

Latecomer Development
Innovation and Knowledge for
Economic Growth

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Why this book?

- This book is set against the backdrop of two major divides:
 - *Income*: the debate on persistent poverty of developing countries, those we have differentially labeled *latecomer countries* as well as the widening divide in income per capita.
 - *Knowledge*: the equally widening gap between the scientific and technological capabilities of latecomer countries and the “frontier” advanced industrial nations.
 - Underlying these debates is the considerable obfuscation on what precisely might be the role of states in the economic advancement of countries that made it and the poverty of those that remain at the bottom of the ladder.

It benefits from

- Our collective involvement in the field of industrial, science and technology policy both in practice and as researchers.
- Six years that we spent at the UNU-INTECH, we led several research projects that tried to understand the root of technology-based and industry-based underdevelopment.

Led us to three sets of conclusions:

- Rich countries build strong institutions as complements to productive systems (frontier as well as emerging), and in so doing, became rich through production and exporting of high quality goods and services.
- Poor countries remain poor because they continue to produce raw materials for the relatively rich countries
- Central to the production activities of all countries that became rich is a set of policies that one might classify as industrial or innovation policies.
- Poor countries need industrial and innovation policies that shift attention from commodities to development of “productive capacities”.

Motivation and techniques:

- First, to reconcile theory and evidence on innovation in the particular context of development.
- Second, while much progress has been made in the ways evolutionary and institutional economics interprets innovation, technology and learning; studies that advance this scholarship leave behind large sets of countries.

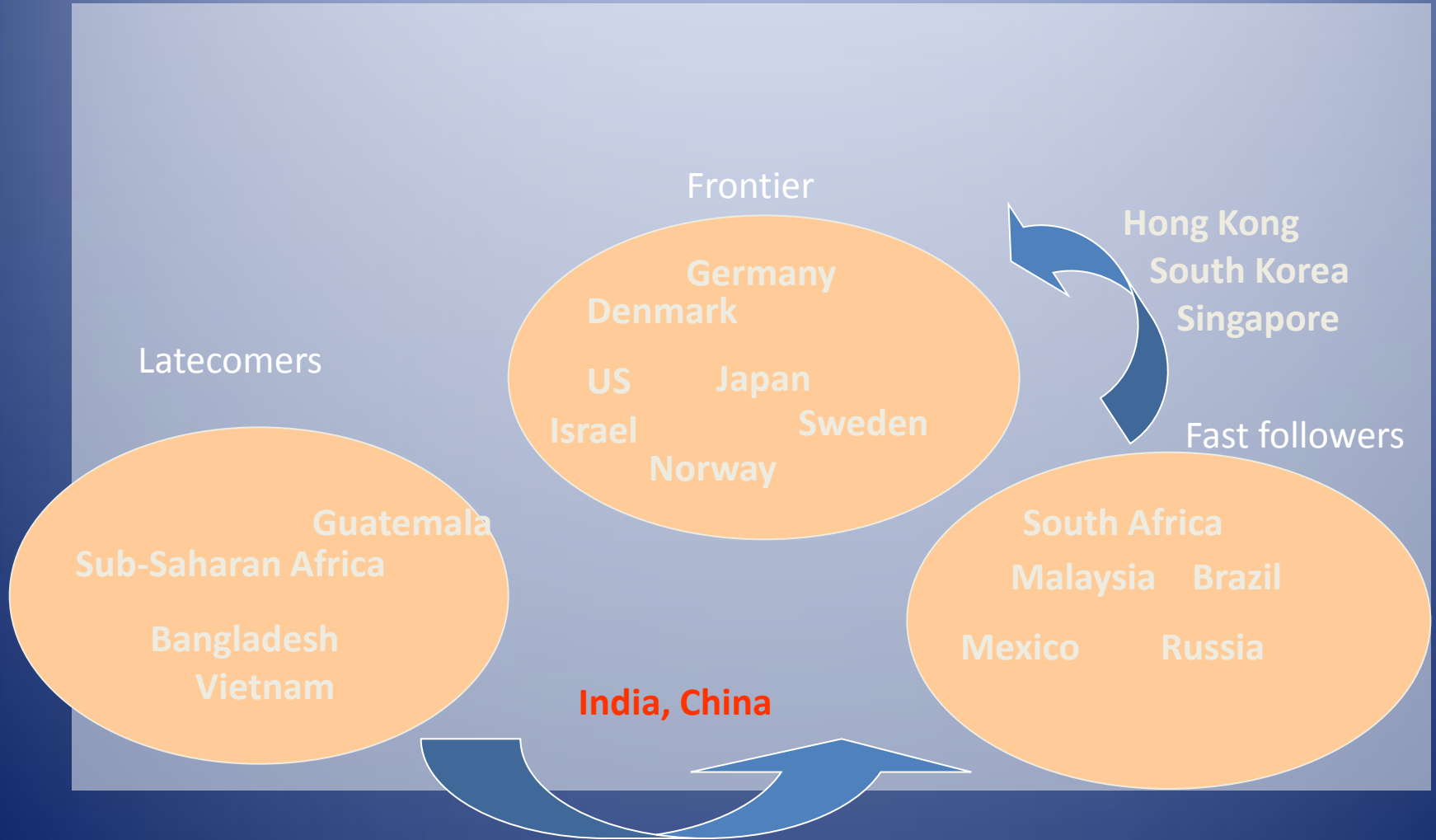
Motivation and techniques:

- Third, the literature on technology and innovation on the one hand and the so-called new development framework on the other can be made to address broader issues of latecomer development.
- Fourth, there is a need to move beyond what we know from technology, to understand the broader social processes that explain the structural transformation of countries.
- We propose that a broadening of the debate under a *Knowledge* framework might better capture the variegated hues of issues and countries under the label of late development.

Methods

- Empirical work at two levels:
 - Macro analysis of 79 countries
 - Micro surveys in different sectors and countries for seven years each
 - Sectors included new technologies such as ICTs, Software and Hardware components, biotechnology, electronics, pharmaceuticals and traditional technologies such as agriculture, textiles and ready made garments, etc.
 - Countries – Kenya, Nigeria, Malaysia, India, China, Vietnam, Bangladesh, Tanzania, South Africa, Ghana, etc...
 - Interviewed over 1500 firms and institutes in Asian and African countries to understand determinants of knowledge and tech learning.

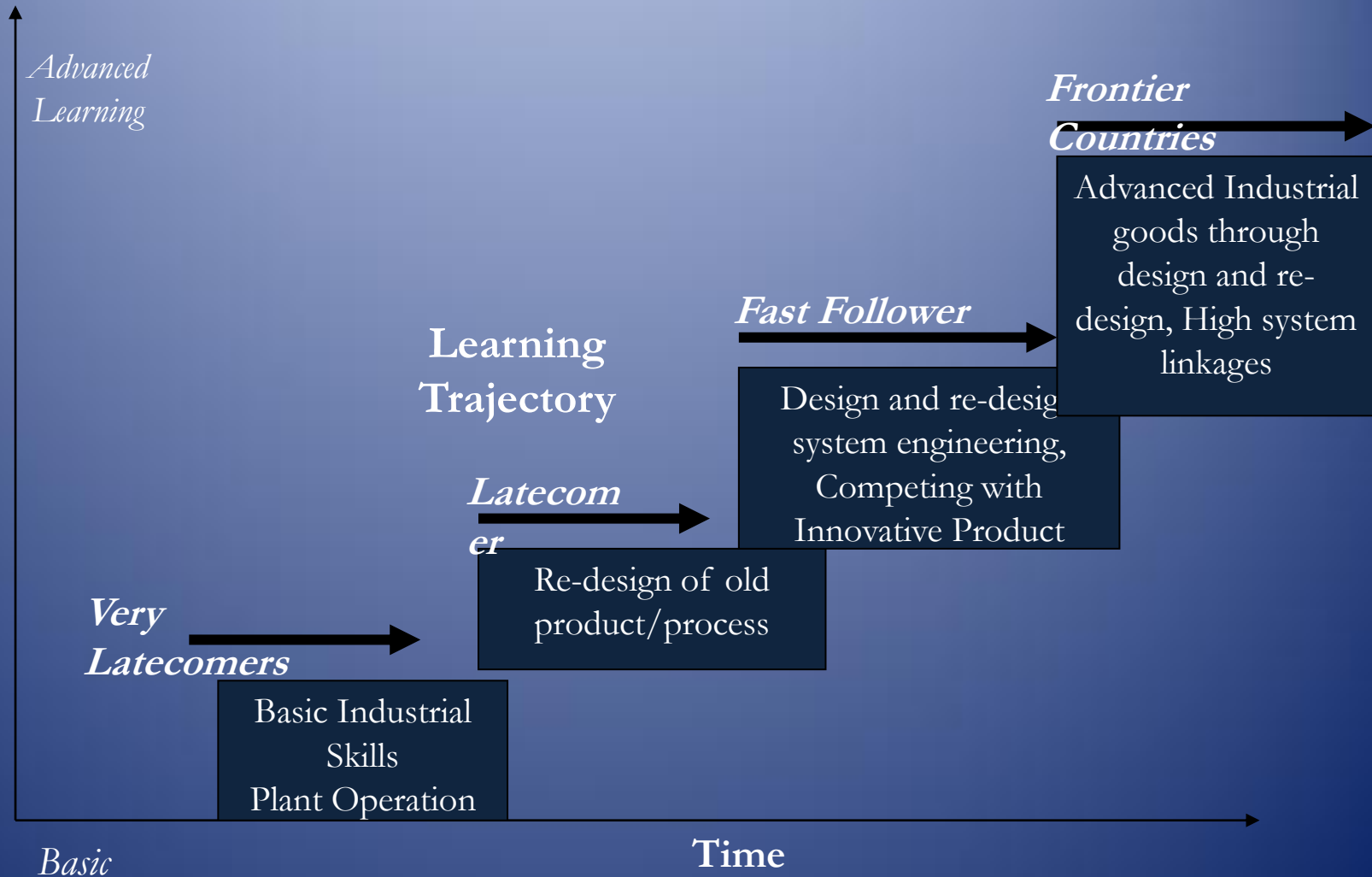
The global distribution of knowledge IS CHANGING.....



