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STRATEGIC AND 'ADAPTIVE' POLICY TARGETING: THEORY AND AN EXAMPLE*

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Pi=Phase (i=I,II,III); E-Effectuation; C-Causation

IRS-Increasing Returns to Scale; DIRS-Dynamic IRS

MF-Market Failure; SF-System Failure; GF-Government Failure

HLO-a meso level, higher level organizations/systems (e.g. a cluster, sector, industry, entrepreneurial system, etc)

SIP-Strategic Innovation Policy; Pr-Priority

SIP (E)-SIP effectuation; SIP (C)-SIP Causation

'Policy Targeting'- policy targeting of a new HLO

RDM-Robust Decision Making

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BIBLIOGRAPHY

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Abstract

This paper further develops the Strategic Innovation Policy (SIP) conceptual framework as applied to Policy Targeting of new,'higher level' organizations or systems (new HLOs, a term which comprises infant industries, sectoral systems of innovation, entrepreneurial systems, etc) found in two previous papers (Teubal and Zlotnick 2011, Teubal 2013a) . In common with those papers, the approach followed in this paper is explicitly systems-evolutionary and has been inspired by Israel's successful ICT-oriented entrepreneurial system of the 1990s (Avnimelech and Teubal 2006, 2008). Like them, it assumes two ideal types of priorities, Type 1 –where the priority-related underlying 'body of knowledge' is characterized by moderate uncertainty or risk; and Type 2, which reflects a dynamic and turbulent global and domestic environment, unexpected events, radical uncertainty and chaos. Moreover while priority setting of Type 2 priorities requires substantial multi-stakeholder deliberation (Swanson and Bhadwal 2009), priority setting of Type 1 priorities might involve a mix between such decentralized mechanisms and other, more top down, expert- led ones.

A key aspect of SIP in all papers is the explicit, continued and knowledge based activity of identifying and setting national strategic priorities related to science, technology, higher education and innovation broadly defined. Explicit priority setting is critical given the prevalence of government failures related to priority setting (Teubal 2013a). The framework is particularly adapted to generic, multi-Ministerial priorities; and to those related to new HLOs which under certain conditions may subsequently be targeted by policy. Despite the inherent complexities and uncertainties associated with Policy Targeting of Type 2, new HLOs the paper makes a strong case for a well functioning SIP system that may contribute to effective adaptive Policy Targeting of such entities.

The general objective of this paper is to generate a broad, systems-evolutionary conceptual framework of SIP processes and components or elements leading to Policy Targeting and Emergence of a new HLO, particularly those of Type 2. The Israeli case strongly suggests the potential importance of assuming three Phases-Background Conditions (PI); Pre-Emergence (PII) and Emergence (PIII); and the value of assuming that initial PI priorities are rather general ("promoting and innovative business sector with an increasing number of innovative companies") while the end-of-PII priority is a more specific and better defined option for generating a new HLO. In this situation, the PII →> PIII transition will involve a decision to attempt to materialize or articulate such an option; and correspondingly, it may (although not necessarily) involve full-fledged policy targeting of the new HLO (or of a set of possible/reasonable specifications of such an entity).

The specific contributions of this paper are:

1. *A strong, multi-variable and multiple-component focus on Policy Targeting of Type 2, new HLO's, which goes considerably further than that presented in Teubal 2013a. A key aspect of this process will be the gradual definition and specification of what was initially a very general priority into a better defined (e.g. a hierarchically higher level of organization or system priority) priority option; and the potential transformation (or not) of the latter option into* ***a meso\Schumpeterian-level,*** *new-HLO priority*

2. *Incorporating into SIP the entrepreneurial concepts of Effectuation (E) and Causation © (the paper considers SIP(E) and SIP© as two distinct components of the multiphase SIP process; and links both of them to E and C through the notion of activation of key agents in the context of SIP (E) and 'experimental policies'-see Sections 1-3)*

   Under the above assumptions SIP (E) should prevail in PI while possibly be present in PII (together with SIP (C)); while SIP © would prevail during new HLO emergence in Phase III (provided no 'creative-destruction' exogenous event occurs during the process)

3. *Introduction of System Learning and Knowledge Integration as a key concept in the evolutionary process leading to Policy Targeting of a Type 2, new HLO. These types of Learning are related to Argyris's and Shon's Double Loop Learning. They should be contrasted with Learning by Doing-type Policy Learning which, under radical uncertainty and unexpected events, may not go far enough to enable better definition and specification of rather general priorities.*

4. *Reasons for separation of Priority –setting and Priority setters from Policy making and Policy makers; and characterization of the resultant priority policy coordination problems that may arise.*

Every priority including a new-HLO one will have a Priority-Policy coordination problem; while only generic priorities will have an Inter-Ministerial Coordination problem as well. The paper proposes the Ex-post and Ex-Ante priority-policy coordination concepts (the latter one being particularly difficult to achieve and subject to disputes and to the influence of 'politics' over 'knowledge'); and the concepts of Endogenous, Knowledge Push and Exogenous, Governance-based inter-Ministerial coordination.

5. *A preliminary discussion of of the links between Policy Targeting Success/Failure; Strong/Weak Policy Adaptation and Good/Bad Luck*

6. ***Implications for Adaptive Policy making (Metcalfe 1994, Swanson and Bhadwal 2009, etc)****. While undertaking SIP(E) with activation of 'key agents' whenever necessary as well as System Learning and effective coordination may make a significant contribution to policy adaptation and Policy Targeting success, they are not sufficient. Even the realistically conceivable best designed policies may also fail due to the inherent*

uncertainty and the dynamics pointed out by Metcalfe(1994), Ormerod (2009) and Taleb (2009).

In a context where existing Innovation Policy systems are oriented to Type 1 rather than to the increasingly important Type 2 priorities, it is not surprising that innovation policy failure is rampant at least in certain, quite general, contexts. Moreover, the 'causes' of failure are two: ineffective or inadequate policy adaptation which may, among other things, block the exploitation of new opportunities for policy targeting; and/or the impact of radical uncertainty, unexpected events and chaotic dynamics which may shift what was positive to negative social profitability of policy targeting even after adequate policy adaptations have been undertaken.

The upshot is that, even without taking the macro-SIP link into account, a 'more of the same' policy perspective will not solve the problem facing Western Economies (i.e. rejecting one size fits all policies-see Rodrik and Haussman and Rodrik- is most possibly not enough anymore to characterize post-Washington Consensus innovation policy requirements!!). It is high time to understand that a Paradigmatic Change in Innovation Policy is required; and that this requires a different Vision of what such a policy is or entails, as well as a much more varied set of accepted methodologies and tools for knowledge generation. As with the evolutionary critique of Venture Capital and High Tech policy in the 1990s (Rosiello et al 2011; Avnimelech et al 2010), the essence of the above mentioned Paradigmatic change does not lie in criticizing this or that policy; rather it consists of questioning the very basic conceptual foundations of Innovation Policy including its objectives and criteria of acceptability as they are understood today.

Introduction

This document further develops the Strategic Innovation Policy (SIP) conceptual framework (Teubal and Zlotnick 2011, Teubal 2013a) and its application to, policy targeting of new Higher Level Organizations or systems (HLOs) like innovation systems, infant industries, sectors, or entrepreneurial clusters. Most of the paper deals with Type 2 rather than with Type 1 priorities, that is priorities involving radical or deep uncertainty, unexpected events (Black Swans in the terminology of N. Taleb 2009) and chaos rather than 'moderate' uncertainty or 'calculable risk' in the context of a well defined 'body of knowledge' (Teubal 2013a, Section 4); Moreover, in contrast to Type 1 priorities, Type 2 priority setting involve decentralized, bottom up, stakeholder intensive mechanisms (Swanson and Dhawal 2009) with or combined with -depending on case- both a knowledge component (with both explicit and tacit elements) resulting from analysis by experts and another resulting from 'entrepreneurial' (or other ley-agent) *doing* on the ground (Teubal 2013a).

The central finding and focus of this paper is the existence of strong non-linearities in the 'positive/normative evolutionary process leading to a new HLO. They result from the fact that not only policies will affect the evolutionary process leading to a new HLO, but such an evolutionary path will affect the specifics of the new-HLO configuration aimed at by policy makers (i.e.

priorities and policy objectives) in a non-trivial way. A key implication is that effective policy targeting ofinnovation systems which deal with the 'deep/radically uncertain' Type 2 priorities(a key and possibly increasing component of the global context) could significantly differ from existing systems which either are not focused or are not adapted to 'policy targeting' at all or alternatively, are focused on 'policy targeting' of Type 1 priorities that is policy making taking place under conditions of 'risk' rather than 'radical uncertainty' .

This paper will analyze such non linearities and their implications for strategic policy targeting of new HLOs in the context of a strategic and evolutionary or systems/evolutionary perspective involving distinct phases including a pre-emergence and a new HLO emergence phase (see e.g. Avnimelech and Teubal 2004, 2006 interpretation of the evolutionary process leading to that country's entrepreneurial system of the 1990s)[1]. A key issue in such an evolutionary perspective will be the transformation of a micro-level priority associated with innovative firms to a Schumpeterian, meso level priority associated with a new HLO. For this purpose we will link them to what we will term SIP Effectuation (or SIP (E), an extension or application of Sarasvathy's 2001 *entrepreneurial effectuation*; to double loop Learning (Argyris 1982,1993; Shon 196??, and Argyris and Shon 1974, etc); to co-evolution (Nelson 1994, Avnimelech and Teubal 2004,6, 9 among others); and to some aspects of the Knowledge (focusing on priority definition and specification)-Politics(associated with Policies on the ground) link. Throughout I will exemplify by reference to the evolutionary process leading to emergence, during the 1990s, of Israel's high tech and high impact, ICT- oriented entrepreneurial cluster or system (Avnimelech and Teubal 2004,6,8; Teubal 2013a,b).

