

Innovative Innovation Policies: Case Studies from the U.S., Israel, the Netherlands and Denmark

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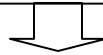
Trachtenberg School of Public Policy and Public Administration

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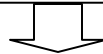


Background

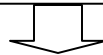
A thriving innovation system is critical to economic growth



Market and system failures impede innovation



Governments intervene via innovation policies



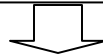
The policies implemented are not innovative, but replications of previous ones (this happens in all policy areas)



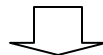
In today's environment, governments must implement **innovative** innovation policies

Relevant literature

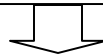
Innovation as driver of economic growth (Lundvall 1992, Kao 2007)



Neoclassical approach (Nelson 1959; Arrow 1962); Evolutionary approach (Nelson and Winter 1982; Ruttan 2001)

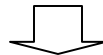


Three generations of innovation policy (Rosegger 1996, Vonortas and Tolnay 2001)



Why public policies are not innovative [lack of incentives (Barzelay 1992, Borins 2001), insufficient time (Merritt 1985), excessive oversight (Schön 1966, Moe 1994)];

Public policies a result of “muddling through” (Lindblom 1959), “groping along” (Behn 1988), and duplication (Walker 1969)



Innovative policy is needed overall (Drucker 1985, Cohen 1988, Golden 1997) and in innovation policy (Porter 1990, Leadbeater 2000, Kao 2007, Nelson 2008)

WANTED:

Innovative innovation policy

- Porter (1990): “Ultimately, nations succeed in particular industries because their **home environment** is the most dynamic and the most challenging, and stimulates and prods firms to upgrade and widen their advantages over time” (p. 70)
- Leadbeater (2000): “We must ... embark on a wave of radical innovation in many of our most basic **political, social and economic institutions**” (p. x)
- Kao (2007): “Our **national approach to innovation** must itself be highly innovative” (p. 13)
- Nelson (2008): “**Institutional change**, and its influence on economic activity, is much more difficult to direct and control than technological change, and hence prevailing institutions often are drags on economic productivity and progressiveness” (p. 2)

The challenge

- Existing mechanisms for generating innovation policy result in “more of the same” or duplication
- Only rarely do governments generate innovative innovation policies
- Insufficient analysis of innovative innovation policies and of link between policy innovativeness and policy success

Guiding research questions

1. How are innovative innovation policies designed and implemented?
2. How does the level of innovativeness of a policy affect that policy's success?
3. How do various components of innovativeness in an innovation policy contribute to the policy's success?

Definitions

- **Innovation policy**: “Those elements of science, technology and industrial policy that explicitly aim at promoting the development, spread and efficient use of new products, services and processes” (EC 1999)
- **Innovative policy**: “Policy that challenges the prevailing wisdom as it creates public value” (Light 1998)
 - Significant departure from how things are done in a particular domain
 - More than good business/organizational practices

Research design

Innovative innovation policy (cause/IV)



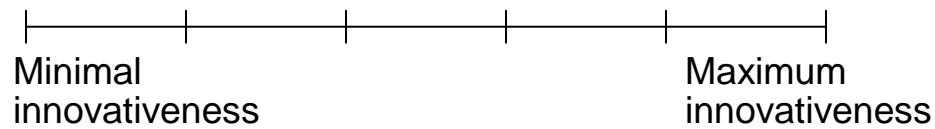
Successful government intervention to support the national innovation system (effect/DV)

Measured by:

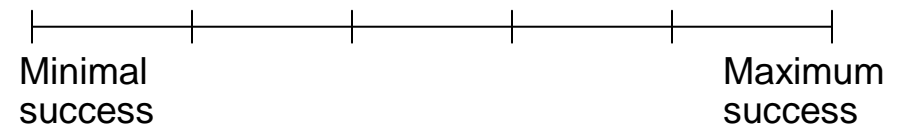
- Novelty
- Quality
- Impact
- Replicability

Measured by :

