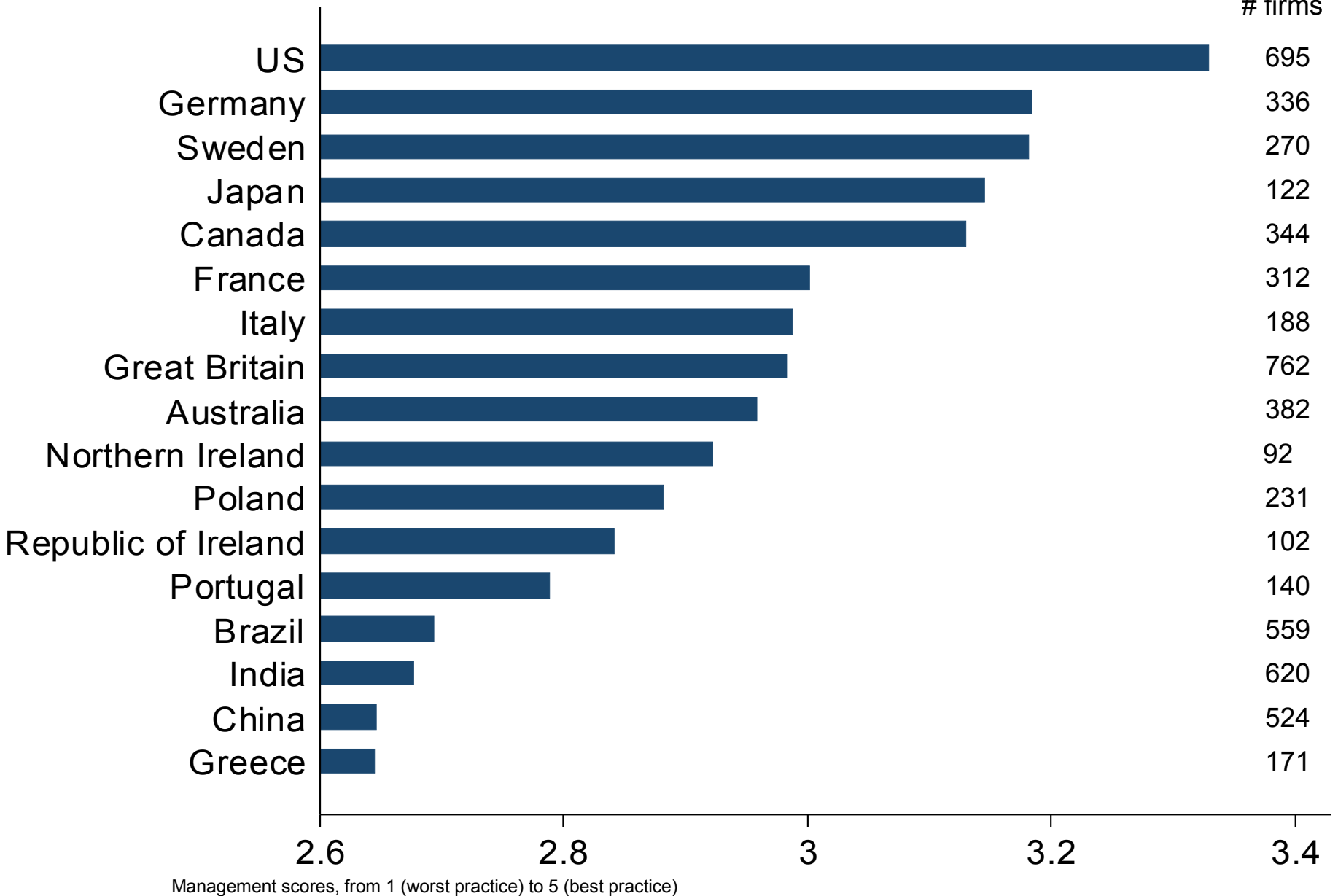
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MANAGEMENT PRACTICE SCORES ACROSS COUNTRIES