Moreover, Israel's success in its Policy Targeting of the above entrepreneurial system sets the base in this paper for a broader conceptual framework linking Success/Failure (S/F) in Policy Targeting of new HLOs with Strong/Weak 'dynamic' policy adaptation on the one hand and Good/Bad Luck on the other (Section 6 and Conclusions).

The outcome of the analysis is a complex policy system and policy process leading to an option for Policy Targeting of a new HLO which may subsequently be taken (shift to emergence phase) or not (truncation of process or standbye during pre-emergence phase i.e. waiting for more information and/or new opportunities for policy targeting). Such a process may or may not be politically feasible even when highly pertinent. Moreover, given the complexities and frequently uncertainties concerning the effectiveness of country/sector adaptation to a changing and unexpected environment (Sections 4,5) and the "wild randomness" of context, the likelihood of policy targeting failure (Ormerod 2006) could be high.

A major conclusion is the need for a paradigmatic re-formulation of policies, one following a strategic and system-evolutionary a pproach ('more-of-the-same' policies will not do). Needless to say this involves not only enhancing the knowledge base underlying policies but also adopting new methodologies and approaches for generating such knowledge. One aspect to be considered in future work might be adopting a computerized Robust Decision Making (RDM, see R.

[1] In fact, SIP in this paper (as with the previous ones) not only considers *priorities* as distinct from *policies* on the ground, but the approach in explaining the priority-policy link through their impact on 'real variables' is definitely evolutionary (see Sections 2 and 6)

Lempert 2013 among others) approach which is particularly adapted to policy making under conditions of radical (or deep) uncertainty and unexpected events

The outcome might be a novel policy approach which may strengthen the link between structural change (understood as emergence of new meso or Shumpeterian-level entities i.e. new HLOs in this paper) and Economic Growth, by strengthening the post Washington Consensus conceptual framework underpinning Policy Targeting under conditions of radical/deep uncertainty and unexpected events. The framework may lead to suggestions of how Ministries of Finance could enhance the *dynamic* efficiency of their resource allocation, particularly, but not only, in the context of Debt-reduction policies which recognize the importance of a simultaneous stimulation of economic growth.

1.SIP Effectuation[SIP (E)]

Effectuation (E) as an alternative to *Causation* (C) was originally used to characterize entrepreneurial decision making and activity when goals/ends are uncertain or not clear relative to the available means (or a set of 'means' of which one will be chosen, Sarasvathy 2001). The opposite holds for © which also pretty much relates to the text-book economic problem facing an individual. I now write-

(C): clear goals/ends-→selection/choice among a set of means

(E): given means-→ selection/choice among a set of uncertain of goals/ends

In what follows, Effectuation and Causation will be used to interpret SIP processes, including those for new HLO Type 2 priorities. [2] *Priorities would be the goals and policies would be the means/ends*. SIP © would mean that priorities are pretty much certain or easy to ascertain while policies are much more uncertain. Policy makers should find ways to choose those policies which are best (or best adapted) to achieve the given priorities. This would hold for Type 1 priorities

At the other extreme, SIP (E) would mean that there is great uncertainty about the relevant priority or priority configuration in the particular priority area being considered, the key issue facing policy makers being the identification of a socially desirable (or set of socially desirable) qualitative configuration (s) of such a priority for policies to promote. This would hold for Type 2 priorities including those associated with new HLOs. Over and beyond the parallel activation of multi-stakeholder deliberation mechanisms of priority setting, policy makers may want to implement dedicated policies (termed 'experimental') to contribute to such priority–relevant knowledge (Teubal 2013a). Such policies would activate those *key agents* (such as, but not only, entrepreneurs) whose search, discovery and 'selection' on the ground may be crucial for generating such knowledge (it could show what specific activities 'work' i.e selection of policy goals).

[2] For Effectuation see Dew and Sarasvathy (2001) and Sarasvathy 2013 and Gore and Kauffman's view as applied to policy targeting of biomed clusters (Gore and Kauffman 2012).

The general description of a SIP (E) cycle for a Type 2, new-HLO priority with entrepreneurs as 'key agents' (see Teubal 2012, Sections 6 & 7)would be

(means)/*"Experimental" SIP policies*-→Entrepreneurial "Doing"-→(goals)/*SIP priorities*,

The above policies could be termed 'experimental': in contrast to policies in a regular SIP © process whose objective is to achieve or materialize predetermined priorities, the main objective is to contribute to priority-relevant knowledge (directly through information/knowledge on what works and indirectly through the new structures on the ground which resulted from entrepreneurial 'doing').

While in principle, the 'activated' entrepreneurs could act according to Causation or Effectuation principles [see 4) below], given the enormous uncertainty surrounding policy targeting of new, Type 2, HLOs, it would not be unreasonable to assume that entrepreneurs under SIP (E) also face radical uncertainty. A good example would be SU entrepreneurs in high tech areas who are likely to face strong uncertainties in technology and in markets. We therefore conclude that a SIP process cycle could involve *a double (E) process*, of policy makers and of entrepreneurs[3].

Agents which are not entrepreneurs could also be *key agents* in the policy targeting process under conditions of radical uncertainty, unexpected events and chaotic environment, as long as their behavior could be characterized as effectuation-like in a broad sense, thereby contributing to define priorities and policy objectives. Assume a policy targeting thought experiment where F. Terman's actions (assumed to be outcomes of 'experimental' policies)-creating a Science/Technology/Industrial park in Stanford to apply university research results in industry-were key to determine the new HLO (i.e. Silicon Valley) configuration aimed at by the hypothetical US policy maker. In contrast to the actual course of events, I assume in this thought experiment that Silicon Valley (a new HLO) was the outcome of policy and more specifically, of a SIP (E) process. Then, he-the Dean of Engineering at Stanford- would have been the key agent enabling Effectuation by policy makers.

An interesting general issue which emerges from the analysis is whether (E) in policy (or more generally, Effectuation at higher hierarchical levels) requires key agents who themselves act based on Effectuation principles. It could be so when there is a strong overlap between the goals of key agents and those of policy makers (and priority setters). Since the 'doing' of key agents is critical for defining the qualitative configuration of the new HLO, this would imply that at least some overlap is implicit in the definition of a 'key agent'[4].

Another key issue is the possible role in SIP (E) of <u>particular</u> key agents rather than of particular key agent <u>classes</u> e.g. the importance of F. Terman specifically in the above thought experiment

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[3] I strongly suggest below that SIP (E) is necessary for successful policy targeting of Type 2, new HLO priorities at least in the early phases, although the potential importance of SIP © for 'scaling up' during new -HLO emergence (if and when the degree of uncertainty facing priority setters and policy makers declines, see below Section 4) cannot be discarded

[4] The 'body of knowledge' which policy makers ***must*** have access to for a reasonable & desirable (and flexible) new HLO configuration which could serve as a basis for policy targeting could easily go beyond that directly and indirectly obtained from the activities of key agents. . Other factors may also be important e.g. concerning specific STE infrastructures, building on alternative future scenarios, computer modeling of Robust Decision Making, links with other priorities (Section 3). The upshot is that full overlap of goals/objectives is not implicit in the definition of key agents.

about Silicon Valley rather than of 'Deans of Engineering' as a class of agents. Finally, a related issue is the role of *policy leadership* and/or a "Window of Opportunity"(as was present in Israel during the 1990s) in implanting a SIP (E) process.

SIP(E) and Policy Learning

While policy design followed by implementation always involves learning and feedback it is unreasonable to infer from this that every policy involves Effectuation. For it to involve Effectuation it is important that learning relate to policy objectives *and* to the underlying priorities that is, that it should be related *upstream* in the SIP process. D*ownstream* policy learning e.g. concerning improved management in policy implementation of a policy with given objectives should not be considered effectuation. The same could be said if the learning points to changes in policy design without changing the underlying priorities, with such changes being seamlessly incorporated into actual policies by downstream policy makers. Thus the criterion for classifying policy learning as involving SIP(E) concerns the *objectives of policy*. While the objective of experimental policies' is to contribute to define and specify the relevant priority (and associated policy objectives), the objective of regular policies is to contribute to materialize a given priority on the ground (i.e through *policy impact*). Still the distinction may not be tight for Type 2 priorities since regular policies may also lead to new knowledge which will better define/specify priorities and policy objectives. Thus learning from regular policies may, *ex-post*, also lead to Effectuation-type outcomes, i.e. to changes in policy objectives and priorities. This means that the distinction between 'regular' and 'experimental' policies, and of the resulting type of learning process is not tight.

2) SIP (E) and Policy Targeting of a new-HLO: A dynamic example

Building upon an ideal example (Box 10 in Teubal 2013a) which deals with the evolutionary process in Israel leading to a new, ICT-oriented entrepreneurial system, we start with a ***general* innovation priority** for the business sector in Phase I such as "*promoting an innovative business sector with increasing numbers of innovative firms" or "General Promotion of Innovative Firms"*. The evolutionary process comprises three *dynamic sequences* involving 'positive' and 'normative' factors[5] one for each of the three phases. I will identify them as the Phases themselves, PiJ (i=I,II,III; J=E, C or E and C). Given my policy focus these sequences will be referred to as *SIP process cycles*. Moreover, since I start with a very general priority which will continue to be so for a time, it is not inconsistent to assume that *SIP (E)* prevails during PI and PII. On the other hand, PIII-where policy targeting of a new HLO will take place- may involve SIP © or a mix between the two.