- Expected results vs. actual results (“public value”)
- Unintended consequences



Level of innovativeness

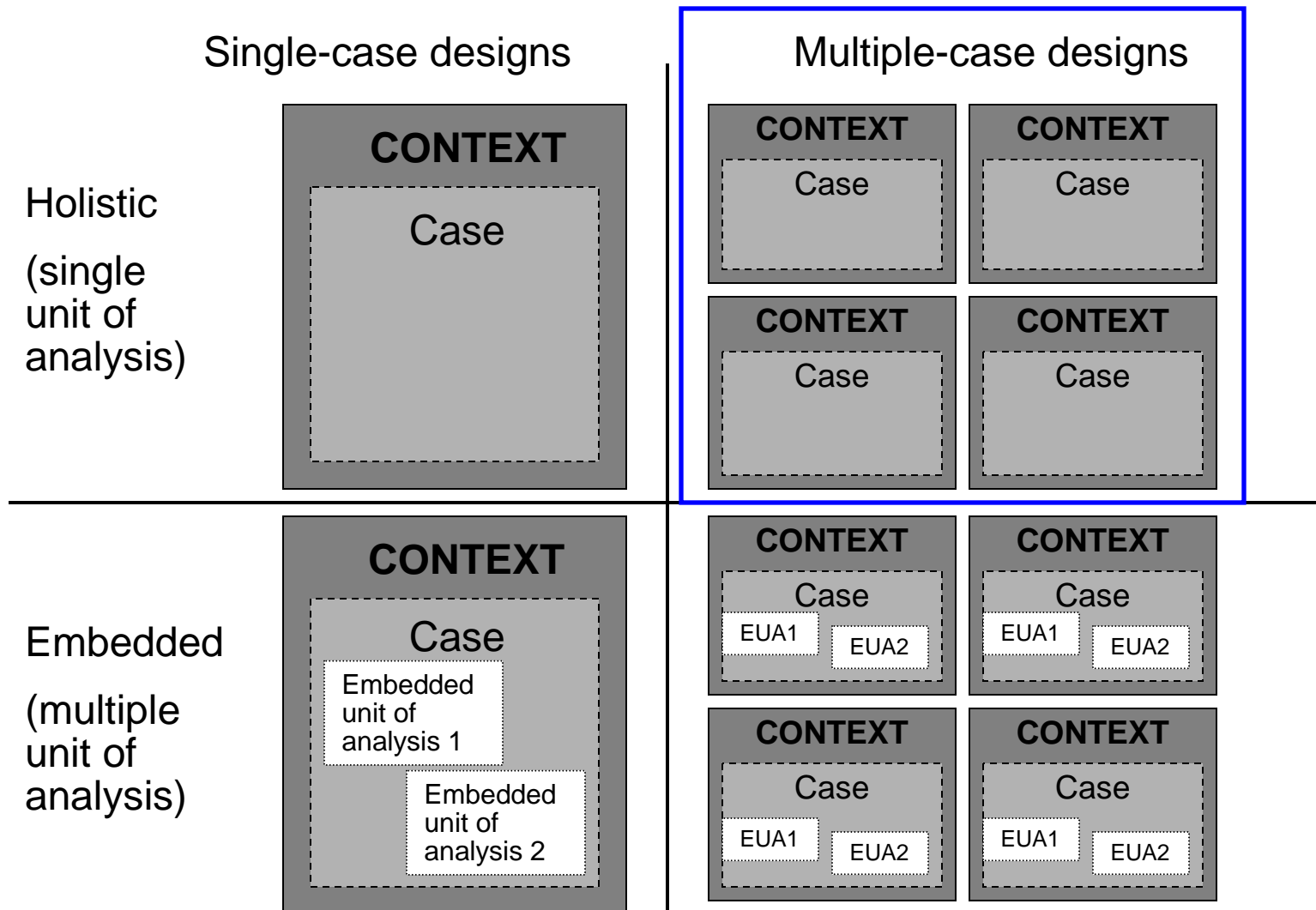


Degree of success

Methodology (1)

- Holistic, multiple-case replication design (Yin 2003)
- Four case studies of innovative innovation policies:
 - Network-Centric Warfare (U.S., 1998)
 - Yozma (Israel, 1993)
 - Innovation Vouchers (Netherlands, 2004)
 - User-Centred Innovation (Denmark, 2006)
- Successful innovation policies with varying degrees of innovativeness
- Similar characteristics: developed, knowledge-intensive economies, R&D intensive, Western, English-speaking
- Access to multiple data sources: program reports, evaluations and interviews

Basic designs for case study research



Source: Yin 2003, p. 40

Methodology (2)

- Measuring policy innovation (IV): application of Altshuler-Zegans model for analyzing innovative policies to innovation policies

