

# Experimentalist Governance for Technology Upgrading: New Open Economy Industrial Policy Process

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# “Doomed to choose”: imperative to focus on certain competencies

Pitfalls of vertical industrial policy

## **Three major assumptions/ problems:**

- ‘picking winners’ in modern fast-changing industries?  
‘Winners’ are continuously evolving: self-discovery problem
- public sector has information/ capabilities to make a choice. It does not: capability problem
- capture by vested/ entrenched interests: a problem of dis-entrenchment (inefficient projects and programs can’t be closed)

# New Open Economy Industrial Policy Process: Making Choices Without Picking Winners

Key assumptions:

- No one has a panoramic view of the economy, all views are partial
- Capability problem is rampant
- Vested interests are powerful and rampant
- Shift from a 'one-time' choice to managing the process of error-detection and correction (e.g. venture capital)
- Making a choice without picking winners: **search process** to manage "strategic bets"
- Since no actor can have a panoramic view of the economy, analysis is helpful but only to the extent it informs joint action
- Experimentation based on co-development in which diverse actors engage in long-term collaborative effort

# Questions of the chapter

- 1) How can we manage and govern this experimental search process? How can we make it accountable? Introduce concepts to describe this process in an operational way – useful for a policy maker
- 2) What is the emerging evidence for NIP process?
- 3) What is the incubation cycle of NIP programs, projects and policies – how are they conceived, corrected and terminated (discontinued)?

**Chapter which stands apart: policy process as endogenous variable rather than afterthought of positive analysis. The key question is ‘how to’: what is the next step in the sequence of actions**

**Builds on work in collaboration with C. Sabel (Columbia University)**

**Method: Appreciative theory (R. Nelson)**

# Collaborative search and experimentation process:

## Two dimensions

- Agents with new capabilities: a new private sector (which learns to innovate by connecting to the world economy) and a new public sector (capable of providing complementary public inputs for private-sector search) develop together
- They are two sides of the same collaborative process.
- This process begins even if government is, on the whole, weak, and many firms are rent-seeking because the public and private sectors are highly **heterogeneous**
- The issue is to leverage this heterogeneity: identify and engage with 5% of good (dynamic) exceptions, both in public and private sector sides

# Search networks: a key building block of new experimental industrial policy

- Any concept design of a policy or program is provisional and encounters problems to implement
- 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 provisional design
- And disentrenching faulty strategies, by showing that others in your situation are doing better than your own efforts suggest is possible

# Examples of search networks

- Highly skilled diasporas
- Early stage venture capital
- Taiwanese project-based cluster and venture capital development programs
- Fundacion Chile Cluster Building R&D Venturing
- Networks of high-risk R&D organizations: DARPA and ARPA-E

## Example of search and experimentation process: Taiwan in the 80's and 90's

- Stage 0: Design phase – emergence of concept design capabilities in a policy space  
‘High achievers’ from both the diaspora and the organizational periphery of the government decide to promote venture capital industry. Mr Lee, an engineer by training – Minister without portfolio – establishes a search network with overseas Taiwanese. NIP program – venture capital program is designed. There always appears to be an engineer at this stage.

### Stage 1: Micro-level – Pilot action

First venture capital fund is established. Diaspora members relocate to Taiwan to manage the fund.

- Stage 2: Mezzo-level: Innovation cluster --Resolving Coordination Problem

Demonstration effect of the success triggers establishment of other funds.