I summarize the *full dynamic sequence* leading to the eventual policy targeting of a Type 2, new HLO priority as follows:

***General* Promotion of Innovative Firms** in Phase I (**=Priority I**) →

[5] In this paper, 'normative factors' are policy –related factors rather than the researcher's choice of variables (or choice of conceptual framework) to analyze a particular phenomenon.

--> PI(E)→PII(E)-→PIII(C or E&C)[6]

That the full sequence starts with a very general, *non* new-HLO priority is due to the deep uncertainty and dynamism surrounding both the priority area and associated initial priority. To some extent this also characterizes priorities at PII. The extent of PI, PII priority specification required for feasible PIII Policy Targeting of the Type 2 priority involves a lot of experience and 'doing' on the ground (which is wanting at the beginning, but even then, significant uncertainty may remain). The three phase-specific dynamic sequences (or SIP process cycles) shown below are adaptations of those in Box 10 of the main paper (Teubal 2013a)[7]:

PI: **Priority I→*Horizontal Policies*** supporting innovation in firms (**Policies I)→policy impact** I → ***Identifying*** **areas and types of companies with actual or potential competitive advantage→Focused** (by area, type of organization) **Promotion of Innovative Firms (Priority I')**

PII: Priority II= *Focused* Promotion of Innovative Firms & Identification of a potentially profitable new-HLO priority area[8] **→***Focused Policies* supporting VC and SU [key agents] related to previously identified area(s) + support of other functionalities associated with new HLO option **(Policies II)**[9] **+ System Learning→ *A partially specified* new-HLO priority option (Priority II')**

The above option may or may not be implemented. If it would be implemented, the economy would shift to PIII although not necessarily to full emergence since unexpected events which could stand on the way may appear; otherwise we have either *truncation* of the whole process (*Priority Deletion)* or *Priority Stand By* in PII. Assuming that the option will be taken; and assuming priority articulation into policies succeeds in triggering/sustaining emergence of the new HLO, then the PIII dynamic sequence will look as follows:

PIII: Priority III= *Specific* new HLO priority →*Policy Targeting* of relevant SU and of **VC market →Emergence of new HLO**

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[6] For a discussion of the SIP(E), SIP© mix, see Box 1 and subsequent text. The phase-based evolutionary analysis leading to emergence of an entrepreneurial system follows that proposed for Israel during 1969-2000 with emergence taking place during 1993-2000 (Avnimelech and Teubal 2004,6,8a)

[7] An implicit assumption is "non-truncation" of the process, at least until 'the end' of PII

[8] Our back-of-the-mind example is a 'ICT-oriented, high tech cluster or entrepreneurial system' without further specification. is Such an area identification is equivalent to an 'Option for a very General ICT cluster or system'.. In other words, over and beyond focal areas for innovative company support at the micro level, the re-defined priority concerns an option for (eventual) promotion of a higher hierarchically higher level of organization of innovative companies i.e. a (meso level) cluster or entrepreneurial system.

[9] These would be directed to create "other" *pre-emergence* conditions related to the identified new-HLO area (see Teubal 2013a and Avnimelech and Teubal 2006). Some of these might be informed by 'System Learning' (see Section 3)

In the above analysis, *end -phase* Priorities I' and II' should be distinguished from Priorities I and II respectively which are *beginning- phase priorities*, with SIP (E) and 'experimental policies' linking between them. Thus horizontal policies supporting innovation in firms and the impact of such policies in PI support the transformation of the original "*General promotion of innovative firms"* priority into a ***Focused*** *Innovative Firms'* Priority (Priority I'). Therefore, Priority I' is more specific than Priority I e.g. it focuses on successful types of firms and on successful areas rather than indiscriminate support to all firms applying for Government support.

READ PARAGRAPH AND FIX A distinction should also be made between an *end phase* priority and the *next beginning phase* priority, with the latter potentially incorporating additional information beyond that garnered in the previous phase as well as additional analysis by priority setters in the intersection of both phases. Thus Priority II is *more specific* than Priority I' in the sense that it further constraints the subset of firms/areas where support is focused e.g. to ICT Start Ups (SUs) in software, communications and medical devices. Note also that PrII' is a meso-level new HLO priority which is *qualitatively different* from PrII i.e. one involving a hierarchically higher-level system e.g. an ICT oriented *cluster or higher level system* [10]. Moreover, the new meso-level priority if arrived at towards the end of PII is a priority option rather than a regular priority.

READ PARAGRAPH AND FIX Another important point is that while Priority II is still a rather general option since the new-HLO priority is couched in very general terms, such an option will be further specified throughout PII, as a result of a SIP (E) process, System Learning and other factors leading to Priority II'. Thus, the impact of PII's focused policies is (partial) knowledge about desirable specifications of the newly identified new HLO priority area. This knowledge would represent *a partially specified* new HLO priority *option* **(Priority II').** Moreover, over and beyond focused policies to the business sector, other PII policies will be implemented to promote favorable pre-emergence conditions supporting the new HLO option. Such policies will favor the eventual policy targeting of such a priority (see Teubal 2013a, section 6).

BOX 1: THE EVOLUTIONARY PROCESS LEADING TO POLICY TARGETING OF A TYPE 2, NEW-HLO PRIORITY: PRIORITY SPECIFICATION AND SIP EFFECTUATION*

	PRIORITIES	**POLICIES**	**EFFECTUATION OR CAUSATION?**
PHASE I	***General Promotion of Innovative Firms* (Pr I)-→→** ***Focused Promotion***	***→>>Horizontal Experimental Policies (Innov. Firms)***	***SIP (E)***

[10] This is one source of non-linearity in the SIP process..

	***of Innovative Firms* (Pr I')**	**←-<←**	
PHASE II	***Focused support of Innovative Firms & Identification of new-HLO option* (Pr II)→** ***Partially specified new HLO-option* (Pr II')**	***→>>Focused Experimental Policies (Innovative Firms)*** ***+Support of Pre-emergence Conditions***** ***+ System Learning*** **<←**	***SIP (E)***
PHASE III* assuming that the Pr II' option materializes	***Specific new HLO-option* (Pr II'=Pr III)→**	***Policy Targeting of new HLO*** **(if successful, → emergence of new HLO)**	***SIP* ©++**

*This table does not explicitly consider the full set of priority setting mechanisms (e.g. stakeholder deliberation, entrepreneurial 'doing', expert opinion, etc) during the various phases, nor does it make explicit the distinction between priority setters and policy makers (nor the links among them). Similarly with respect to *coordination* issues (see Section 4 below). It implicitly assumes that such mechanisms operate effectively e.g. non existence of distortions resulting from undue influence of 'politics' on priorities.

**complementary policies e.g. supporting other pre-emergence conditions, to enhance the desirability and feasibility of eventual policy targeting of the new HLO

++ or a mix between SIP © and SIP (E)

The fact that PI and PII in Box I are characterized by SIP (E) reflects that their beginning-of –phase priorities are rather general, the central purpose of policy being –through 'experimental' policies- to contribute to specify such priorities. Having said hat it is important to mention that the general conceptual framework underlying what has been written till now is consistent with alternative patterns of E and C e.g. while SIP (E) prevails in PI, a mix between SIP (E) and SIP © could prevail in PII. Moreover, if the option underlying Pr II' is materialized through 'Policy Targeting' a shift to SIP © may be required. Alternatively it may be stated that ***if*** SIP (E) in PI and PII succeeds in reducing the 'uncertainty' facing policy makers by leading to much clearer

goals or priorities, it could be followed by SIP © or by a mix of SIP(C) and SIP (E) if a 'creative-destructive' unexpected event makes its appearance during PIII' emergence process..[11]

Thus, a shift to SIP © may be required to assure a swift and endogenous emergence process once SIP objectives become clarified, well specified and realistic. Alternatively, it could be stated that *an initial SIP (E) process* involving *experimental policies* leading to a well designed, specific priority in PII could easily set the base for the implementation of SIP © with its quantitative economies of scale advantages (this possibility is reflected in Box 1 above). [12]

It should be noted however that, *in certain contexts*, pure Causation in Phase III may not be realistic under Type 2 priority assumptions (like radical uncertainty and the possibility of unexpected events, either endogenous or exogenous). Thus when the evolutionary process in PII (and at the PII-PIII intersection) leads to *partially specified* Priority II' and Priority III, it may still be that PIII policy targeting should include a component of SIP (E*) in order to re-define or re-specify along the process the relevant new HLO priority*.. Therefore, while a full description of the various steps comprising PIII might reveal possible Causation in some stretches of the dynamic sequence, in others Effectuation may be present as well. [13]

I can now summarize the role of SIP (E) stretches or cycles in the evolutionary process leading to policy targeting of Type 2, new-HLO priorities. First, in such priority areas the goals/objectives of policy makers and the underlying priorities are highly uncertain, and very likely, more uncertain than the means/policies for implementing them (although there are cases where the means or resources are also very uncertain e.g. in periods of macro-economic instability)[14]. Therefore for the typical or likely policy targeting case, *experimental* policies may be required in order to further define or specify goals/priorities i.e. policy making should involve Effectuation

[11] The shift from SIP(E) to SIP© parallels Sarasvathy's view that entrepreneurial E should be followed by entrepreneurial C (Sarasvathy 2013).

[12] Note that PIII (C) does not exclude the introduction of minor changes in *downstream* policy during the PIII emergence process, and more so, for *sustaining* (as opposed merely triggering) the process. But these changes in management of the SIP process and even in policy design specifications are directly introduced during the policy implementation phase as part of an ongoing learning process by the policy makers themselves. There would be no need for further explicit, *priority* specification.

