5 Growth Mysteries in Search of a Broader Innovation Policy

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Policy Research Talk
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May 19, 2014

References

- “Engineers, Innovative Capacity, and Development” (2014) with Felipe Valencia Caicedo
- “Why Don’t Poor Countries Do R&D?” (2014) with Edwin Goñi Pacchioni
- “The Persistence of Fortune” (2013) with Felipe Valencia Caicedo.
- “Does What You Export Matter?: In Search of Guidance for Industrial Policies “ with Daniel Lederman
- “Immigrants, Entrepreneurship and Development”
- “Risk and Quality Upgrading” with Pravin Krishna

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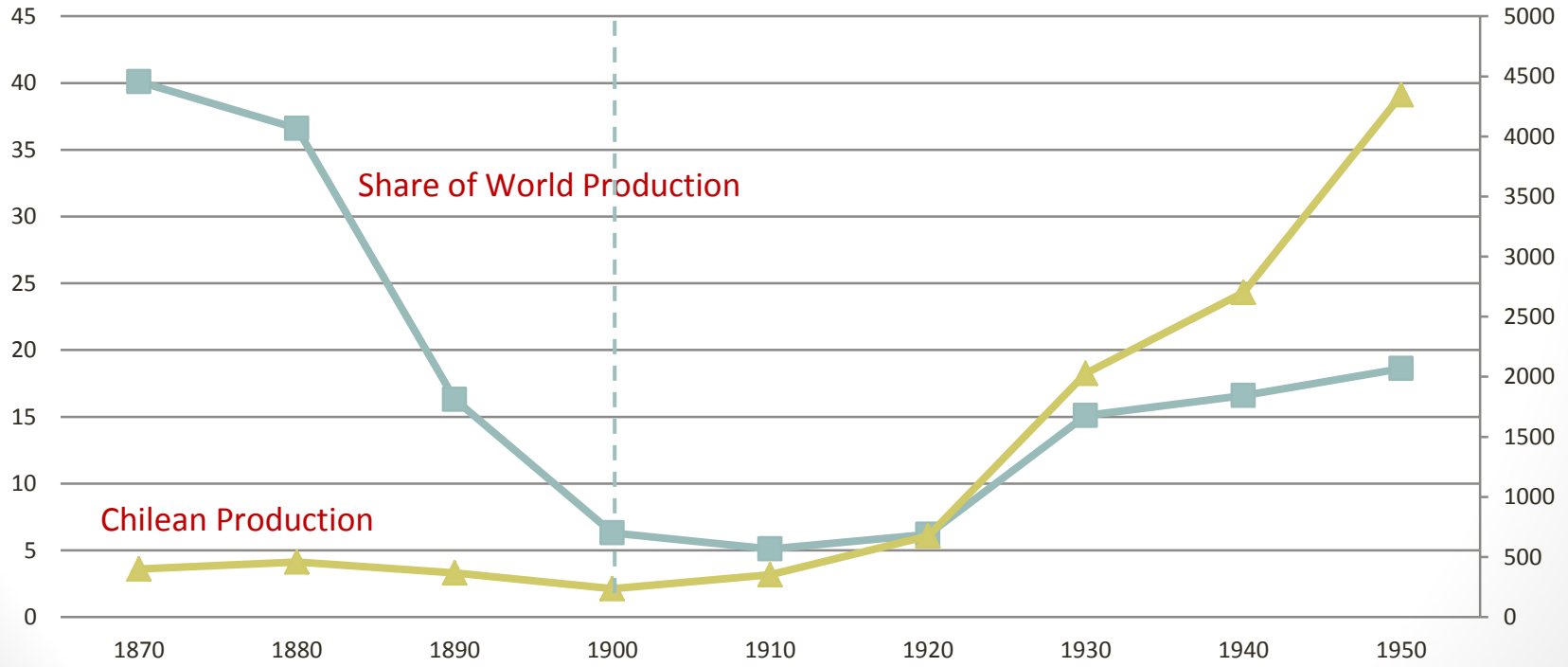
ANCIENT HISTORY

Mystery I:
Same good, different development results

Copper in Chile, 1870-1950:
Production and Share of World Production



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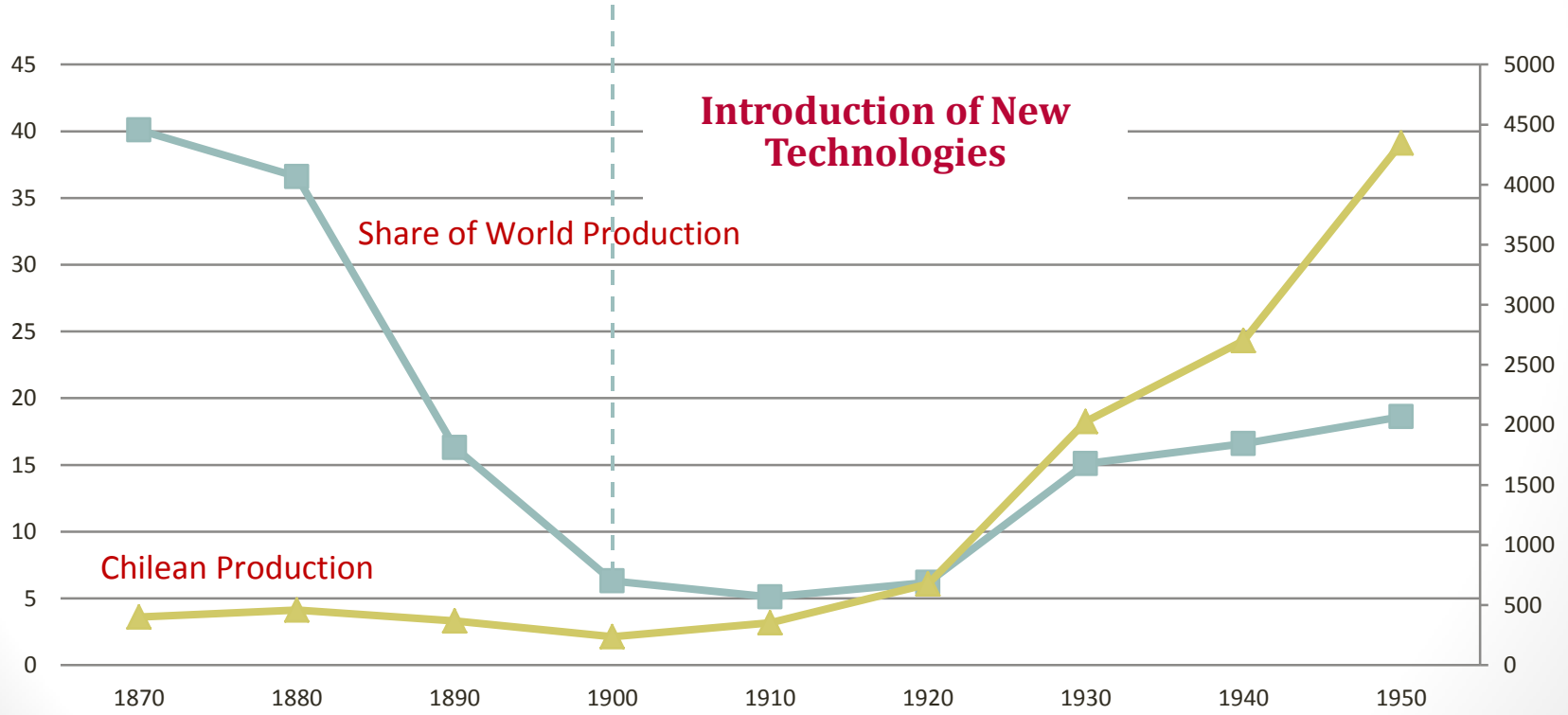


