

Adjusting to Globalisation

Capability Building in Indian
manufacturing

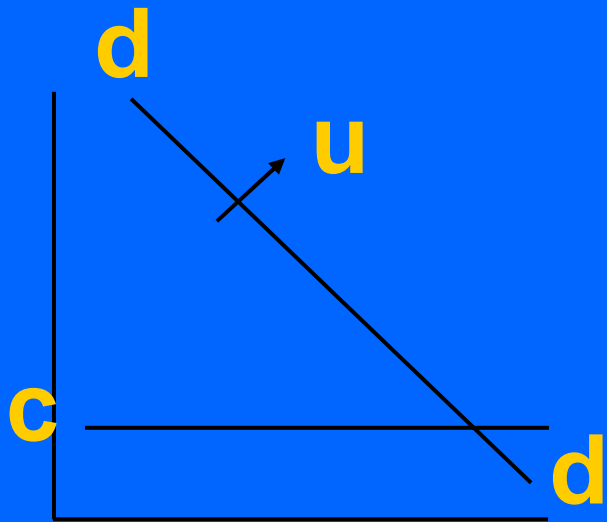
The “Capability” Concept

- At one level, this is a straightforward generalisation of the standard concept of productivity.

The “Capability” Concept

- At a deeper level it involves
 - (a) relating the capability of the firm to the know-how of individual workers.
 - (b) Analysing the decision of the firm to invest in capability building what is of central interest here is that this decision takes place in a climate of true (Knightian) uncertainty.

Capabilities

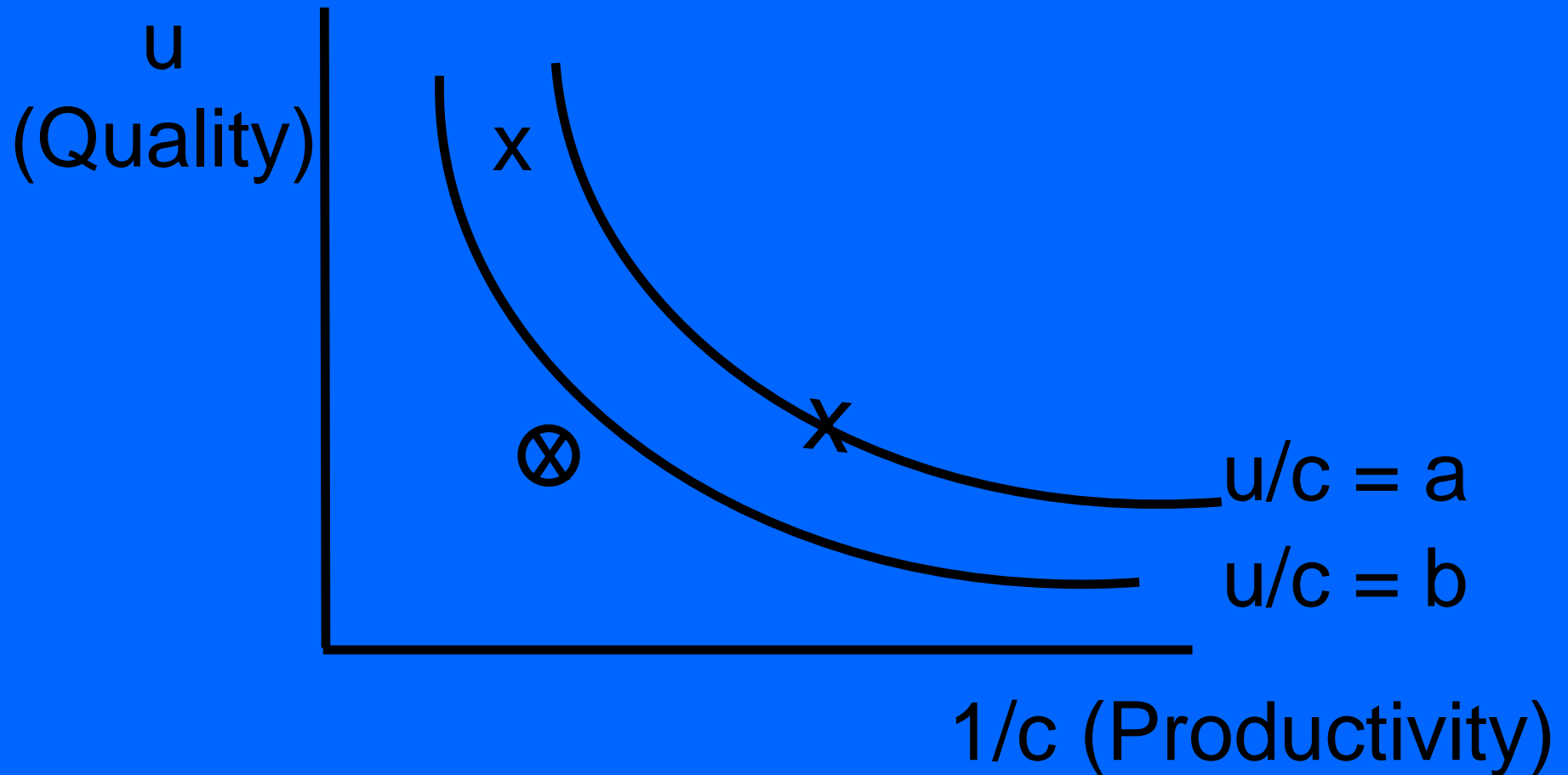


$c =$ 'productivity'

$u =$ 'quality'

Capability is a pair (c, u) for each technical trajectory (submarket)

Competing in Capabilities



Key feature:

The consumers choose products offering the best u/p

Implication: if $u > v$, the market share of a firm offering u cannot be eroded to zero by any number of firms offering v