[13] Pure Causation in policy targeting, though, may be realistic under moderate rather than radical uncertainty as in the traditional infant industry promotion argument. Moreover, even for Type 2 priorities, there exists a possibility that the reduced uncertainty resulting from two prior phases of enhanced priority specification may have transformed the priority into one closer to the ideal Type 1. This possibility may be reinforced by exogenous events

[14] In future work I intend to explore the implied meso-macro link involved in SIP ©. Note that radical uncertainty in both priorities and policies would tend to reduce the overall desirability of 'Policy Targeting', one reason being the large amount of policy adaptations required along the relevant evolutionary path (see Section 6 for an analysis of why policy adaptations would tend to be more frequent [and more likely to fail] for Type 2 relative to Type 1 priorities, where Type 2 priorities involve radical uncertainty in the relevant priorities but not in the relevant policies downstream along the policy process).

(E). This means that the evolutionary process leading to policy targeting of a Type 2, new HLO would include, in Phases I and/or II, SIP (E) stretches or even full process cycles (Box 1, third column). [15]The corresponding multi-phase evolutionary process would then be characterized by a SIP (E)→SIP © or SIP (C & E) sequence. [16]

3) Learning and Non-Linearities

In the previous SIP paper (Teubal 2013a) I emphasized the importance of non-linearities in the SIP process, particularly for Type 2 priorities where they seem to be *necessary*, although they also may exist in connection with Type 1 priorities. Non-linearities are closely related to SIP (E) since the *direct* contribution to value added (or other *quantitative indicators* of social benefit) of 'experimental policies' may be relatively negligible. This very plausibly could contrast with their *indirect*, contribution to improved policy objectives/goals, which could be relatively high. It should be mentioned, however, that not all non-linearities are outcomes of SIP (E).

The table and the distinction made above between upstream and downstream learning impacts, suggests the following two types *of* ***learning from policy implementation and/or policy impact*:** Learning by Doing and System Learning(only partially and indirectly related to policy experience). These two types of learning roughly correspond to Single Loop and Double Loop Learning respectively (Argyris 1976,1993; , Shon and Argyris and Shon 1974), originally formulated in the context of organizations rather than for policy systems/processes as in this paper. Learning by Doing is *immediately applicable* learning from what happens on the ground through improved policy implementation routines resultant from trial and error experience or success/failure analysis. Such analysis focuses on innovative firms' projects, their management and forms of organization. It strives to identify *immediate/proximate* causes rather than fundamental causes originating in *area variables* (e.g. changes in markets) which are external to the firm. It is learning how to better implement a given policy (with given objectives) or-more generally- how to improve SIP © in the context of given goals and given mental maps/ frameworks of the relevant agents. Most policy makers nowadays are aware of policy-related Learning by Doing; and many strive explicitly to generate and exploit it.

In contrast, System Learning goes a step further in thinking about possible policy implications of policy experience. It

[15] Note that deliberative, decentralized/bottom-up priority setting does not inherently nor necessarily imply SIP (E). Tyler states when considering a deliberative/decentralized approaches to policy and priority setting "*.it also permits tentative policy objectives to be tested against a range of experience, opinion and public positions to build shared vision and commitment (Tyler 2010)".*

[16] The above analysis is consistent with Israel's successful emergence of an ICT-based entrepreneurial cluster during the 1990's. The process of specifying such a cluster in terms of early phase SU involved in software, communications and medical technologies resulted from SIP (E) in *Phases I & II*(this is implied in Avnimelech and Teubal 2006,8a in their analysis of the Israeli case between 1969 and 1992). Moreover, *Phase III's policy* targeting (1993-7/8) involved SIP(C) *and possibly a measure of SIP (E)*(the latter because the central vector of *Policy Targeting* was direct support of SUs and of VCs who are relevant *key agents* related to entrepreneurial 'doing' on the ground in the context of SIP (E))

i) changes policy agents' (that is priority setters and policy makers) conceptual framework about *the relevant ecosystem* which influences and *is/could be* influenced by policy in the short, medium and long term, making it e.g. more systemic and more dynamic;

ii) Contributes to generate a 'positive-normative' vision involving a set of *plausible and* ***reasonable*** *evolutionary paths* in the particular new-HLO area being considered;.

iii) Helps conceptualize and differentiate those paths and associated priorities/policies which are *'more of the same' from those which represent a 'radical or revolutionary change'* [17];

iv) further sharpens the identification of *a "small" set of plausible and* ***desirable*** *evolutionary paths*, and through this, *helps focus on the mutual interaction between priorities and policies during the medium and long term;*

The techniques/methodologies used are varied depending on case. They could include future projections and scenario analysis , activation of key agents , multi-stakeholder deliberation, expert opinion or analysis, etc (see Swanson and Dhawal 2009 among others). An important tool to be considered is computer modeling of Robust Decision Making, which may be useful for situations of deep uncertainty(Lempert, R,).

By changing policy agents' conceptual framework e.g. about the relevant ecosystem which influences policies and policy impacts and which is also influenced by them, such learning would influence policy makers and/or priority-setters views about possible dynamic implications of ongoing policy experience. However, *this requires complementing or linking direct policy experience with other 'bodies of knowledge'* and other capabilities, some in-house and others outsourced. Some of these would involve explicit attempts at 'relating' or 'looding' into the future. The outcome could be a significant reformulation of policies including in some cases shifts in policy agents' vision and policy portfolio emphasis, such as when the hierarchical level of the relevant priority changes from a micro-level focus to a systems or meso- level focus (see the shift from Priority 1' to Priority II and, later on, to Priority II' in Section 2 above). For this to happen the relevant agents would need to develop a strategic outlook of policy and of knowledge acquisition based on system evolutionary views. Moreover, dynamic coordination among separate policy institutions must be assured. [18]

If underpinned by a SIP (E) process, System Learning could potentially lead to a substitute and qualitatively different priority or priority configuration in response to emerging threats and opportunities. For example, a shift from a priority which focuses on micro-elements like firms or

[17] The set of such sequences will exclude those leading with high likelihood to non-emergence or truncation (weak/ negative *indirect* effects) and those leading to socially undesirable profiles of emergence

[18] Such System Learning would also be key for a successful shift from a traditional to a systems-evolutionary policy paradigm, a challenge facing many countries nowadays (see Conclusions).

R&D projects, to a new HLO priority defined in terms of a hierarchically higher level cluster or system. [19]

System Learning is only *indirectly and partially related* to actual policy experience, the latter being only a part of the overall learning process. It should involve adopting both a broader conceptual framework and possibly a new vision or paradigm of policy requiring both additional 'external' knowledge inputs, outcomes of deliberate SIP (E) processes and new technologies and approaches for looking into the future. Key to success is 'Double Loop Learning', particularly by 'priority setters' but also by policy makers in order to assure both effective transfer of priority-related knowledge and effective priority articulation into policies on the ground. [20] Lempert mentions

"When policy makers and decision makers face a hard-to-predict, deeply uncertain future, they need more than traditional prediction-based decision analysis to help them choose among alternatives. Fortunately, there are new approaches, such as Robust Decision Making (RDM) that exploit increasingly capabile computer tools and are well suited for such situations. RDM rests on a simple concept: rather than using models and data to describe a best estimate future, RDM runs models many hundreds to thousands of times to determinehow plas perform in a rang of plausible futures. Visualization and statistical analysis of the resulting databsse of runs then help decisionmakers sidistinguish fthose future conditions in which ther plans perform well from those in whch thir plans peform poorly, assisting them in making their plans more robust. This research highlight discusses how RDM works and illustrates its benefits throught two example applications: helping a water management agency adaptively plan for cliniate change and determining whether fedral terrorism insurance would cost or save taxpayers money." (Lermpert, R.).

Since the learning processes mentioned above are key for the evolutionary process leading to a Type 2, new-HLO priority, it can safely be ascertained that *non-linearities are central elements in the policy targeting process of such priorities* (see alsoTeubal 2013a). They will be part of SIP(E) during Phases I and II and possibly in Phase III. In the Israeli case of the 1990s (Avnimelech and Teubal 2006, 2008a) we observe a clear non-linear cumulative process of emergence with positive feedback in Phase III. These are the result of regular externalities, reputation effects, the inflow of new agents into the fledging system and co-evolutionary

[19] The techniques/methodologies used are varied depending on case. They could include future projections and scenario analysis , activation of key agents , multi-stakeholder deliberation, expert opinion or analysis, etc. See Swanson and Dhawal 2009, Ernst and Young, etc

[20] "When considering feedback as an input to Double Loop learning , managers "need to ask not only the reasons for their current actions but what to do next and even more importantly, why alternative actions are not to be implemented. In contrast, Single Loop Learning 'solves (operational) problems without asking why such problems arose in the first place and without questioning basic assumptions'. Thus in contrast to Double Loop learning which searches for higher level explanations or directions for action, Single Loop learning's analysis is largely restricted to the 'here and now'.

processes. In contrast to PI and PII, Phase III non-linearities do not depend on the particular mix of SIP (E) and SIP © that prevails i.e. they may also occur with SIP ©.

