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NATIONAL STRATEGY, POLICY TARGETING AND 'COUNTRY' ADAPTATION: A SYSTEMS-EVOLUTIONARY PERSPECTIVE

Summary of a Memorandum with the same title (in process)[1]

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Acronyms: SC-Structural Change; ONG-Overarching National Goal; VoD-Valley of Death; CU-Catch Up; MIE-Middle Income Economy; S/E-Systems-Evolutionary; NIS-National Innovation System; ONG-Overarching National Goals; EHTC-Entrepreneurial High Tech Cluster; VC-venture capital; VC/EHTC-Israel's EHTC (high tech entrepreneurial cluster of the 1990s)) with an early stage VC industry embedded into it

Introduction and Abstract

Countries are currently facing not only the effects of a global crisis but also the impact of paradigmatic changes in the global (and also, frequently) the domestic context. It takes numerous forms e.g. an increase in the Radical Uncertainty (ignorance of what event or type of event might occur in the future and/or unknown probability of occurrence of events that might occur) facing nations (understood as the relevant political entity whether a country, a state or a Federal or Supra-national entitity; or a region within a particular country); the emergence of a new hegemonic power (China) with strong implications for almost any aspect of policy; new technologies with potentially revolutionary consequences for existing industries, Structural Change (SC) and Employment; issues of immigration, climate change and spread of disease ; the rise of middle classes in catch up countries; new security threats, continued unemployment and poverty and potential complementarities between their reduction and sustainable growth etc.

A key implication is the enhanced strength of the links among nations and among the various priorities and priority areas within nations; and the corresponding need for new forms of coordination, both domestic and global. This adds to the inherent need to set national strategic priorities 'upstream' in the Priorities/Strategy and Policy System (the System which would substitute for what currently could be called 'the Policy System') or-for simplicity-the *priorities-policy system.* The 'Priorities/Strategy' part which was added to the Policy System should be considered as *a key knowledge component* of the National Innovation System (NIS) since it underpins both priorities

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& policy objectives and-through e.g. Public Entrepreneurship-their implementation in terms of policy design and policy implementation on the ground.

Countries and supranational entities have only imperfectly adapted to the above changes. In some we observe the continuation of short term, stand alone policies e.g. of the traditional macro type without linking the meso/SC dimension with the macro-dimension (thereby reducing Debt and reducing growth as well). In others like Australia and maybe Canada, we observe e.g. the continued promotion of resource based exports at the expense of manufacturing and enhanced product and sector variety, a 'strategy' which might endanger country resilience to unexpected changes in the global environment. This Think Piece's objective-among others- is to contribute (in the best of cases, *indirectly*) to an Agenda for Adaptation and Change for Advanced Economies. Its main objective is to visualize alternative institutional structures particularly concerning the Priorities/Strategy and Policy System of 'countries' with possible implications for a shift in the relative balance of influence in policy making between *Knowledge* (including that embodied in National Strategic Priorities) on the one hand and the *(Democratic)Political Decision Making Process* on the other.

Its key thrust and focus is the desirability of a National (and, when necessary, Supranational or Federal) Strategy (necessarily balanced by a role of regional and local institutions in some cases) with explicit mechanisms and institutional settings for setting priorities and articulating them in terms of policies on the ground, and for assuring various forms of coordination in the short/medium & long term, both market and non market (including macro-*economic* and macro-*strategic* coordination). Key priority areas considered (or to be focused in the future) relate to SC-based growth; Science/Technology/Higher Education and other aspects/components of the National Innovation System (NIS) such as continued and updated vocational training; and eventually (future work) --as part of a 'country vision' involving steady & sustainable growth-- the Targeting and consequent Empowerment of Socio Economic Groups.

Throughout, a key distinction is gradually emerging, namely, between 'normal times' and 'non-normal' times; with 'complexity' issues and associated dis-functionalities in Government and in the Political Process potentially blocking 'desirable' country/supranational adaptation to the changing global and domestic environments (during the latter, non-normal times). I hope this and related work may contribute to think anew about the nature of the problems affecting us today, and its causes, as well as stimulating the visualization --within a dynamic, systems evolutionary context-- of alternative patterns of improvement in policies, policy (or national strategy and policy) systems, and even in the functioning of an Entrepreneurial State.

Summary

I.PREMISES

This summary is based on seven premises. The <u>first</u> <u>premise</u> comprises two parts: first that most countries face a dynamic, partly non-predictable global (and frequently, domestic) environment propelled by changes in technology and markets and in the Policies of Governments; by political changes and novel security threats; and by

changes in the area of communications and media as well as social and cultural changes. Moreover, such changes are very likely to have a strong impact on the Vision/Overarching National Goals of many countries (such as *Steady* --and increasingly-*Inclusive* Growth; Equality; Education and Health; Security and Defense; Environment, etc

A <u>second premise</u> is that *country adaptation* to such an environment (notably concerning determining or re-formulating a country's National Strategy) most likely requires important changes in policy and in policy institutions, both in approach and in substance and organization. Not only policy makers should be *adaptive* (Metcalfe 1994) to effectively respond to changes in the global and domestic environment (both expected and unexpected, both 'destructive' changes or creative/destructive ones) but the *Priorities/ Strategy & Policy System* and even the *System of Government* and the *Nature of the State* (see Bonvillian 2012, 2013; Mazzucato's 2013 and the memorandum underlying this paper) might have to adapt e.g. by becoming more strategic and more entrepreneurial; and by systematically promoting entrepreneurship and an entrepreneurial attitude.

