Misallocation and Productivity

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Symposium on Growth and Development

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Outline

1. Macro productivity residual
2. Micro productivity gaps
3. Evidence on misallocation

Growth Accounting

$$\frac{Y}{L} = A \cdot F\left(\frac{K}{L}, \frac{H}{L}\right)$$

U.S. 1961–2011 annual growth rates:

$g_{Y/L}$	g_F	g_A
2.31%	1.14%	1.17%

Source: U.S. Bureau of Labor Statistics

Development Accounting

Ratio of rich (90th percentile) to poor (10th percentile) countries:

$$\underbrace{\frac{Y}{L}}_{24} = \underbrace{A}_{3-6} \cdot \underbrace{F\left(\frac{K}{L}, \frac{H}{L}\right)}_{4-8}$$

Again, a large productivity residual.

Sources: Caselli (2005), Erosa, Koreshkova and Restuccia (2010)

Is the Residual Entirely Technology?

Poorest countries using 100 year old technology???

Maybe in subsistence agriculture, informal sectors.

But diffusion is not that slow for many 20th c. technologies.

Comin and Hobijn (2010), Comin and Mestieri (2010)

Soviet Growth

1928–1987 annual growth rates:

$g_{Y/L}$	g_F	g_A
2.9%	3.3%	-0.4%

Source: Easterly and Fischer (1994)

Allocative Efficiency?

In Econ 1, we say markets are generally good at allocating resources.

So not surprising to see low productivity in the Soviet Union.

Or in Communist China.

Or under the License Raj in India.

Quantitative Theory on Allocative Efficiency

Key references:

- Banerjee and Duflo (2005)
- Restuccia and Rogerson (2008)

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Revenue Productivity vs. Real Productivity

$$Y_i = A_i \cdot F(K_i, L_i)$$

Real productivity $= A_i$

If i are different products, do not want all inputs at $\arg\max_i(A_i)$.

Revenue productivity $= P_i \cdot A_i$

If proportional to marginal products, want this to be equalized.

Misallocation and Reallocation

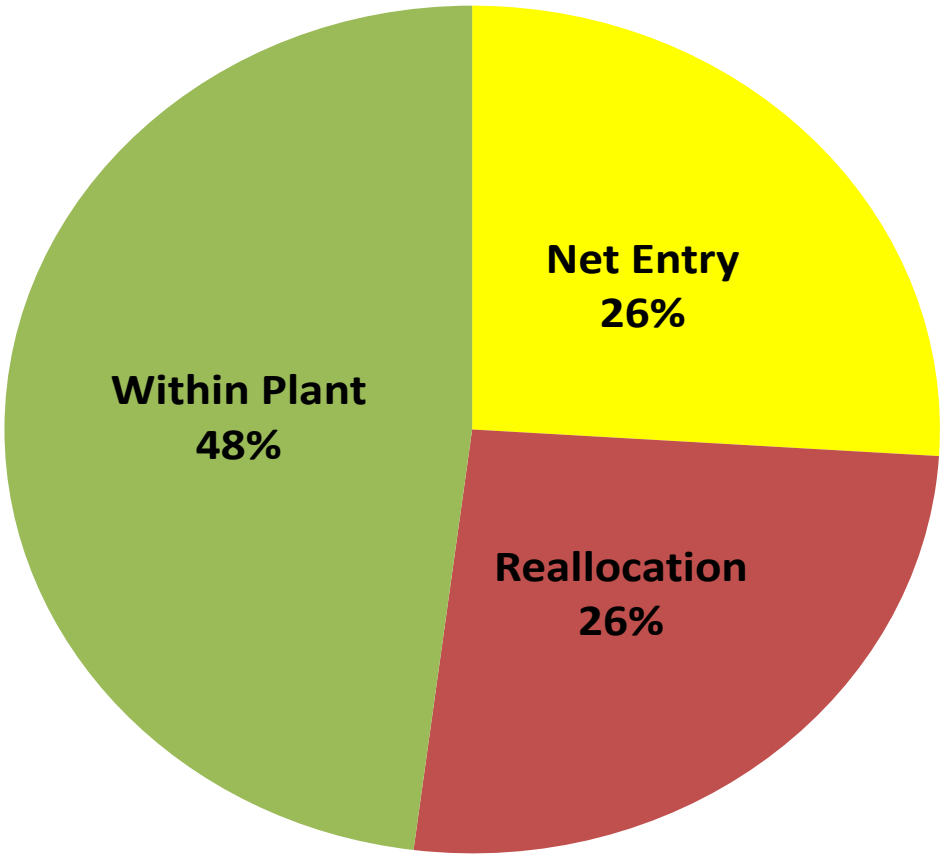
Misallocation:

$$P_i \cdot A_i \neq P_j \cdot A_j$$

Reallocation:

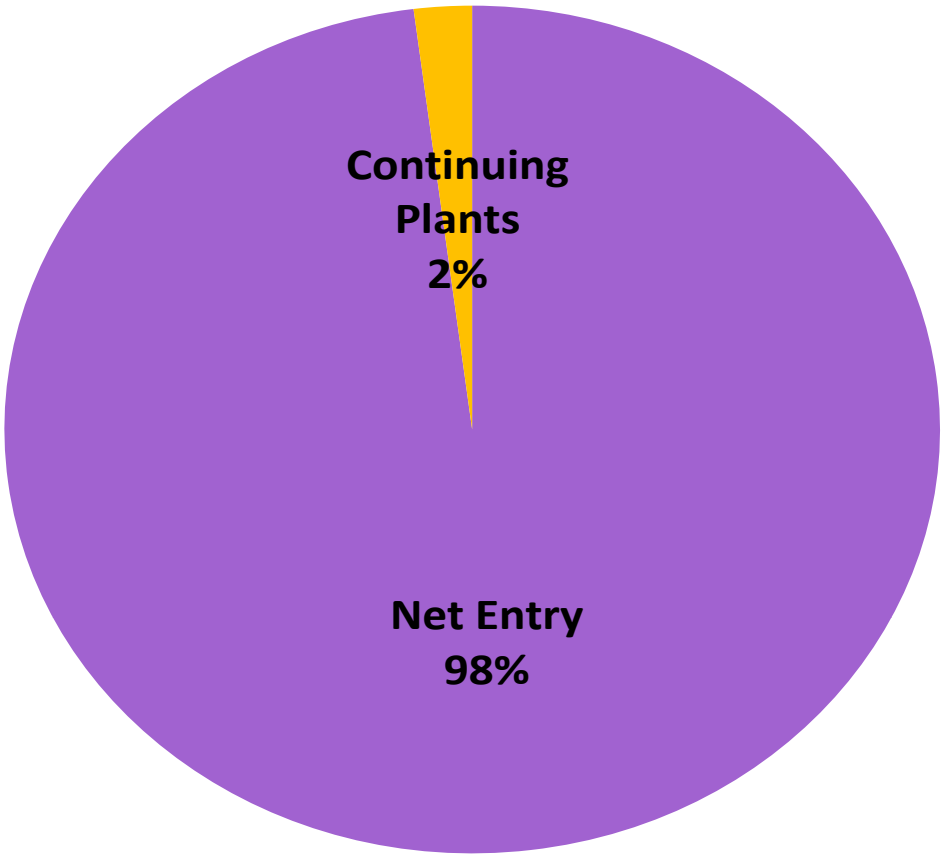
$$\frac{\sum_i \left(P_i \cdot A_i - P \cdot A\right) \Delta F_i}{P \cdot A}$$

U.S. Manufacturing Productivity Growth, 1977-1987



Source: Foster, Haltiwanger and Krizan (2001)

U.S. Retail Productivity Growth, 1987-1997



Sources: Foster, Haltiwanger and Krizan (2006)

Wal-Mart Elsewhere

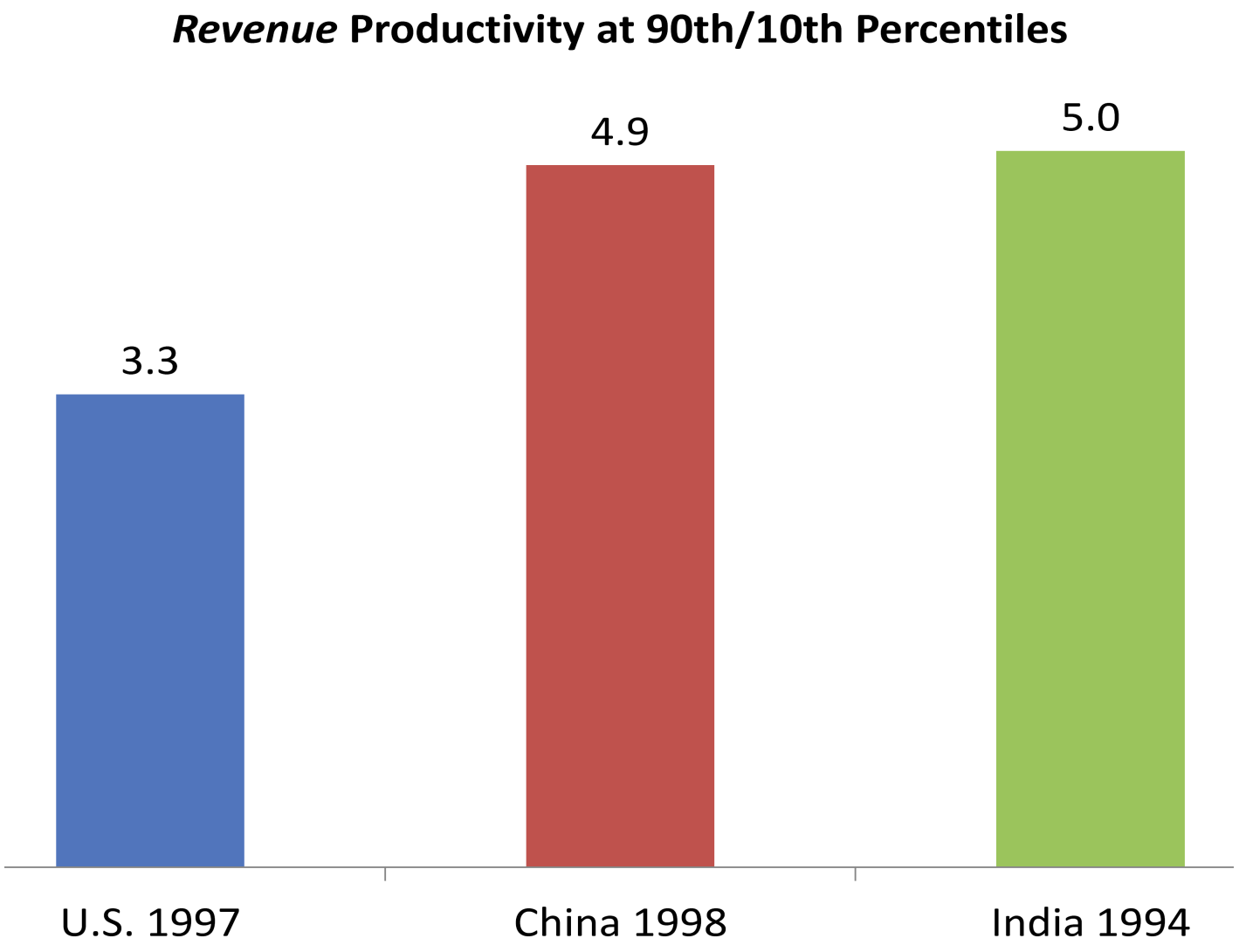
India won't let Wal-Mart enter.