The background to such non-linearities follow from the fact that the relevant evolutionary process 'starts' with a simple, very general priority due either to ignorance of policy makers (Teubal 1997) or to radical uncertainty or both. Through SIP (E) it is then superseded or morphed into a more complex, new HLO priority which is first 'identified' and then partially defined and specified (possibly as an option). Actual non-linearities are the outcome both of 'accumulation of policy-relevant knowledge' (an indivisible entity) and from the fact that the impact of such learning is likely to be low in the short term (i.e. during PI and PII) and relatively large in the longer term (during PIII under conditions of non truncation of the emergence process).[21]

Challenges to Policy Makers

Over and beyond potentially serious priority-policy coordination problems (see next Section), non linearity imposes strong challenges to policy agents. First they may have to change their assumptions and 'policy vision' and, correspondingly, be willing to act on the basis of an incomplete and somewhat different body of knowledge e.g. about the qualitative structure of the new HLO aimed at. Second, for Type 2, new HLO priorities this clearly requires Double Loop Learning by Policy agents rather than Simple Learning by Doing. Third, a key aspect of the relevant SIP (E) process is *identification and activation of key agents* i.e. agents whose activity on the ground is critical for priority specification and uncertainty reduction. For certain types of new HLO such as new entrepreneurial systems, such agents are *entrepreneurs* **([22])**[23].

Key to the above is assembling and integrating other knowledge inputs affecting priorities/goal specification, possibly as part of an explicit and reinforced 'qualitative' component to standard computer based RSM models. Such knowledge relates to the relevant ecosystem ; to a 'positive-normative' vision involving a set of plausible and reasonable evolutionary paths; to the mutual interaction between priorities and policies during the medium and long term; etc. Needless to say that knowledge creation and integration is complex since it may involve different types of knowledge and of knowledge-creation processes e.g. *structured knowledge* in the Science, Technology and Innovation areas including regulatory knowledge; *informal knowledge and information* emerging from decentralized stakeholder deliberation; *on line knowledge from key agents 'doing' in the context of SIP (E) processes;* etc.

4. **Coordination and Co-evolution** (Type 2 Priorities)

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[21] An important pre-emergence condition for the ICT cluster in Israel which emerged during the 1990s was having achieved a critical mass of SUs which, by inducing VCs to set up shop in the 'cluster in the making' of the time, sparked a largely endogenous VC-SU co-evolutionary process (a key vector in the cumulative emergence process of 1992/3-7/8)

[22] The externalities from activating key agents in the context of SIP (E) processes differ from those generated by agent interaction during a cumulative critical mass or cluster-building process (which might or might not be a pure SIP © process)

[23] The role of specific key agents or specific entrepreneurs in effective SIP (E) emphasizes the importance of 'agent-based' systems and agent-based modeling when thinking about SIP.

In contrast to *classical* entrepreneurial effectuation or causation where the mutual adaptation of goals to means takes place within a single agent (the entrepreneur), the SIP framework of analysis suggests the desirability of distinguishing between two types of Policy Agents, *Priority Setters* from *Policy Makers* (Teubal and Zlotnick 2011 and Teubal 2013a). Major issues are the desirability of such a separation, possible obstacles to effective priority-policy *coordination* and possible governance requirements to surmount them. Achieving smooth coordination, in turn, would seem to be a requirement for effective priority-policy co-evolution and adequate policy targeting of new HLO priorities.

While in previous SIP papers a clear and unambiguous knowledge-'**politics' or priority**-policy separation for Type 1 priorities was considered as desirable, in what follows I also suggest that achieving ***coordination*** among the two is indeed feasible and likely with a minimum of top down governance imposition. On the other hand, for the highly uncertain and 'dynamic' Type 2 priorities, achieving coordination, while still desirable, may either be difficult or impossible (or may require heavy-handed governance requirements which might not be effective).

Our analysis of dynamic sequences of Section 2 suggests that defining and specifying what initially were very general or ill-defined priorities could require implementation of policies (termed 'experimental') rather than the other way around thereby enhancing the complexity and difficulty of assuring effective priority-policy coordination. Thus, for Type 2 priorities such coordination is very likely to be singularly more difficult than for Type 1 priorities. Not only policy makers should be made to 'adapt' and 'be coherent' with given priorities (as in Type 1 priority, SIP© situations), but, for typical Type 2 priority & SIP (E) situations, they should coordinate with priority setters to make 'experimental policies' coherent with the need of inducing adequate (& at best consensual) priority definition and specification . Thus, the 'institutional' separation or distinction between priority setting/specification on the one hand and policy design and implementation on the other is very likely to be fuzzier and coherence more difficult than for Type 1 priorities.

Finally, since most priorities (including new-HLO ones) are a mix between the ideal Type 1 and ideal Type 2 priorities (see Teubal 2013a, section 4) *we always might have a SIP (E)-type priority←>policy coordination problem*. This contrasts with standard entrepreneurial Effectuation or Causation (Sarasvathy 2001) where there is no coordination problem, since the same entrepreneur sets goals and implements means to address or reach such goals.

4.1 Why Priority-Policy separation?

There are three main reasons for such a separation (and for the associated coordination problem)

1. To assure *independence of knowledge-creation* (associated with Priority setting) from 'politics' (assumed to potentially originate in *Ministry-specific policy making);*[24]

[24] **EXTEND** This paper ignores other aspects of 'politics' such as priorities which are overwhelmingly being 'created' by 'politics' rather than by priority-related 'knowledge'; the creation or deletion of new Ministries (or of areas of jurisdiction of existing Ministries); dynamic aspects such as when what would

2. To *exploit Static Increasing Returns to Scale (IRS*) in the (setting of) and in the deployment of *generic*, multi-Ministerial priorities;

3. To better exploit Dynamic Increasing Returns to Scale (DIRS) from *collective learning and capability development* in policy making, involving several Ministries benefiting from common generic, multi-ministerial priorities

The first reason for "separation" is applicable both to Ministry specific and to 'generic'/multi-ministerial priorities; and would be relevant for Type 1 or Type 2 priorities. In other words, a basic issue facing any type of priority is how to insulate the setting of priorities from the frequently encountered tendency of policy making institutions to substitute knowledge for politics. **ADD BUCHANAN'S PHRASE**

Concerning the second and third reason reason for 'separation': by characterizing a common backbone of the generic priority which is relevant to two or more Ministries who need, through policies, to provide services and/or infrastructure of one kind or another; and by exploiting commonalities, it would be possible to supply higher quality infrastructure and service at lower cost e.g. by avoiding duplication, exploiting static and dynamic economies of scale and collective learning.. This reason for separation is applicable to 'generic/multi-ministerial priorities' of Type 1 or Type 2 but not to priorities which are specific to individual Ministries

DIRS in the exploitation of 'generic'/multi-ministerial priorities in areas such as ICT, digital medicine, robotics, 3D printing, etc are of two kinds. First, mutual learning across Ministries in the identification of generic trends, opportunities and threats (and methodologies thereof) required for effective sub-priority specification.[25] Second, mutual learning in articulating such ministerial sub-priorities in terms of Ministry-specific 'policies'.

4.2 Coordination Modes and their Impact

For generic priorities, there are two different *Types* of Coordination:

- *Priority(or sub-priority)-Policy Coordination* : Linear or non-Linear, always involving one Ministry at a time
- *Inter-ministerial Coordination:* in specifying the set of Ministerial *sub-priorities and*/or the set of Ministerial *policies* flowing from a generic priority

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seem to be non-consequential modifications of priorities/policies today may have momenoteous negative effects tomorrow e.g. politically motivated delays in implementation; the role of 'politics' on Vision (and indirectly in determining the list and order of importance of priority *areas*), etc. Needless to say, these aspects of 'policy interference' in the priority identification, definition and specification process underlie many if not most of the priority-related Government Failures (GF's), see Teubal 2013a, Section 1.

[25] In this paper, a sub-priority is a Ministry-specific component of a generic priority

There are two modes of Priority- Policy coordination, a *Linear Mode* for Type 1, new HLO priorities and *a Non-Linear Mode* for Type 2, new HLO priorities. In *Linear Priority-Policy coordination*, policies should 'adapt' to or be coherent with a reasonable and well specified, pre-existent priority, like those of Type 1. Such a 'linear' SIP process is a SIP © process. For Type 2 priorities we would have *Non-Linear Mutual Priority-Policy coordination*. Not only policy makers should 'adapt' to and 'be coherent' with given priorities (as in Type 1 priority, SIP© situations), but they should coordinate with priority setters to make 'experimental policies' coherent with the need of inducing adequate/reasonable (and even mutually consensual) priority definition and specification .As shown in the interpretation of the Israeli case in section 2, its starting point (e.g. in PI and maybe in PII) could be a general priority leading to 'experimental' policies directed and continually contributing to further its definition and specification. Solving this coordination problem involves achieving a feasible and socially desirable *mutual 'Priority-Policy'* adaptation & coherence pattern, in the context of a *non-linear* SIP (E) process (or mixed SIP (E) and SIP © process).

The second type of coordination is Inter-Ministerial coordination which refers exclusively to generic, multi-ministerial priorities. It has two possible, interrelated meanings: either to 'allocate' such a priority to each particular Ministry (thereby creating Ministerial *sub-priorities*) or to coordinate the actual generic priority articulation into policies of each Ministry. Rather than dealing with this issue, I will focus here on the differences in modes of Inter-Ministerial coordination for generic Type 1 and Type 2 priorities.

Since a generic *Type 1* priority to be 'allocated' among individual Ministries would supposedly be relatively well specified and widely understood, there would be relative less leeway for 'politics' to inflate the share of particular Ministries at the expense of others, either of the priority itself or of the policies and associated resources allocated, or of both. We could express this by stating that the *strong body of knowledge* of Type 1 priorities, through a *Knowledge Push Effect*, might-in certain contexts- induce *priority-policy* coordination. For this reason, this mode of inter-ministerial coordination for generic priorities is termed *Endogenous Knowledge Push Coordination*.