### Stage 3: Global Marshallian District

- Emergence of globally competitive innovation clusters. Massive return of talent



# Three ingredients of New Industrial Policy Process

- **A new generation of programs** which institutionalize search and experimentation networks. E.g. Yozma in Israel, Supplier Development in Ireland, VC program in Taiwan
- **A locus of experimentation: Schumpeterian development agency** which runs a portfolio of such programs (Office of Chief Scientist in Israel; Foundation Chile, Scottish Enterprise in UK). Usually on the organizational periphery of the government and outside the formal public sector structure
- **Diagnostic (problem-solving) monitoring:** a procedure to detect and correct errors in specific programs and portfolio of programs

## Diagnostic (or problem-solving) monitoring

- No matter how carefully the new projects are defined and planned, there are unanticipated problems – limits of conceptions, surprises of execution.
- To detect and resolve these problems it is necessary to connect the concept design stage of projects to an institution that monitors the progress of projects, uses signs of difficulty to trigger inquiry into the root cause of the problem, and convokes the actors who can help solve it – or calls the attention of higher-up authorities to problems that remain unsolved.
- We'll call this **DIAGNOSTIC MONITORING** – monitoring to underscore the continuing need at all levels to check on progress, given the limits of planning, and diagnostic because the aim is to facilitate and organize problem solving by the actors, not to use the threat of punishment for bad performance as an incentive for good behavior.

## Fundacion Pro Arroz (FPA) in the province of EntreRios, Argentina

- **A routinized, meticulous system of monitoring** that regularly reviews the progress of each undertaking, surfaces problems early, and where possible organizes technical support to overcome them. The core of the system is a set of technical teams operating under a central coordinator. They review projects at least once a month and in some cases every two weeks.
- The task of the teams is to diagnose problems and their likely causes, detect variations across similar projects and suggests remedies for poor performers, and suggest mid-course or, in extreme case, the discontinuation of ongoing initiatives. The Foundation's technical teams monitor projects undertaken on the foundation's behalf, universities and other institutions to ensure comprehensive review of all initiatives according to the same criteria, and to accelerate the cross-fertilization of ideas.

## Contrast between accounting and diagnostic monitoring

	Conventional / accounting	Diagnostic/ problem-solving
Key question	What (is the gap between performance target and outcome)?	Why (is there a gap)?
Who benefit from monitoring	External to the process: e.g. funding agencies	Participants in the process: e.g. project managers
Flow of information and accountability	<b>Vertical: principal-agent problem</b>	<b>Horizontal: extended peer review</b>
Relevant expertise	General (task management)	Specialized expertise: new knowledge is created in the process
Information gathering procedures	Focus on formal indicators of performance Performance reports	Focus on site visits Technical meetings of diverse experts
Risk management procedure	Ex ante (before the project/program begins): through elaborate indicator-based	Endogenous: 'just in time' error-detection and correction

# Two types of new industrial policy processes

- In the narrow (managerial) sense: running a project portfolio within existing SDA: short-term planning horizon

Some capability of accountable experimentation already exists (taken as exogenous variable)

**The NIP process in the narrow senses can be controlled by a policy maker**

**Tip of the iceberg**

- In the broad (evolutionary) sense: long-term planning horizon

How this capability is created? What triggers it?

Usually, it emerges at the intersection of three forces: 1) sense of Urgency 2) personal initiative 3) opportunity

**The NIP process in evolutionary sense can't be controlled: it is open-ended and it depends on policy entrepreneurs (like Mr. Lee in the Taiwan example)**

# NIP process in the evolutionary sense

## Examples

Taiwan venture capital program : 1980-90s (slide 8)

Experimentation to promote high tech cluster in Israel:

- 1974 – obscure OCS (Office of Chief Scientist) established, supported by the World Bank
- OCS runs a portfolio of NIP programs – NIP processes in a narrow sense
- Some of them involve failures: 1991 – failure of INBAL
- OCS develops substantial capabilities as Schumpeterian development agency
- 1992-2000: Stunning success of YOSMA – public fund of funds to attract American private VC to Israel

## NIP in a narrow sense: ARPA-E

- Established in 2009 to foster radical innovation in the energy sector.
- Concept design stage consists of two reviews: of concept papers (explaining why specific research direction is taken) and of full applications.
- Typical program consists of 10 projects, each awarded three million dollars to be spent over the course of three years
- Implementation stage is organized on the basis of milestones agreed upon between program director and research partners. There is a 'traffic light' system: if project misses critical milestones persistently ('red light'), then, as a problem project, it becomes a subject of particular scrutiny.
- Milestones can be reset to develop an alternative research approach – meaning that the project is back to the design stage. If problems persist, program director sends 'at risk' letter to implementing research team detailing remedial actions including reduction of funding.
- Problem projects are thus closed gradually and incrementally – through remedial measures – blurring the distinction between implementation and closure.