Proposition 1

- given any configuration of capabilities

$(c_1, u_1), (c_2, u_2) \dots (c_n, u_n)$

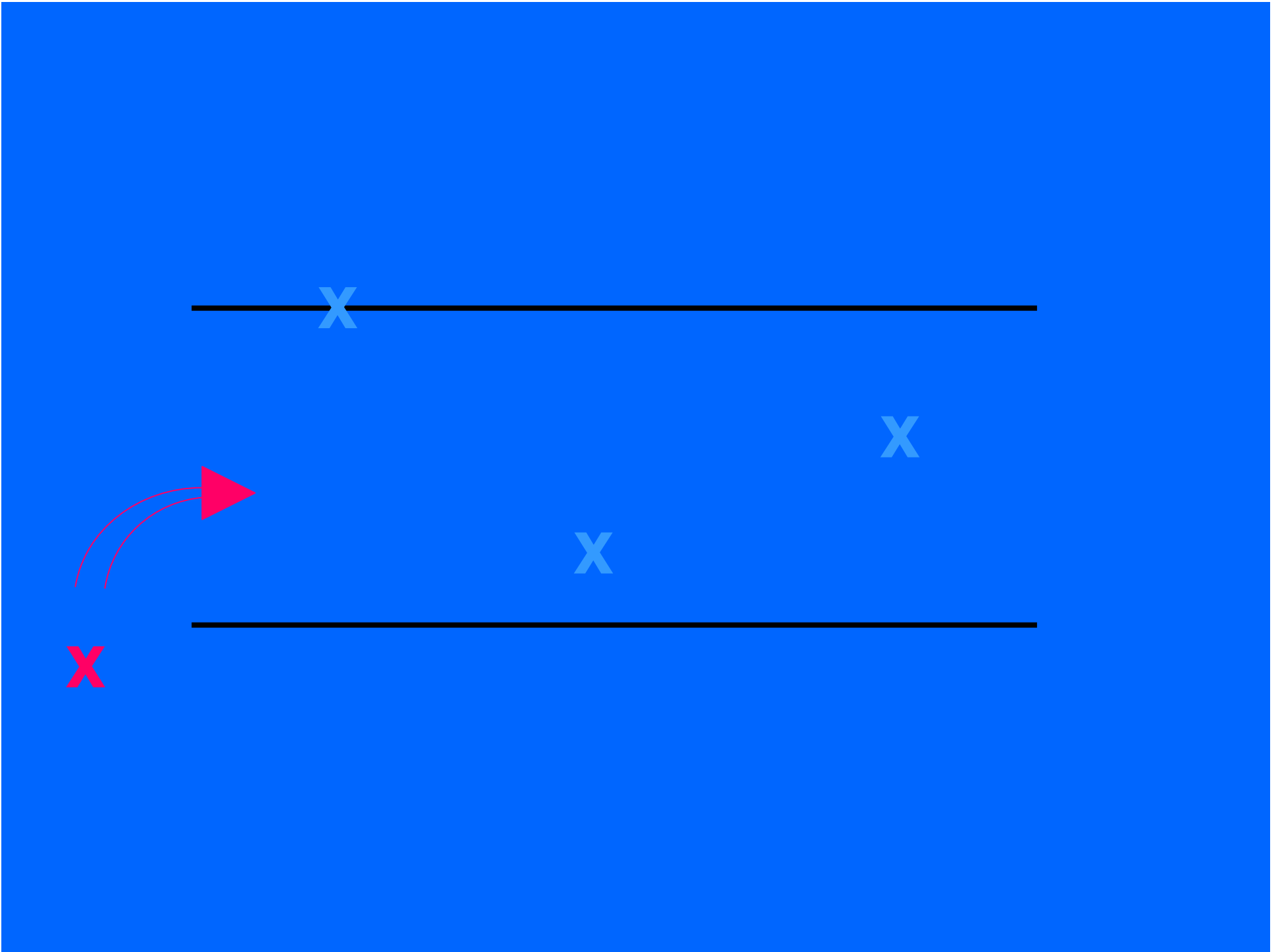
there is a lower bound in (c, u) space below which a firm cannot achieve positive sales at equilibrium

(ex. Cournot equilibrium)

Proposition 2

Suppose one element in building capability is the expenditure of fixed outlays (“sunk costs”)

- Then competition in ‘capability building’ will lead to a bound on the number of firms ‘in the window’.



X

X

X

X

x

x

x

x



X



X

X

X

The Competitiveness Debate

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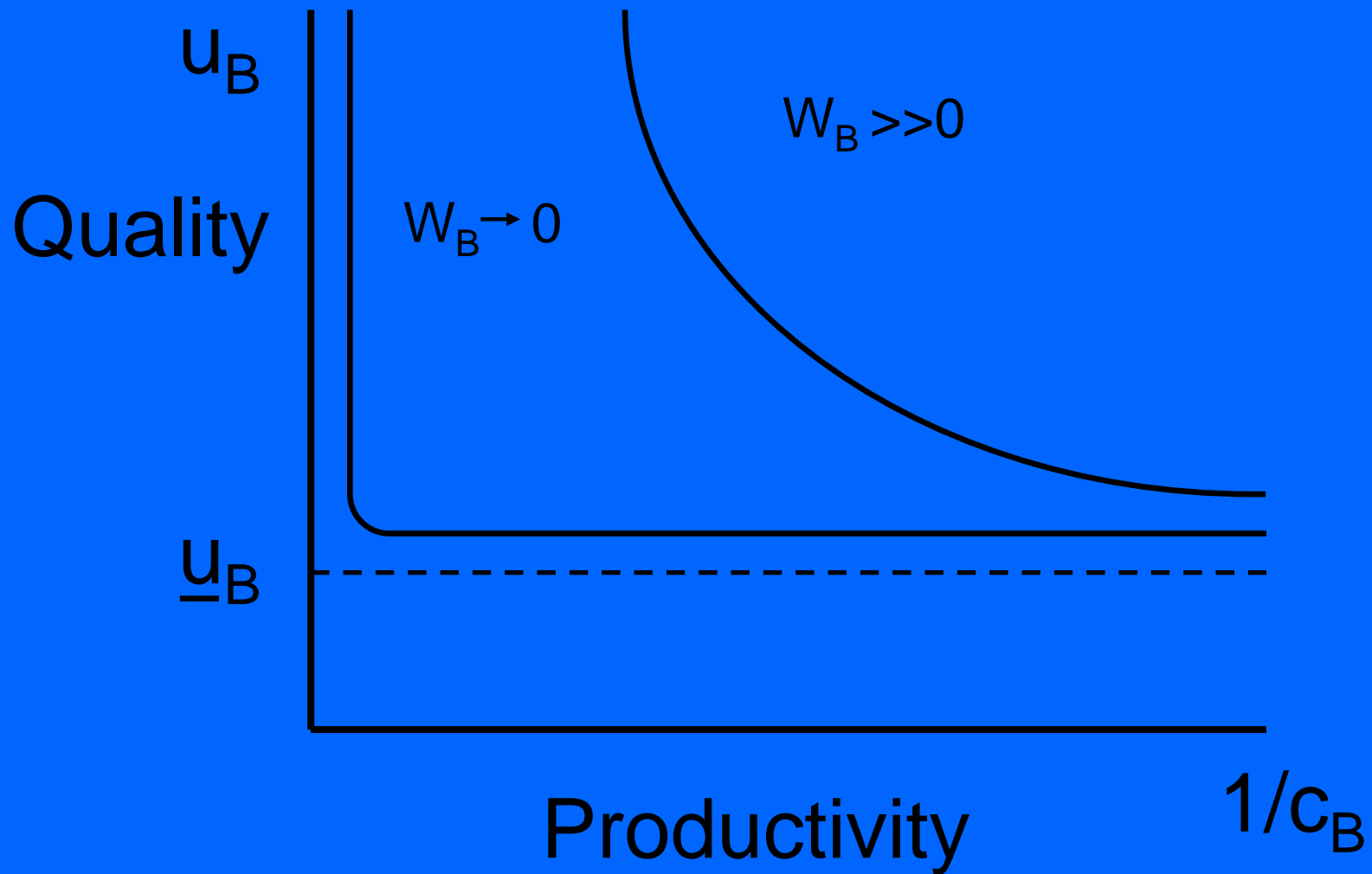
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- Viability depends on relative capabilities.
- At given wage levels, raising v has no effect until a threshold is reached.
- Wage adjustment can only partially offset this, by widening the window.
- A rise in capability elsewhere can render viable industries unviable.

So what's new?