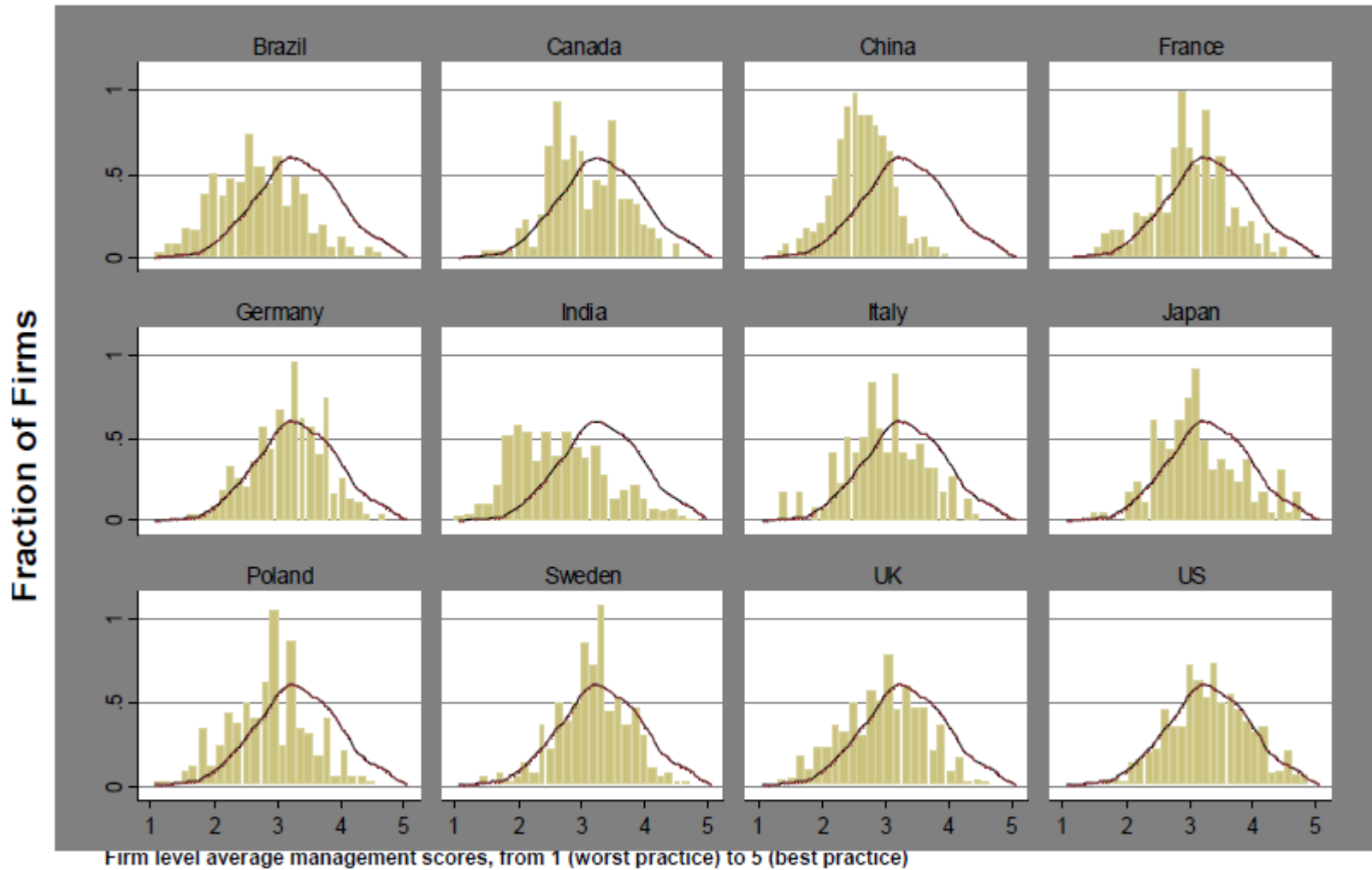
firms



Note: Averages taken across all firms within each country. 5,850 observations in total. Firms per country in the right column

Source: Bloom, Genakos, Sadun and Van Reenen (2009)

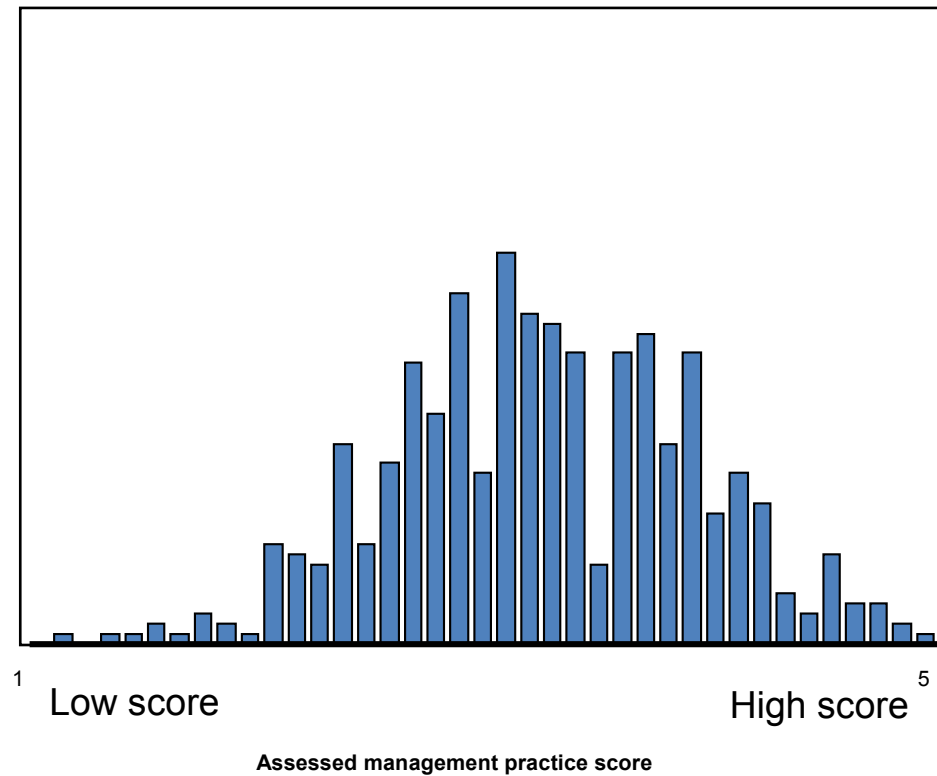
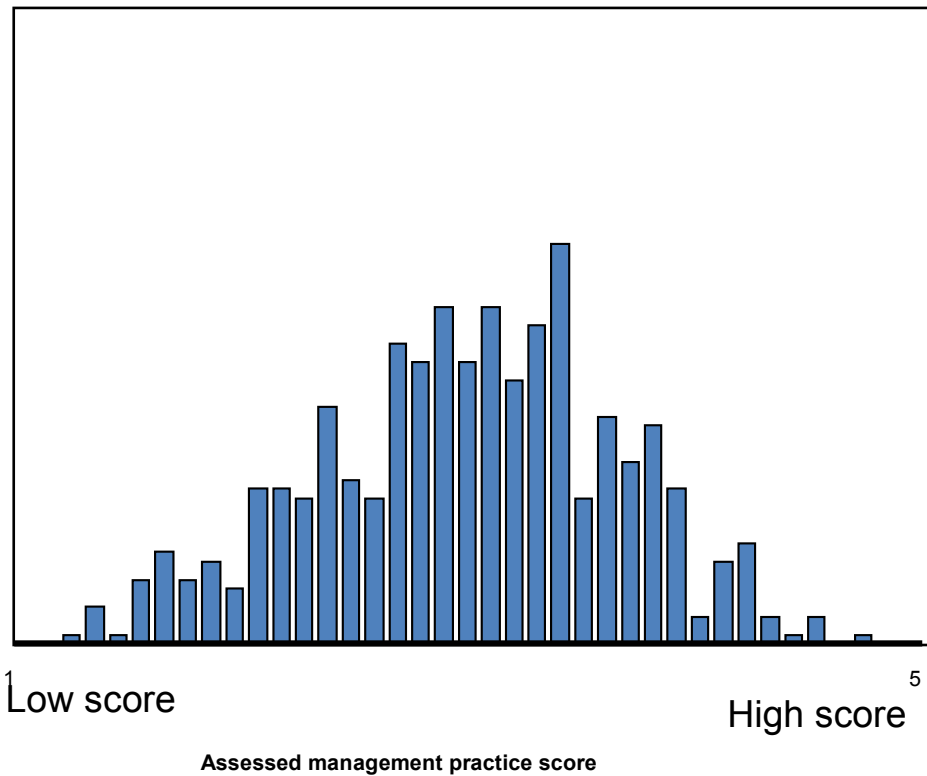
MANAGEMENT PRACTICE SCORES ACROSS FIRMS