The <u>third</u> <u>premise</u> is that *continued Structural Change* (SC-understood as the emergence of new meso-level entities like a new sector, industry, cluster or system) is nowadays a key requirement for sustainable Economic Growth which is a key Overarching National Goal of most countries; and-as in other policy areas and following the first premise- such policies must increasingly consider a very Dynamic Environment involving, side by side with 'calculable risk' (Type 1 uncertainty), Radical/Knightian Uncertainty and 'Unexpected Events' (Type 2 uncertainty).

While not underestimating other factors, this paper's <u>fourth premise</u> is the assumption that increasingly *three key aspects of such adaptation* are becoming important:

•   building a *National Strategy* i.e. (for simplicity) a coherent set of <u>National Priorities</u> in areas reflecting 'Social Needs' or *Overarching National Goals* ';
•   linking/coordinating it with/to policies on the ground(Teubal and Zlotnick 2011, Teubal 2012, Teubal 2013a,b); and
•   *Policy Targeting*, particularly of new meso level entity *priorities*.

Sometimes, the cost of not adapting country Vision and ONGs may be very high, see e.g. G. Corm's analysis below of the failure of Arab countries to do so in the wake of the fall of incumbent dictators.

Throughout, the notion of *'Policy Targeting'* (Lall and Teubal 1998, Reinert 2007, Avnimelech and Teubal 2008, Teubal 2013, Rosiello et al 2013) could involve a variety of policy options for selective Government Support of SC/emergence ranging from *minor catalytic selective* incentives and/or regulatory changes to *strong & sustained selective* incentives possibly accompanied by other policies e.g. regulatory and other. Note that *'Policy Targeting'* is a subset of the policy implications of the need for continued/sustained SC (third premise), for *two reasons*: (i) only a subset of meso-level entity priorities require-for implementation on the ground- public policy support i.e. only those associated with market failures (MF) and/or system failures (SF) blocking endogenous or autonomous 'emergence'; and ii) only a subset of meso-level entity priorities requiring public policy support should be 'Policy Targeted' i.e.

those for which emergence involves significant *selective support* .

The *fifth premise* which follows from the previous two paragraphs is that effective 'Policy Targeting' nowadays might require adopting a *system-evolutionary approach which is both 'strategic' and 'entrepreneurial'*. This involves i) a multiphase process comprising Dynamic Sequences (Sections 1,4 & 6 of the monograph) with mutually linked and evolving strategic priorities, policies and policy outcomes oriented to creation of new Policy Targeting *options* and emergence of new meso-level entities; and ii) Entrepreneurship broadly conceived to include search, experimentation, investment and risk-taking, and acceptance of 'failure' throughout the 'Priorities/Strategy and Policy System' and the Government as a whole (for Public Entrepreneurship see Bonvillian 2012,2013 and Sections 3 & 9 of the manuscript); and (iii) 'adaptation'.

'Adaptation' of the Policy Targeting activity to unexpected events (global or domestic) might involve either a) seizing new opportunities or b) restructuring (including cancelling) on-going Policy Targeting *process*es. As with ii) it might also have to involve deeper changes in the functioning of the Priorities/Strategy & Policy System (or even in the operation of Government or the State).

A *sixth premise* is that it may be in the interest of certain groups of countries (as reflected in their National Strategy) to consider developing high tech entrepreneurial clusters as a mechanism for supporting *continued* innovation-led, SC-based economic growth. In this connection it is important to mention that Israel's successful development of an ICT-oriented, Start Up (SU) oriented entrepreneurial high tech cluster (EHTC) during the 1990s has, during the last 15 years, been referred to, and many countries continue to be interested in knowing more about that experience[2].

A *seventh* and final *premise* concerns the need for explicitly considering both micro-meso and meso-macro links. Such links are part of the *Priorities/ Strategy and Policy System* and *Process*. An interesting instance was the branching out from an early micro level 'innovation and innovative firm support' priority in Israel a 'support of high tech/ICT-oriented entrepreneurial cluster' option which was subsequently targeted (see Section 1 and especially Section 6). A fuller and formal analysis of micro-meso and especially of meso-macro links is left for future work .

II. MAIN THEMES/GENERAL OBJECTIVES
The main objectives or themes of this monograph are
- (i) An analysis of *National Strategy* including *Vision/ONG & Strategic Priorities;* and – for the relevant subset of priorities associated with Market and/or System Failures- *Policy Implementation* on the ground;
- (ii) Linking the above to, *Policy Targeting of Structural Change* [*SC,* understood as new (or significantly upgraded) meso level entities e.g. a new sector, industry, cluster; network, etc]
- (iii) *Multi-level Adaptation* to exogenous or endogenous changes in the global environment at the *priority, policy, Priorities/Strategy and Policy System,*

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[2] See Memorandum Sections 1,6 for a description of the VC/EHTC and Sections 9,10 for further interpretation and attempts at assessing the applicability and possible relevance for other countries interested in developing entrepreneurial clusters

and/or Government/State;levels

(iv)   *A Systems-Evolutionary approach* (see below Evolutionary Phases and Dynamic Sequences) *to country evolution* (see Sections 6 & 9 of the memorandum) oriented both to identify *Valleys of Death* and possible roles of *Policy Targeting* to overcome them;

(v)   *Applying the above conceptual framework to selected cases* [3]
           *a*nd

   (vi)Broader Implications and Related Topics [see III below].