Mystery II: Same climate, differing abilities to introduce new products/firms

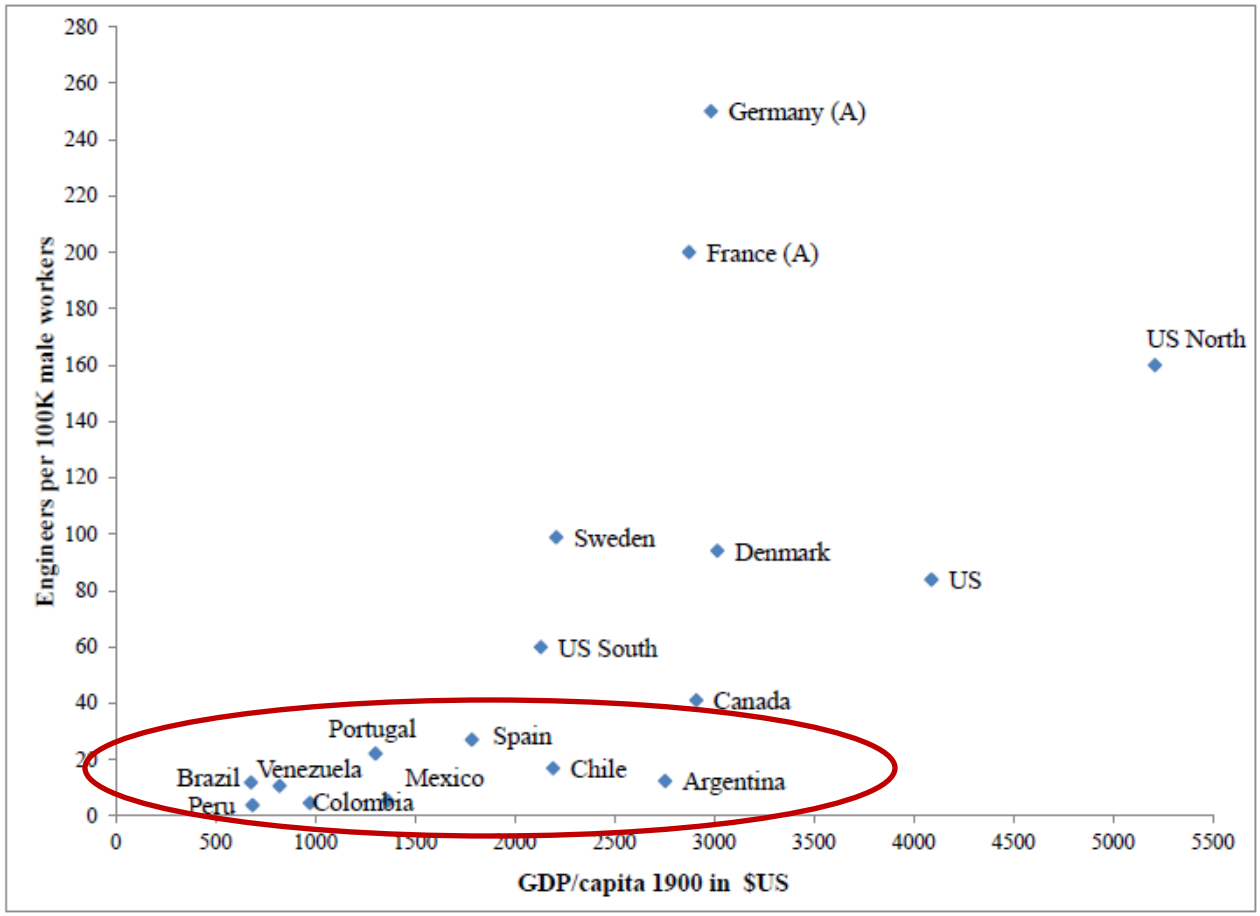
Percentage of Firms Owned/Managed by Immigrants

Country	Year	Immigrants as % Owners	Immigrants as % Population	Ratio
Argentina	1900	80	30	2.7
Brazil (Sao Paulo)	1920-1950	50	16.5	3.0
Chile	1880	70	2.9	24.1
Colombia (Antioquia)	1900	5	4.7	1.1
Colombia (Barranquilla)	1888	60	9.5	6.3
Colombia (Santander)	1880	50	3	16.7
Mexico	1935	50	0.97	51.5
		Ex Samurai		
Japan (Shizoku)	1868-1912	50	5	10

Source: Maloney (2014)

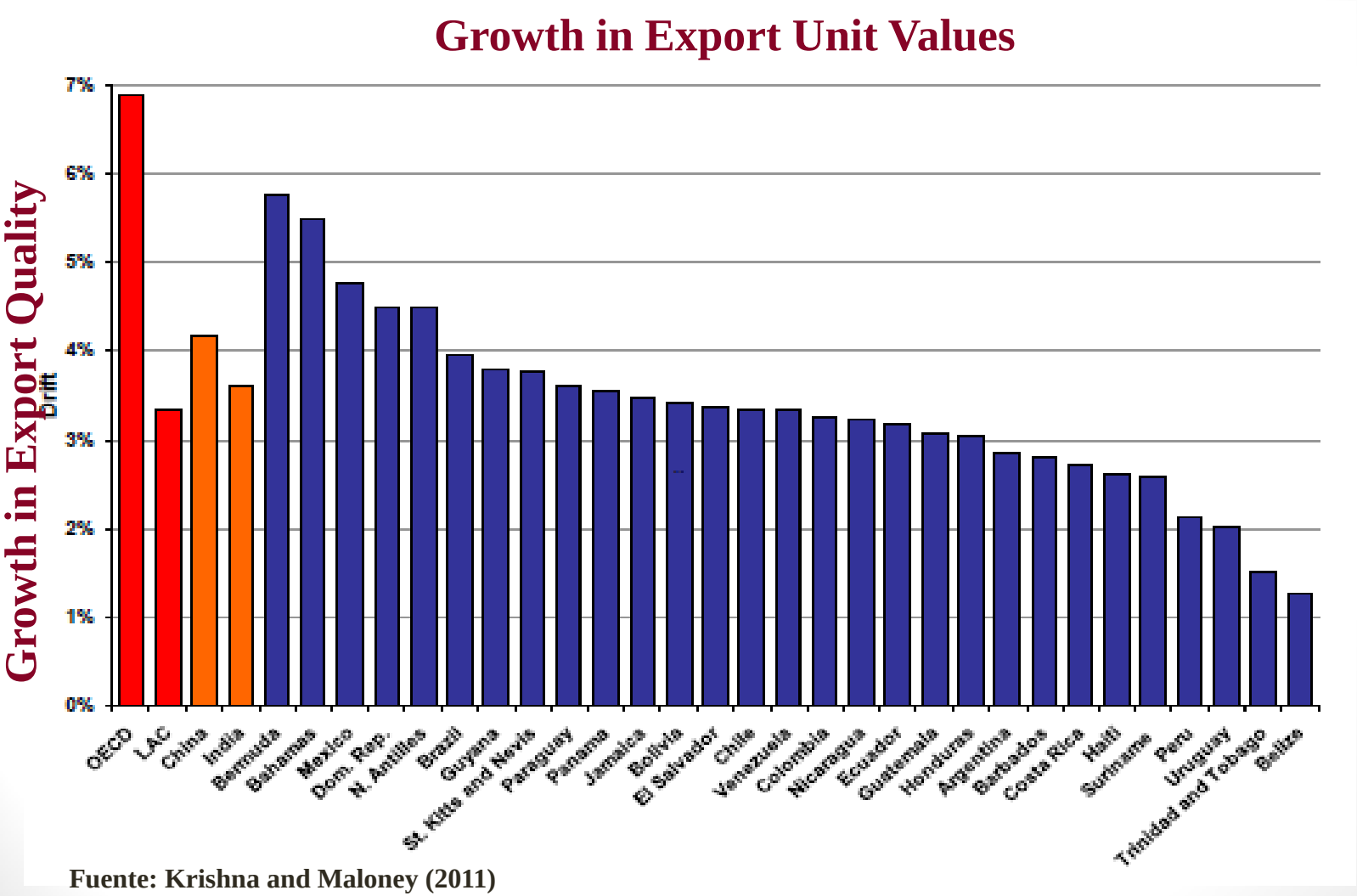
Weak innovative capacity explains why new technologies introduced by foreigners.