Note: The bars are the histogram of the actual density. The line is the kernel of the US density for comparison. Portugal, Ireland and Greece omitted for presentational reasons, <http://www.nber.org/reporter/2008number4/bloom.html>

MUCH OF THE CROSS-COUNTRY DIFFERENCES DUE TO THE “LOWER TAIL”

Distribution of firm level management practice scores



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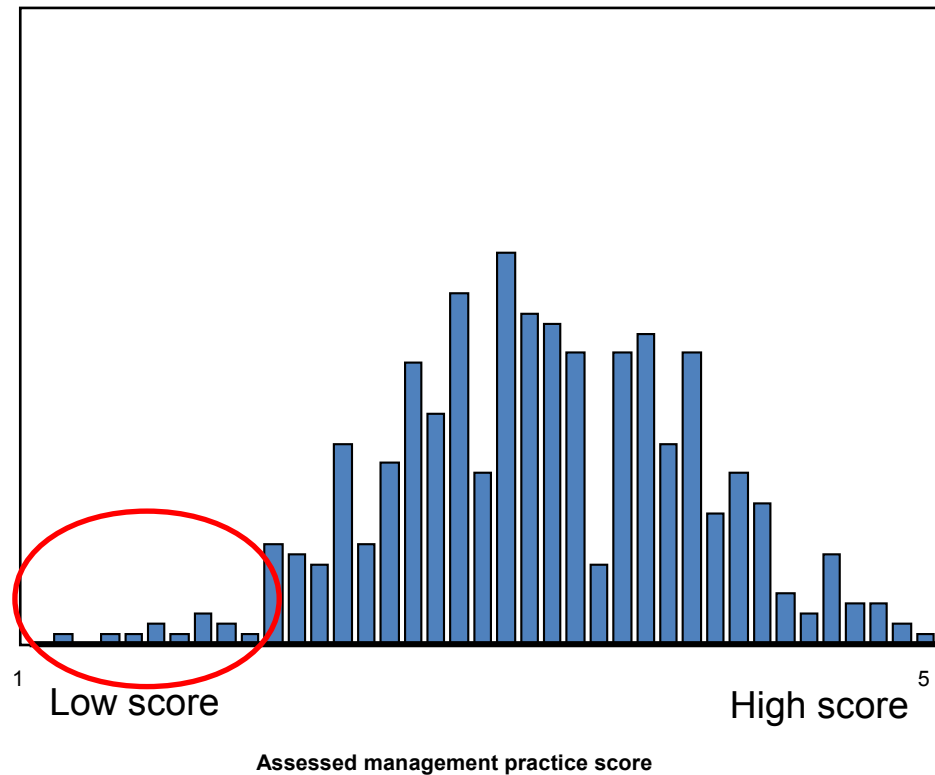
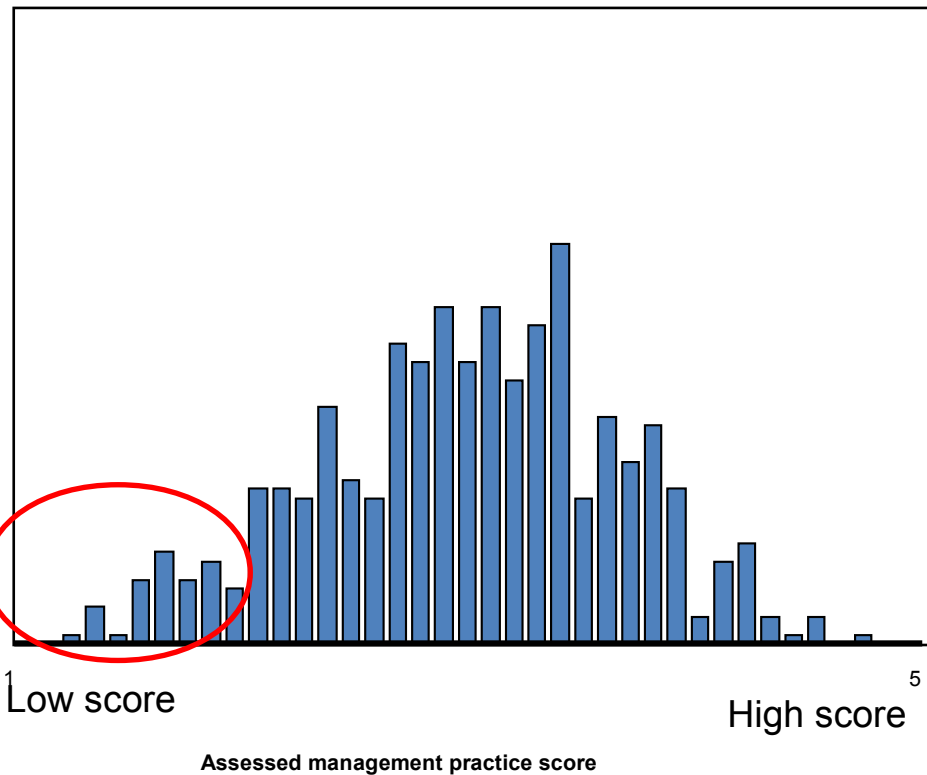
Distribution of firm level management practice scores



U.K.