Criterion	Definition	How operationalized
Novelty	Level of creativity in the policy	Roberts (1992) levels of policy innovation: origination , adaptation, borrowing
Quality	Level of clarity in which the benefits of the new policy are presented to “clients”	How clearly were the expected benefits of the policy communicated: <ul style="list-style-type: none">• Through effective channels• To relevant target audiences
Impact	Magnitude of impact the policy will have	<ul style="list-style-type: none">• Number of expected beneficiaries• Geographic scope of impact• Range of issues covered by policy
Replicability	Extent to which the policy is transferable beyond where it was initially implemented	Number of instances in which policy was duplicated

Policies with higher scores on these criteria will be considered more innovative than those with lower scores

Methodology (3)

- Measurements of policy success, “public value” (DV)

Criterion	Definition	How operationalized
Results	Expected vs. actual	<ul style="list-style-type: none">• Analysis of expected results as articulated in policy documentation• Analysis of actual results
Unintended consequences	Positive vs. negative	Analysis of unforeseen results due to innovative policy selected: <ul style="list-style-type: none">• Positive• Negative

Policies with higher scores on these criteria will be considered more successful than those with lower scores

Limitations

- Internal validity
 - Causal inference: ability to demonstrate link between cause (innovative policy) and overall effects (economic growth, competitiveness, etc.)
- Measurement (construct) validity
 - Social desirability
 - Purposeful or accidental misrepresentation

Case study 1: US

Goal: Revolutionize military force through IT

- Policy: Network-Centric Warfare (1998)
 - Substituting information for mass
 - Drastic reduction in military platforms (planes, tanks, ships, etc.); drastic increase in sensors and ICT systems
- Results: duplicated worldwide; increased interoperability with allies through common doctrine and systems; competitive advantage for U.S. firms; learning by doing

Case study 2: Israel

Goal: Create national VC industry

- Policy: “Yozma” (1993)
 - Publicly-funded, privately-managed VC funds
 - \$100 million invested by government
- Results: created robust VC industry (~80 VCFs) that manage ~\$10 billion; support for growth of domestic high-tech firms; worldwide recognition

Case study 3: Netherlands

Goal: Move knowledge from public research institutions and large companies to SMEs

- Policy: Innovation Vouchers (2004)
 - Allow SMEs to ask experts a set of questions
 - € 8.25 million/year for 1,100 vouchers worth € 7,500 each
- Results: duplicated in several countries; broadened to multinational level with neighboring regions in Belgium and Germany; yet little innovation

Case study 4: Denmark

Goal: Transferring innovation from lead users to firms

- Policy: Denmark User-Centered Innovation (2006)
 - Collaborative environment (“lab”) where lead-users can interact with private sector designers/engineers
 - \$30 million investment for 2007
- Results: recognized as “first adopter” of innovative practice from academia

Initial results (1): measuring innovativeness

	US	IL	NL	DK
Novelty	High: Original concept	Medium: Adapted from private sector	Low: borrowed from similar programs for SME support	Medium: Adapted from academia
Quality				
Impact	High: "Revolution in Military Affairs"; reduce risk to soldiers; shorten time to decisive military victory; global scope	Medium-high: Generate sustainable national venture capital industry; reduce unemployment for skilled workforce	Medium: Facilitate knowledge-transfer from specific public and private entities to SMEs	Low: Application of new innovation strategy to 6 large firms, potentially to others at later stage
Replicability	High: duplicated and adapted worldwide;	Medium-high: Duplicated in several countries;	Medium-high: Duplicated in several countries; broadened to multinational level	Medium-high: "UCI lab" concept can be easily duplicated