Neither will many big U.S. cities.

Mexican retail had been dominated by small outlets with lower productivity than big stores.

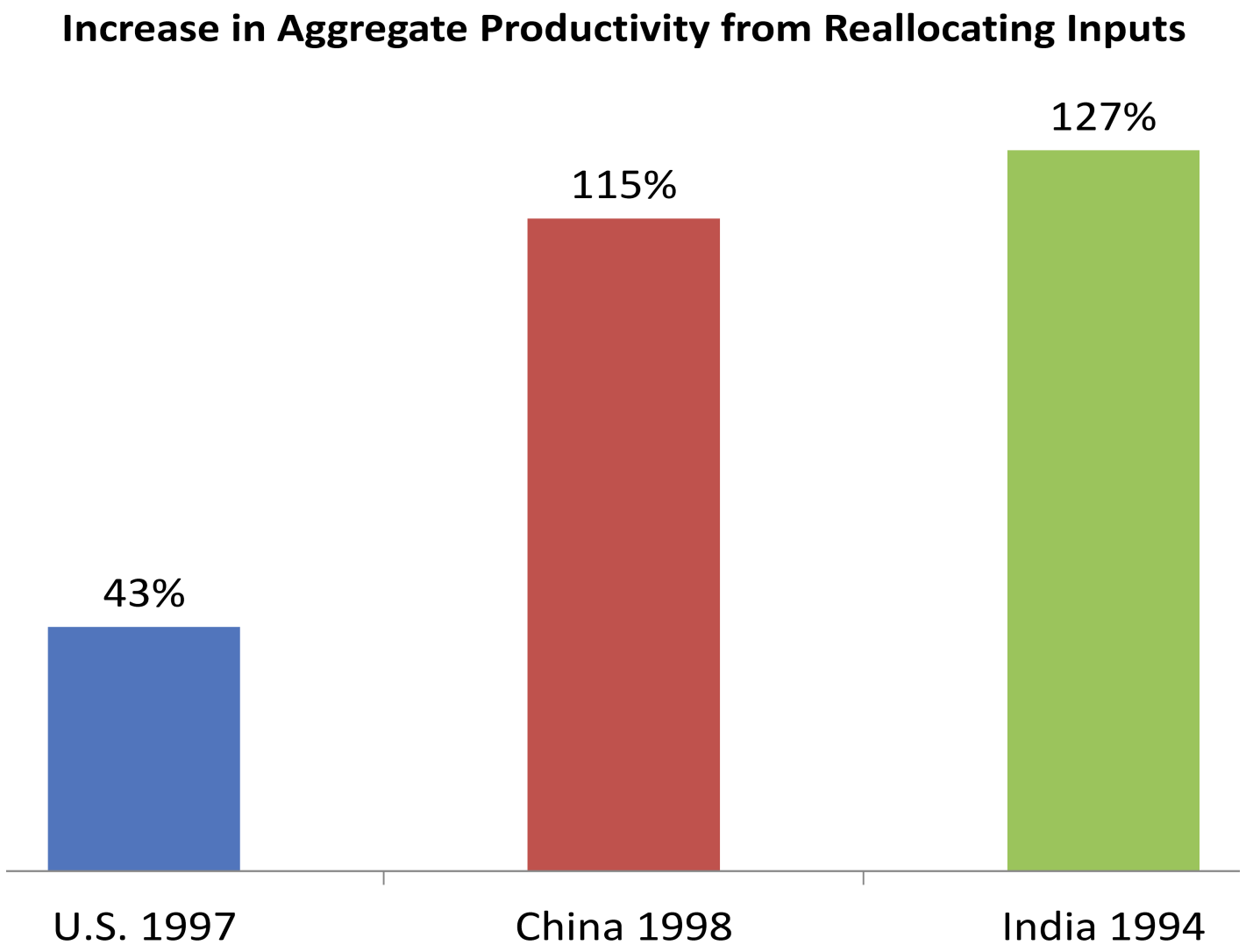
Now Wal-Mart is the biggest private employer in Mexico.

Productivity Gaps in China and India vs. the U.S.



Source: Hsieh and Klenow (2009).

Hypothetical Gains from Equalizing Productivity



Source: Hsieh and Klenow (2009)

Micro Productivity Gaps in other Countries

Latin America (Inter-American Development Bank, 2010)

Europe (Bartelsman, Haltiwanger and Scarpetta, 2011)

Big micro productivity gaps, consistent with misallocation.

But not so correlated with income per capita.

Reallocation and Growth: China vs. India

Rapid productivity growth in Chinese manufacturing 1998–2007.

2/3 from net entry (Brandt, Van Biesebroeck and Zhang, 2012)

Rapid productivity growth in Indian manufacturing 1980–2007.

But not from reallocation (Bollard, Klenow and Sharma, 2012).

Outline

1. Macro productivity residual
2. Micro productivity gaps
3. Evidence on misallocation

Why do we need to know the sources?

To confirm the misallocation is real rather than ...

- Measurement error
- Model misspecification

And to guide policy

- Which reforms will have the biggest productivity payoff?

Evidence on Five Sources

1. Adjustment costs
2. State-owned enterprises
3. Informality
4. Trade costs
5. Allocation of talent

#1 Adjustment Costs

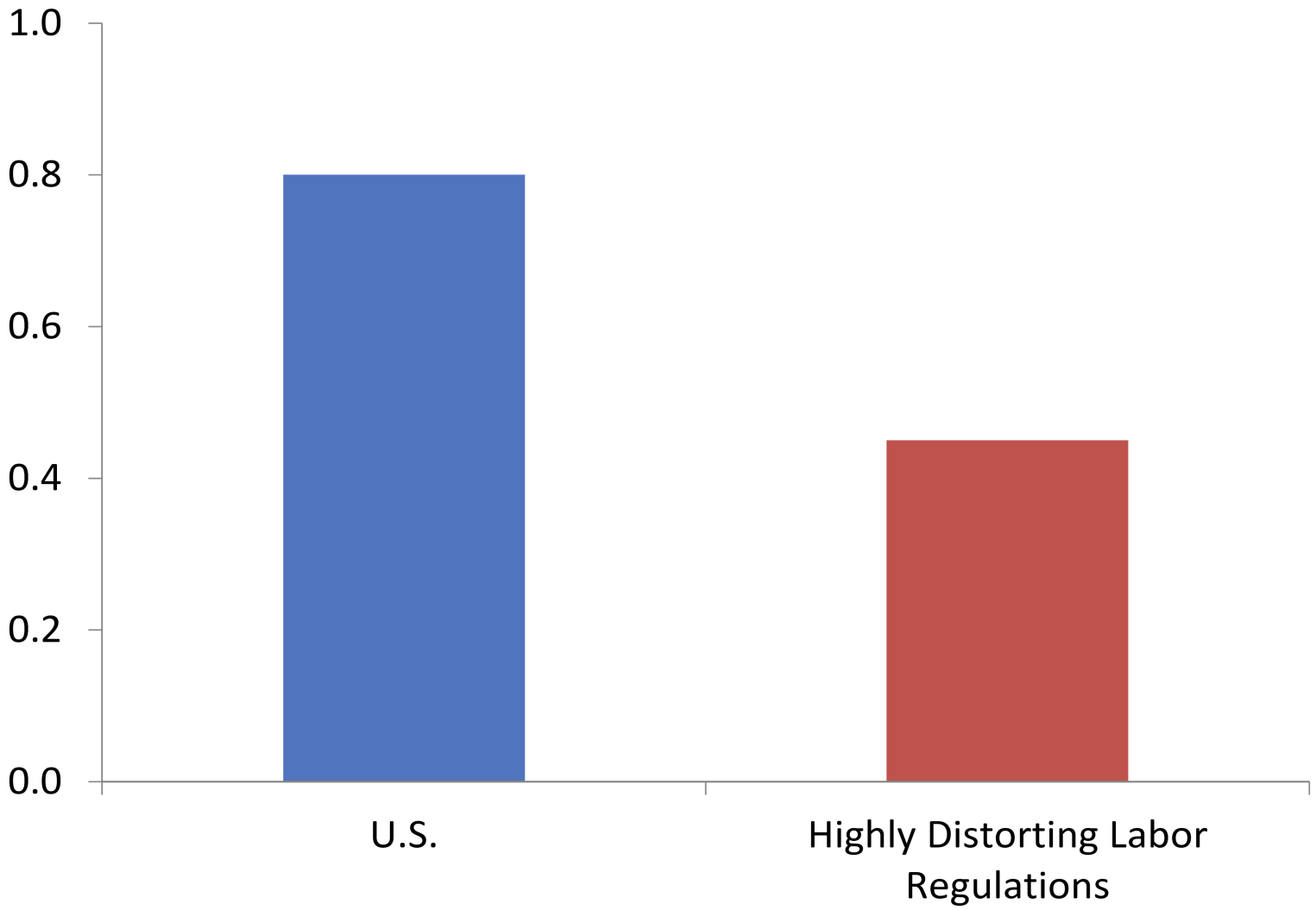
Pervasive evidence:

- Labor (e.g. Caballero, Engel and Haltiwanger, 1997)
- Capital (e.g. Cooper and Haltiwanger, 2006).

Can they help explain *country variation* in micro productivity gaps?