- The model has been chosen so that prices and qualities, and therefore productivity and quality enter in a completely symmetric fashion
- The key point is that unit materials cost sets a floor to price, thus limiting the degree to which changes in wages and productivity can offset changes in quality

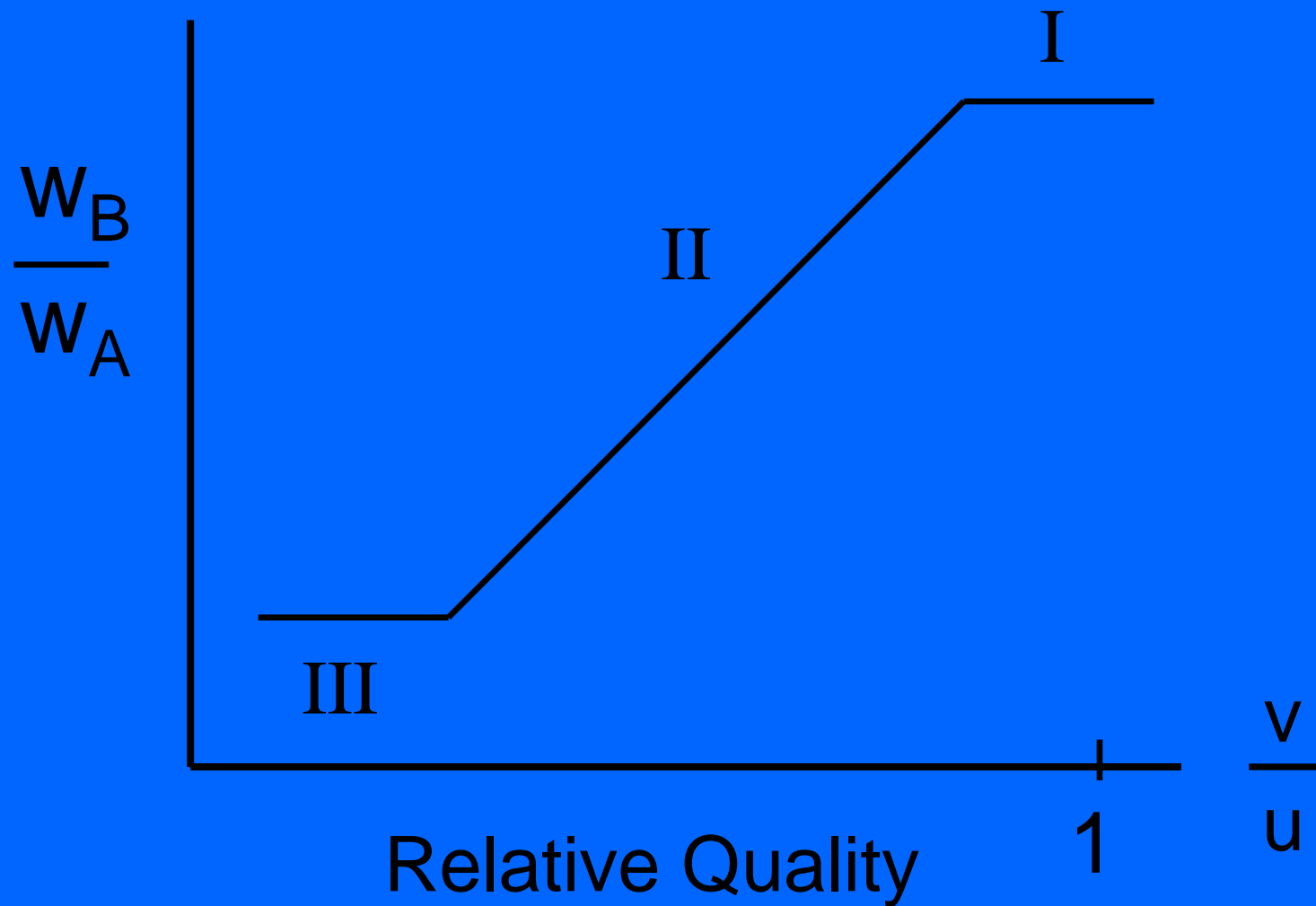
Capability Threshold



So what's new?

- The effects are analogous to those in a Kremer model of an O-ring technology, but with no special assumptions about the nature of the technology, or about complementarities within it

Relative Wages



How poor can you get?

- In a word of 'productivity' ($u = v = 1$), we have

$$\frac{w_B}{w_A} \geq \frac{c_A}{c_B}$$

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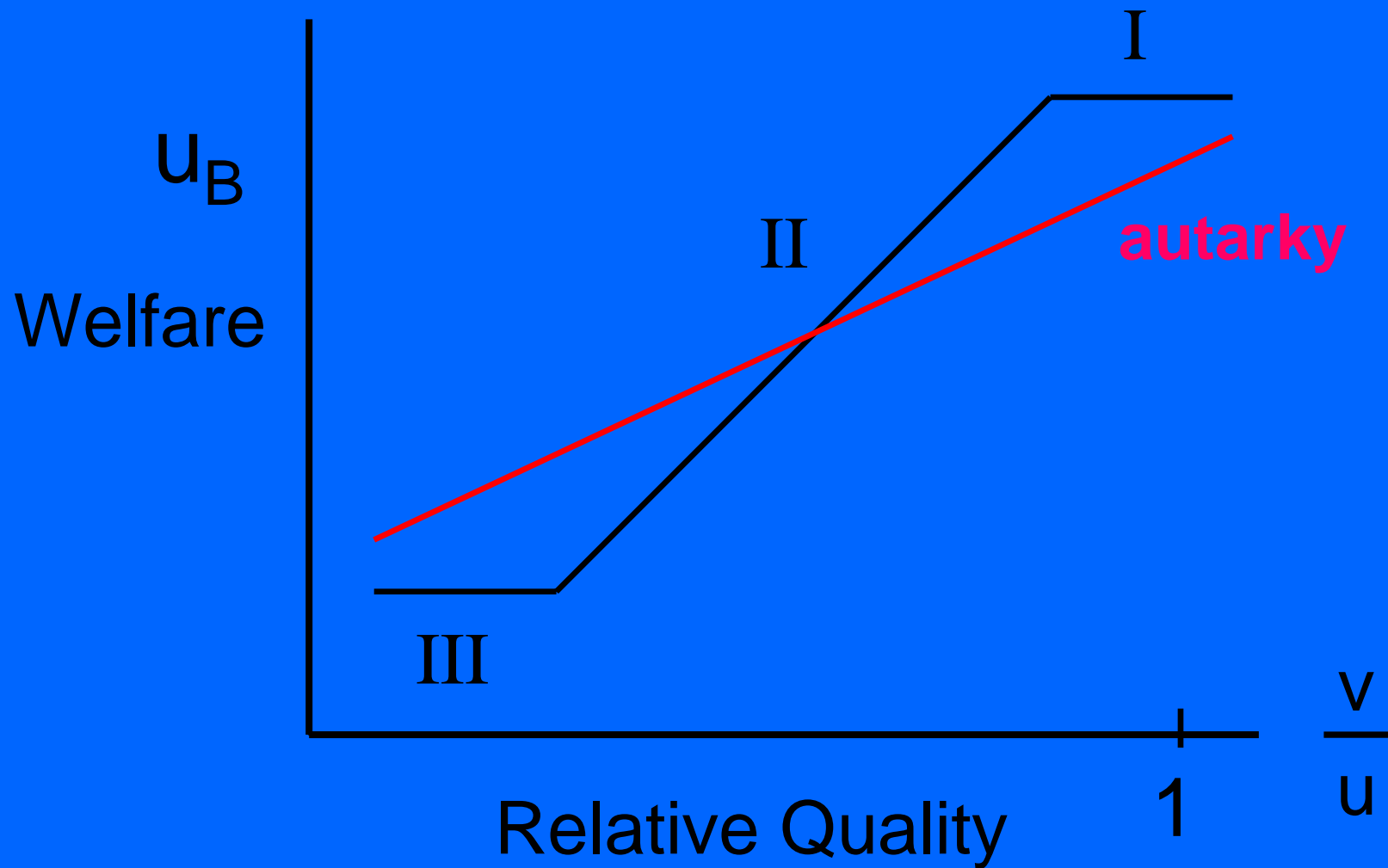
$$\frac{w_B}{w_A} \geq \frac{c_A}{c_B}$$