Density of Engineers and GDP/Capita (1900)



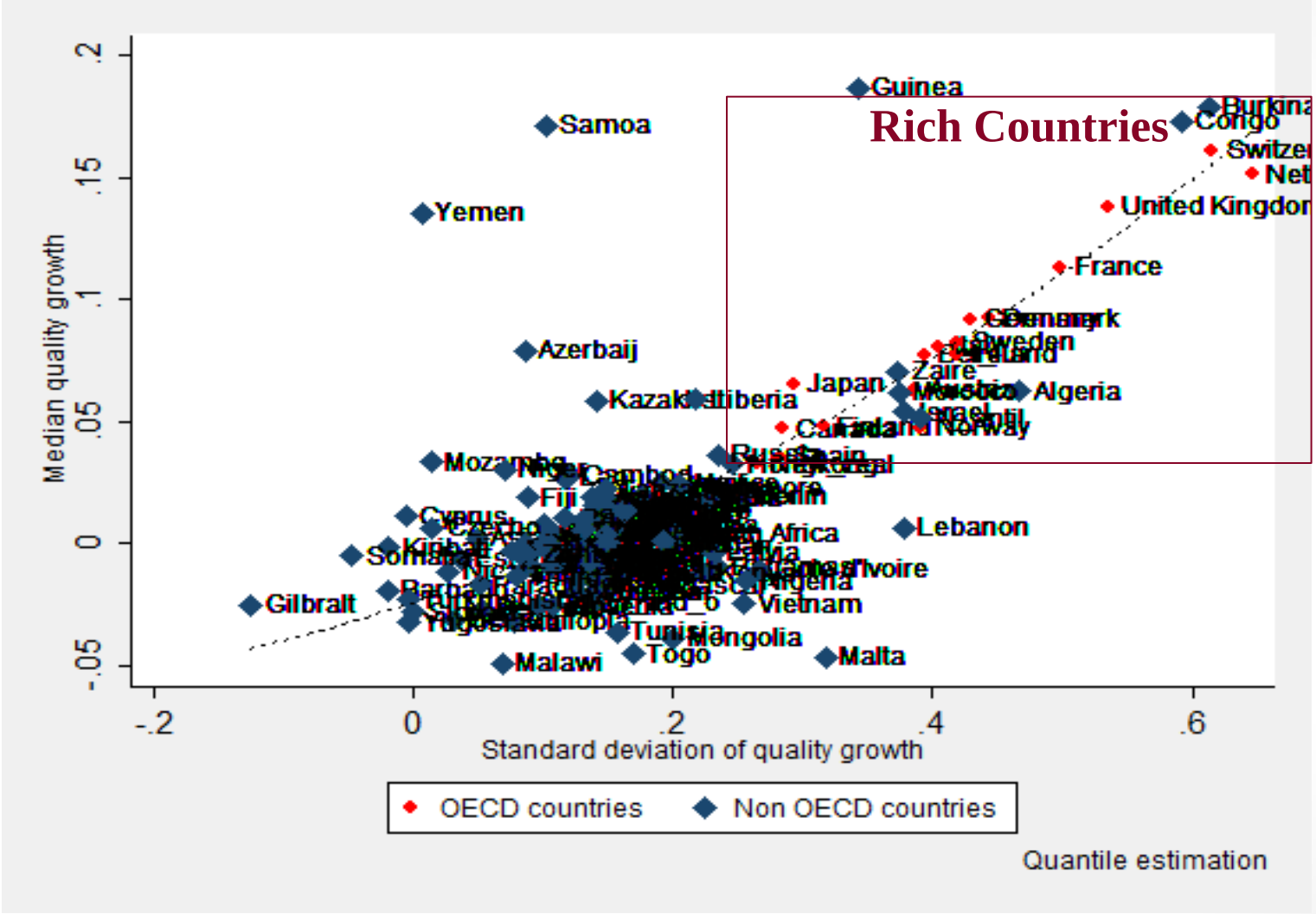
Fuente: Maloney y Valencia (2014)

Mystery III: Why are we not seeing catch up in export quality?



Fuente: Krishna and Maloney (2011)

Innovation implies risk



Fuente: Krishna and Maloney (2013)

Summary

- Goods can be produced with very different levels of sophistication and quality.

- Not enough to focus on narrow measures of technological progress- # engineers, patents, R&D.
  - Management
  - Financial Markets etc?

MYSTERY IV: WHY DON'T POOR COUNTRIES DO R&D?

Estimated returns to R&D are very high

- US firm level/industry data- social returns
  - Bloom et al (2013) US 55%
  - Griffith, Redding, Van Reenen (2004) US 57%
  - Jones and Williams (1998) US 28%
- Jones and Williams (1998): US should quadruple investment in RD
  - Doraszelski and Jaumandreu (2013) Spain 40%

…and get higher with distance from the frontier

- Two Faces of R&D (Cohen and Levinthal 1989)
  - Invention
  - Learning\Catch-up
  - Poor countries should have much greater returns

- Griffith, Redding, Van Reenen (2004)

	Dist. Frontier	RoR R&D
USA	-.18	57%
UK	-.53	77%
Italy	-.73	88%

- What should the rate of return be for Korea (-1.33), Malaysia (-2.28), Indonesia (-3.74)? 200%? 300%?

When we consider that

1. 50% of growth is attributed to factor productivity a large part of which is probably innovation.