The paper will conclude with some remarks concerning the importance of *Think Pieces* as part of a knowledge-creation process taking place during periods of radical or paradigmatic change (even if some of these would not be directly implemented or applied in any particular country). Despite this it is hoped that this piece would contribute to the critical thinking taking place nowadays on ways to overcome the current global crisis while striving to adapt to what seems to be a Paradigmatic Change in the Global (and frequently, the Domestic) environment.

(i) *National Strategy*

The monograph starts with a *theoretical view of National Strategy and (Strategic) Priorities,* followed by a classification of Priority-related System Failures with examples. The strong dynamism, Radical Uncertainty (or 'wild randomness') and 'complexity' that frequently characterizes both domestic and global environments is the underlying reason why the explicit formulation of national strategic priorities [which are strongly related to policies on the ground] is required.

Throughout a distinction should be made between Overarching National Goals (ONGs, see Teubal and Zlotnick 2011) and National Strategic Priorities ('priorities'). ONGs are broader 'Social Objectives such as Steady Growth, Defense, International Relations, Education, Health, Equality, etc, the backbone of a country's Vision. The first premise mentioned above (that countries face a very dynamic environment involving radical uncertainty) implies that, at least for a subset of countries, such circumstances may require a change in country vision i.e. in the set and relative importance of its ONGs.

A fascinating example of absence of such an 'adaptation' i.e. absence of a new Vision and a new, explicit National Strategy in the context of Arab Countries is provided by the analysis of Geoge Corm (see G. Corm 2014[4]). G. Corm states-

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[3]This is a long term endeavor. A partial country example is the recent re-interpretation of Israel's successful policy Targeting of a high tech, ICT oriented entrepreneurial cluster during the 1990s (see Teubal 2013, 2014 and Section 9.3 of the memorandum which presents the beginning of a dynamic conceptual framework where countries may have to overcome various types of Valleys of Death which block their transition from one Evolutionary Phase to another).

[4] Contemporary Arab Affairs 2014 http://dx.doi.org/10.1080/17550912.2014.976403. © 2014 The Centre for Arab Unity Studies. This lecture was delivered at Carthage Palace in Tunis, Tunisia, on 14 June 2014. Thanks to Riccardo Galli for having suggested this example.

The author first makes an attempt through several indicators to identify and describe the main symptoms of this bad growth; and then he describes how to move from a rent-based and unproductive economy toa virtuous and inclusive growth model whereby human resources are all mobilized in a national effort to appropriate an adequate cluster of technologies….[5] Corm states "…*This lack of virtuous growth in Arab Countries* [including after the overthrew of pre-existing dictatorships]*, is due to the development of neo-patrimonialism within the context of rent economies that cannot produce real democratic institutions…*"

"…*During the wave of Arab uprisings, Arab and International media limited their focus to the issue of democracy and personal freedoms. Absent from the analysis of revolutionary matters was any indication of the ways and means to reach a renewed developmental style, independent from the neoliberal model popularized by international, regional, Arab and Islamic financial institutions*" . *All that we have seen were promises to improve the standard of living, materialized partially and chaotically in wage increases here and there, under pressure from workers and their trade unions, without reciprocating any plan for a rise in production aimed at breaking the chain of the rentier economy characteristic of Arab economies.*

Concerning the absence of key national strategic priorities it was stated…"*It is this chain of negative influence that has, for decades, been preventing the Arab economy's entry into the world of production, science and knowledge and, consequently, the adoption of an effective economic model such as the one in East Asian countries. Such a model could offer sufficient work opportunities to include all those not employed in contributing to production for Arab economies to enter into a true state of competitiveness in international markets. Remarkably, the new governments in both Egypt and Tunisia have not yet developed alternative developmental goals to secure lost opportunities for employment. Such policies must emphasize a strategy to appropriate science and technology across all social classes, including prioritizing rural and poor urban groups. This is what has been implemented by the countries of East Asia and Japan as a priority in their modernization policies*"

Another relevant remark follows. *"...However, in the Arab world the descriptions originating from the Washington Consensus, more than three decades ago, have made no change to the size and scope of poverty or unemployment, especially among the educated youth component. That is because the only successful policy to combat poverty is hidden in the process of indigenizing science and technology and entering the world of intensive production of goods and services demanded in the globalized economy which has become, to a large extent, a single free market. Delaying a transformation is to be doomed to remain in the rentier economy and dependent on foreign aid, ..*"

To summarize, Gorm's view seems to be that, despite the fantastic opportunity opened up by the fall of dictatorships, the liberal democratic forces that accessed power in several Arab States adopted liberal/non strategic approaches to policy (Washington Consensus). Obviously donor countries where not aware of the need and feasibility of a strategic alternative to a simplistic liberal approach i.e. one which would promote both steady and inclusive growth as well as empower lower social groups. It was as if a liberal democracy would- by promoting free trade, etc- automatically 'solve' all the problems (alternatively, maybe donors were not interested in pressing for such an alternative).