U.S.



COMPETITION & MODELS OF MANAGEMENT

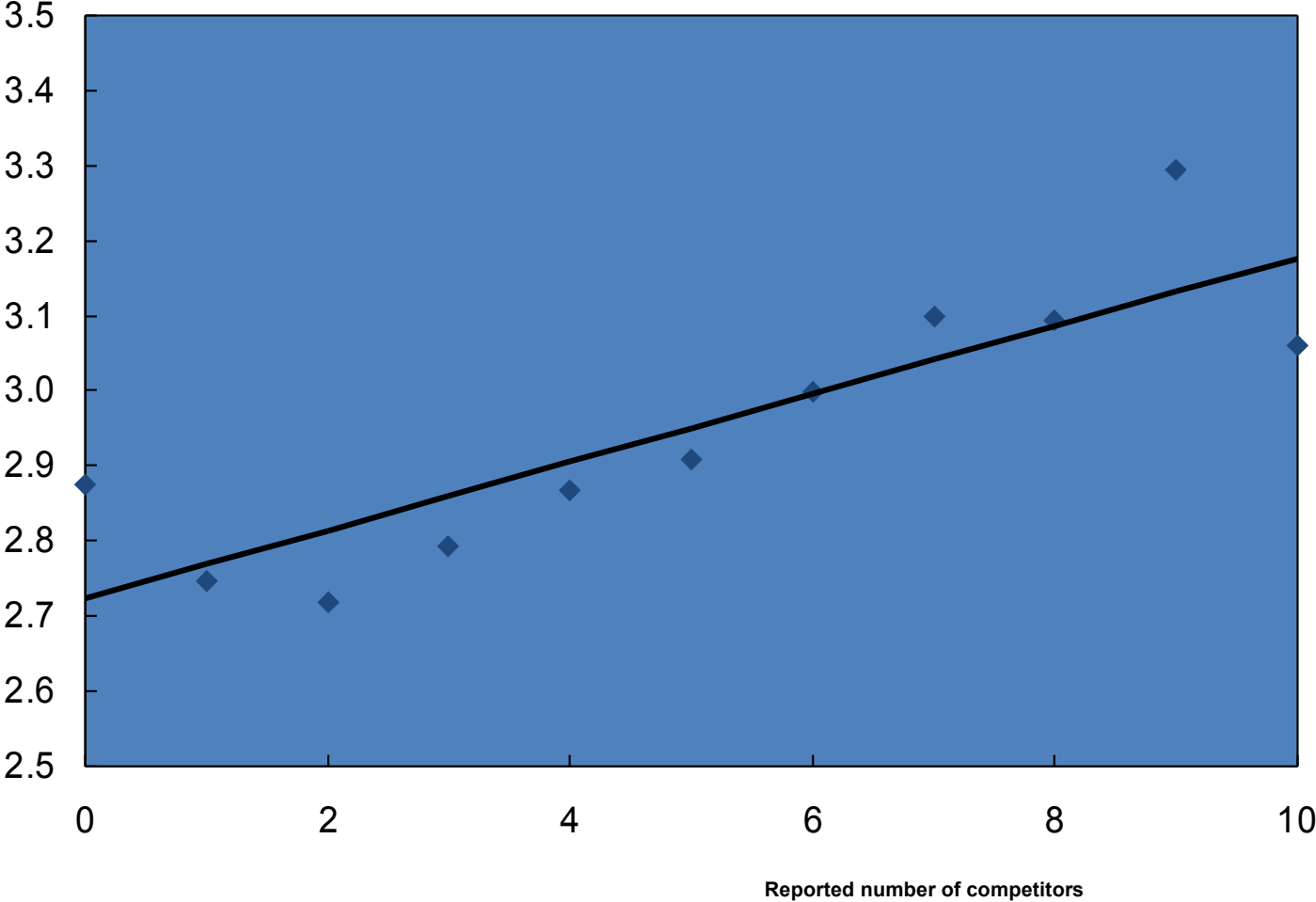
Various ways that competition may influence management

- Selection – badly run firms more likely to exit
- Effort – forces badly run firms to try harder to survive

We find competition is strongly linked with better management through a mixture of selection & effort