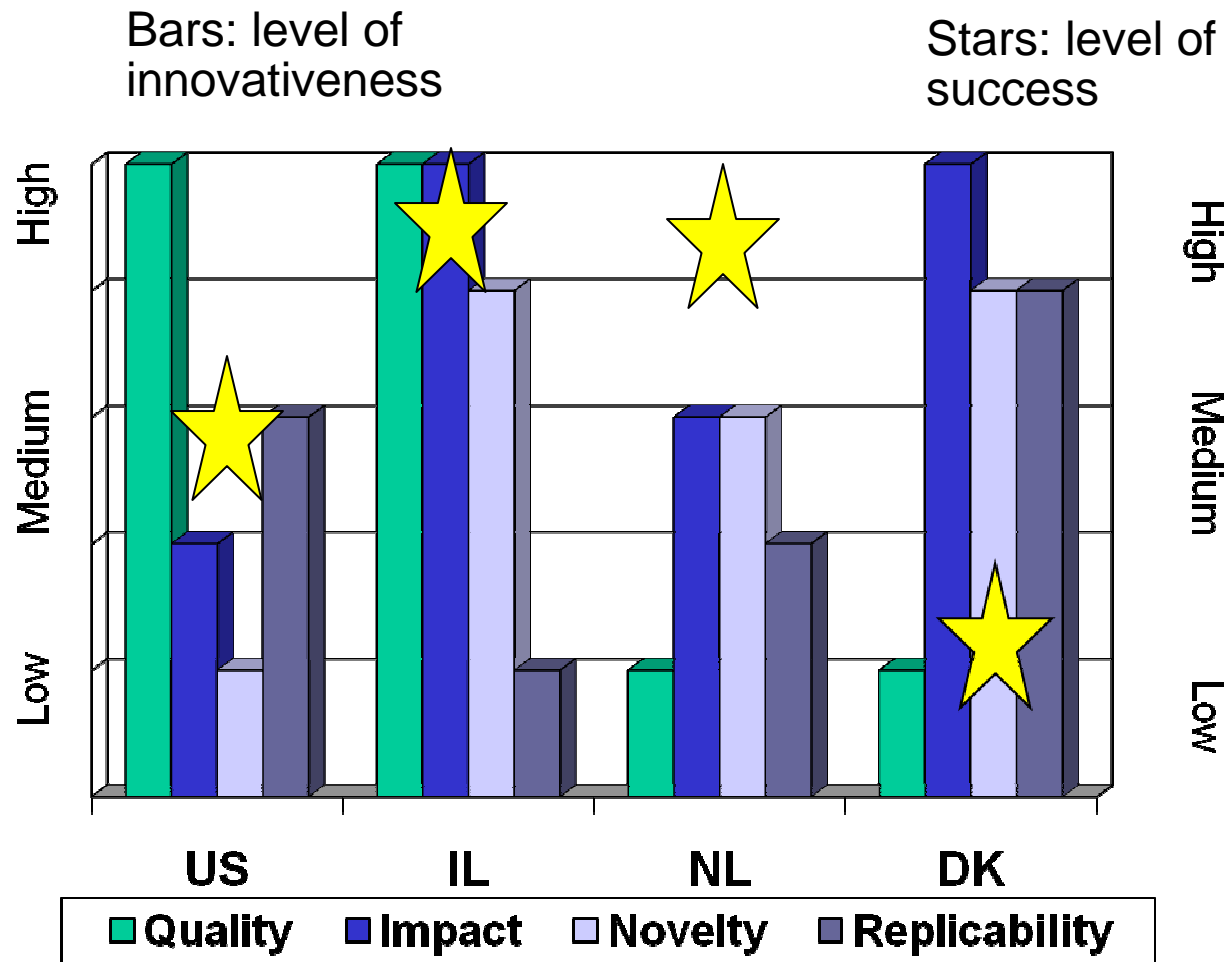
Initial results (2): measuring success

	US	IL	NL	DK
Results		Generated sustainable national venture capital industry (~80 VCFs); infused cash to large number of domestic hi-tech firms over short period of time; VCFs \$2.7 billion raised in 10 years	73% of voucher recipients continued to work with their voucher partner; primary impact on process improvement but little impact on product or process innovation	
Unintended consequences	Increased interoperability with allies; competitive advantage for US firms; lock-in on technologies that are less relevant for new security environment		Limiting consumers' choice tends to subtract from economic welfare (even when cost of intervention is excluded); 15% of voucher recipients did not use them	

Initial results (3): linking innovativeness to success (EXAMPLE)

Innovativeness \ Success	High	Low
High	A, B	
Low		C, D

Initial results (4): linking elements of innovativeness to success (EXAMPLE)



Expected results

- In-depth analysis of innovative innovation policies
- Establish relationship (necessity?) between policy success and policy innovation in innovation policy
- Assess contribution of each of the components of policy innovation on policy success
- Validate technique for innovation policymakers to analyze innovative innovation policies in order to achieve desired benefits

Summary

- In-depth analysis of case studies
- Use A-Z model to measure level of innovativeness of case studies
- Measure success of case studies
- Analyze relationship between level of innovativeness and level of success
- Analyze relationship between individual components of innovativeness and success

Key sources referenced

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Questions?

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