A final reflection: *"It is no wonder that the Arab economies, which were affected by the popular uprisings and political changes, are suffering from greater financial dependency on foreign*

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[5]This would seem to confirm that Corm's view is that no ___new___ Vision nor Strategy [understood as a new set of national strategic priorities] emerged from the Arab uprisings of the last decade or two.

sources and that unemployment is increasing, rather than decreasing. This has been caused by the lack of political stability and <u>the complete absence of any alternative developmental vision</u> [my underlining], *the closing of economic institutions, laying off workers and avoiding internal or external investment, even in the rentier sectors, such as the development of real estate and tourist facilities. As a result, the new governments are falling into more severe dependency on external funding sources, given their lack of any formulation for alternative public economic and social policies and have been slow to implement the mobilization of all available human capacity among the popular classes, as well as those with skills and qualifications. They need to join the process of changing the course of development and to enter seriously into the world of production beyond the mechanisms of the rentier economy. The result will be success in gradually eliminating the prevailing socio-economic model which is preventing such a mobilization from occurring and is the main factor in the process of fundamental non superficial change ".*

A priority, which by definition relates to a particular 'priority area', could involve a rather extensive Body of Knowledge (BoK). The BoK would include an analysis of the background (or alternative narratives to the background) to the relevant area which justifies it being a national priority, its short-medium and long term aspects, its links with other priorities; and 'Recommendations/Policy Objectives". For example, a Health System computerization -related priority links to *Diffusion of IT* into the Economy/Society and to *Promoting Skilled Manpower/Human Capital* related to the 'manning' of the future industries emerging from SC and policy targeting. Note that in principle not all priorities lead to policies, only those associated with market and/or system failure. Depending on the preferences of the various groups and stakeholders formulating priorities (whose implementation on the ground is constrained by market and/or system failure), and the latter's complexity, the last sections of a priority's BoK will present <u>*alternative views*</u> not only about what the priority is, but- *downstream* in a country's Strategy/Priorities and Policy System- also concerning 'policy objectives'. These will be termed 'priority options'. Selection among these (see Appendix of the main Monograph) will set the basis for the subsequent *downstream* process of policy design and implementation .

Given that a set of *distinct/alternative <u>'policy objectives'</u>* **options** are likely to be generated in relation to any 'complex' priority, effective downstream policy implementation on the ground depends on arriving--through further analysis and compromises among participants in the priority formulation process (preferably consensually??)--at a single *policy objectives* option.[6]

Note that even if a single remaining '*policy objectives'* <u>option</u> is arrived at, it is not sufficient for downstream policy implementation on the ground. This because implementation of such an option may depend either on the appearance of particularly favorable conditions or on beliefs concerning their appearance in the future (see Section 6 of memorandum).

(ii) Policy Targeting
In order to acquire a "time" and an "evolutionary phase" dimension the notion of Policy Targeting should go beyond the Strong/Weak distinction used in the past , see e.g. Teubal 2011, Rosiello et al 2013/4. First and foremost, it should include Direct

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[6] This paper will not deal with the intricacies of such a process. I will only state that interaction among participants and stakeholders may be critical in this respect, see Innes and Booher 200? And III(i) and III(ii) below . The Principle-Agent interaction literature (see e.g. Mas-Collel   ) could also provide some insights into this issue

and Indirect Policy Targeting (Section 9) where *grosso modo Indirect Policy Targeting* focuses on creating pre-emergence conditions (e.g. creating an appropriate institutional setting for a particular new cluster, see Teubal and Kuznetsov 2012 and other papers related to Israel's experience) for subsequent Direct Policy Targeting of new meso-level entity priorities. A similar inter-temporal link also holds for Policy Targeting of the National Innovation System (NIS) (Section 9) and, to some extent, Policy Targeting of a country's Physical Infrastructure .[7]

These forms of policy targeting-which are incorporated into the Country Dynamic Sequences (Section 9 of the memorandum)- may be of particular importance when considering possible shifts from the Catch Up (CU) phase of a country to a steady, post CU Middle Income Economy (MIE) phase thereby avoiding what the OECD has termed the "Middle Income Trap" (OECD 2014).

A key point raised in the memorandum underlying this document is that the Policy Targeting process depends crucially on whether the meso-level entity targeting involves Type 1 or Type 2 uncertainty (Type 1 involves "calculable risk" while Type 2 involve "radical uncertainty or wild randomness", see Taleb 2006 pp). Thus, in contrast to Type 1 entity priorities, the evolutionary process/dynamic sequences leading to effective policy targeting of a new Type 2 meso level entity is likely to require *Experimental Policies & Robust Decision Making,* as well as *complex priority formulation, priority-policy coordination* and *inter-priority coordination* (Sections 2.3 and 7).

(iii)*Adaptation and Failure to Adapt*

Nelson and Winter in their 1982 book (Nelson and Winter 1983) 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'. His subsequent statement that there is no assurance that policies will succeed or be effective links with the issue of *policy (or priority & policy) adaptation.*

A related view despite coming from a different angle is Swanson and Dhawal's analysis of priority setting (& policy making) in the context of multi-stakeholder deliberation mechanisms (Swanson and Dhawal, 2009). A key conclusion of particular importance for Type 2 priorities is *the need to adapt policies to a "set of futures" rather than to a single future.* In the context of 'Policy Targeting' this could mean that the *qualitative* [or the qualitative and quantitative] *configuration* of the meso-level entity *priority* aimed at should be adapted to achieve what could be termed 'strategic robustness' (see also Robust Decision Making in Lempert et al 2013).