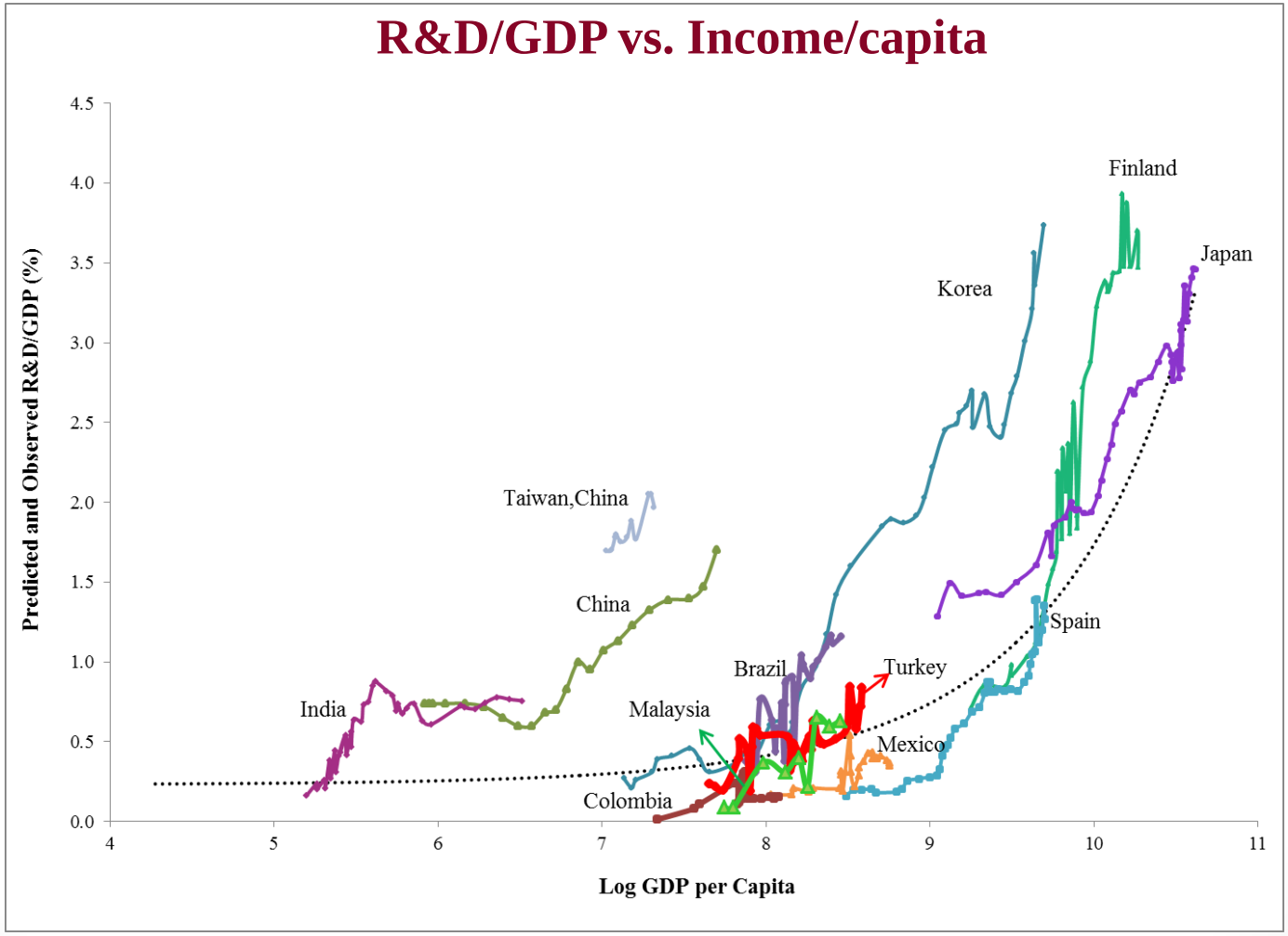
2. Innovation is essential for the diversification of the economy, and taking advantage of FTAs.

3. Key to address Dutch Disease and resource curse.

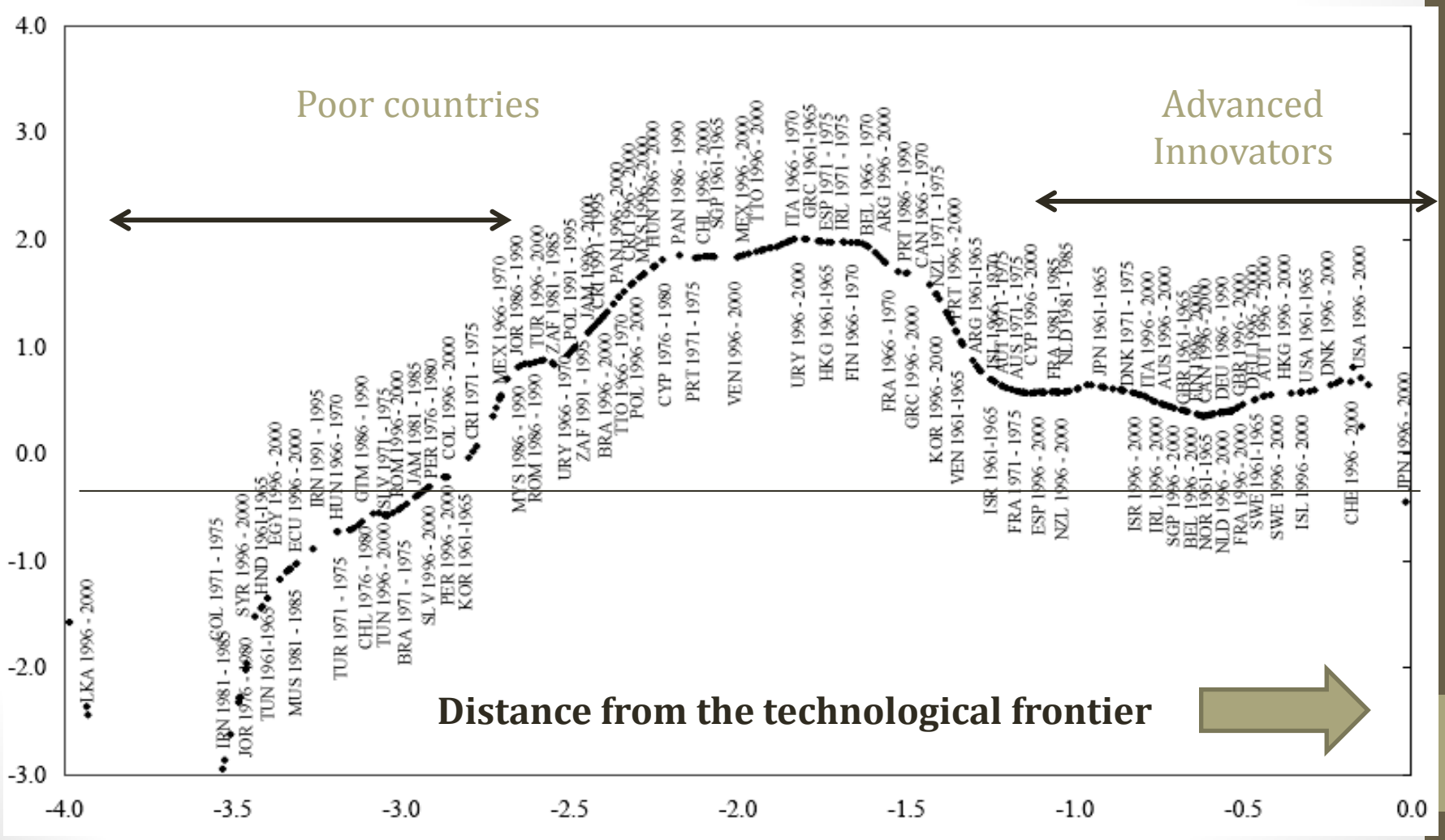
4. Essential to generate more challenging jobs.

To paraphrase Lucas (1978), it's hard to think of anything else!!!!!

Mystery IV: So why don't poor countries do more R&D?