- In a world of 'productivity and quality', when $v < \underline{v}$ we have

$$\frac{w_B}{w_A} \approx \frac{1}{\sqrt{m-1}}$$

where m = number of products

Welfare in Country B



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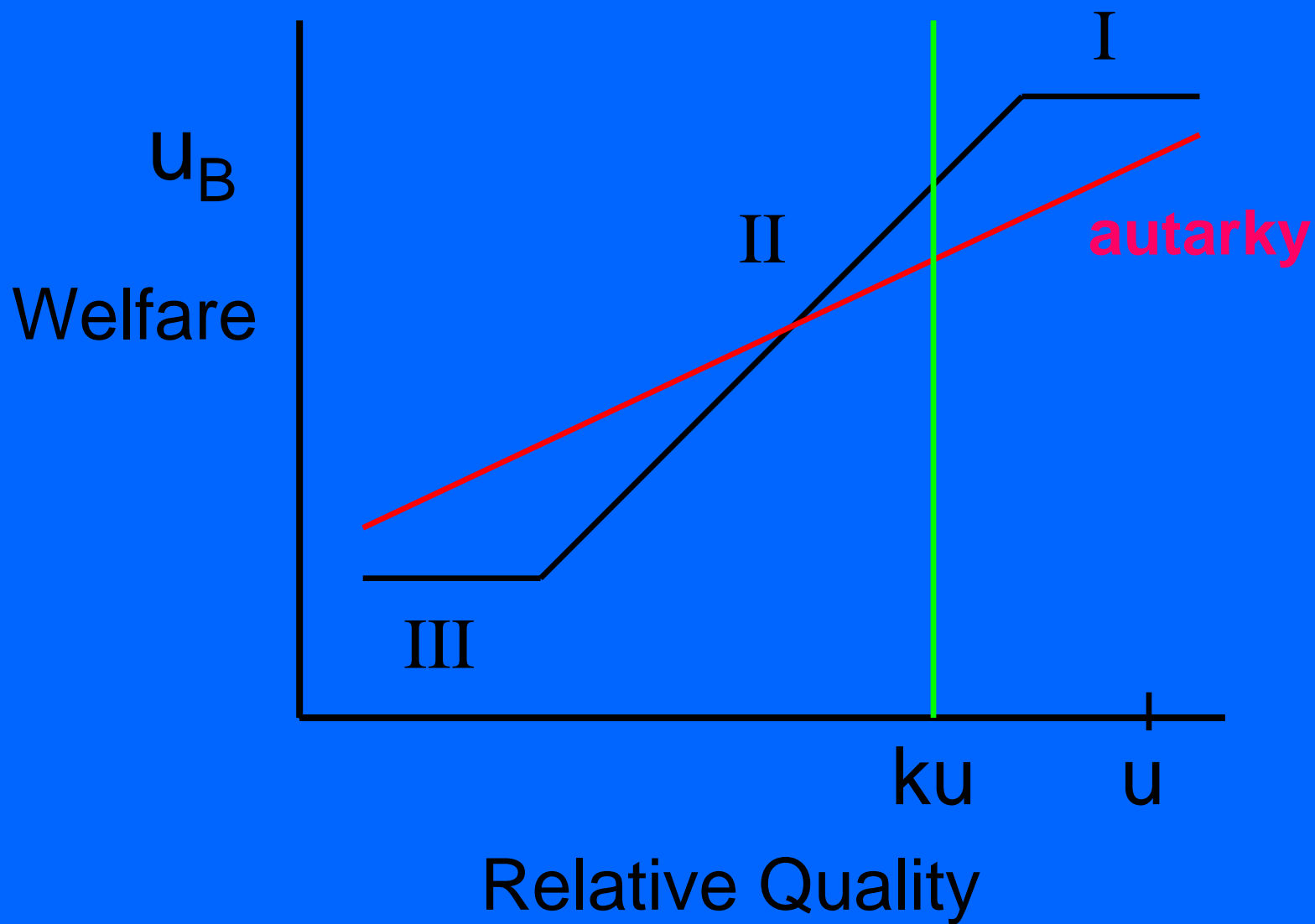
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 - III. The acceleration in the pace of capability building which it generates, and which leads to a process of escalation and shake-out at the global level
- A convincing defence of the case for globalization requires that we move at least to the dynamics of Phase II

Strength of Transfers



The Speed of Transfer

- Delicately dependent on industry characteristics
- Key channels differ by industry
 - (a) Buyer search channel: Textiles
 - (b) Trade Fairs: Ubiquitous
 - (c) Supply chains: Vertical Transfers

The Evidence on “FDI Spillovers”

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Speed of Transmission

FAST

Auto components:

Vertical relations with shared technology; standardization and codification of working practices.

Domestic Appliances:

Horizontal JVs – here incentives of senior partner are critical (cf. China).

Machine Tools:

Public sector bodies etc.