Note that the conceptual framework of the authors above is not always based on an

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[77] Alternatively we could state that no less important than targeting a new industry today is to create the conditions for a future Policy Targeting option. This could take place either by targeting a rather particular set of pre-emergence conditions-indirect Policy Targeting- or by targeting certain 'generic' NIS elements or components today to create favorable conditions for future policy targeting options in a number of areas. Let us recall that whatever the *Indirect* Policy Targeting which takes place, it might be followed either by 'endogenous' emergence of by *Direct* Policy Targeting efforts.

analysis of national priorities nor of their links with policies, nor do they explicitly consider priority-policy coordination. Once we consider these in the context of Type 2 'Policy Targeting' we get a list of "*failures to adapt*" under the assumption that there are no inter-ministerial coordination problems. These include

• <u>Absence of 'experimental policies'</u> in the early phases of the relevant evolutionary process[8];

• <u>Weak "System Learning" by Priority setters</u> leading e.g. to failure to generate and/or integrate knowledge that characterizes and defines both the new meso-level entity priority aimed at by Policy Targeting and the relevant ecosystem (s) within which it might operate[9]

• <u>Policy Coordination failure</u>. This may be due to absence of an adequate *knowledge-oriented* coordination mechanism e.g. undue influence of 'Politics'. Thus even if priority makers 'adapt' or are willing to do so there still may be a coordination failure if *policy makers* i) do not re-configure the required experimental policies in a fully coordinated way with priority setters, nor (ii) *in their policy making role* fully consider the *adapted*-meso level entity priority configuration as defined/specified by priority setters .[10]

Note that successful adaptation of the Priorities/Strategy and Policy System does not guarantee Policy Targeting success. Even under these circumstances unexpected events may lead to failure from the point of view of SC outcomes. An extreme case would be when even a 'reasonable/robust' priority & policy adaptation to such type of event justifies truncation of the evolutionary process (prior to or during emergence) as a means of avoiding larger losses.

A key issue is the link between 'Luck' (e.g. derived from both exogenous and endogenous events, particularly, unpredictable ones) and 'Policy Adaptation". Rather than well defined propositions, the following should be regarded as 'food for thought :'

<u>First</u>, on occasions it may be useful to make *a distinction between 'adaptability' (or 'potential adaptability') of the Priorities/Strategy and Policy System (or Process)* and *actual 'policy adaptation'*. Changes in system adaptability may affect priority/policy

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[8] This might be due to 'path dependence' (B. Arthur 1994) in the Policy system and process, a not uncommon phenomenon in the real world. Path dependence might reflect organizational inflexibility, bureaucratic conservatism, 'sectoral interests' ad/or 'politics' [e.g. a refusal to improve a system when recognition and impact may come after the forthcoming election] or lack of entrepreneurial initiative (experimentation, learning and selection), etc.

[9] Like with experimental policies it could reflect unawareness about the need to adapt priorities, policies or the policy system, possibly as a result of 'lack of openness' of policy makers (Portheous 2013). Alternatively, Weak System Learning may reflect an *inappropriate policy system* such as one focused on Type 1 rather than Type 2 priorities [where uncertainty-reducing knowledge acquisition is under-emphasized relative to the needs of Type 2 priorities]. In Israel's Type 2 'Policy Targeting' case, System Learning took place towards the end of Phase II in the evolution of its VC/EHTCand even during the early emergence (early in Phase III, see Sections 4-6).

[10] A related situation concerns "adaptations" of a new meso-level entity priority which is "generic" in the sense of pertaining to a number of different Ministries, each one with its own political and functional interests.

'adaptation' while the opposite need not be true.

Second, *'Bad Luck'* in the sense of *unexpected unfavorable events* should be distinguished from *'other variables' which are expected even with 'reasonable' probabilities*. For example, the unexpected appearance of 'political leadership' or of a 'policy window of opportunity' during a crisis (or when major decisions should be taken in a short period of time) might be an example of 'Good Luck'.[11] On the other hand, whether or not the political system becomes dysfunctional might be considered as the effect of other variables.

Third, 'Luck' may affect 'Policy Targeting' through enhanced priority-policy system adaptability in the presence of new threats and/or the effective seizing of new Policy Targeting opportunity [12].

A final point is recognition that there are limits to the intervention of the State. In cutting edge high tech areas support of government is a prerequisite. On the other hand, traditional sectors might spontaneously introduce new tech, new organizational approches or higher quality products. This happens in Europe, partucularly in Germany and Italy, the top manufacturing countries of the continent.[13]

In rural areas of Europe what is remarkable is the development of agro-food-cultural-craftsmanship complex districts, strongly oriented towards environment and culture protection. Rather than national authorities key roles in these cases are played by local authorities, chambers of commerce, and entrepreneurial associations.[14]

A System Evolutionary approach
This piece adopts a Systems-Evolutionary (S/E) approach with a non-conventional focus on Policy or policy oriented variables and phenomena. Given the dynamic environment facing countries, a S/E approach is inevitable despite the obvious conceptual, formal and empirical difficulties associated with it. It involves

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[11] According to Breznitz and Ornston 2013 the conditions for *radical policy change* are more likely to occur at the periphery of the public sector, in agencies with few hard resources and limited political prestige. The authors illustrate this view with examples from Finland and Israel. In our context, 'Good Luck' may refer to the timely creation of such agencies. The authors' insights are also potentially relevant to explain Strong/Weak policy adaptation

[12] For an interpretation of Israel's Adaptation in connection both with preparing 'pre-emergence' conditions (such as overcoming the macro-economic crisis during the mid 1980s), and in seizing new opportunities for developing its VC/EHTC during the late 1980s and 1990s, see v) below and Sections 1 & 6 of the Memorandum.