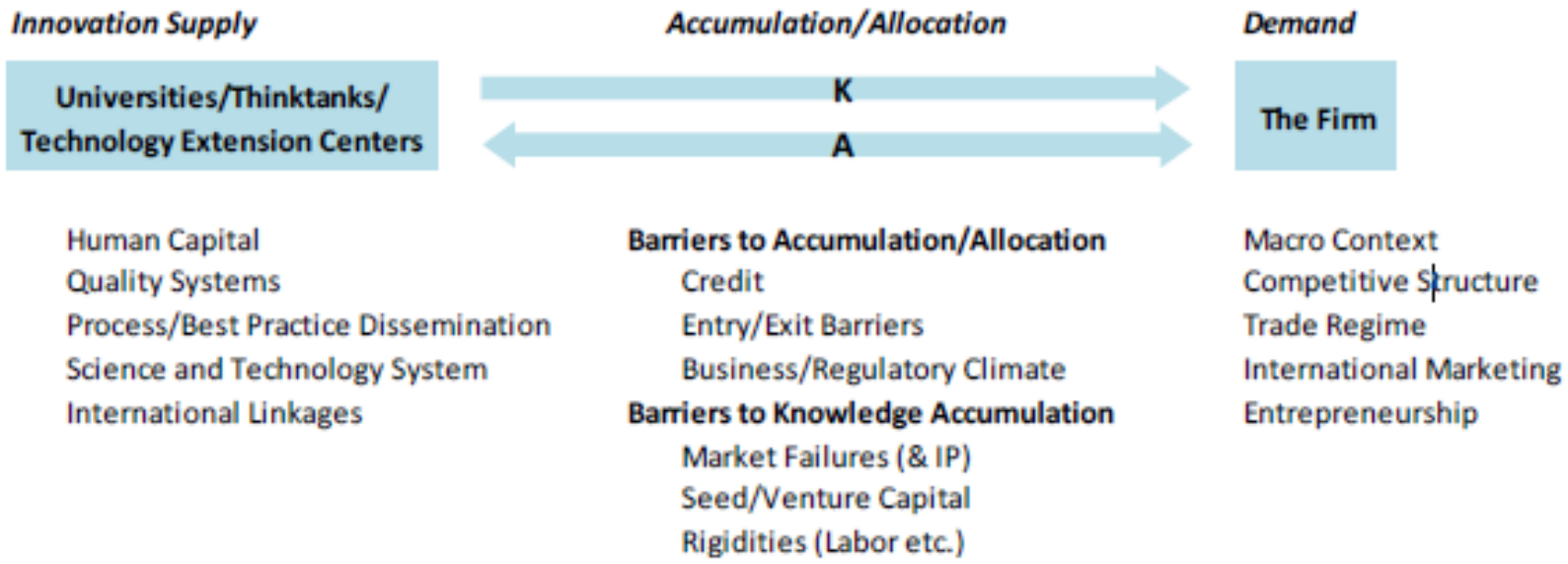
Because maybe they don't get Griffith et al's high returns to R&D!



Source: Goñi, and Maloney (2014)

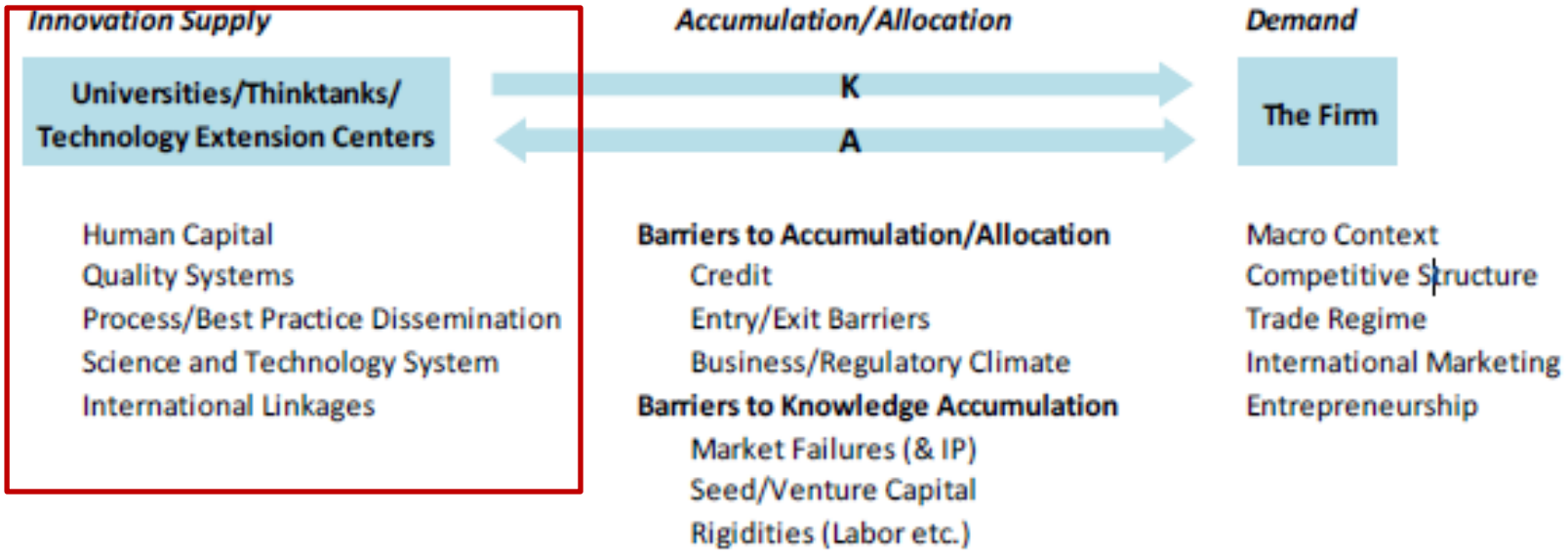
MISSING INGREDIENTS IN THE NATIONAL INNOVATION SYSTEM?

The Greater National Innovation System



SUPPLY SIDE

The Greater National Innovation System



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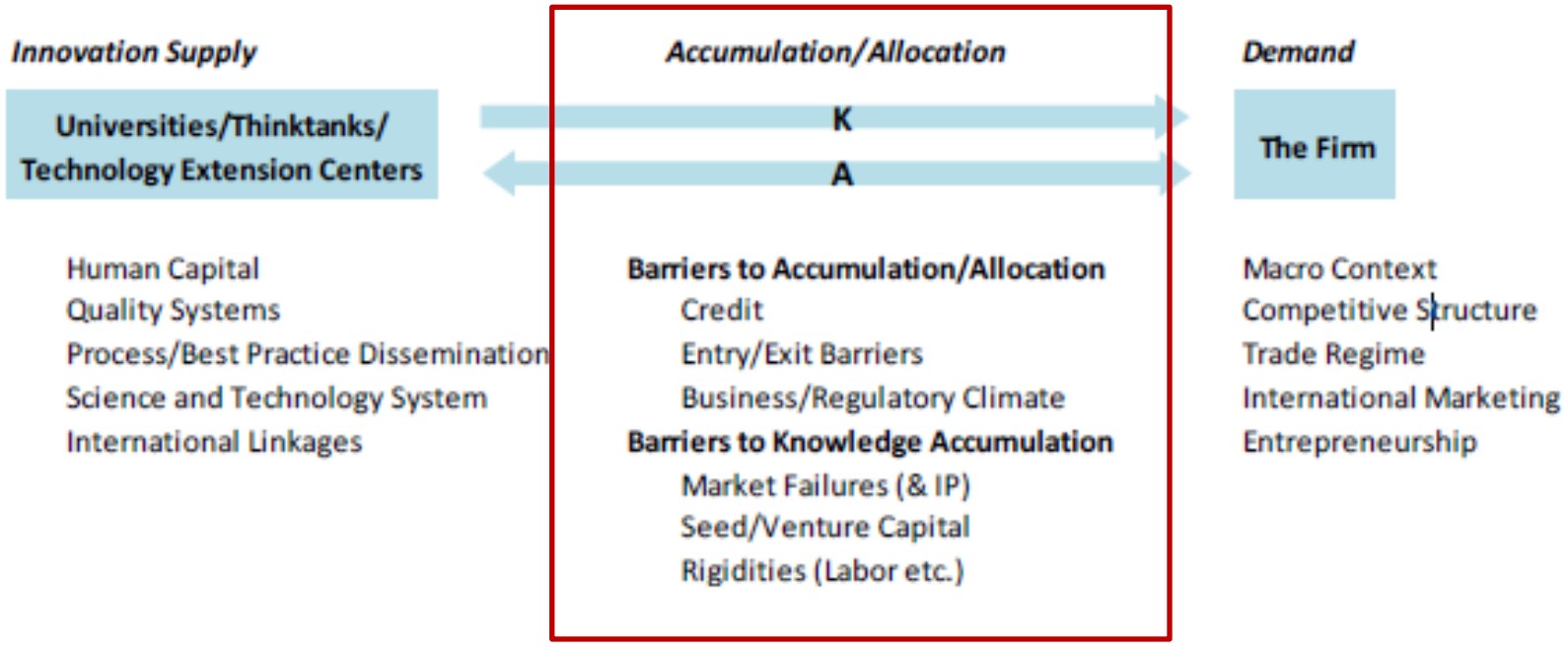