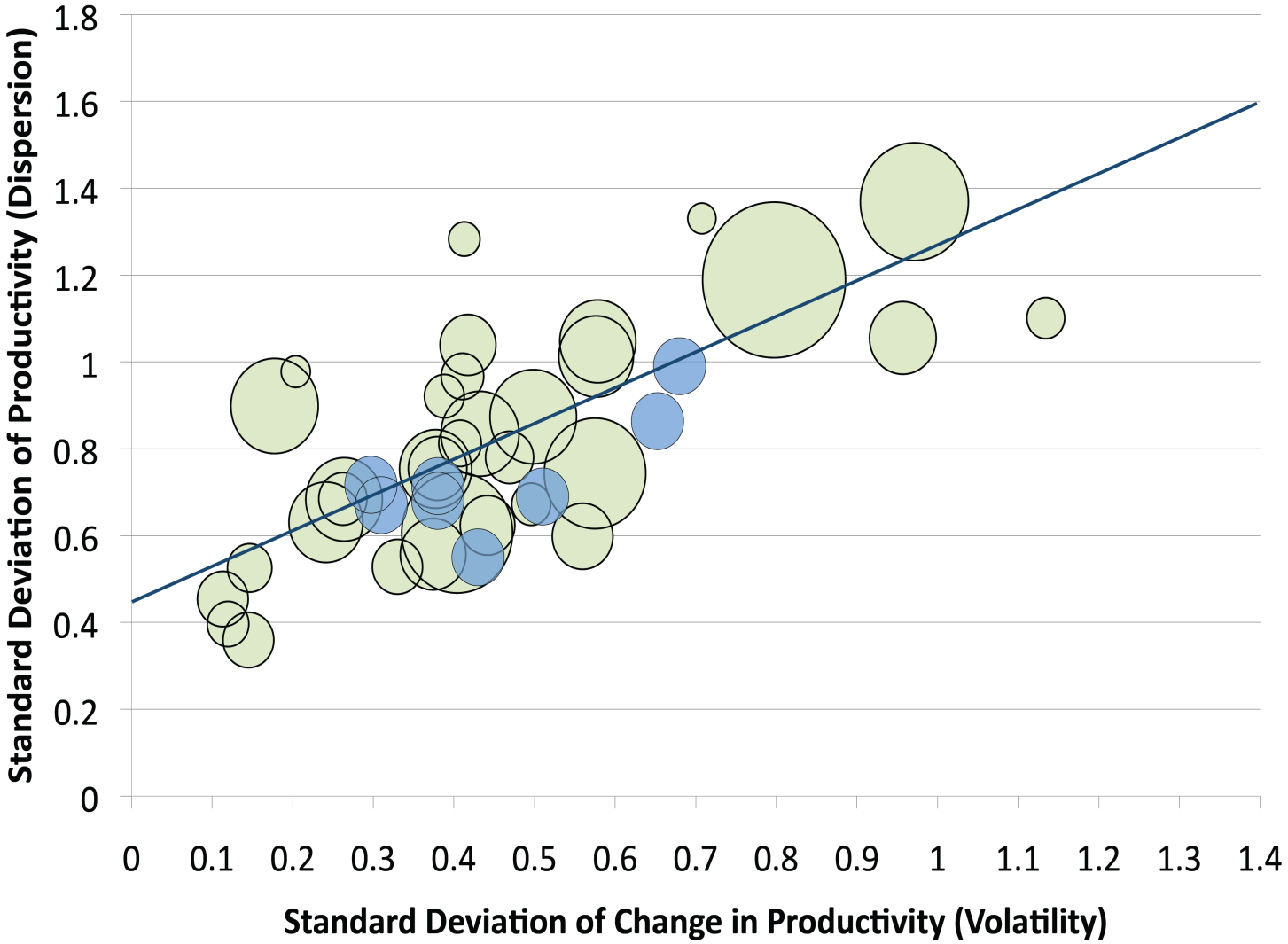
e.g. Hopenhayn and Rogerson, 1993

Job Reallocation Across Industry-Size Classes



Source: Haltiwanger, Scarpetta and Schweiger (2008)

Capital Productivity Gaps vs. Productivity Volatility



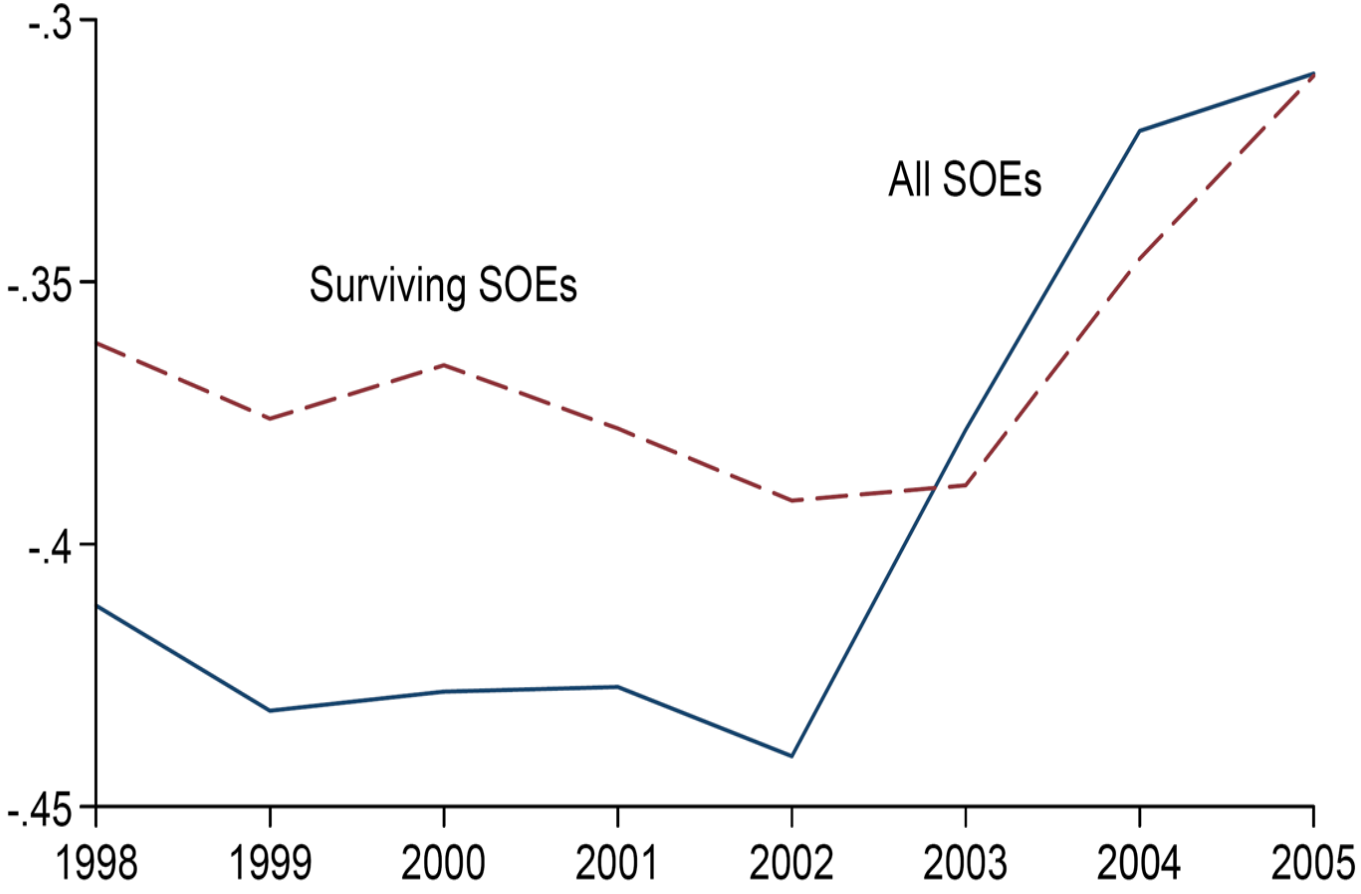
Source: Asker, Collard-Wexler, and de Loecker (2012)

#2 State-Owned Enterprises and Misallocation

Examples:

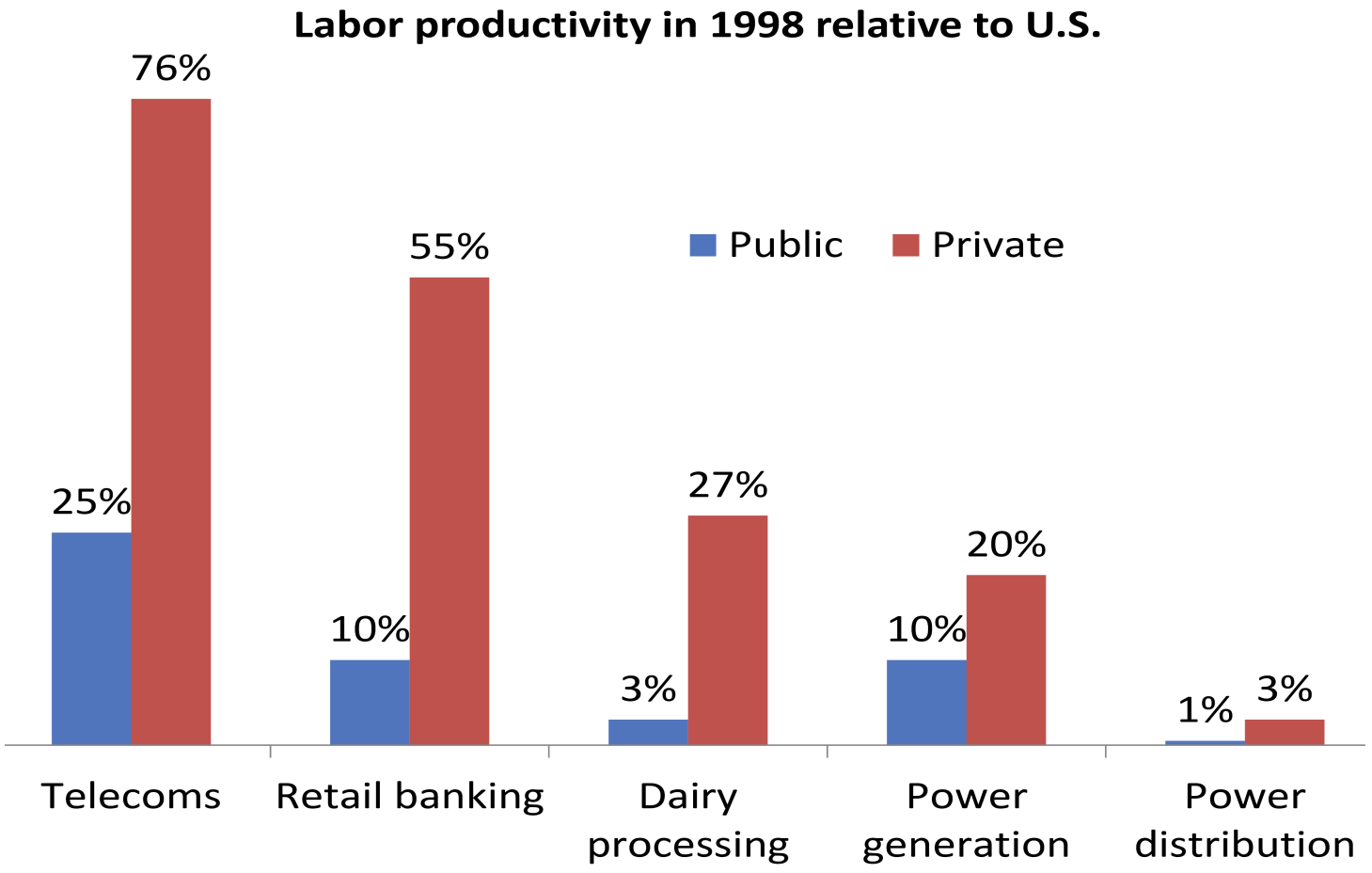
- China
- India
- Mexico

Revenue Productivity of SOEs in China



Source: Hsieh and Klenow (2009)