With Type 2 priorities, the knowledge base would not only involve strong lacunae and uncertainties (Weak rather than Strong Knowledge), but will be controversial and may lead to disputes[26]. These resemble the disputes mentioned by Nelson in his analysis of public-private(market-based) governance systems at the sectoral level, particularly those connected with mixed systems in the areas of child care, the system of justice, education, health and other areas (Nelson). In such sectors, a major problem that arises in policy making is ***'disputes'*** concerning the *objectives of policies* i.e. "priorities" for our purpose. Such objectives are strongly related to e.g. 'Vision' and Values of policy makers, stakeholders and the public at large. Therefore, almost inevitably there are strong differences in opinion. The upshot is that in such *Weak Knowledge* situations, the endogenous knowledge push effect will be relatively weak, there

[26] Our use of the terms Strong and Weak Knowledge does not necessarily coincide with their technical meaning in the literature.

might be endless discussions and at some point a line should be drawn[27]. Since assuring effective coordination in this mode will then have to involve possibly stronger and explicit Governance to allocate priorities across Ministries, I call this mode *Exogenous Institutional Coordination* .

Box 2 summarizes the two types of coordination and the two modes for each one of them. [28]

BOX 2. COORDINATION MODES FOR TYPE 1 AND TYPE 2 PRIORITIES*

Type/Mode	***Mode for TYPE 1 Priority***	***Mode for TYPE 2 Priority***
Priority-Policy Coordination (*Ministry-specific* priorities or sub-priorities) Key for Policy Targeting of new HLOs (those relevant to individual Ministries)	**Linear Priority-Policy Coordination** or ***Ex-Post Policy coordination*** **Well defined, Knowledge-Based Priority or sub-priority** **Low Probability of non-coherent, non- coordination outcome** **Still some 'politics' interference is possible**	**Non-linear Priority-Policy Coordination** Or ***Ex-ante Policy coordination*** A simultaneous element i.e. priorities in some sense should be adapted to policies while policies should be adapted to priorities. Inherently more difficult than Linear/ex-post coordination. Possibility of disputes and of mix between 'knowledge' and 'politics'→**Explicit 'governance-based' coordination may be required**

[27] Note that with strong knowledge there might still be differences of opinion about desirable inter-ministerial allocation of priorities/policies. However, these differences would a)be better defined; and b) easier to bridge relative to what one would expect when the knowledge underlying priorities is Weak.

[28] For *generic priorities* there is a double coordination challenge: *achieving* ***Priority Policy Coordination***, (linear or non-linear coordination relevant to individual Ministries) and *assuring* ***Inter-Ministerial Coordinatio*** (endogenous knowledge push or built-in institutional coordination).

Inter-Ministerial Coordination *(for Generic Priorities)*	***Endogenous* Knowledge -Push Coordination** **By setting clear and easily understood sub-priorities for each Ministry →A narrow range of plausible/reasonable options→.** **→ a more restricted role of 'politics' in the allocation of priorities and budgets→** **Strong governance-based coordination may not be needed**	***Exogenous* (Built-in) Institutional Coordination** **Weak Knowledge (and Knowledge-push impact) due to the broader range of potential disputes --→ enhanced role of 'Politics'** **→Requires explicit 'governance-based' coordination forced upon Ministries**

***Note that there are *two types of coordination*; and *two modes of coordination for each type* (one relevant to Type 1 priorities; and another to Type 2 priorities)**

Inter-ministerial Coordination of Generic Type 1 priorities

In the *original* SIP and Policy Targeting model which implicitly focused on genericType 1 priorities (Teubal and Zlotnick 2011) a top-down knowledge oriented institution (the SIP Council) was responsible for priority definition and specification up to a certain point beyond which policy makers would take over. Inter-ministerial coordination with respect to sub-priorities and/or policies would then be the task of a 'politically –driven' *Inter-Ministerial Council (IMC)*. This was done for two reasons: first, to maintain the reputation for objectivity of priority setters (SIP Council) *viz a viz* the various Ministries; and second, to adequately take into account idiosyncratic aspects of implementation (including funding). **While** the predominant role of Knowledge in priority-setting was assured upstream in the priority definition and (most of the) specification process, a measure of 'politics' would penetrate the system *even before* downstream, Ministry-based, policy design and implementation would take hold. This is consistent with Box 2, upper row. The final impact on the 'quality' or 'purity' of priorities and policies would depend on the specificities of each case, but at least, a clear opportunity for upstream, unbiased knowledge creation and knowledge push would exist.

While the situation is more complex for generic, Type 2 priorities, I prefer at this point to focus below on Ministry-specific, new HLO priorities exclusively. This will be the policy targeting case analyzed in this paper. The only relevant type of coordination for such a case is Priority-Policy coordination.

Priority-Policy Coordination under Policy Targeting (Type 2, new-HLO priority)

The priority-policy coordination mode for Type 2, new HLO priorities is more complex than the linear, ex-post, coordination mode for the corresponding Type 1 priority. Policies must be determined in the absence of well-defined priorities, while aspects of priority definition may depend on 'experimental' policies whose characteristics may lie beyond the control of priority setters. We are in the presence of a non-linear process involving an, ex-ante coordination mode, involving a mutual or simultaneous element

Such a coordination mode could easily fail. It could lead to non-adequate experimental policies, either because of irreducible 'priority setters' –'policy makers' *differences of opinion* or due to '*politics'*. The outcome could easily be 'inadequate coordination' from the point of view of policy targeting.

The upshot would seem to point out to the desirability of an explicit, exogenous (and governance-based) mechanism. What mechanism would depend on the specifics of each case; and it may change through time.

CHECK RELEVANT OF FOLLOWING PARAGRAPH For example, if the relevant Type-2 priority eventually becomes well defined and well specified (say in Phase II) in such a way that policy targeting of the new-HLO may be attempted, subsequent coordination may take place *within* the set of policy makers () without recourse to priority setters (see Section 2 above). It would involve though, coordination between *policy objectives* (which are closely related, albeit not identical, to *priorities*) and *policy design* (see also 4.5 below*)*.

5. Comparing Policy Targeting of Type 1 with that of Type 2 priorities

Most of the coordination and co-evolution discussion above related to Type 2, new HLO priorities and to Policy Targeting of such priorities. It is clear that there are serious challenges in achieving, reaching or attaining 'reasonable' Policy Targeting profiles for such priorities. Needless to say it would be much easier with Type 1 priorities, see Box 3 below.

The main SIP process and policy targeting differences between Type 1 and Type 2 priorities are summarized in Box 3 below.

BOX 3: KEY REQUIREMENTS FOR POLICY TARGETING OF NEW HLOs

TYPE 1	*TYPE 2*
Linear SIP Process	***Non Linear SIP Process***
SIP © throughout	***SIP (E) necessary, SIP © possible***
Learning by Doing	***System Learning, Learning through active agents' 'doing', and Knowledge Integration***
Ex-Post priority-policy coordination	***Ex-ante Priority-Policy Coordination***
Low Probability of Disputes	***High Probability of Disputes***
****Relatively effective Knowledge-Push in Inter-ministerial coordination***	****Ineffective Knowledge Push –---- ----***
low probability that 'Politics' significatntly affect 'Knowledge'	**Relatively high probability that 'Politics" significantly affect "Knowledge"**
Not very likely that Governance-based coordination be needed	**Governance-based coordination required**

*Whenever Inter-Ministerial Coordination is needed

7. Reflections on Adaptive Policy Targeting of new HLO

Radical Uncertainty and Adaptive Policy Maker

Nelson and Winter in their 1982 book (Nelson and Winter 1983) and others pointed out that in the 'real world' there is 'no-optimum' which policy makers could aim at; and that "satisfying" is a key behavioral principle of both private agents and Governments. Related to this, Metcalfe in his 1994 paper and elsewhere (Metcalfe 1994, Metcalfe and Georghiou 1995)

indicated that with Radical Uncertainty, policy makers are or should be adaptive rather than 'optimizers'. Moreover, there is no assurance that policies will succeed or be effective.

Uncertainty-related policy failure has also been the subject of Ormerod in his 2006 book (Ormerod 2006). His point is that the complexities of multi-agent systems which policies are supposed to affect lead to radical uncertainty as to how agents will react to and interact as a result of policy. Still, while policies may easily fail, this is not inevitable. Implementing certain types of policies may certainly be justified. This view is consistent with the Policy Targeting results of this paper as applied both to Type 1 and to Type 2 priorities.

Another implication of Radical Uncertainty has been formulated by Swanson and Dhawal (Swanson and Dhawal, 2009). They point out *the need of adapting policies to a "set of futures" rather than to a single future.*

Links between Success/Failure(S/F) in Policy Targeting, Strong/Weak Adaptive Policy Targeting and Good/Bad Luck

I reflect upon these and other antecedents in an attempt to define and characterize a SIP perspective to Adaptive Policy Making in the context of Policy Targeting of a new HLO (with a focus on Type 2 priorities). As with other parts of this paper, such an exercise has been inspired by Israel's successful Policy Targeting of an ICT-oriented, high tech entrepreneurial cluster during 1993-7/8 (Avnimelech and Teubal 2004,6; Teubal 2013a,b). That case exemplifies *Successful Policy Targeting* with *Strong Policy Adaptability/Adaptation* and *Good Luck*, that is, one point in the space of permutations of the three variables.

Note that 'Luck' may affect S/F in Policy Targeting either *directly* or through changes in adaptability *(indirectly)*. Moreover, it may make Adaptability and de facto policy adaptation easier or more difficult.