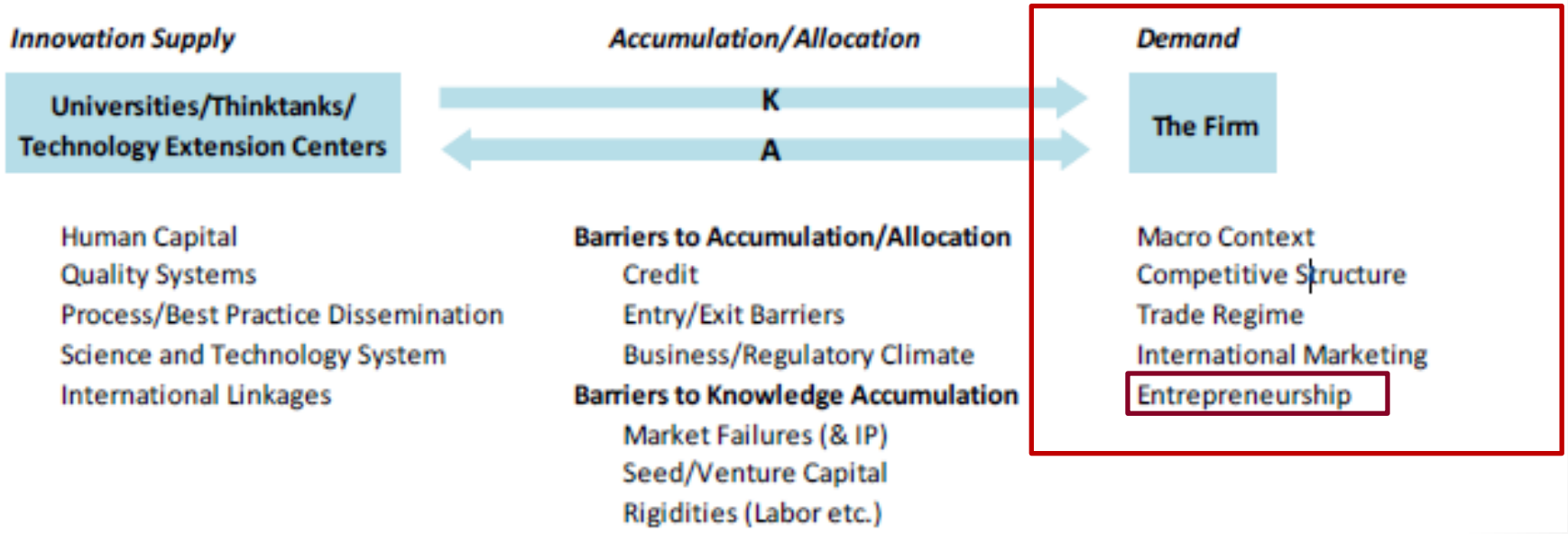
BARRIERS TO ACCUMULATION

Policy Issues

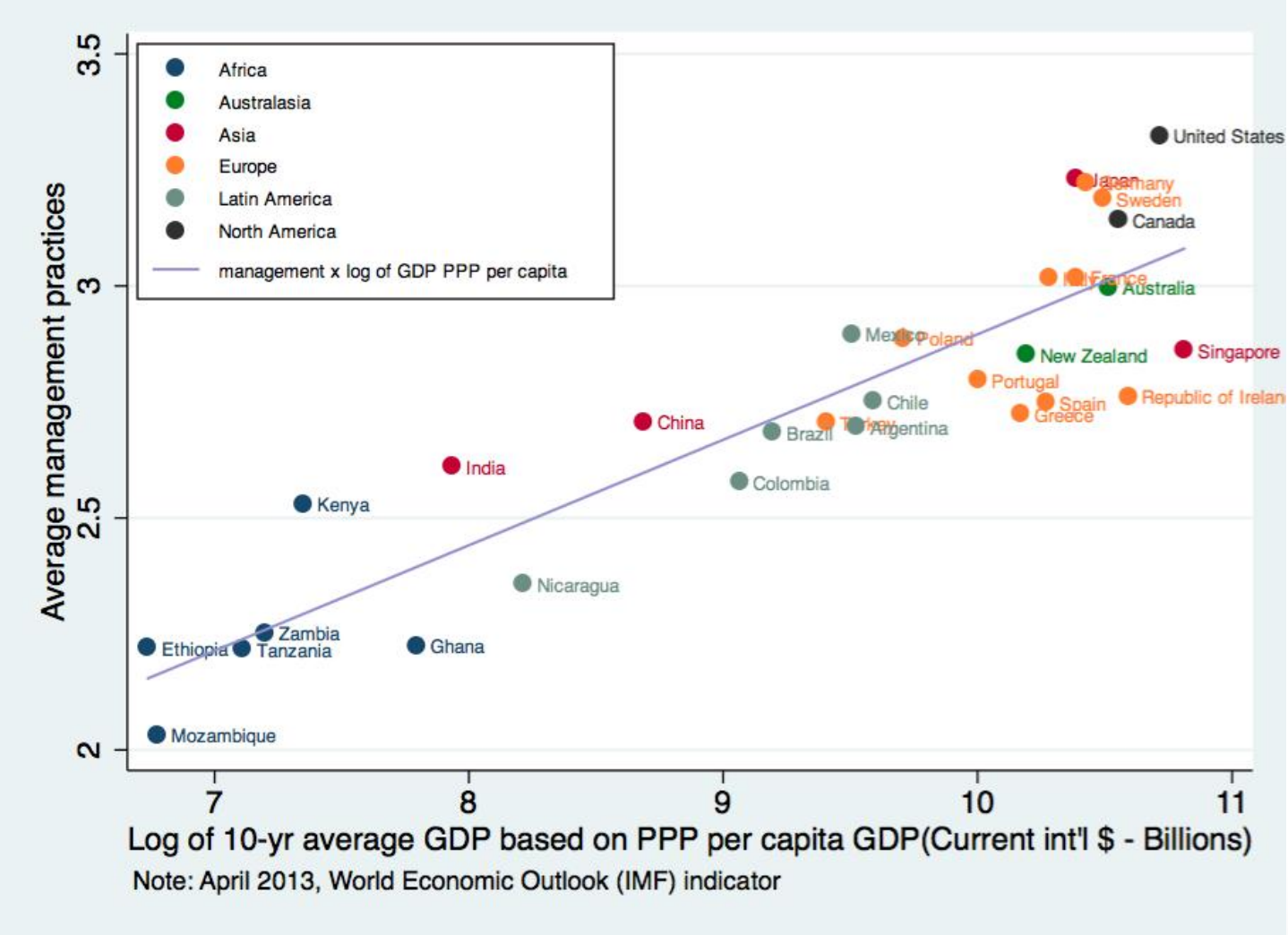
- Measurement
  - Can't focus on accumulation of Knowledge capital without overall system of accumulation
- Whole business climate
- Is the financial sector diversifying risk?
- Entry and Exit. Bankruptcy laws?
- Social attitudes toward failure?
- Clear property rights in distributing winnings?