COMPETITION IS ASSOCIATED WITH BETTER MANAGEMENT PRACTICES

Assessed management practice score



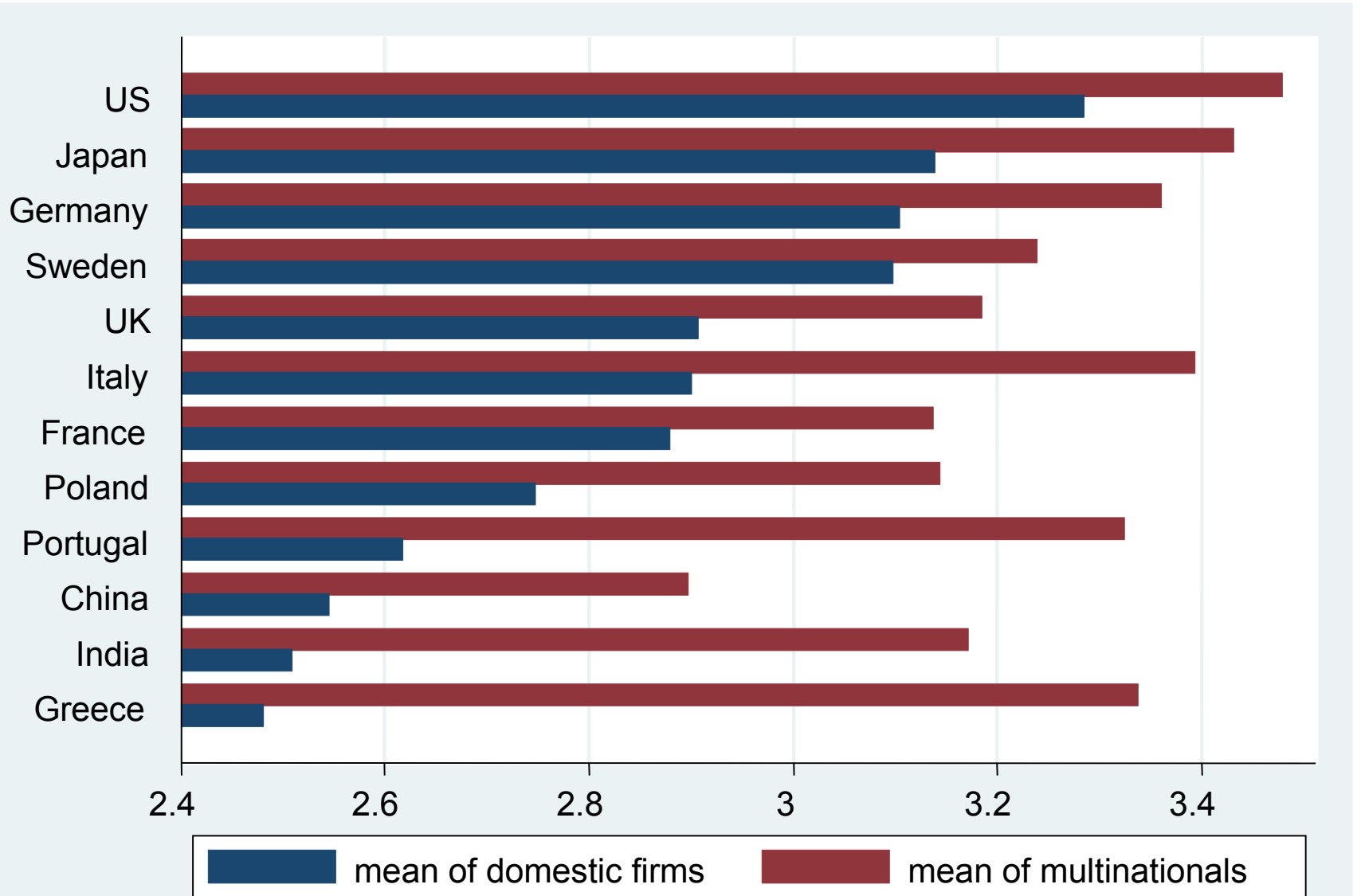
FAMILY FIRMS (OWNED WITH ELDEST SON AS CEO) AND GOVERNMENT FIRMS HAVE WORST MANAGEMENT

Average score on 18 management practice questions

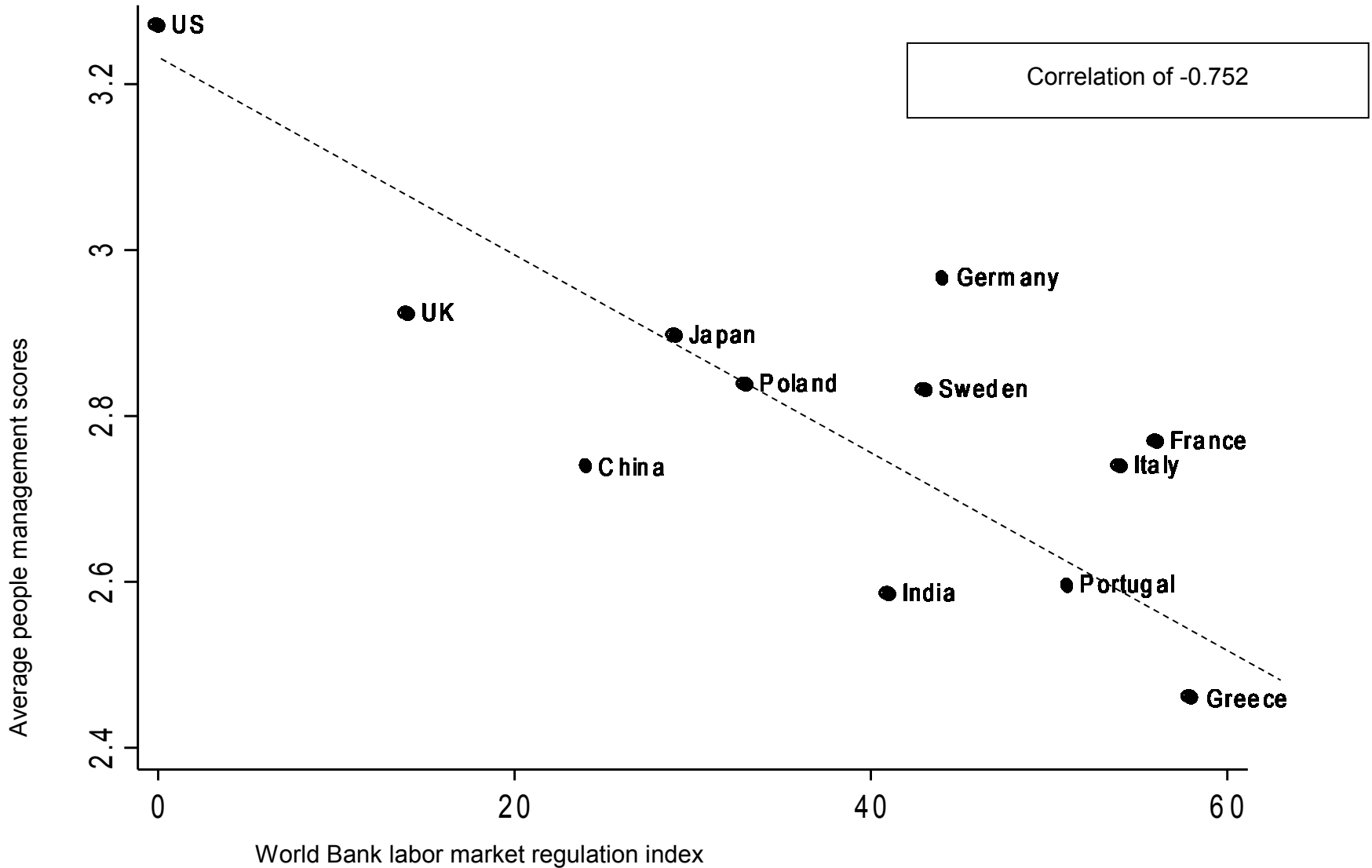


Note: Sample of 4,221 medium-sized manufacturing firms. The bottom bar-chart only covers the 3696 firms which have been in the same ownership for the last 3 years. The "Other" category includes venture capital, joint-ventures, charitable foundations and unknown ownership.