State-Owned Enterprises in India



Source: McKinsey (2001)

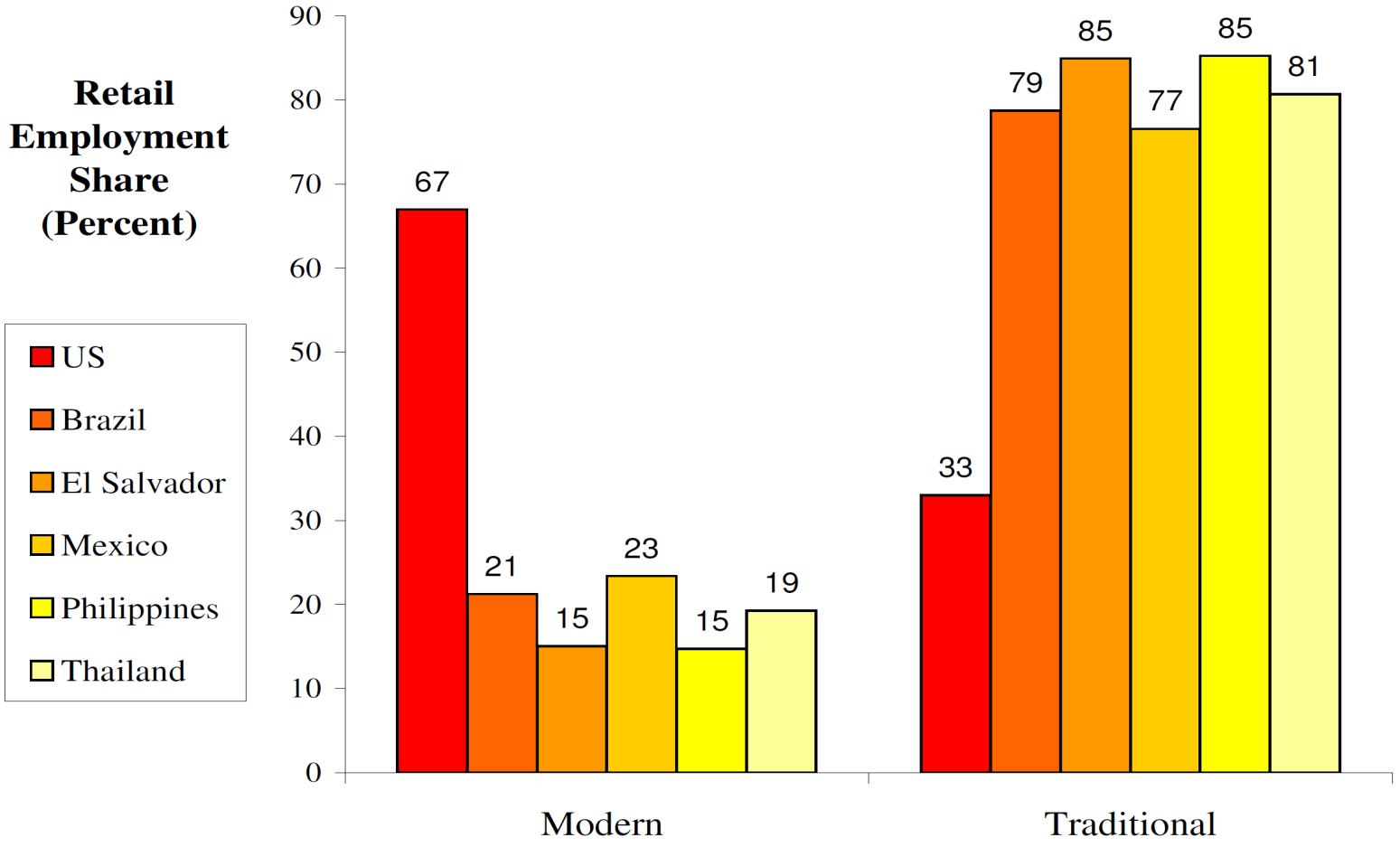
Early 1990s Privatization Wave in Mexico

Post-Privatization / Pre-Privatization vs. rest-of-Industry:

Real Output	Employment	Labor Productivity
1.52	0.65	2.35

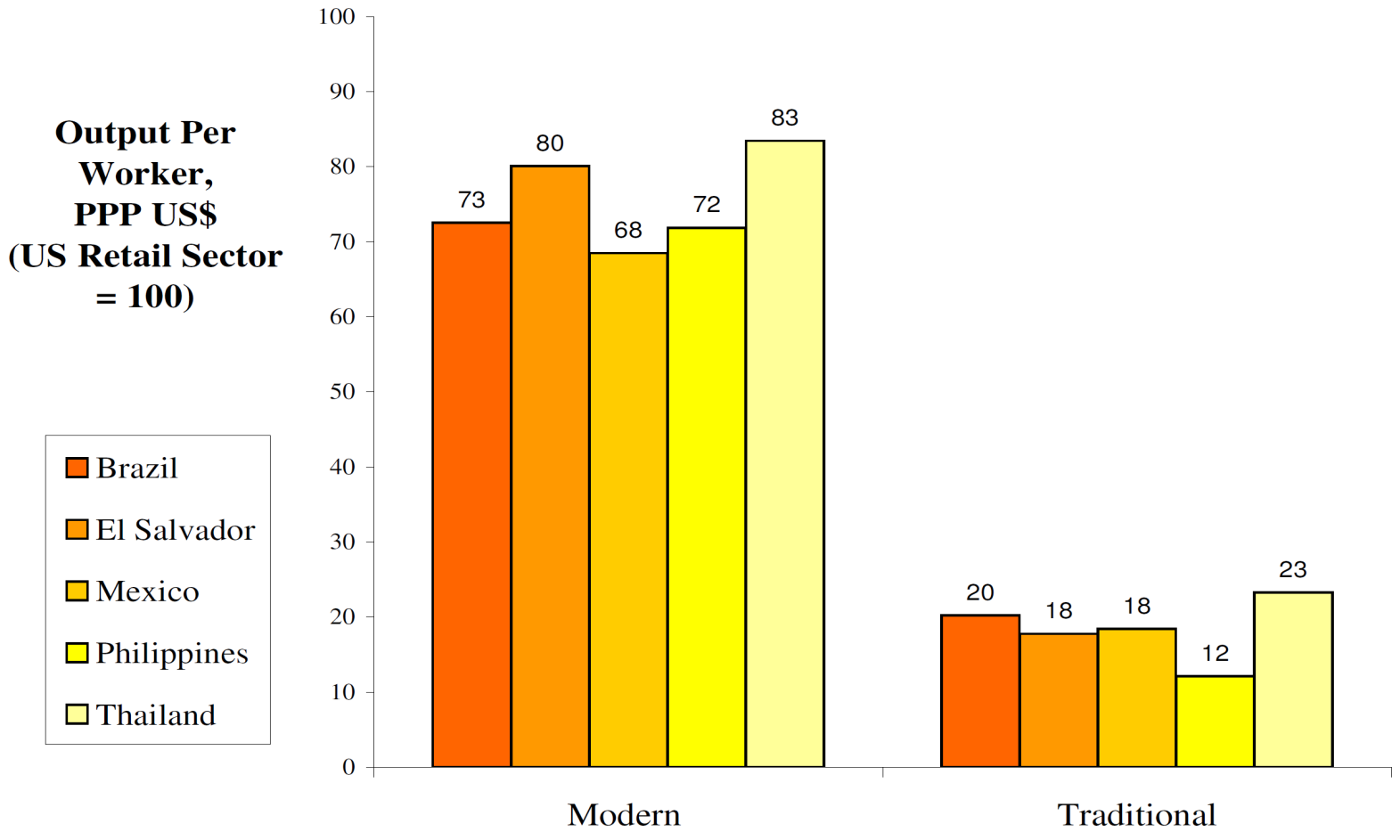
Source: La Porta and Lopez de Silanes (1999)

#3 Informal Sectors in Retail Trade



Source: Lagakos (2009)

Low Productivity of Informals in Retail Trade



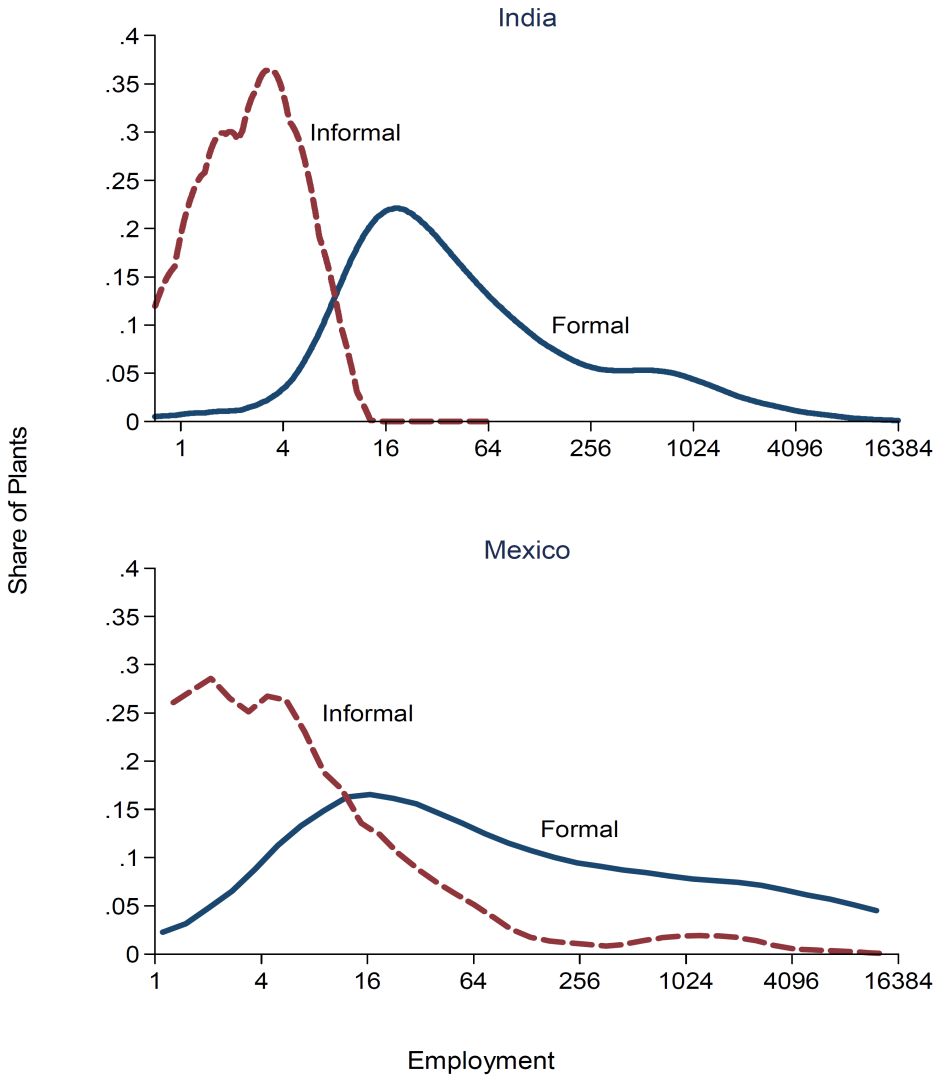
Source: Lagakos (2009)