Latecomer categorization

- New categorization is needed is better understand the catching up process and why countries succeed in a latecomer context.
- Sustainable development is only achieved when economic growth rates are steadily accompanied by learning and knowledge accumulation.
- While some countries manage to do so, others stagnate or even regress.
- This book therefore not a narrative of technology, but a narrative of knowledge, productive capacity and development in the long run.

Model of technological learning and catch-up



A framework on innovation, knowledge and development:

- Constructed to articulate the underlying linkages and institutional policy choices that help to build capacity in countries and sectors.
- We coded the knowledge index (KI) factors based on four composite indices which are:
 - A country's level of technological capability, (elaborated in chapter three);
 - Formal and informal institutions support, (elaborated in chapter four);
 - Physical infrastructure support, (elaborated in chapter four); and
 - Advanced Knowledge infrastructure (also elaborated in chapter five).

Basis of the ranking:

The KI ranking resulted in three groups of countries:

- Frontier countries (FCs) which predictably comprise mostly the advanced industrial countries,
- Fast followers (FFs), which has a large number of transition countries.
- Latecomers, which has a large number of relatively poor countries.

Key Findings

1. National knowledge systems consists of four main knowledge domains:
 - The largely science-based domain with scientists and engineering research and development (R&D) as the dominant activity;
 - The Design and Engineering domain which involves systematic engineering and scientific specification of products, processes, systems including computer hardware and software;

Key Findings

- The modern production and manufacturing domain with engineers as well as skilled technicians but less so scientists as the dominant actors;
- The informal or traditional domain, which characterizes developing environments. The main actors are artisans, crafts persons and technicians. The locus of activity is the diverse but structurally homogeneous maintenance and repair garages, clusters of low technology, traditional products and production processes such as indigenous knitwear, leather and footwear making and so on.

Key Findings

2. The framework and the model suggests:
 - Close connection between knowledge generation and GDP for the frontier and fast follower countries.
 - The underlying differences can be best coded in terms of knowledge infrastructure, physical infrastructure and *linkages* for economic national/sectoral integration within countries.
 - A determining factor: policy and institutional capacity.
 - These results are validated through the 79 country analysis and the micro-evidence from 11 countries.

Key Findings

3. Critical differences between those who succeed and the rest: presence of industrial and innovation policies that shape technological capabilities' accumulation in a critical way.

These advances have been supported by superior physical and knowledge infrastructure, which in turn depends on the **presence of a developmental state that facilitates knowledge – based growth.**

Key Findings

4. State facilitation means:

- States need to formulate a long-term vision and goal and pursue it;
- States have to provide coordination in order to bring harmony and efficiency to the action of multiple actors acting in a system;
- States have to put in place institutions where they are missing and strengthen those that are weak;
- States act as guarantors of risks and provide innovation “insurance”; and lastly,
- States have to manage conflict and resolve problems of asymmetric power relations.

Implications for IGOs, Donors and Other Organizations:

- Innovation is not about R&D, it's the use of knowledge in application. This calls for simultaneous efforts by all actor and across a wide range of policy areas – including education, technology transfer, IPRs, etc.
- Innovation capacity is about fostering integration of all economic and non-economic actors in order to bring about synergies in products, processes and organizational structures. Eg; health and access to medicines; ICT and knowledge capacity

Implications for IGOs, Donors and Other Organizations:

- Both states and markets are key institutions, none is dispensable in the development process.

THANK YOU

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