At every stage in the organization of research—the definition of programs of investigation; selection of a portfolio of projects, advancing the program purpose; and supervision of individual projects in the portfolio—ARPA-E treats goals as provisional, or corrigible in the light of experience.

## NIP Process in the narrow sense: Incubation Cycle of NIP project/ program

	NIP	Venture capital	Conventional (NPM)
<b>1. Concept design: Generation of a project concept</b>	Active: Iterations of search for project concepts.	Usually passive (entrepreneurs approach VC for funding) and informal	Usually passive: applications come in response to call for proposals
<b>2. Implementation -- adjustment of concept design</b>	Continuous correction of a project concept through diagnostic monitoring	Informal diagnostic monitoring	Accounting monitoring through progress report from the implementor of a project to funding agency. The need for adjustment as a problem
<b>3. Closure</b>	Extension of diagnostic monitoring: gradual phasing out of a	Judgement call. Trivial for failing projects, difficult for 'living deads'	Political decision to stop funding a project. Example: program that funds the project runs out of resources



# Central policy tension of NIP

- Policy maker can control only NIP process in a narrow sense: incubation cycle of a specific program. Yet it is only the tip of the iceberg
- To be effective, specific NIP must be inserted in the long-term evolutionary NIP process: it is familiar Schumpeterian logic applied to a policy space
- Little patience or even awareness of evolutionary NIP process: fragile or ineffective NIP programs as outcome

# Fragility of NIP process in a narrow sense

## Russia's Megaprojects ('Science does Matter') in 2002-3: the Monitoring group

- A program to demonstrate that R&D matters: matching grant scheme to industry (in the order of 10 mln. US per project) to transform R&D of research institute into commercially successful and visible projects.
- Deal flow problem: many applications, no projects to select from. A Monitoring Group consisting of individuals from consulting industry, beneficiary organizations and the governments is set up by a high-ranking official to transform good ideas into projects.
- Projects are re-defined as they evolve: monitoring of projects as central issue. Monitoring is performed by the same search network.
- The Monitoring Group as a platform to establish genuine co-development, an example of a new generation of programs
- The Monitoring Group is the embryo of a Schumpeterian development agency

Once the Monitoring Group is dissolved, we are back to the 'business usual': vested interest are on display

## New industrial policy processes: paradoxes (as a way of conclusion)

- Accountable experimentation in the private sector is pervasive (open innovation, early stage VC, Toyota style production). Very limited role of public sector
- That was not always the case: 60-70 – first generation of experimental industrial policy in small open economies (Israel, Ireland, Taiwan, Finland)
- Centrality of innovation and call for new public management: shrinking organizational space for new industrial policy and accountable experimentation
- Second generation of NIP is in emerging economies (Argentina, Russia, India, China). But with the exception of China, the scale of NIP is limited
- Outlook for NIP is modestly positive, better for emerging economies than for developed ones

# An invitation for collaboration

- All second-generation NIP episodes (Argentina, India, Russia) were discovered by serendipity – as part of diagnostic monitoring of country's innovation efforts
- Can we make similar discovery in Korea, Brazil and other emerging economies?
- This is an open invitation for co-development and collaboration

## Conclusions: Main Concepts

- **NIP as a process of error-detection and error-correction**
- **Diagnostic monitoring as a procedure to manage this process**
- **SDA: organizacional capability for accountable experimentation**
- **Contrast between NIP process in a narrow and broad sense**