DEMAND SIDE

The Greater National Innovation System



Management Quality and GDP



Source: Bloom, Van Reenen et al World Management Survey 2014

Sub-Dimensions of Management

Fuente: Bloom et al. 2010, DNP, WB

So why is Antioquia not Boston?

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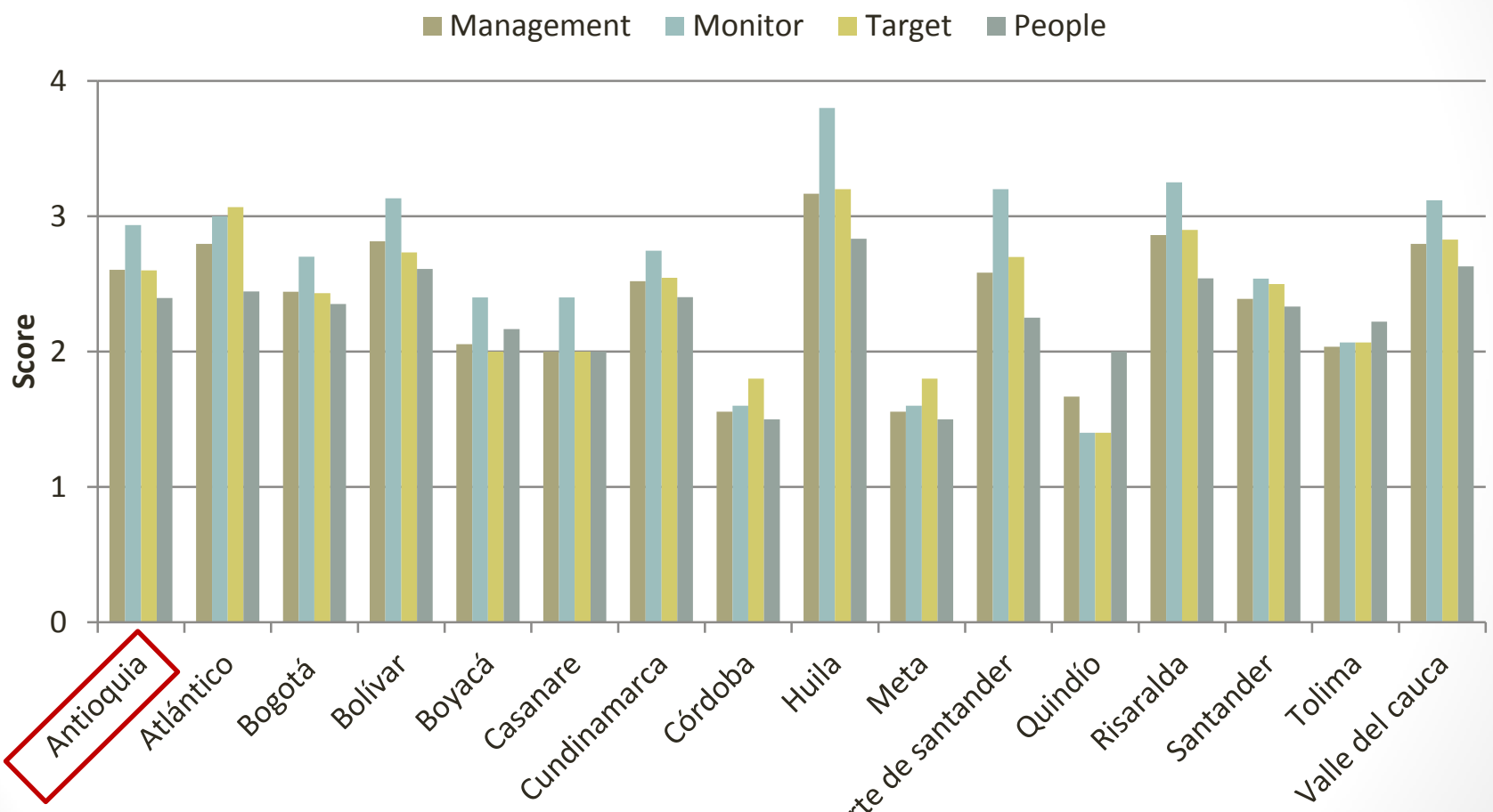
Source: Maloney (2014)

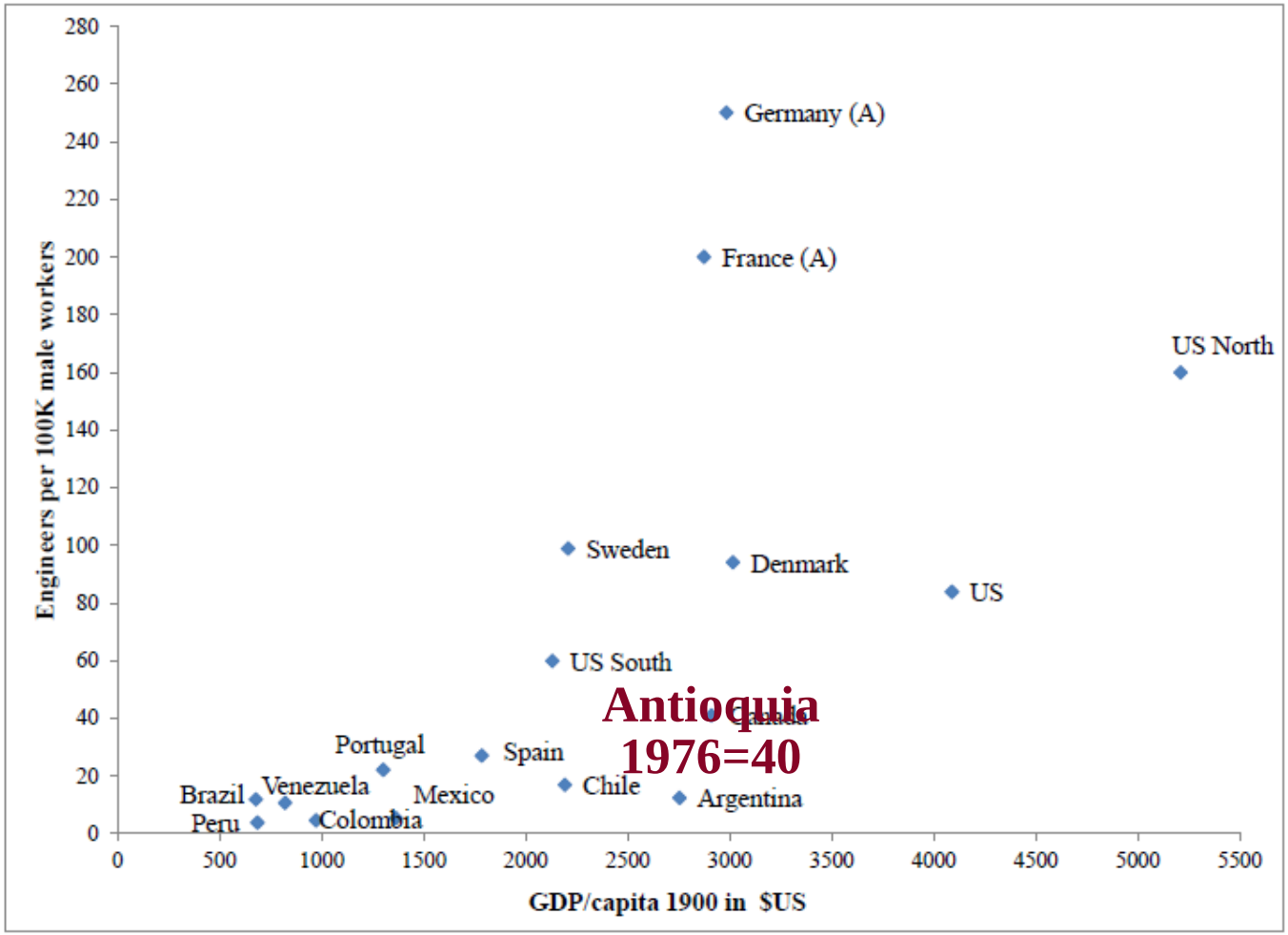
Antioquia lost its Mojo!!!