[13] See also the Smart Specialization literature (e.g. Foray 201?) which seems to focus on the 'restructuring' of existing sectors rather than the creation of new sectors. A key issue concerns the links between sector improvement and sector survival. When such links exists, they could enhance country resilience through enhanced intra-sector variety. Another important link is that between new activities common to several sectors e.g. design, IT services, specialized inputs on the one hand and emergence of a separately identifiable 'vertical' sector (when referring to this process in the context of machine tools, Rosenberg 1961 would characterize it as involving Technological Convergence and Vertical Des-integration). see Section 9 of the memorandum underlying this summary.

[14] Thanks to R. Galli for this and the following comment: ".. **The above 'regional policy' success is the result of avoiding what has become endemic at the national level, namely corruption coupled with short-termism. Needless to say such problems should be considered explicitly in the context of the capacity of countries & regions to adapt to the continued changes in the global environment".**

constructing Dynamic Sequences or Evolutionary Phases [see Sections 6 and 9.2 in the monograph, and III(iv) below]. Over and beyond the focus on Priorities/Strategy (*upstream)* and Policy (*downstream)*, the S/E approach is characterized by the following—

-a focus on new meso-level entities which are the substance of SC and a key element in SC-based economic growth. This contrasts with the conventional Economics view which overwhelmingly focuses on aggregate growth (or other macro variables such as aggregate productivity and Debt-reduction);

-a multi-phase analysis of the process of creation of a new meso-level entity (=SC), with a *focus both on Emergence and on Pre-Emergence phase*s (and to some extent a focus on Background Conditions and on a Post-Emergence phase)

-analyzing "adaptation" to (unexpected) exogenous or endogenous events (see (iii) above). There are several levels: changes in Policies without changing the system; changes in the Priorities/ Strategy and Policy System, or changes in the System of Government and/or the State

Explicit Dynamic Sequences and Valleys of Death
Dynamic Sequences are implicit in the analysis of A.Marshall, A. Young (Economic Journal 1929?), Nelson and Winter 1982 and others. As part of the analysis of   Policy Targeting of a particular meso-level entity (for the Israeli example see Sections 1 and 6); *and* as part of a broader Country- level analysis of National Strategy, Policy Targeting and Adaptation (Section 9), they operate both *within* evolutionary phases and when considering the continuity or truncation *across* phases.

More specifically, I envisage the possibility of applying Dynamic Sequences to further analyze priority/policy/system adaptations at the country level; and more specifically, to overcome possible Valleys of Death (VoDs) that could lie along the their evolutionary path. With this in mind, I focus on 4 types of Valleys of Death (VoD) potentially confronting countries along their evolutionary paths:

1) VoD associated with the shift from accumulation-based growth to innovatioin-based growth;
2) VoD associated with pre-emergence conditions leading to a high tech entrepreneurial cluster (Section 1), with Out of the Box policies implemented to deal *individually* with each company with high potential contribution (but currently with a high probability of disappearance)*;*
3) VoD in the implementation of New (Generic)Technologies in Advanced Economies in terms of structural change and growth, *as a result of non support-due to absence of Public Entrepreneurship- of the technological design/production interface*   linking between those developing the technology [public agencies like DARPA-type activity and organization, see Bonvillian, several papers] and those implementing it downstream (firms producing for the civilian market); and
4) a more complex VoD where e.g. success of countries in the CU and post CU phase (and even in the Advanced Country stage of evolution) leads to enhanced complexity and dis-functionality of the political system/system of government [e.g. more groups entering the middle class; many more 'vested interests', etc]. The outcome could be 'stagnation'/non-adaptation and enormous social costs.

The intellectual challenge of 4) is to visualize ways to overcome non-adaptability of the political system Broadly speaking, this may require new institutions and mechanisms which assure a greater role of Knowledge including explicit priorities (formulated according to a S/E perspective) relative to Politics and the (imperfect) Democratic Process. Needless to say, understanding the nature and causes of the first VoDs In the list as well as possible solutions may require broader thinking than what is usual, both Economic and beyond. Some reflections on these matters follow in Section III of this document/ Think Piece.

(iv) Emergence of Israel's High Tech Entrepreneurial Cluster

Between 1993 and 2000 Israel succeeded in developing *a high impact early stage Venture Capital (VC) industry* together with a *Start Up (SU)-intensive, ICT-oriented high tech entrepreneurial cluster* (EHTC) which fuelled its economic growth during the last years of the decade and even more intensively during the 2004-7 period. With the possible exception of the advanced technology cluster in the Cambridge area which had a relatively higher component of Life Sciences/Medicines and Drugs, Israel's EHTC was one of the most successful examples of a high impact Silicon Valley type cluster (Bresnahan & Gambardella 2004) beyond the US. From 300 SU's approximately in 1993 the number of such organizations rose to around 2500 by the end of the decade. Similarly with VC organizations and total capital under management: from 4 early stage VC Limited Partnerships (LPs) in 1992 to 50 in the year 2000 ; and from relatively small amounts raised and invested in the early 1990s to over 8B$ under management towards the end of the decade .