Informal Sectors *in Manufacturing*

Country	Year	% of workers
India	2005	80.5%
Mexico	2008	30.4%

Source: Hsieh and Klenow (2012)

Size of Informal vs. Formal Manufacturing Plants



Source: Hsieh and Klenow (2012)

Why So Few Large Manufacturing Plants in India?

We have archaic labour laws. Nobody in their right mind is going to set up a plant employing 10,000 people.

– B.N. Kalyani, CEO of Bharat Forge

Bharat Forge is a car part maker with $1.3B in annual sales.

Source: *The Economist* (2012).

Why Are Informal Enterprises Less Productive?

- Skill (Bollard, 2010)
- Taxes (InterAmerican Development Bank, 2010)
- World Bank *Doing Business* costs
- Bribes (La Porta and Shleifer, 2008)

All but the first imply misallocation.

#4 Trade Costs and U.S. Agriculture in the 20th century

Output gains from declining price gaps across counties:

1880–1920	1950–1997
148%	98%

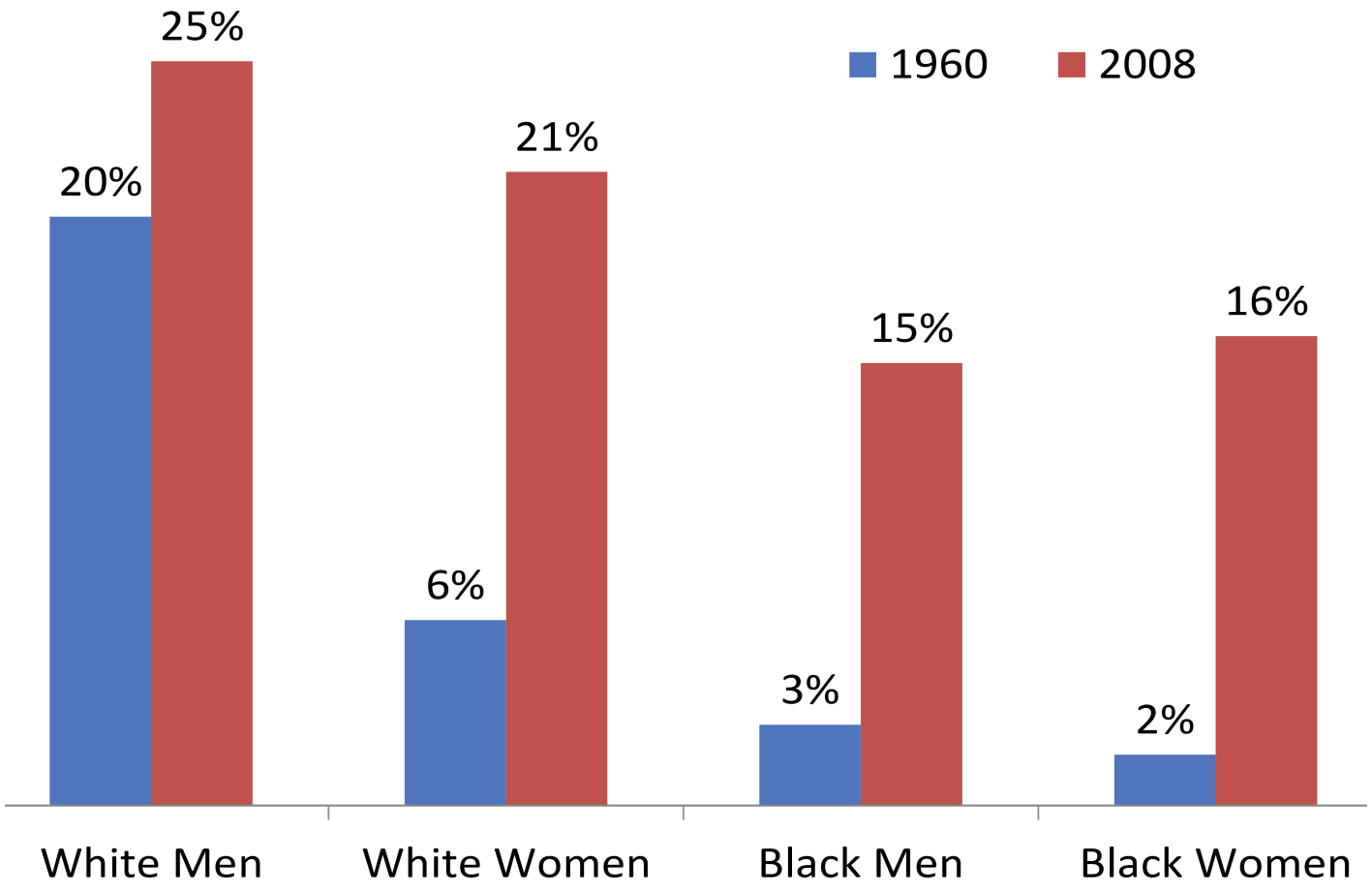
Source: Costinot and Donaldson (2012)

#5 The Allocation of Talent

Examples:

- Gender and race in the U.S.
- Caste in India
- 2nd generation managers in family firms

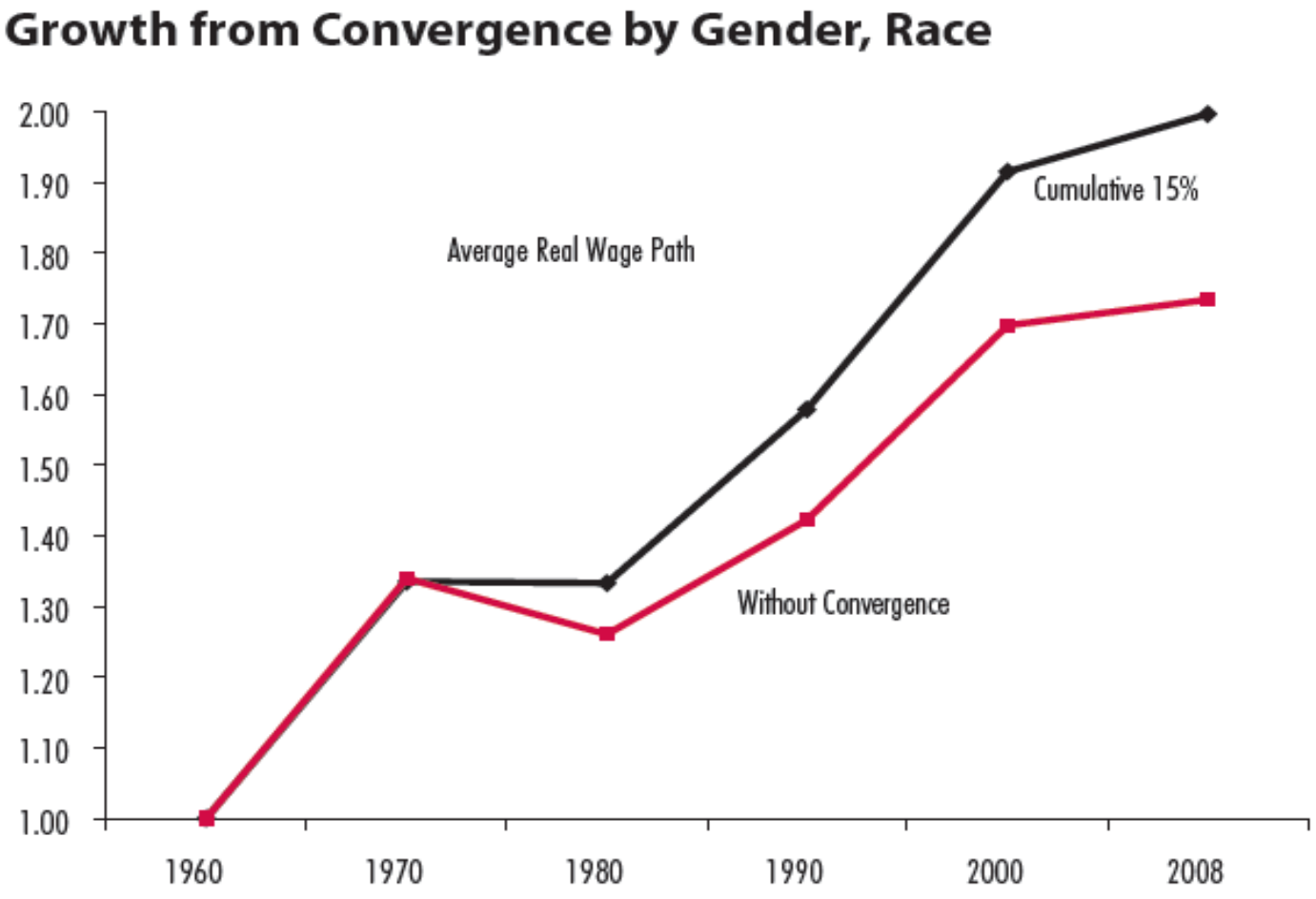
Share of Groups in High Skill Occupations



High-skill occupations are lawyers, doctors, engineers, scientists, architects, mathematicians and executives/managers.