Fuente: DNP, BM (2014)

Antioquia is where US South was in 1900..lack of demand for innovation?

Density of Engineers and GDP/Capita (1900)



Fuente: Maloney y Valencia (2014)

China, too, lacks management skills for innovative firms

		Mean all countries	China's Value	Rank (of 21 countries)
Management	Average of all management questions	2.9391	2.8757	14
	Sub-subcomponents			
O1	Introduction to Lean (Modern) Manufacturing	2.8464	2.5917	16
O2	Rationale for Lean (Modern) Manufacturing	2.9161	2.6095	17
M1	Process Documentation	3.1904	2.9588	16
M2	Performance Tracking	3.3595	3.3941	8
M3	Performance Review	3.3236	3.4647	6
M4	Performance Dialogue	3.1674	2.9647	18
M5	Consequence Management	3.1082	2.8765	19
T1	Type of Targets	2.9063	2.5706	19
T2	Interconnection of Goals	3.0623	3.0882	9
T3	Time Horizon	2.8714	2.6294	17
T4	Goals are Stretching	2.9744	2.7588	17
T5	Clarity of Goals and Measurement	2.6862	3.1824	1
P1	Instilling a Talent Mindset	2.4244	2.5647	7
P2	Building a High-Performance Culture	2.5484	3.0765	2
P3	Making Room for Talent	3.0080	2.8765	14
P4	Developing Talent	2.9888	2.7353	17
PI5	Creating a Distinctive EVP	3.0270	2.9941	13
P6	Retaining Talent	2.4948	2.4294	11
See Annex for detail on categories. Rank: 1 correspond to the country with the highest value				

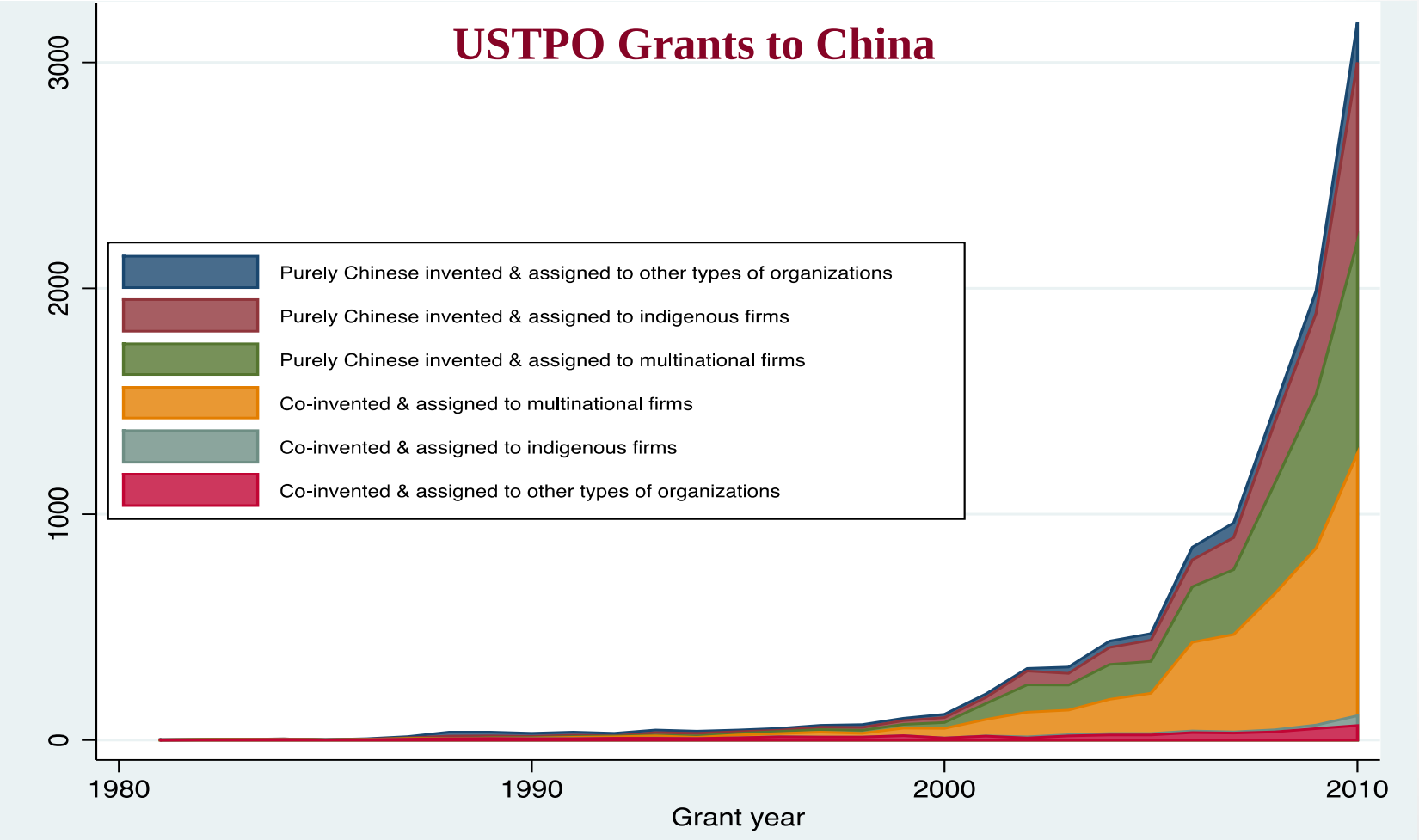
Source: Maloney 2014

In sum

- Latin America
  - Potemkin Industrialization? No capital goods, no potential for advance?
  - Never developed either managerial or innovative capacity
  - Doomed to do whatever it does in a low-tech fashion?

- China???

Mystery V: So why does China do so much R&D?: China imported US and Taiwan's NIS!



Source: Branstetter 2012

Policies

- Japan, Korea, Singapore: All employ programs supporting management-Kaizen, 5S- see SME's being left behind by Chaebol and MNCs
  - Japan: National Productivity Center; Deming Quality System.
  - Korea: The Small and Medium Industries Promotion program
  - Singapore: Local Industry Upgrading Program (LIUP)
  - India: (Bloom, McKenzie… 2013)
- Colombia Technolology Extension Pilot (Maloney, McKenzie, Iacovone)
- Establish the foundation to progressively better adoption of new technologies.

Conclusion

- Perhaps *ad nauseu*m: Not what, but how you produce
- Effort to improve productivity through adoption of existing technologies is one of central development tasks
- Requires a broad view of the National Innovation System.

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