SLOW

A Tale of Two Industries

CNC Machine Tools

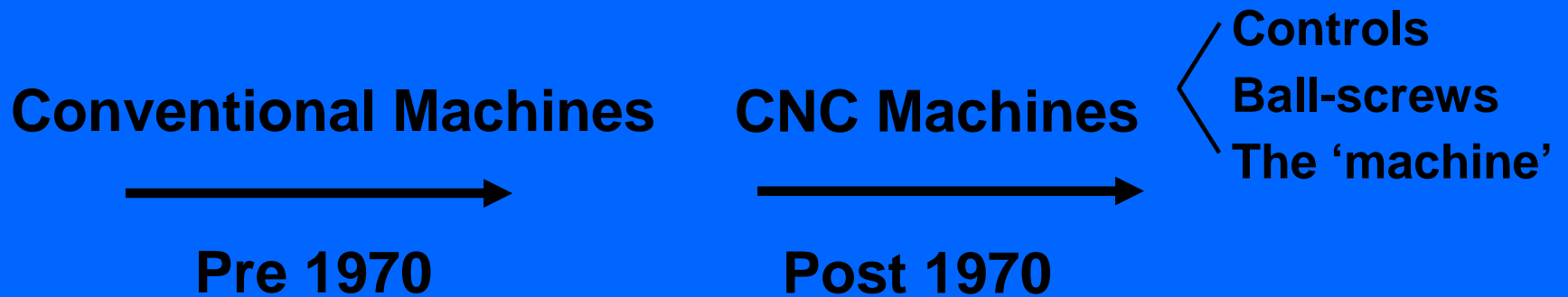


ACE Designers

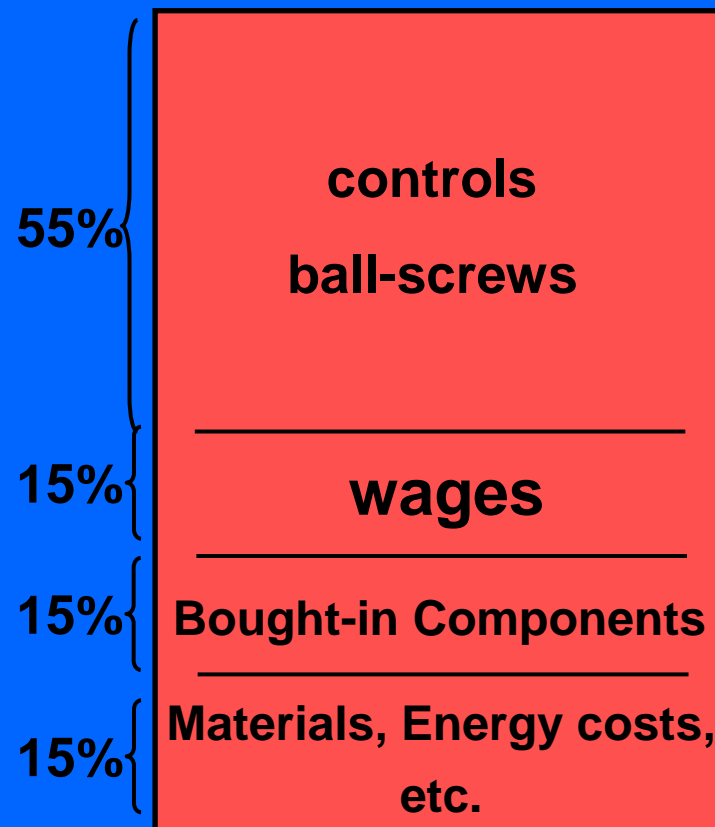


The Machine Tool Industry

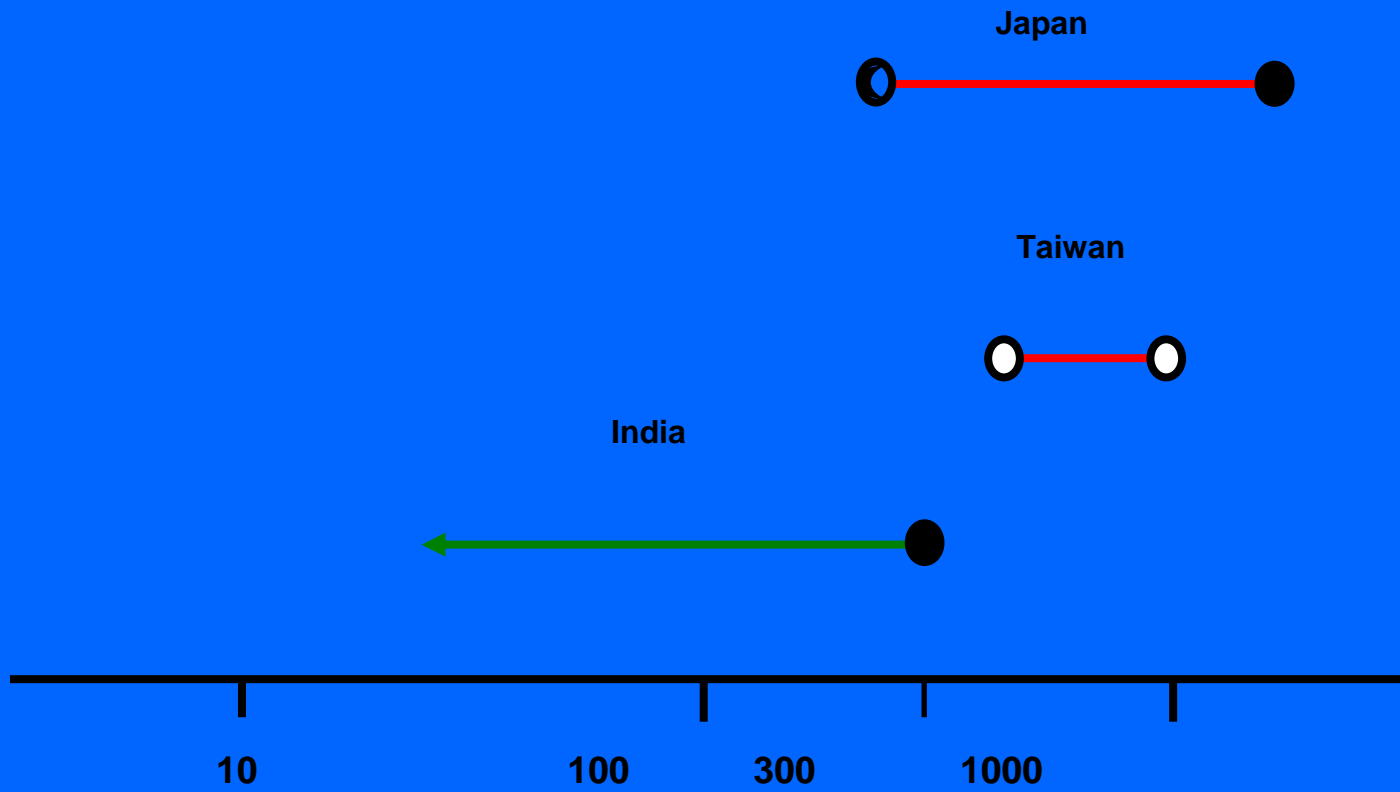