Both the outlines of the relevant priority (through System Learning) and the Yozma (Policy) Program were conceived/undertaken/implemented by the same individual (the former Chief Scientist of the Ministry of Industry and Trade who subsequently became the head of the Yozma Unit or Directorate of the Ministry, see Teubal 2013 d,e) [15]. A contributory factor to its success was the simultaneity at the time of two complementary priorities i) promotion of a high tech entrepreneurial cluster; and ii) immigrant absorption (over which-in relation to the flood of immigrants from the former Soviet Union at the time- there was broad political consensus about its importance as well as consensus among bureaucrats and policy makers)[16] . The Yozma program which focused on early stage VC and indirectly on EHTC, in fact also (partially) articulated the relevant 'immigration absorption' strategic priority of the time. It helped that both the priorities (VC/EHTC) and the policy ('Yozma') directed to VC/EHTC involved the same individual, namely, the former Chief Scientist of the OCS and Head of the Yozma Program Committee[17]. There is no doubt that this

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[15] The System Learning generated i) an understanding of the 'problems' encountered by implementing the pre-existing Grants to company R&D program to support high tech SUs (a novel form of innovative SMEs first appearing in the country in the early 1980s); ii) conceiving a 'solution to such problems in the form of creating an early stage VC industry and market; and iii) a policy shift from micro-support of individual organizations to support of a new meso-level entity (EHTC) which included such a domestic industry/market (see above Sections 1 & 6)

[16] Immigrant absorption was an *Overarching National Goal (ONG)* rather than a particular priority (which should be more specific). This means that it translated into a number of strategic priorities the main ones during the 1980s/1990s focusing on various dimensions of absorption of immigrants from the former Soviet Union.

[17] In coordination with the Ministry of Finance, this individual had utlinied the key features of the early

unique possibility of automatically overcoming coordination problems in the context of 'national consensus' and a corresponding diminished role of 'politics' in the policy process at the time was also of great importance for Yozma's success (Teubal 2013d.

Some key insights concerning the VC/EHTC's pre-emergence phase follow:

- the key to *potential* SU survival during pre-emergence was the availability of at least a few *experienced early stage VCs,* that is VCs with a strategy of and capability for identifying and implementing *high opportunity/high return projects;*
- In the absence of a critical mass of high quality SUs such *experienced* organizations (mostly foreign at the time) would not be easily available. Through continued exper-imentation and initiatives, Government Policy should find close substitutes ;
- This would require implementing 'Out of the Box' policies (Teubal and Kuznetsov 2012) in the context of a long term policy perspective (Lerner 2009, Avnimelech et al 2010, Rosiello et al 2011, Teubal 2013a) and a relatively clear and consensual set of National Strategic Priorities(Teubal 2012, 2013a).

I concluded that, under the conditions prevailing during the late 1980s early 1990s in Israel, failure to induce emergence of what could become a high tech entrepreneurial cluster could be widespread (Avnimelech and Teubal 2004, 2006, 2009; Rosiello et al 2013, Teubal 2013c) even in contexts where there is a continued and significant entry of new SUs. Moreover, it should not be surprising that conventional policy support schemes like subsidies, Government owned VCs or even incubators might not-by themselves- be sufficiently effective. A key dimension of the required *out of the box policies* as applied to the subset of "promising" early stage SUs is addressing the specific needs of each individual SU within that group

"Out of the Box Policies" could include *Networking/ Linking* e.g. with Diasporas (Saxenian various papers) identifying, engaging and supporting *key agents* (companies or individuals) in the context of experimental policies whose activities may further clarify what is required to sustain worthwhile companies; *Mentoring* by successful nationals living abroad*; Risk-taking by policy makers* e.g. supporting promising companies who are 'fragile' given the circumstances or flexible implementation of existing regulations, especially those which are bound to change shortly; and steps taken to *enhance the reputation* of the existing proto-cluster or system and its potential. Implementing such policies requires a rather *entrepreneurial policy maker* that to some extent is willing to take risks provided that the 'social benefits' are high. Out of the Box policies may be difficult to implement in the normal course of events or in normal times. On the other hand, there may be a *policy window of opportunity* which may facilitate their implementation (see above). My conclusion is that by and large how to attain such flexibility and entrepreneurship in policy structures is an open question.[18]

Prelliminary Summary and Comments
The Israeli case exemplifies *Successful Policy Targeting* underpinned by *Strong Policy*

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stage VC and related entrepreneurial cluster priority during his last term of office as head of the Office of the Chief Scientist, Ministry of Industry and Trade (knowledge which he carried during his subsequent term as Head of the Yozma Committee

[18] For additional analyses relevant to the above 'Phases' see Sections 6 and 8 of the memorandum.

Adaptability/Adaptation and <u>*Good Luck,*</u> that is, one point in the space of possible combinations of the three 'variables'. From an Appreciative Theory Perspective (Nelson and Winter 1982 pp.   among others) as applied to the development of entrepreneurial systems/clusters within a S/E point of view, that case is only the beginning of what may evolve into a broader theory of success/failure in the emergence and evolution of such systems.