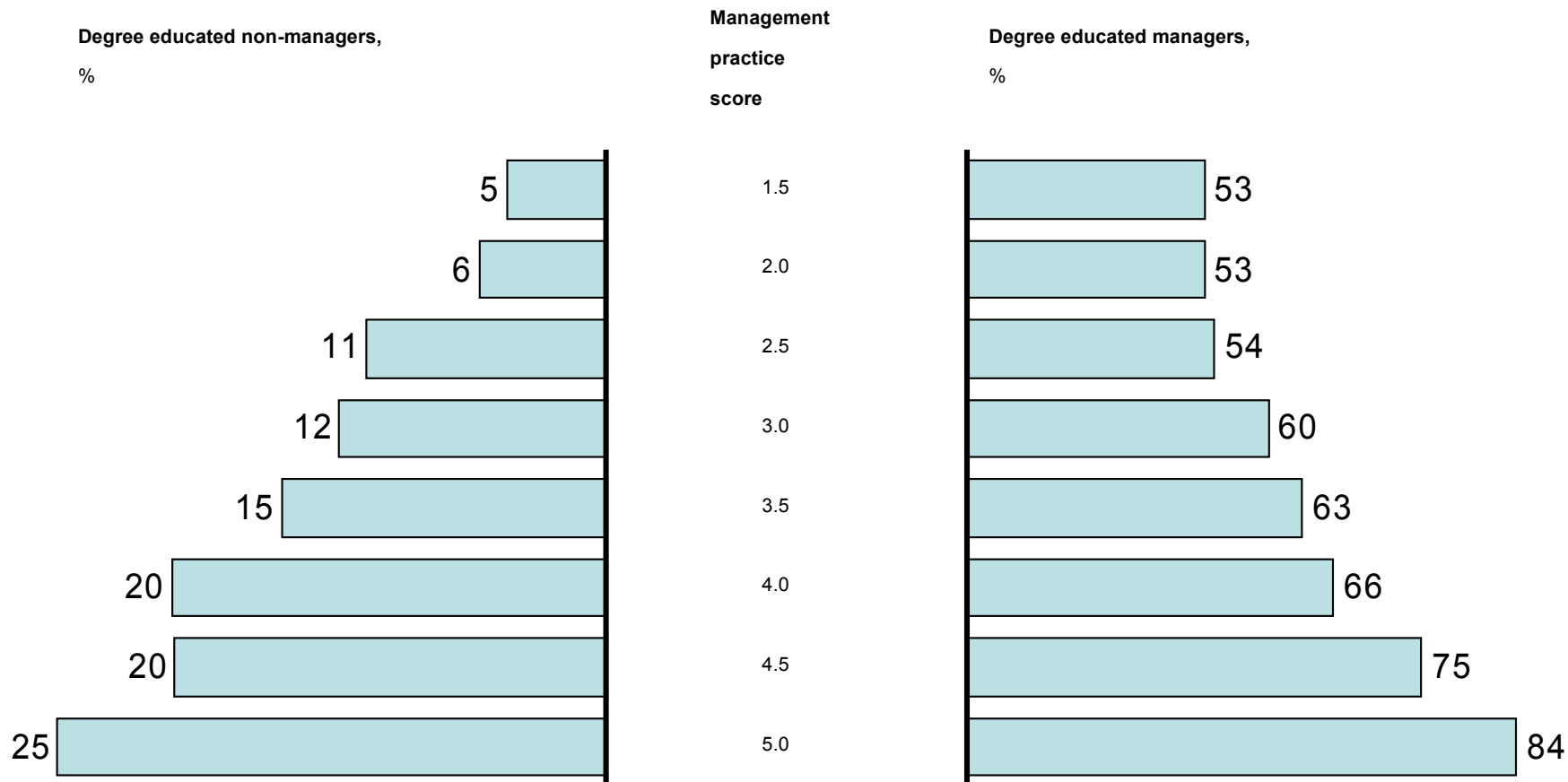
MULTINATIONALS APPEAR TO BE WELL MANAGED IN ALL COUNTRIES



LABOUR MARKET REGULATION ARE NEGATIVELY CORRELATED WITH PEOPLE MANAGEMENT...



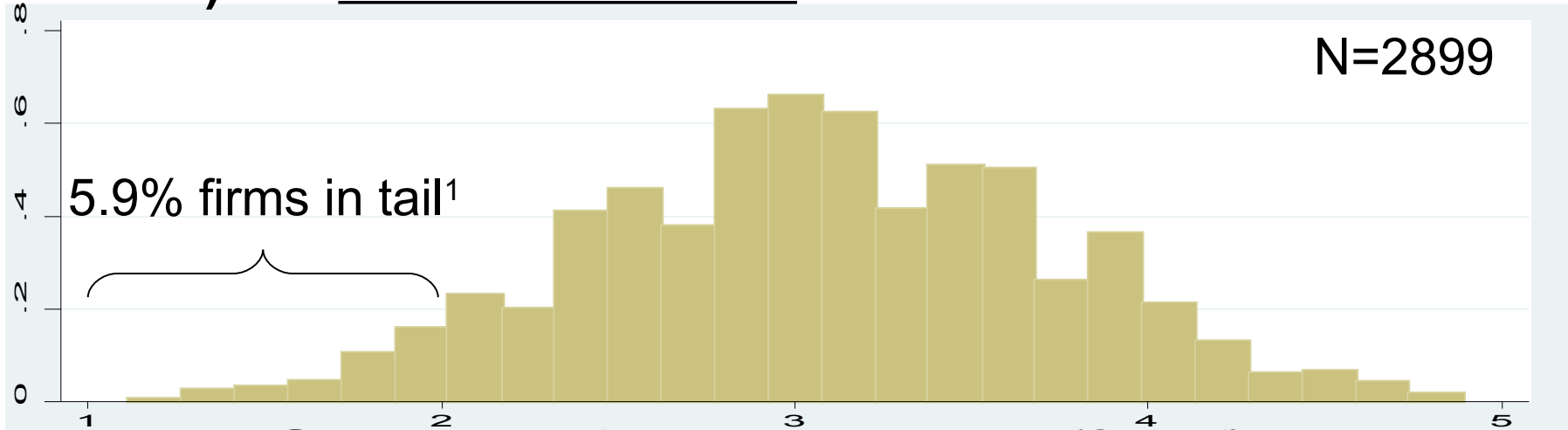
BETTER MANAGEMENT IS LINKED WITH HIGHER SKILL LEVELS OF BOTH MANAGERS AND NON-MANAGERS