However, Adaptability/Adaptation (or lack of it) depends on other factors or events as well e.g. whether or not the political system is dysfunctional or whether there is or is not political leadership at the right time; or whether or

not there exists a policy Window of Opportunity. Moreover, certain events may or may not enhance adaptability-depending on what other actions are taken.

Part of Israel's good luck *directly* favored high adaptability/adaptation in the sense of requiring a lower effort to adapt e.g. lower costs- compared to what could have been otherwise- both of the Targeted Policy Yozma and of complementary programs which contributed to trigger and sustain emergence of that country's high tech entrepreneurial cluster. Another part of Israel's Good Luck related to favorable external events whose exploitation required a greater 'systemic' effort which accompanied Policy Targeting namely, a timely strategy/policy on immigrant absorption (Teubal 2013c,d).

I conclude that for Policy Targeting of Type 2, new HLO priorities there are *numerous instances of policy adaptation which are likely to be required* along the evolutionary process leading to a new HLO, *and correspondingly, numerous sources of possible 'failures to adapt'*. This strongly differentiates Adaptive Policy Targeting of Type 2 new HLOs from that of Type 1.[29]

Needless to say, much more needs to be done in terms of analyzing other cases of Policy Targeting of Type 2 new HLO priorities in order to build a corpus of Appreciative Theory focusing on the link between Strategic Policy success/failure, strong/weak policy adaptation and good/bad luck.

Causes of Weak Policy Adaptation: A Summary

I now summarize a number of possible 'causes' of Weak Policy Adaptation along the evolutionary process leading to Policy Targeting of Type 2, new HLO priorities as summarized in Boxes 1 and 2, with the Israeli case (or the evolutionary pattern underlying that case) in mind. As done before, I assume an institutional separation between priority setters upstream in the SIP Policy Targeting process and policy makers downstream; and a new HLO which is linked to a single Ministry (i.e. there is no inter-ministerial coordination problem).

[29] In the conclusions I further develop the 'substance of policy adaptability' namely the *What?* and the *How?* of such a process

- Implementing SIP © rather than SIP (E) in the early phases of the relevant evolutionary process[30];
- Ex-ante Policy Coordination failure, in such phases due to 'Politics' in policy making (e.g. a distorted choice of key agents to activate through 'experimental policies'), "disputes" or absence of an adequate 'governance-based' coordination mechanism'
- Insufficient System Learning, a Priority setter failure in generating and/or integrating new knowledge to complement that obtained through experimental policies in order to better characterize, define and specify the new HLO priority
- Ex-post Policy Coordination failure(PIII) when e.g. due to 'politics', policy makers do not fully consider the new-HLO priority as defined/specified by priority setters.

Unexpected events can transform even Strong Adaptation and the best of Policy Targeting into a failure (even worse when timely adaptation is not possible). Among other possibilities, the outcome might be forced truncation of the evolutionary process (prior to or during emergence) as a means of avoiding larger losses.

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Co-evolutionary Process implications of Successful Policy Targeting involving ***Strong Policy Adaptation*** and ***Good Luck*** [31]

With strong *policy adaptation* and no untimely 'creative/destruction' unexpected events (an example of Good Luck), successful Policy Targeting in Phase III could be visualized as being the outcome of a *virtuous co-evolutionary process* spanning the three phases of the relevant evolutionary process. Such processes would involve mutual Innovation Policy/SIP<→ innovative firms/innovation links (Avnimelech and Teubal 2009, Teubal

[30] This might be due to 'path dependence' and 'lock-in' (B. Arthur 1994) which would seem to be quite common in existing policy systems. In Phase III we expect that SIP © would be dominant (see Box 1 above)

[31] The following theme should be further analyzed.

2013e in relation to the Israeli case, and Patarapong 2011 in the context of Malaysia, Thailand, Singapore and Taiwan). In the Israeli case, co-evolution was 'slow' initially, but accelerated during the emergence process.

A key underpinning of such co-evolution is *successful priority-policy coordination* during the three phases as well as strong *system learning* during Phase II. This would lead to a monotonic reduction in the uncertainty and the generality of the relevant priority; and absent exogenous creative/destruction unexpected events, to successful Policy Targeting.

The priority-policy coordination and learning processes of Phases I-III would look as follows-

PI: General & increasingly Defined/Specified Priority→←'experimental' policies

[Ex-ante Priority-Policy co-ordination in the context of SIP (E) and learning from 'key agents' + a mechanism for settling disputes and/or Explicit 'governance-based' coordination] ---→>

PII: An increasingly well Defined/Specified priority→continued 'experimental' policies and <u>onset</u> of 'regular' policies→System Learning→ Identification and definition of reasonable/plausible/robust new meso-level HLO Priority *option*

[A measure of ex-ante Priority-Policy coordination based on SIP(E) and a component of ex-post Priority-Policy coordination based SIP©. System Learning and Knowledge Integration enable the conceptual shift at identifying and defining a new, meso level HLO priority *option* for eventual Policy Targeting. Further System Learning to assess possibility of materializing the new priority option]-→>

PIII: Successful PIII Policy Targeting

[A decision on 'Policy Targeting' is made, a fact which signals initiation of PIII. Absent 'creative-destruction' exogenous events, successful *ex-post*

priority-policy coordination largely based on SIP © would lead to Policy Targeting success][32].

If the conditions in PI-PIII hild, we would in principle, be in a situation of successful Policy Targeting, underpinned by Strong Adaptation and Good Luck

On the other hand, absence of any one of the above elements or events in PII is likely to negatively affect the quality and range of plausible & socially desirable specifications of the new-HLO targeted by policy. Moreover, the evolutionary process leading to a new-HLO may stall, the process meandering at or switching to stand by in Phase II. For example, a linear SIP process view operating in the context of Type 2, new-HLO priorities risks- through absence of experimental policies- truncating the priority-policy learning and adaptation process which otherwise might plausibly lead to new HLO emergence. With SIP © in Phase I of the evolutionary process of such priorities, the Learning by Doing impacts resulting from Horizontal support of innovative firms might not be enough to define, specify or change priorities e.g. into a new HLO priority or priority option. In such a case a major precondition for effective policy targeting may be missing; and PI and /or PII may consequently extend themselves and languish rather than setting the stage for PIII. [33]

Finally, let us recall that success in the decision to go forward and materialize such a new-HLO option through policy targeting is predicated on two additional conditions. First, absence of [radical] creative/destructive changes in the environment which both drastically reduce or eliminate the

[32] These statements are those of Section 2 simplified with the explicit addition of SIP Effectuation/Causation and of priority-policy 'coordination' processes. They should eventually be proved mathematically in the context of a formal model or by simulations. Having said that, it would seem that while the sequence in the following paragraph is not the only one assuring successful policy targeting (there certainly are others), certain components e.g. SIP (E) in the early stages and System Learning would seem to be critical under a broad set of conditions.

[33] Still, if despite the above analysis, policy makers decide to target a new-HLO leading to a temporary transition to PIII, there would be a strong likelihood of failure in which case the relevant evolutionary process will return to PII. Note that there are other factors which also can cause Phase I and/or PII to languish e.g. absence of critical mass of resources or of other key factors (Avnimelech and Teubal 2006) due to e.g. lock- in into obsolete institutional structures (system failures which block emergence of new HLOs including new markets).

potential profitability of the existing new-HLO aimed at by policy makers (embodying a previously defined 'set of possible futures'), or, if such an exogenous change does occur, absence of capacity to adapt (as well as de facto absence of policy adaptation) to an alternative, socially profitable, new-HLO con figuration.

Notes on Politics-Knowledge Links

The above analysis ignores the potentially negative impact of 'politics' on policy adaptation throughout the evolutionary processes leading to successful Policy Targeting of a new HLO. Thus, 'politics' may affect priority-policy coordination or -due to path dependence or the weak effect of knowledge on policy design and implementation- the possibility of engineering a shift from a micro level priority in PI and part of PII to a meso level new HLO priority option in PII. Moreover it may affect the knowledge underpinning of priorities by blocking adequate *experimental policies* in the context of SIP (E); as well as System Learning (which ideally should involve cooperation between priority setters and policy makers). These coordination failures may be rampant under Type 2 priorities due to legitimate differences of opinion or 'disputes' between Ministries and priority setters.

The outcome of 'politics'-originating System Failures might be inadequate or *biased* priorities and/or biases or knowledge scarcities in the policy targeting process itself. .

An example of the role of politics in Type 2 priorities is when incentives are directed away from key agents like SUs and entrepreneurs (whenever these are the relevant key agents, like in relation to new entrepreneurial systems) and in favor of formal institutions or large companies. A related case is when policy makers adopt a SIP © profile rather than SIP (E), with policy makers refusing (or not knowing how) to implement experimental policies at all. In this case they would be focusing on policies without having a clear idea of priorities. The impact of both types of SIP *System Failure* could easily be an ineffective SIP process. As mentioned above, in extreme cases it could even lead to truncation of emergence and subsequent regression back

to Phase II of the evolutionary process. This highly undesirable scenario would be associated also with a highly singular non-linearity in the SIP process

I conclude that for Type 2 policy targeting, there may be no easy way to avoid 'politics' from being involved in priority setting/specification and in priority articulation into policies on the ground. Even in the absence of purely politics-induced distortions in policy objectives, there may be *bona fide* differences of opinion and 'disputes' between upstream priority setters and downstream policy makers. Absent political leadership and a clear vision, this may lead the SIP process to stall or be ineffective. The frequency of such situations would contrast with Type 1 priorities where neither SIP (E) nor experimental policies would be required for priority specification and stabilization; and where 'Politics' would not have an immediate affect on priorities (see Box 2).[34]

As mentioned, this paper ignores other aspects of 'politics' such as priorities which are overwhelmingly 'created' by 'politics' rather than by 'knowledge'; the creation or deletion of new Ministries (or of areas of jurisdiction of existing Ministries); current policy makers' 'actions' to weaken the impact of past policies through e.g. politically motivated delays in implementation; and the role of 'politics' on Vision (and indirectly in determining the list and order of importance of priority *areas*)

SUMMARY AND CONCLUSIONS

General

Nelson and Winter in their 1982 book (Nelson and Winter 1983) and others pointed out that in the 'real world' there is 'no-optimum' which policy makers could aim at; and that "satisfying" is a key behavioral principle of both private agents and Governments. Related to this, Metcalfe in his 1994

[34] To avoid the influence of politics, independent priority setting mechanisms/institutions should also have a say and be involved in experimental policy making. This may be impossible politically.

paper and elsewhere (Metcalfe 1994, Metcalfe and Georghiou 1995) indicated that with Radical Uncertainty, policy makers are or should be adaptive rather than 'optimizers'. Moreover, there is no assurance that policies will succeed or be effective.