How trajectories develop/divide

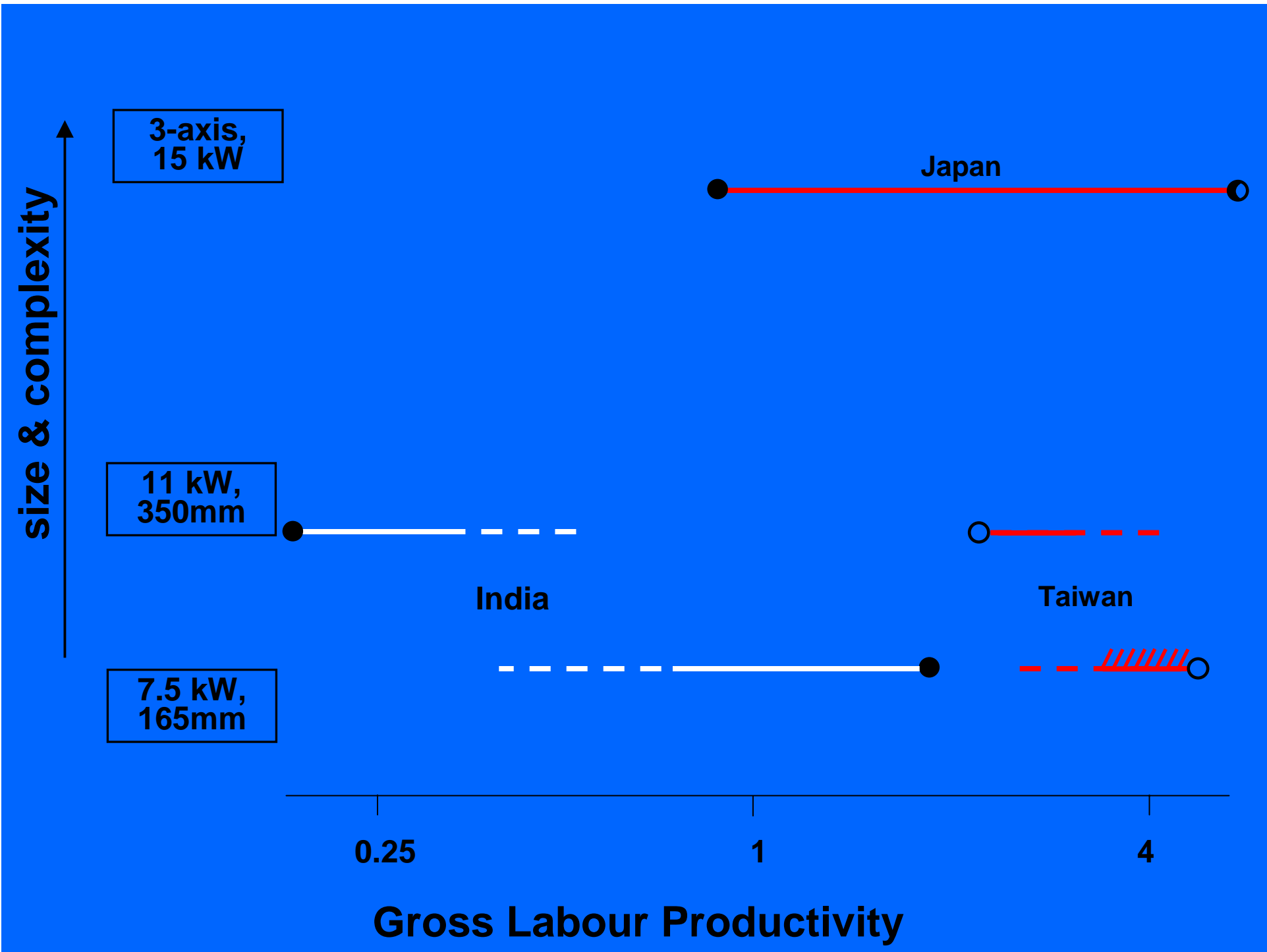


The Invidious Trade-Off

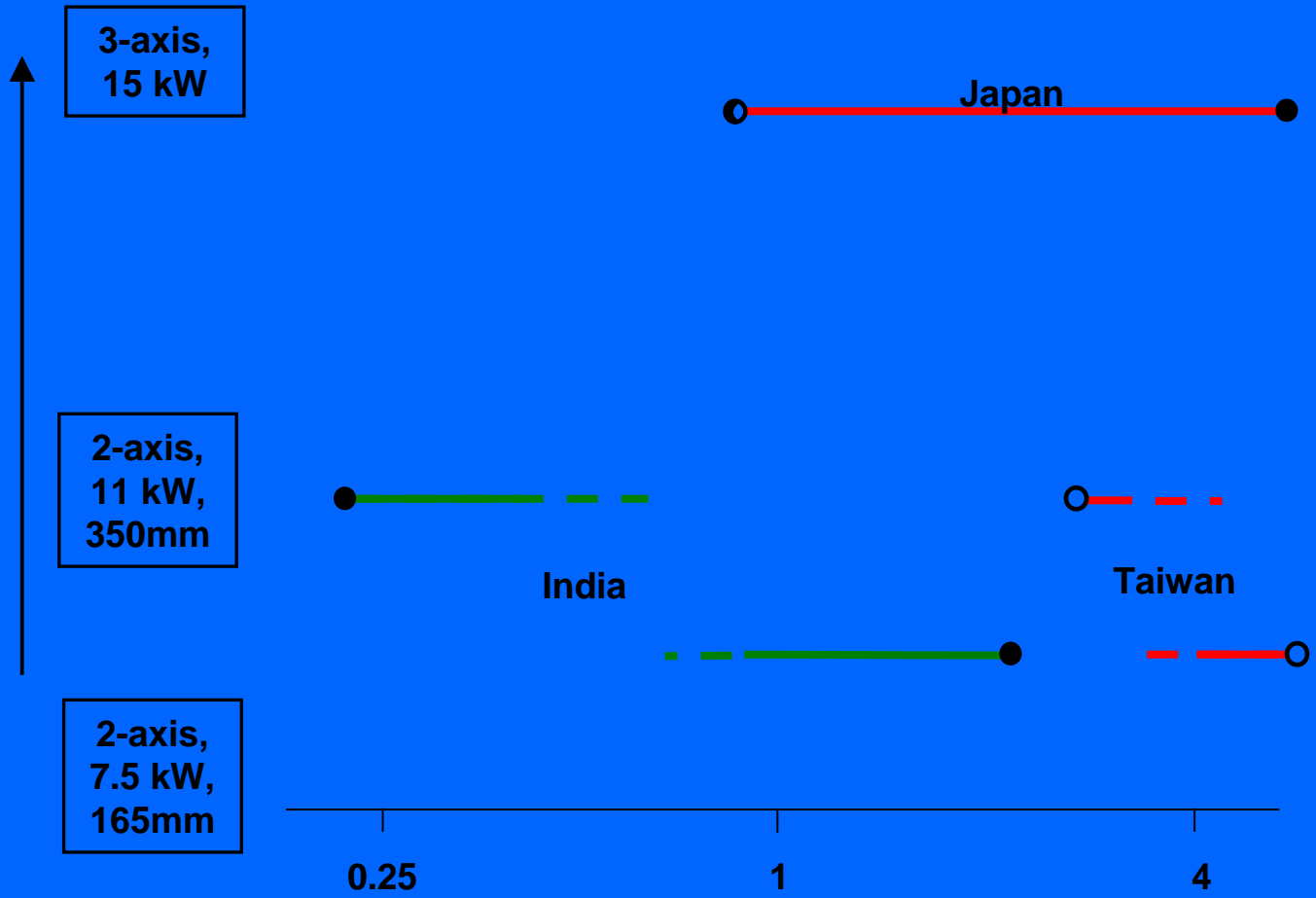


A typical cost breakdown





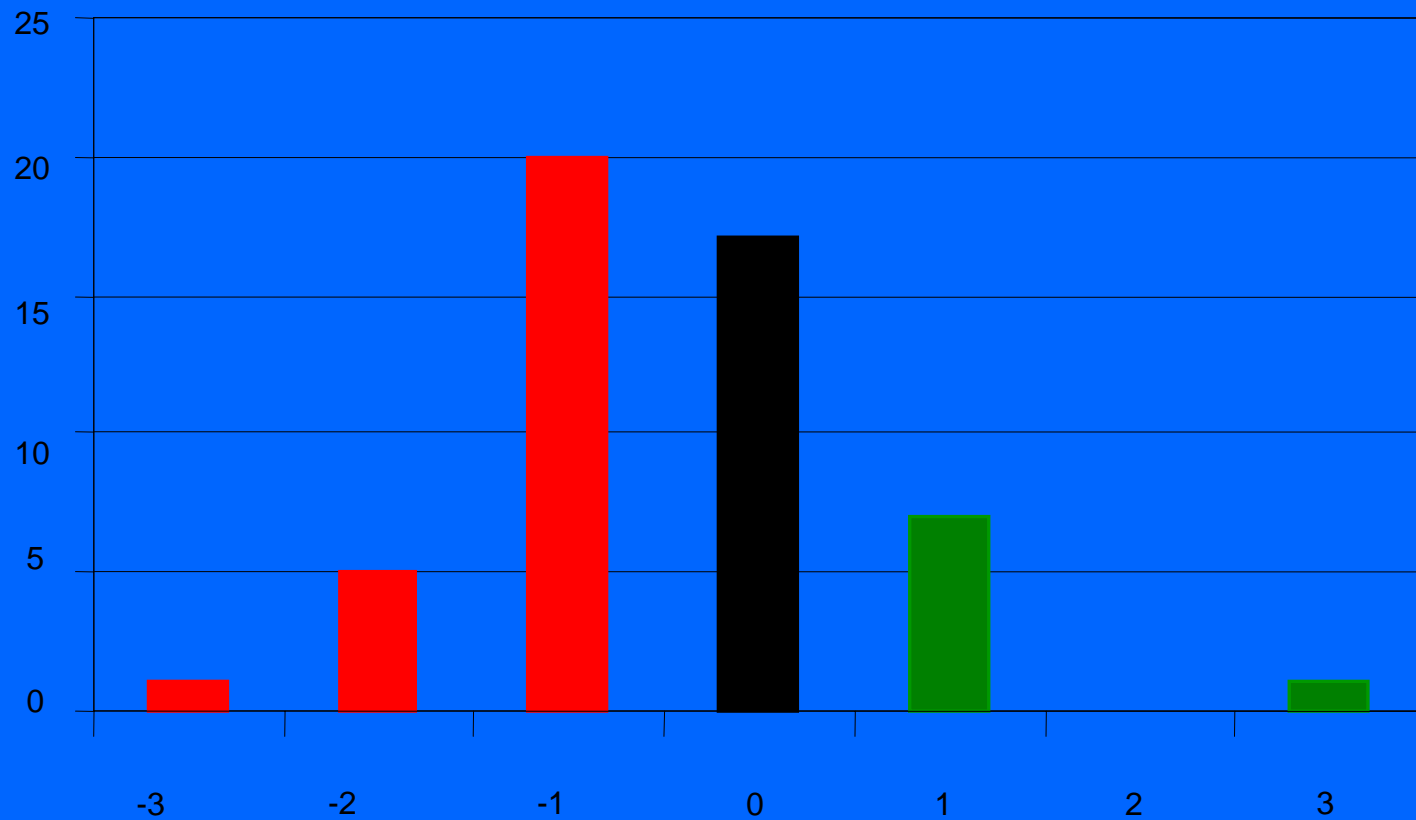