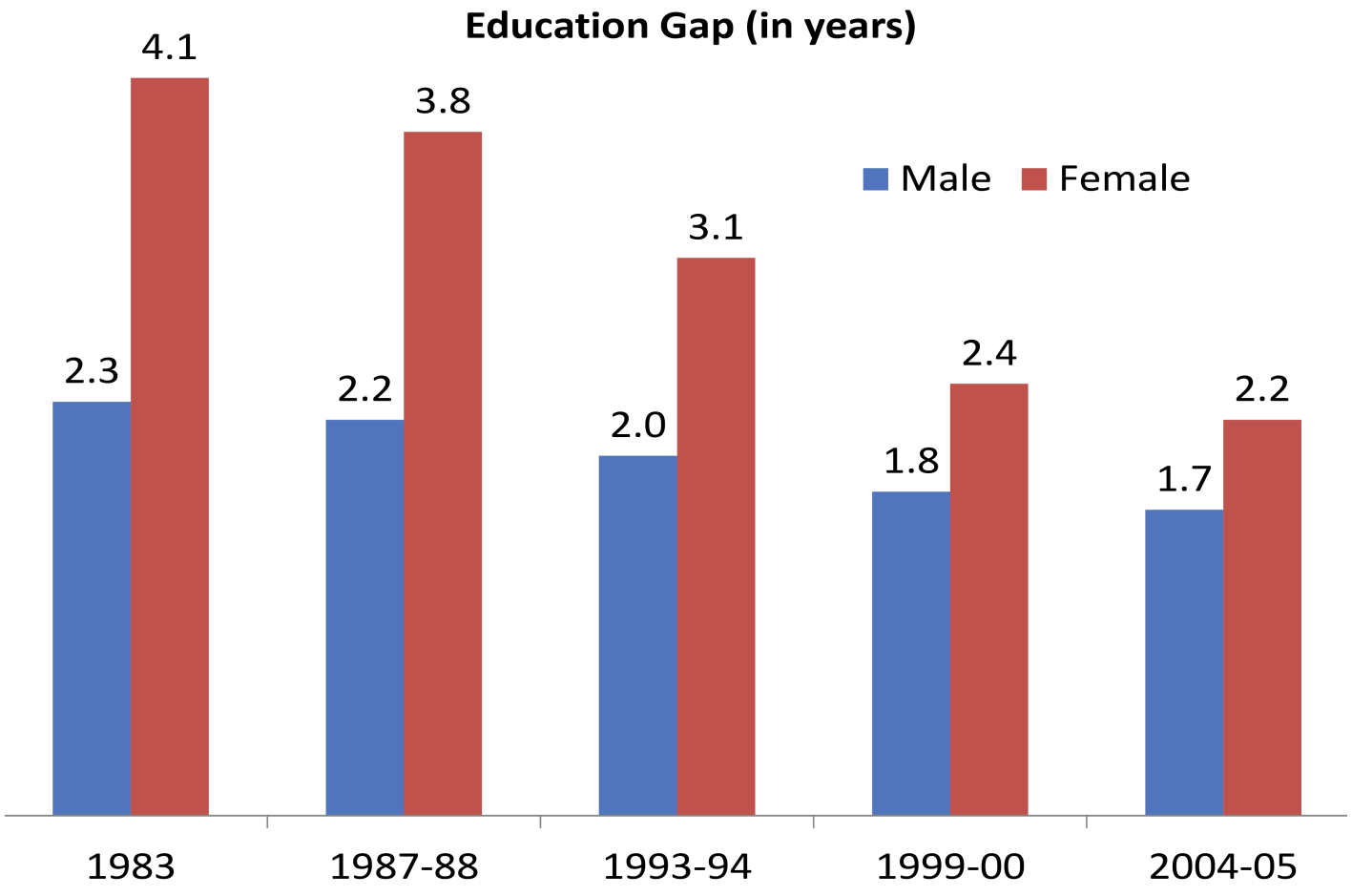
Sources: 1960 Census, 2006-2008 American Community Surveys.

Gains from Occupational Convergence in the U.S.



Source: Hsieh, Hurst, Jones and Klenow (2012)

Non-Disadvantaged vs. Disadvantaged Castes in India



Source: Hnatkovska, Lahiri, and Paul (2012)

Managers in Family-Run Firms

Theory

- Financial frictions
- Costs of monitoring non-family managers

Evidence

- Family firms are more prevalent in developing countries.
- First-born sons of founders are particularly bad managers.

Sources: Caselli and Gennaioli (2012), Bloom et al. (2012)

Dynamic Effects of Distortions

More efficient establishments face bigger distortions.

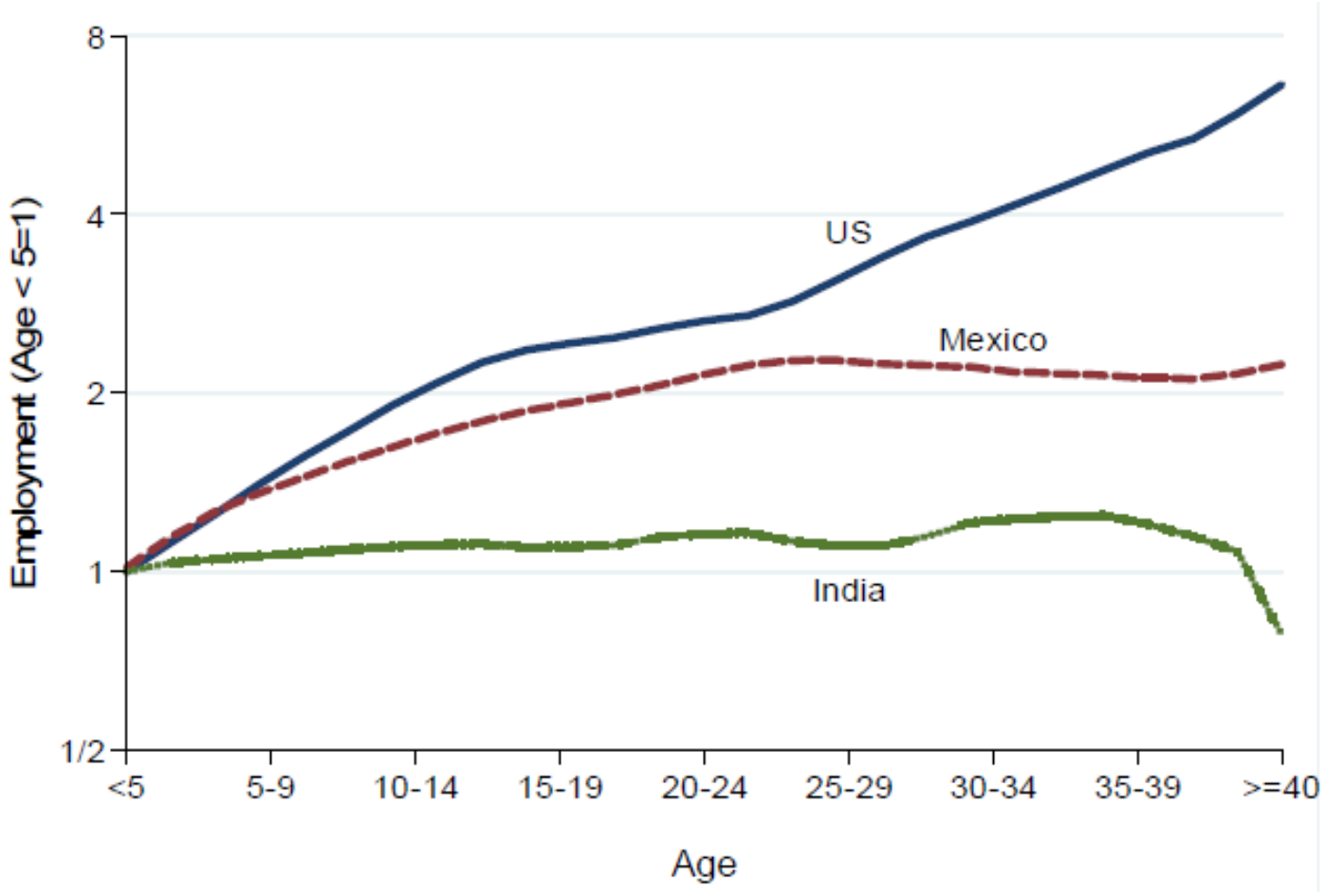
These undermine a firm's incentive to invest in better technology.

$\Rightarrow \downarrow$ *average firm real productivity on top of static misallocation.*

Examples

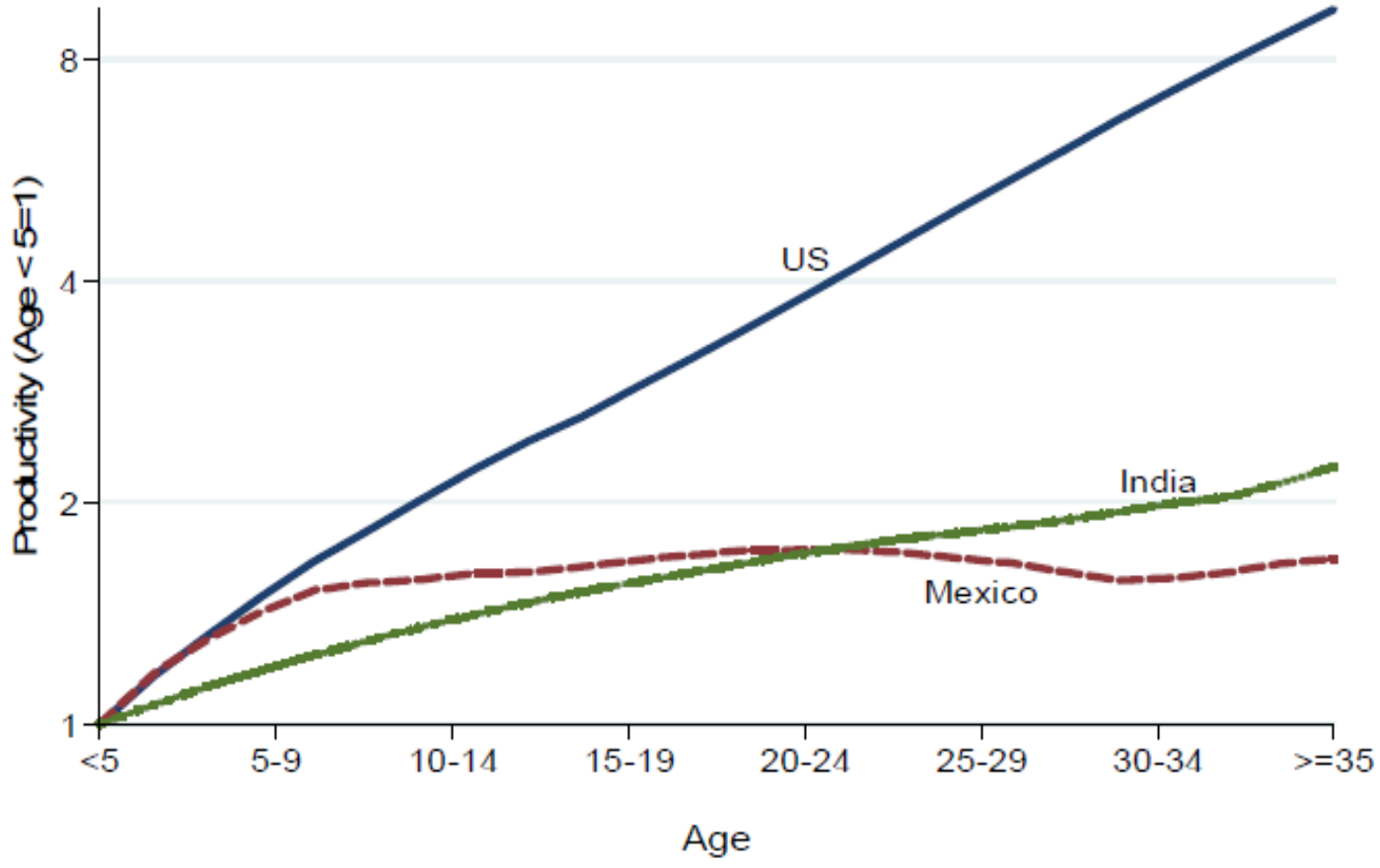
- Parente and Prescott (2000)
- Schmitz (2005)
- Atkeson and Burstein (2010)