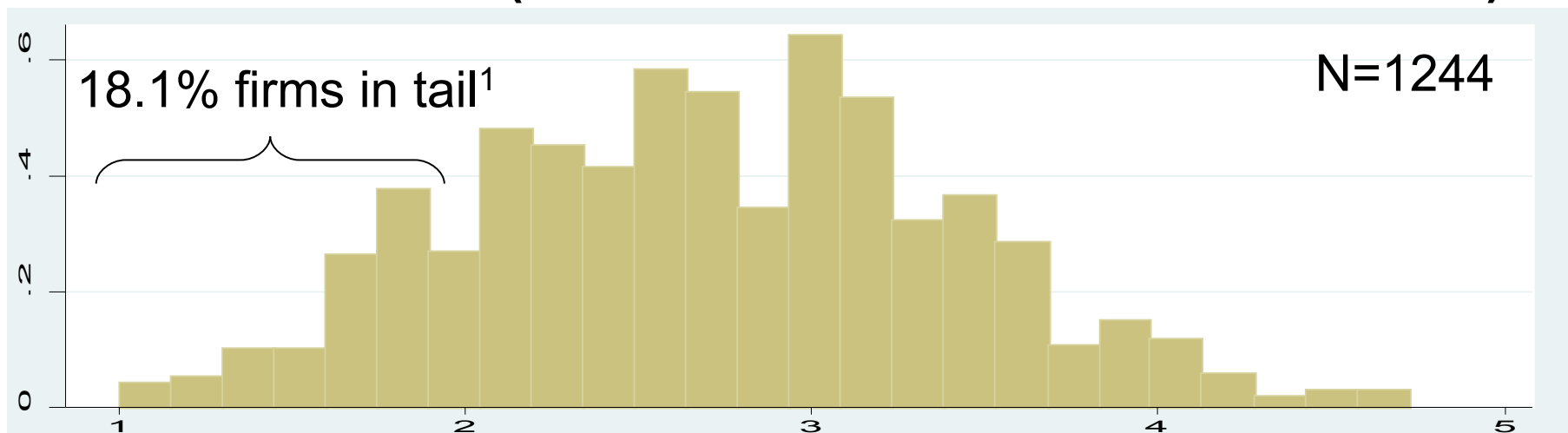
QUANTIFYING EFFECTS OF COMPETITION, FAMILY FIRMS, MULTINATIONAL & LABOR REGS:

- **ACROSS FIRMS ~ 1/2 VARIATION**
- **ACROSS COUNTRIES ~ 1/2 VARIATION**

“GOOD DOMESTIC” (MANY COMPETITORS, NOT PG FAMILY) OR MULTINATIONAL



“BAD DOMESTIC” (FEW COMPETITORS OR PG FAMILY)



¹ Tail defined as a score ≤ 2 . In the whole sample 9.6% of firms are in the tail.

SUMMARY OF FACTORS DRIVING MANAGEMENT QUALITY

- Product market competition
- Multinationals, especially from high productivity countries like US & Japan
- Meritocratic CEO selection
 - These three things account for about 50% of the variation across firms and across countries
- Skills: both worker & managerial (MBA examples)
- Labour market regulations