size & complexity



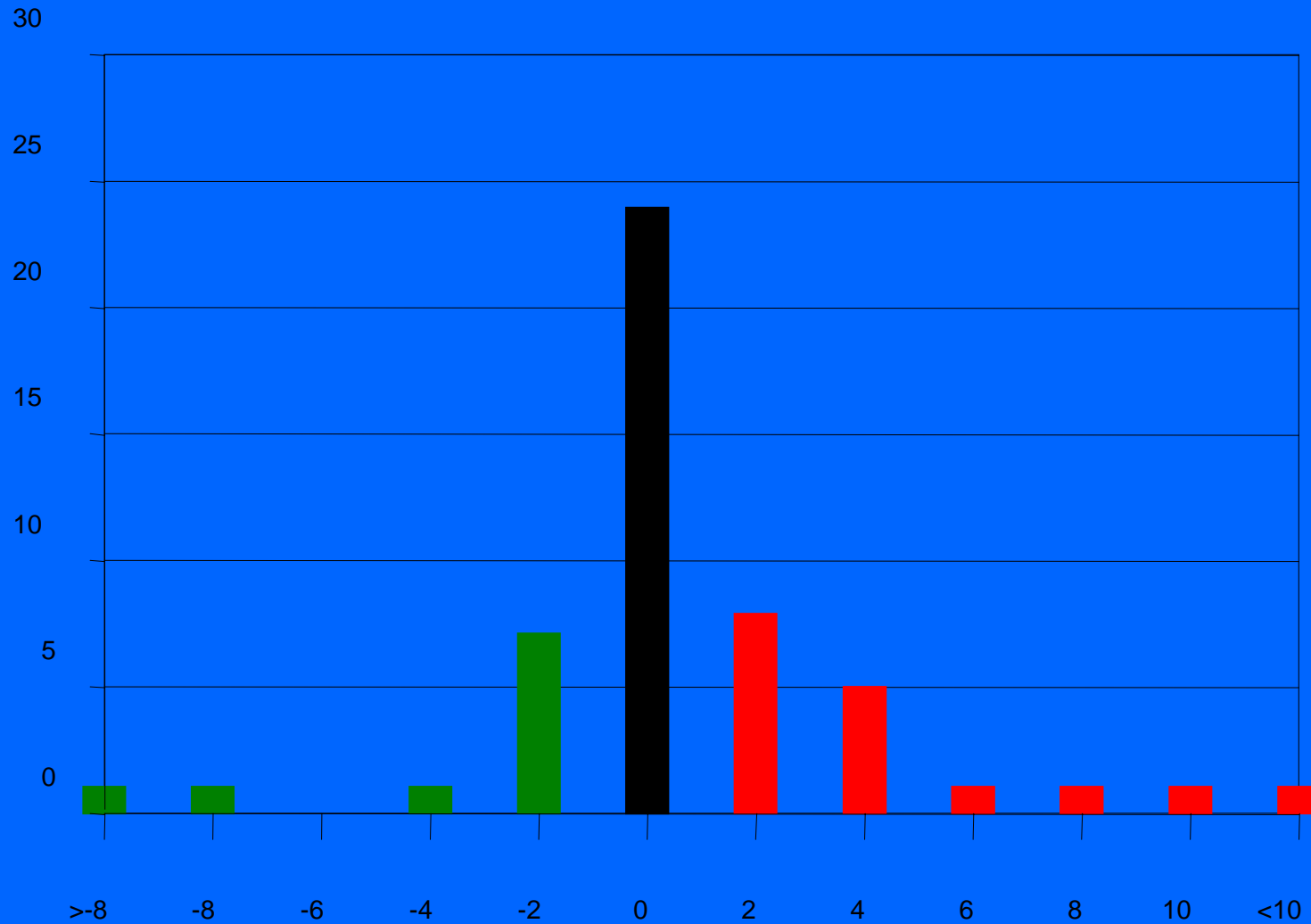
Quality Comparisons

50 Indian CNC lathes and vertical machining centres were twinned with equivalent foreign machines doing a similar job in the same plant.