This paper builds upon these views and on previous work (Teubal & Zlotnick 2011, Teubal 2013a) by proposing a SIP perspective to Policy Targeting of new HLO priorities which is explicitly systems-evolutionary in its approach. Policies based on explicit priorities and on continued and knowledge-based priority setting (definition and specification, and re-definition and re-specification if needed), could, in principle, be more adaptable relative to those where priority setting is either non-existent or haphazard. More specifically, a SIP system and process could contribute to reduce somewhat what seem to be *pervasive Government Failures* in Innovation Policy (both failures of omission and failures of 'commission') which originate in priority identification and priority setting (Teubal 2013A).

My analysis of adaptive policy making focuses on SIP as applied to Policy Targeting of Type 2, new Higher Level System/Organization priorities like a new sectoral system of innovation, infant industry, entrepreneurial system or technological cluster. It makes use of a multi-phase evolutionary approach which combines 'positive' and 'normative' variables, an extension of the extended industry life cycle perspective used to describe the evolution and emergence of Israel's ICT-oriented entrepreneurial system of the 1990s. Following Teubal 2013a, a clear distinction has been made between those new HLO priorities which are characterized by radical uncertainty & the possibility of unexpected events (Black Swans, see Taleb 2009) and those involving only moderate uncertainty or risk (Type 1 priorities).

The evolutionary process leading to the possibility of policy targeting of such an entities is assumed to start with a very general, non-focused priority (e.g. "support of an innovative business sector with an increasing number of innovative firms") which is not yet a higher level system or cluster which could be the subject of explicit Policy Targeting. Throughout the subsequent evolutionary process and the gradual priority definition and specification

process that follows as part of strong policy adaptation efforts, there are mutual links between priorities and policy objectives on the one hand, and the evolutionary process itself (this sharply contrasts with at least some Type 1, new HLO priorities where by and large, priorities could be rather well defined and specified 'at the beginning', and where the above mentioned mutual links between priorities/ policies and the evolutionary process as a whole are absent).

For Type 2 priorities, the analysis shows that-beyond 'Bad Luck'- there are numerous sources of possible 'failures' in Policy Targeting which result from absence of adequate policy adaptation. Correspondingly, numerous aspects of policy adaptation to a changing context which are required in the context of Policy Targeting of a Type 2, new HLO. These include

- **Priorities:**The need for SIP (E) and experimental policies, including those oriented to activate Key Agents on the ground (our extension to SIP of Sarasvathy's entrepreneurial effectuation, see Sarasvathy 2001,2008,2013) whose activity would inform efforts at defining and specifying 'very general' priorities (in our example, related to innovation in the business sector);

- **System Learning:**Efforts at System Learning (Shoen, Argyris, etc) and Knowledge Integration, critical inputs in priority-setters' shift from micro-level priorities concerning e.g. innovation in the business sector, to a meso/Schumpeterian level, new HLO priority *option* , which may be the subject of subsequent Policy Targeting;

- **Coordination:**Effective priority-policy coordination (assured by a strong explicit *Governance* component) despite a complex coordination problem, one prone to disputes and undue interference of 'politics' in the knowledge-based process of priority setting.

Since such adaptations should be undertaken whenever a significant exogenous or endogenous event or development takes place, it would be misleading for policy agents to choose *a once and for all 'set of futures"* and, correspondingly, a *once and for all set of plausible & desirable (robust) new HLO specifications*. Thus, to avoid decisive Policy Targeting failure in

the presence of any significant 'creative-destruction' exogenous event, policy makers would either have to suspend existing plans for policy targeting or introduce radical changes on the pre-existent new HLO configuration aimed at. The latter would mean initiating a new round of 'policy adaptations' comprising at least elements of each one of the three items mentioned above. Needless to say, the above 'adaptations' are only *necessary conditions* for successful Policy Targeting of new HLO priorities. Following what could be termed Ormerod's *inherent policy failures* (those that result from complexity –induced uncertainty in multi-agent structures) adaptive policy making *cannot assure* policy success (see Section 6 above).

More on Policy Adaptability and Policy Failure

Adaptive Policies do not mean successful Policy Outcomes. Thus for Type 2 priorities, 'apparent failures' might still reflect adaptive behavior e.g. when they are the outcome of unexpected events. The outcomes of such "successful" adaptations could conceivably be: truncation of evolutionary path, either during or prior to emergence; abandoning altogether a particular priority area; or substituting the existing new-HLO evolutionary process for another one.

More Generally speaking, with Type 2 priorities we might have

*adaptive but failed Policies (due to 'Bad Luck'), or

*weakly adaptive policies and successful policy outcomes (due to 'Good Luck')

The substance of policy adaptability

I will address the *What?* and the *How*? of Policy adaptation/adaptability, as well as other aspects of the above theme. The *Whom*? will include priority setters and policy makers, as well as 'political agents'.

The *What?* of policy adaptability mentioned above could be restated in broader terms as follows:

- priorities should be linked to reasonably desirable future possibilities (a set of futures) identified if possible through Robust Decision Making procedures;
- they should be flexible i.e. change with circumstances
- should effectively overcome the inevitable non-linearities associated with SIP (E), System Learning and priority-policy coordination
- should assure a "strong governance of knowledge" through adequate priority-setting mechanisms i)a minimal influence of 'politics', ii)mechanisms for resolving 'disputes'; iii) mechanisms (including changes in governance) for solving coordination problems.

The *How?* of Policy Adaptation requires-

- continued updating of the relevant knowledge base
- continued search and identification of new agents and new mechanisms for priority setting
- search of /experimentation with new and potentially more adaptive institutional mechanisms for improving priority-policy coordination,
- the underpinning of the above e.g. insights originating in 'System Learning', 'How to Ask Questions', 'Enhanced variety of knowledge sources', 'adoption of computer modeling e.g Robust Decision Making models provided the required 'qualitative knowledge' is used; and 'Training of priority setters and policy makers'

Conclusion

A key issue in the context of Structural Change and Economic Growth concerns the inherent difficulties emphasized in this paper in *achieving effective policy adaptations* in the context of Policy Targeting of Type 2,

new HLO priorities; and correspondingly, without Good Luck, of attaining Policy Targeting Success. In addition to the inherent potential for failure which follows from Ormerod's, Metcalfe's and Taleb's analysis which focus on *radical (*and sometimes, *inherent) uncertainty*, there is a strong likelihood of System Failures in policy making which results from a weak capacity to effectively and continuously undertake Adaptive policy making in a very dynamic context.

The major conclusion is the importance of paving the way for *a Paradigmatic Change in Policy* (in contrast to focusing on existing areas, capabilities, knowledge creation perspectives and longly-held assumptions i.e. *More of the Same* approaches) making it *more flexible and capable to undertake policy adaptations*. Key requirements are: a strategic perspective (which is not 'planning' nor the approach followed in traditional Industrial Policy and Infant Industry support) with a variety of mechanisms for defining national strategic priorities and for relating to the future (e.g. RDC, see Lempert 2013), and with links between the Short, Medium and Long Term; an explicit Radical uncertainty assumption; enhanced importance of Policy Targeting; policymakers having to confront Valley of Death situations by implementing Out of the Box policies; and explicit, systemic support of entrepreneurship.

Such changes may be very difficult to implement due to policy/policy process lock-in (B. Arthur, 1994). They may require enhanced flexibility and an entrepreneurial approach towards policy i.e. continued/frequent experimentation and learning, a component of 'personalized' support of individual stakeholders, incorporating virtuous co-evolution and emergence of new meso- level entities as a key policy objective; and, eventually, linking evolutionary/systemic perspectives to SIP (which first and foremost focus on the meso-level) to the macro-level of policy and to the decision making processes of Ministries of Finance.

A necessary condition for change is recognition of the need for new methodological approaches both for strategic prioritization and for ex-post evaluations which explicitly recognize the growing importance of radical uncertainty and unexpected events. Moreover, the implicit and related

assumptions that if there is no proof to the contrary, market forces tend naturally to create value rather than focus on rent-seeking, and that we look at the future by extrapolating from the past, are increasingly being questioned in light of the Global Financial and Global Economic Crisis.

Despite the difficulties (some of which may be insurmountable in the short term), favorable circumstances may emerge e.g. 'Political Leadership' acting during a 'Window of Opportunity'. This was Israel's case during the late 1980s and 1990s, when among other favorable factors, a social and political consensus was achieved concerning the need to absorb large numbers os highly skilled immigrants from the former Soviet Union (Teubal 2013c,d).

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