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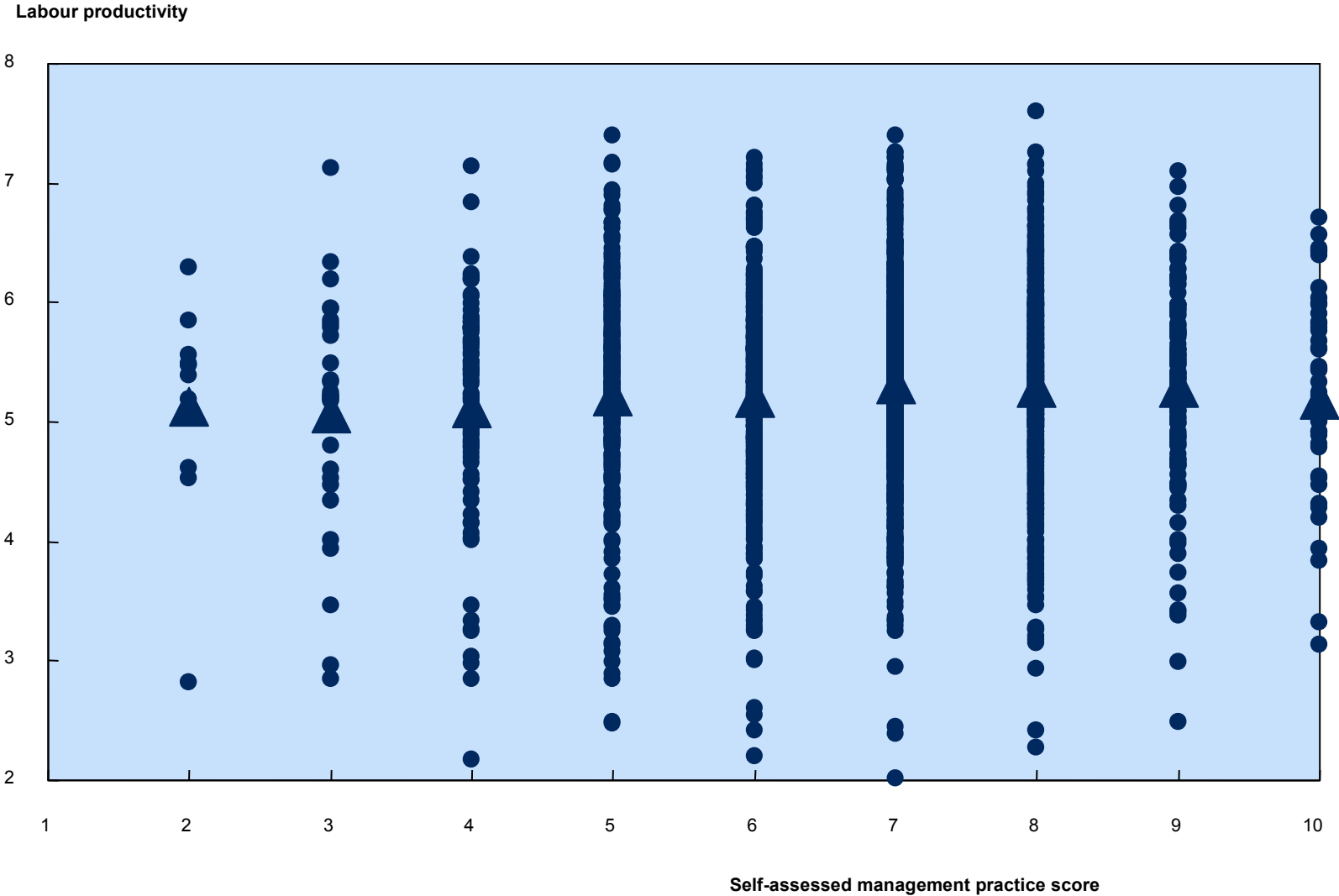
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IMPLICATIONS FOR BUSINESSES

- Good opportunities at home and abroad
 - Multinationals able to thrive in hostile environments
- Why do so many managers get it wrong?

MANAGERS ARE POOR AT SELF-ASSESSING THEIR FIRM'S MANAGEMENT PRACTICE



IMPLICATIONS FOR POLICY MAKERS (1/3)

- **Product market Competition**
 - A key force for selection and incentives
 - Singapore an open market economy
 - Any room for improvement? Competition policy?
Trade policy
 - Public sector (example of UK hospital reforms)
 - Creative destruction & reallocation
- **Openness to foreign investment**

IMPLICATIONS FOR POLICY MAKERS (2/3)

- Meritocratic CEO appointment not eldest sons
 - e.g. Estate tax zero for family firms in UK, creates distortion to promote inefficient family-run firms
 - Singapore government support for some family SMEs (e.g. soft loans)
- Skills & Education
- Immigration issues
 - Report of Singapore ESC
 - Immigration can stimulate innovation & entrepreneurship

IMPLICATIONS FOR POLICY MAKERS – INNOVATION, 3/3)

- Competition again important
- Universities and basic science
- R&D tax credits
 - Significant spillovers so social return exceeds private (Bloom, Schankerman & Van Reenen, 2010)
 - R&D helps “absorb” new knowledge (Griffith, Redding & VR, 2004)
 - R&D tax credits do raise R&D (Bloom, Griffith & VR, 2002)
 - But innovation wider than R&D, e.g. Managerial innovation. Can’t simply subsidise this

CONCLUSIONS

- Recession focuses need to raise productivity in order to grow
- Related to innovation in conventional technology but also to management practices
- Great potential for Singapore given large productivity gap & many positive structural aspects of Singapore
 - Product markets
 - Labour markets
 - Trade & FDI
- “Left tail” of under-performing firms. Many are SME family firms

MY FAVOURITE QUOTES:

The difficulties of defining ownership in Europe

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

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

Americans on geography

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

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

MY FAVOURITE QUOTES:

The traditional British Chat-Up

[Male manager speaking to an Australian female interviewer]

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

Interviewer “Sorry, but I’m washing my hair every night for the next month....”

MY FAVOURITE QUOTES:

The traditional Indian Chat-Up

Production Manager: “Are you a Brahmin?”

Interviewer “Yes, why do you ask?”

Production manager “And are you married?”

Interviewer “No?”

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

MY FAVOURITE QUOTES:

India is such an interesting place...

Plant Manager: “Modern manufacturing? Yes, I have heard about it, but it doesn’t make any sense at all, does it?”

Interviewer: “How do you identify your star performers?”

Manager: “This is India, everyone thinks he is a star performer!”

Interviewer: “How do you keep your top performers?”

Manager: “I am a star performer and I want to leave!”

MY FAVOURITE QUOTES:

Staff rewards the American way

Production Manager: “For example, if an employee suggests a company slogan, and his name is used, he gets a TV.
If he is employee of the month, he gets a parking space”

Staff retention the UK way

Interviewer: “How would you persuade your top performers to stay?”
UK Chairman: “Sex is a great thing! If the employee finds a new girlfriend somewhere else, I can’t do anything!”

Further Reading

1. Bloom and Van Reenen (2007) "Measuring and Explaining Management practices across firms and nations" Forthcoming, *Quarterly Journal of Economics*, Centre for Economic Performance Discussion Paper No. 716 <http://cep.lse.ac.uk/pubs/download/dp0716.pdf>
2. Bloom, Sadun and Van Reenen (2007) "Americans do IT better" Centre for Economic Performance Discussion Paper No. 788
<http://cep.lse.ac.uk/pubs/download/dp0788.pdf>
3. Lisbon agenda
http://cep.lse.ac.uk/briefings/pa_lisbon_agenda.pdf
4. UK productivity improvements :
http://cep.lse.ac.uk/briefings/pa_uk_productivity.pdf