Plant Employment vs. Age in India, Mexico, U.S.



Source: Hsieh and Klenow (2012)

Real Productivity vs. Age in India, Mexico, U.S.



Source: Hsieh and Klenow (2012)

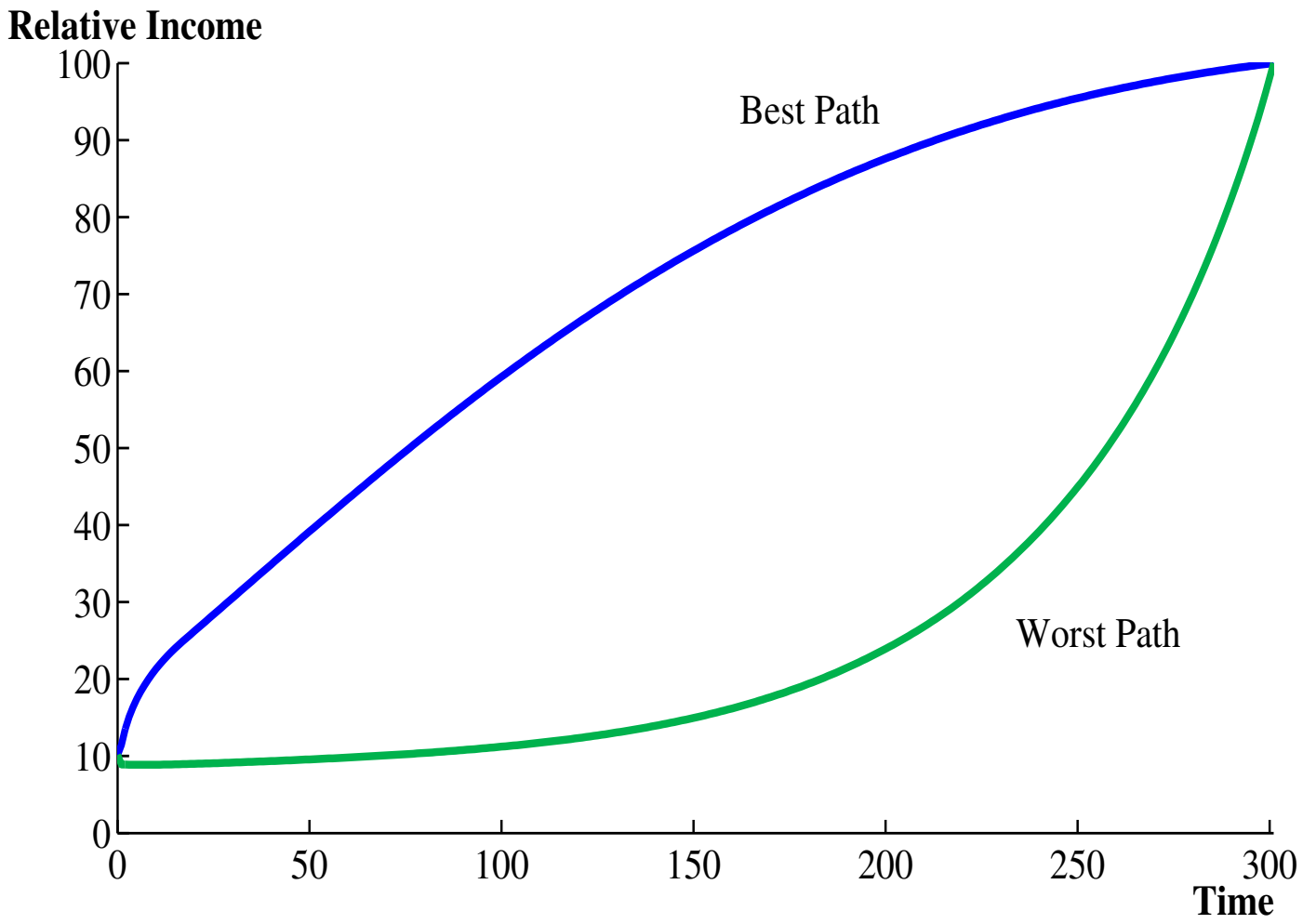
Many More Sources of Misallocation

- Credit (e.g. Kaboski and Townsend, 2011)
- Rural market imperfections (e.g. Udry, 2012)
- Markups (e.g. Peters, 2012)
- Barriers to migration (e.g. Gollin, Lagakos and Waugh, 2012)
- ...

Conclusions

- Micro distortions matter for macro productivity.
- Myriad of them, so no magic bullet.
- Piecemeal policy reforms may disappoint.

Macro Productivity and Micro Reforms



Source: Jones (2011)

Some of the Many Open Questions

- Limited evidence on the often-large *service* sector.
- How much of micro productivity gaps are amenable to policy?
- The "right" firm dynamics model for quantifying the impact of micro distortions?
- How much of the macro productivity residual can be explained by micro distortions?

Extra Slides

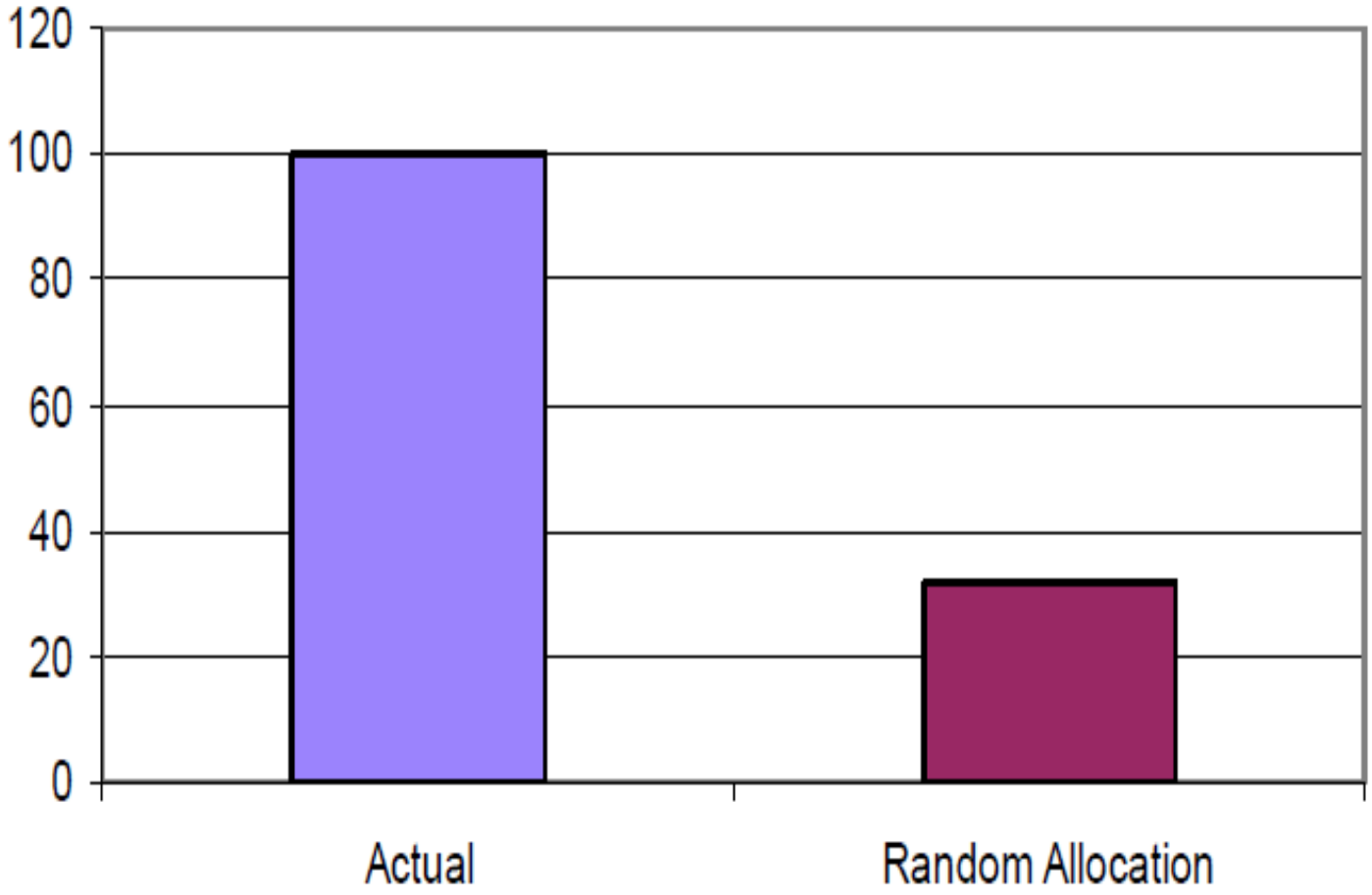
Productivity Gaps Within U.S. Industries

Ratios of *Revenue* Productivity at various percentiles:

75th/25th	90th/10th
1.34	1.92

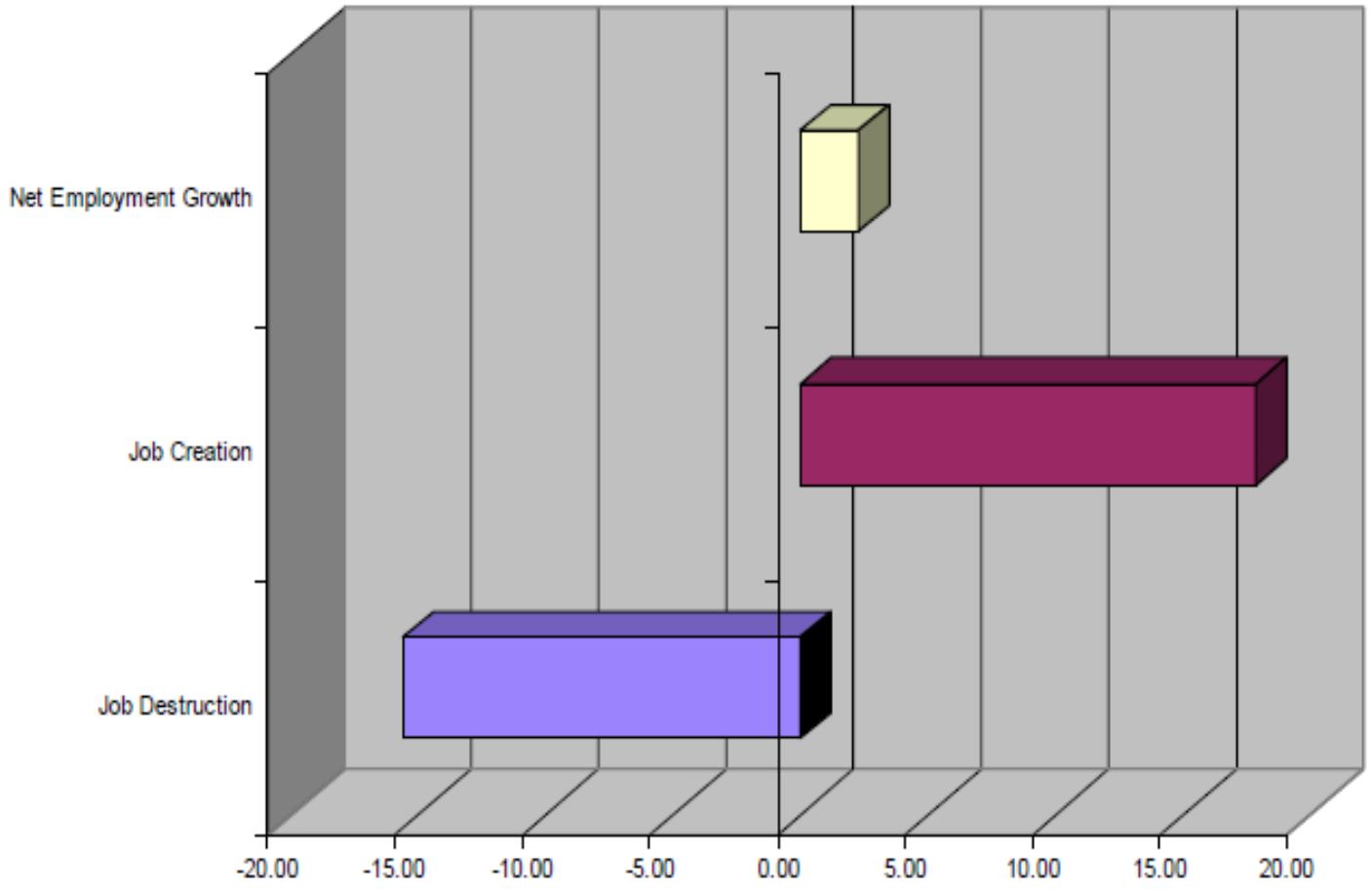
Syverson (2004), gross output basis, 1977 Census of Manufactures.

Labor Productivity with Random vs. Actual Employment



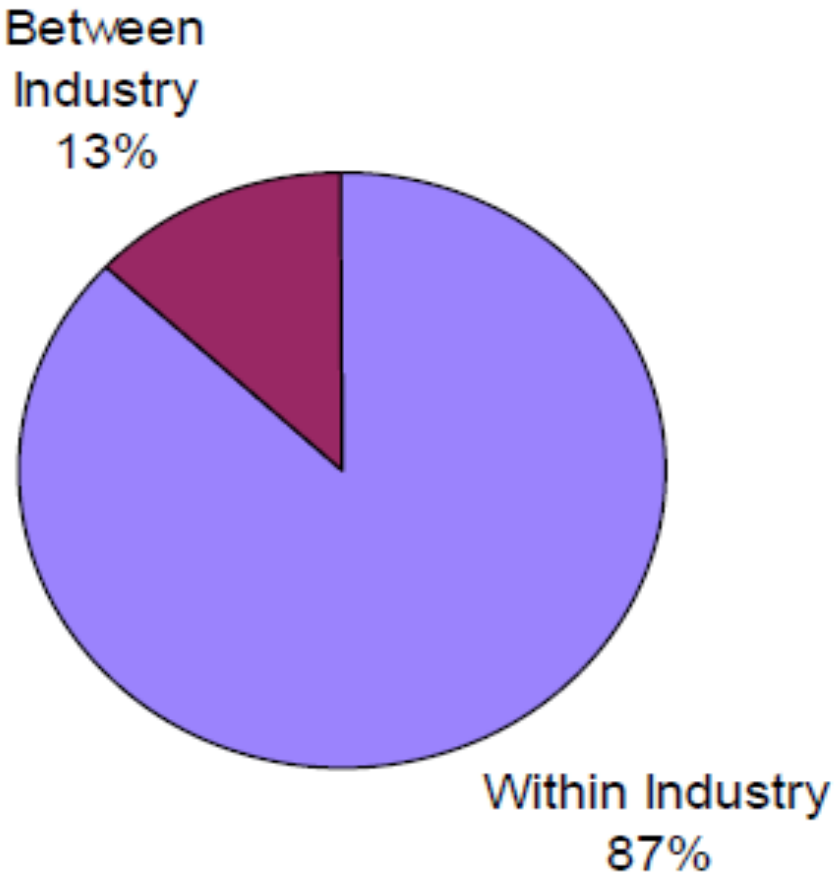
Source: Bartelsman, Haltiwanger and Scarpetta (2009) using the 1987, 1992, and 1997 U.S. Manufacturing Censuses.

Creative Destruction in the U.S. Private Sector



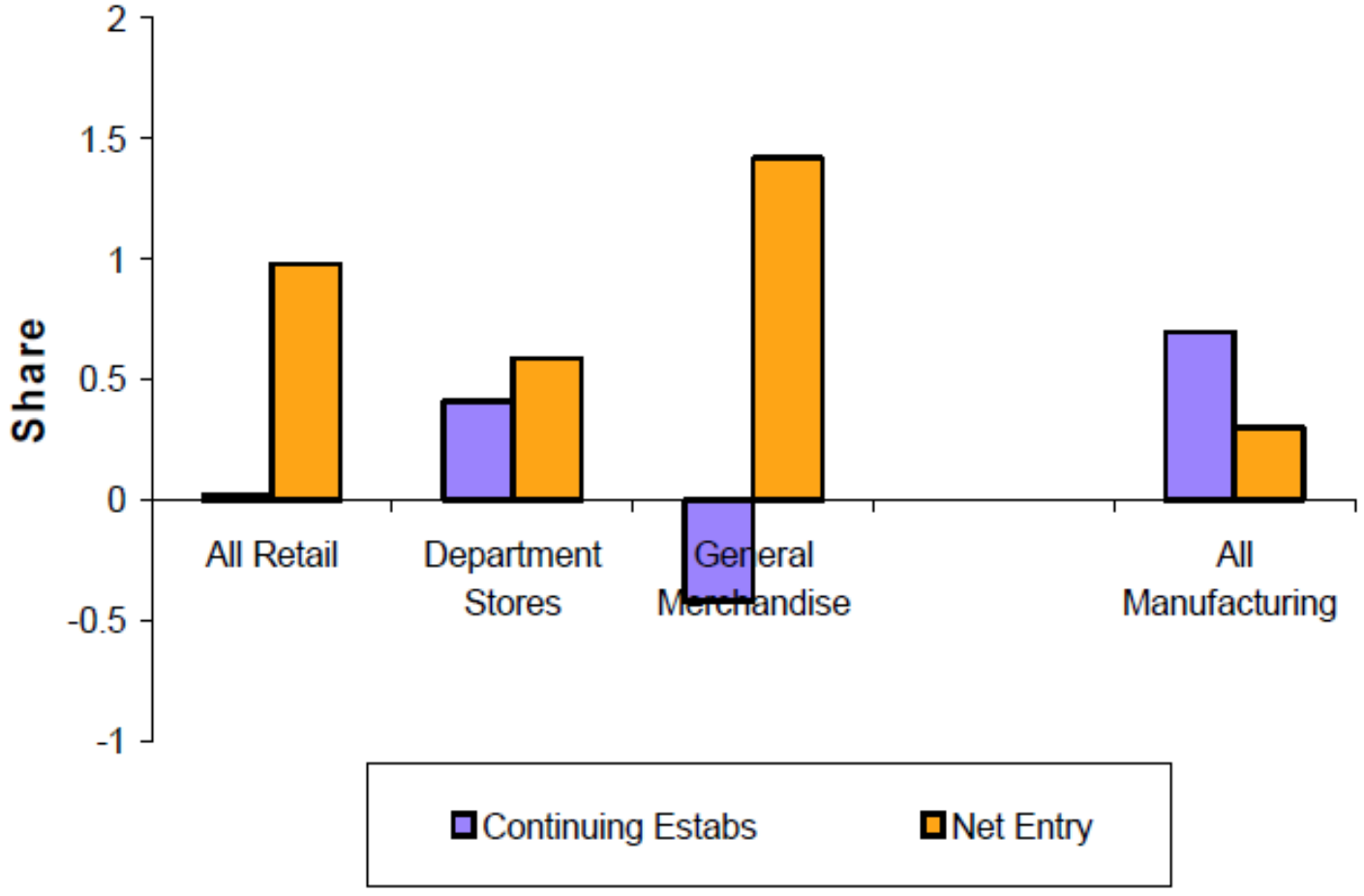
Source: Haltiwanger, Jarmin and Miranda (2010) using Business Dynamics Statistics, 1992-2005.

Reallocation Within and Between U.S. Industries



Source: Haltiwanger, Jarmin and Miranda (2010) using the Longitudinal Business Datafile, 1992-2005.

U.S. Retail Productivity Growth, 1987-1997



Sources: Foster, Haltiwanger and Krizan (2001, 2006)

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