General Satisfaction with Machine



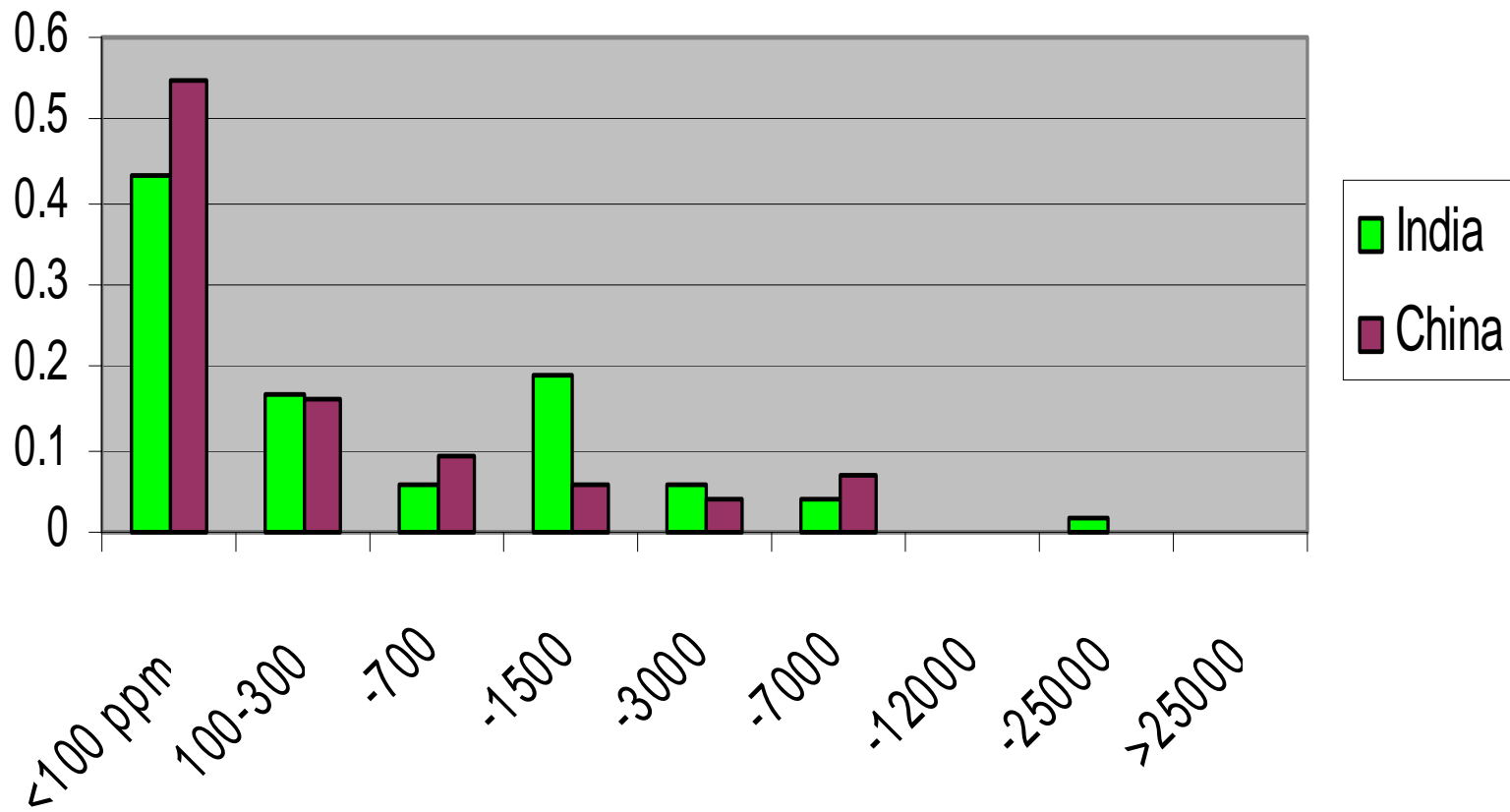
Difference in Frequency of breakdown



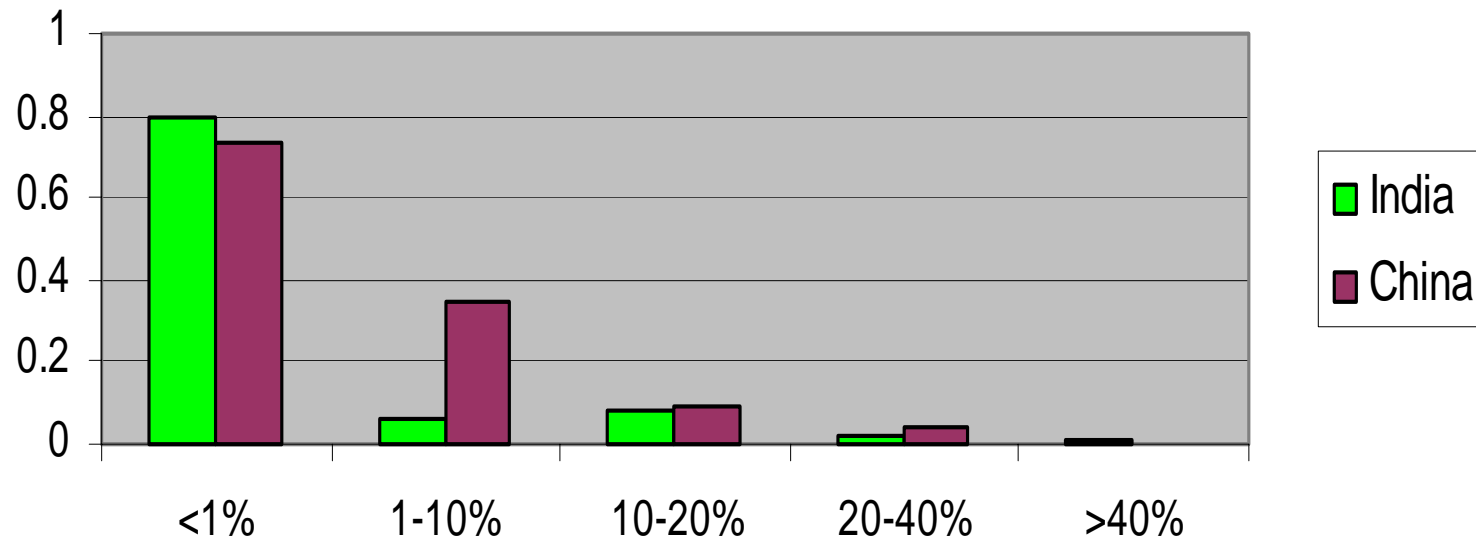
The Auto-Component supply Chain

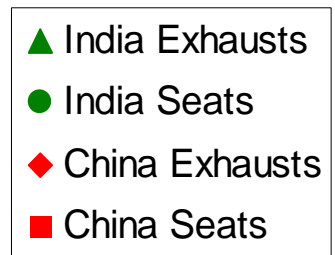
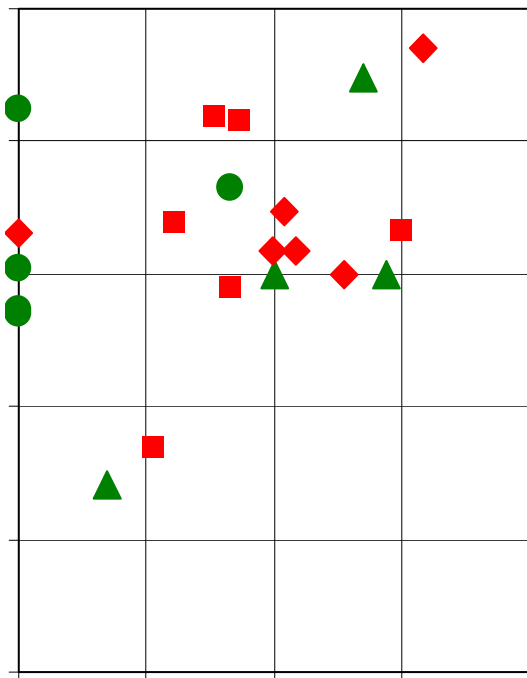
India and China

Component Suppliers to Multi-National Car Makers



Component Suppliers to Steering Gear Firms





A Timescale for Capability Building

- A multinational seat maker on a greenfield site in India drops from initial 2,085 ppm to 65 ppm in year 3.
- A domestic Indian seat maker drops from 20,000 ppm to 200 ppm over 5 years.

The Mahindra Story



Policy Lessons: A Few Illustrative Points

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- A 'basic' lesson: improving the general 'business climate' reduces non-wage costs and is equivalent to a rise in the capability of all the country's firms.

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- A 'basic' lesson: improving the general 'business climate' reduces non-wage costs and is equivalent to a rise in the capability of all the country's firms.
- 'Big push' fallacies: governments are not good at picking winners. Capabilities grow slowly.
- A controversial issue: for big countries, 'Domestic Content Requirement' can tilt the speed of domestic capability building. (China and India in auto-components).