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Developing Economies as Toyoda Production  
Systems: Why the analogy makes sense, how  
it can inform industrial policy

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# Developing Economies as Toyota Production Systems

- Why the Analogy makes sense
- What it means for economic policy

# Development as Endowments: the pre-conditions for growth

- No barriers to internal commerce or international trade
- Strong property rights little public property
- Institutions to ensure the rule of law to ensure that property rights are respected and that exchange domestically and with the world remains free
- A culture to ensure respect for the rule of law?
- Social capital to build a culture to respect law?

# First Objection: Heterogeneity

- If endowment view were right, *growth* would be uniform within economies with the same institutional frame, and stable unless that frame is changed.
- It's not.
- If endowment view were right, *institutions* would be uniform within economies with the same basic frame, and stable unless that frame is changed.
- They are not.

# Heterogeneity of Growth

- Spontaneous growth spurts are common in developing countries.
- Growth varies sharply by region (Mendoza/Santiago del Estero)
- Growth varies by cluster
- Growth varies within clusters
  - Firms that compete on cost alongside
  - Firms that compete on design/collaboration

# Heterogeneity of Institutions

- Institutional capacity varies enormously within developing economies
- In Argentina INTA works very well
- INTI--not so well
- But INTA doesn't work equally well everywhere: wine industry flourishes in Mendoza, not in neighboring San Juan

# Contextuality

- Growth requires different kinds of learning in different periods: the meaning of growth, and the institutions that encourage it depend on its context. As Helpman puts it
- “Major changes in technology always induce major changes in economic organizations. The ... large business corporation in the late nineteenth century, the process of vertical integration at the beginning of the twentieth century, and the recent trend toward greater fragmentation of production exemplify organizational responses to technological change. As a result, the ability of a country to grow also depends on its ability to accommodate such changes, and the ability to accommodate change depends in turn on a country’s economic and political institutions. (Helpman, 2003)

# Another kind of Contextuality

- Institutions, like words, have meaning only in relation to each other. So the “meaning” or function of an institution in a developing economy depends on its relation to other institutions.
- At the limit, institutional change can create its own context or preconditions--growth creates the institutions for growth, not vice versa



# China: growth creates its own institutional preconditions

- 1970s--agricultural reform recognize the peasants' control over their plots, and permit them to sell at market prices surplus above target levels.
- 1980s--proceeds of agricultural improvement invested in Town and Village Enterprises (TVEs): manufacturing firms, owned by municipalities or public-private partnerships. And so on
- So bureaucratic tutelage in context does the work of private property rights and courts. But on the consensus view property law and courts protect investors against bureaucrats.

# first results regarding growth

- Growth is not hard to start (it almost starts itself, somewhere, sometimes)
- But keeping it going is not easy
- An doing so requires attention to the context of growth--the form it takes in a particular epoch, such as the present

# Same goes for institutions

- Almost always possible to find some that are working (except in the case of infernal traps--market failures re-enforced by political failures re-enforced by social failures)
- Problem is using the ones ones that work to improve those that don't
- This too requires attention to context--of growth and of other institutions

# Quiz

## What kind of organization

- Takes for granted that it can't specify its precise goals or the means for achieving them all at once, ex ante, and therefore
- Refines the goals, and the means for achieving them, by detecting bottlenecks or errors, and then searching out and eliminating their causes?

# No, the answer is not

- The market
- If you thought it was, it may be time to take a business person to lunch.

# Answer, the Toyota production system, of course

- Assumes that the current production design and set up are provisional
- But can be incrementally improved, and even transformed, by
- benchmarking and
- error detection and correction
- Which both have the property of causing organizations to search routinely outside the boundaries of their current routines

# Root-cause analysis: 5 whys

- Why is machine A broken? No preventive maintenance was performed.
- Why was the maintenance crew derelict? It is always repairing machine B.
- Why is machine B always broken? The part it machines always jams.
- Why does the jam recur? The part warps from heat stress.
- Why does the part overheat? A design flaw.  
(MacDuffie, 1997, p 494)

# Benchmarking

- evaluation of which products are enough “like” the target design to be worth comparing draws attention from habitual preferences and broadens consideration of just what that target should be.
- But the strengths and weakness of competing solutions are mutually illuminating.
- So detailed consideration of the alternatives produces a useable map of the solution space.
- Upshot: you look beyond the lamppost but don’t get lost in the dark.



# The developing economy as a toyoda production system

- Problem is not to assemble the preconditions for growth and protect them for disruption
- Goal is to build institutions that can identify opportunities and bottlenecks to exploiting them
- But these institutions also have to be able to identify, or allow others to identify, errors and bottlenecks in *their* operation

# Search networks: a key building block

- Search networks are networks that allow you to rapidly identify people or institutions that are solving (part of) a problem closely related to the one you are trying to solve
- Search networks are thus key to benchmarking--finding solutions that inform your provision design
- And uprooting faulty strategies, by showing that others in your situation are doing better than your own efforts suggest is possible

# Examples of search networks

- Fundacion Chile Cluster Building R&D Venturing
- Taiwanese project-based cluster development programs
- Supplier Development Programs (Ireland, Singapore, Wisconsin, USA)
- Venture Capital

# INTA/INTI?

- Work with clusters/regions
- Provide standards that connect to world markets
- But also technical help to meet the standards

# From Principal-Agent Accountability

- Principal agent accountability assumes that *some* actor among those seeking to coordinate their efforts have a precise enough idea of the goal to either give precise instructions to the others or reliably recognize when their actions do or don't serve the specified end.

# To Peer Review

- If solutions can only be identified as they are pursued; if actors have to learn what problem they are solving, and what solution they are seeking, while problem solving, then principal agent relations are impossible.
- here accountable behavior is provision of a compelling explanation for choosing, in the light of fresh knowledge, one way of achieving one (sub)goal over others:
- peer review, in which decision makers learn from and correct each other even as they set goals and performance standards for the organization....