Note that part of Israel's *Good Luck* --the global high tech boom and the growth of the global VC industry during the 1990s-- *directly* favored Policy Targeting –itself an expression of 'seizing' a new opportunity- while also requiring a lower effort to adapt. This expressed itself in terms of lower (compared to what could have been otherwise) *direct* costs of Policy Targeting (Yozma Program) and no less important, greater willingness of foreign investors to invest in the private, *hybrid* 'Yozma Funds' that resulted from such a policy. It also led to new opportunities and lower costs of implementing complementary programs which contributed to trigger and sustain emergence of that country's high tech entrepreneurial cluster (Technological Incubators and Magnet Programs).

As mentioned above, another part of Israel's Good Luck in the above area was recognitions by both politicians and policy makers at the time of the mutual complementarities between Policy Targeting of that country's VC/EHTV and the strategic and holistic policy on immigrant absorption which focused on the highly skilled immigration from the former Soviet Union.

Needless to say, analysis of other cases of Type 2 Policy Targeting is required in order to build a corpus of Appreciative Theory focusing on the link between "Policy Targeting" success/failure, strong/weak policy adaptation/adaptability and good/bad luck

Relevance of the Israeli Case: Pre-Emergence Conditions Today

While the above thoughts are significant even today when it comes to think about a new high tech entrepreneurial cluster, there are additional considerations that may have to be taken into account. These include i) the world VC industry is more globalized than what it was during the early/mid 1990s i.e. it may be easier now relative to what it was then to open shop beyond the US and Western Europe; ii) there are more 'angels' with experience looking for projects in different parts of the world relative to what they were at the time; iii) idem with respect to established companies and business groups looking for projects and SUs to invest in within their own countries (like the Elron Group in Israel did during the 1970s-1990s & Teva with respect to biomed companies) iv) there are stronger networks (including Diaspora networks that were also operating then, see Saxenian 2002, 2006) connecting individuals, SUs and other agents in proto-clusters with counterparts, potential partners or sources of advice in major centers of entrepreneurial, high tech activity; v) there are immense opportunities for developing new apps for smart-phone and other devices as well

as in design including design of services[19] ; and vi) there are emerging hubs of activity in major cities over and beyond the centers that operated since or before the 1990s (e.g. , New York, Berlin, Stockholm, etc).

To summarize, it would seem that while ' the deepening of globalization' has been immensely helpful in the development and emergence of Israel's VC/EHTC during the 1990s, it might be even more helpful nowadays as regards new attempts to develop such clusters. Having said this, it is important to mention that the specifics of 'enlisting' the potential advantages of globalization vary from place to place and are most probably different than those confronting Israel during 1985-2000.[20]

(iv)Smart Specialization {TO BE SUMMARIZED LATER ON}

III. ADDITIONAL TOPICS AND BROADER IMPLICATIONS
(i) Priority Setting/Formulation: Towards a New Form of Kahneman's "Slow Thinking" (Kahneman 2011)

I WILL INTRODUCE HERE KAHNEMAN'S DEFINITION OF SLOW THINKING

Complex, Type 2 priorities (which are of increasing importance) are statements where both the Background and Narrative/Formulation parts of priority Body of Knowledge (BoK) as well as the Recommendations/"Policy Objectives" parts are not wholly objective nor are they exclusively the result of expert knowledge or the work of experts. They involve i) subjective components and ii) knowledge and expectations from, users and producers, other stakeholders, and the public at large .

It follows that both *'preferences'* and *'visualizations of & expectations about the future'* are likely to play key roles in the BoK of complex priorities. In the first instance, this may lead to divergent views either about the *Background + Narrative* of the priority and/or in its concluding *Recommendations/.Policy Objectives,* a fact that may hinder 'downstream' articulation of the priority in terms of policies on the ground. Further deliberations (and maybe also knowledge accumulation) may then be required to achieve both a consensual & reasonable priority narrative and a consensual and reasonable set of recommendations/policy objectives. Note that even if successful, both the priority's BoK and the priority setting process would be qualitatively different from Kahneman's statements or propositions requiring or associated with System 2 (Slow thinking).

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[19] This trend is also increasingly applicable in the context of certain Developing and African countries where substitutes for imperfect (or, due to absence of) banking services for small producers or even households is common, see The Economist November 2014

[20] Future work will include sections devoted to other clusters, of major importance in Europe as well as (1) emergence of new traditional manufacturing clusters supported by new technologies and (2) emergence of complex clusters in rural areas involving agro-food-culture-heritage-environment supported by high tech .

A temporary conclusion is that Kahneman's notion of Slow Thinking, while useful as a starting point, is seemingly not always directly applicable to Priority formulation (both its 'narrative' or 'set of narratives' and Recommendations/Policy Objectives) particularly when these involve 'complex' priorities. The existence of a (partly) unknown and unknowable world strongly suggests that additional methodologies should be used to express possible future trajectories and scenarios. These could include Technological Forecasting, Robust Decision Making, and Computer Simulations & Games. Together with preference differences among priority setters the implied mix of types of knowledge could lead to a set of *alternative priority narratives* and to a set of alternative Policy Objectives/Recommendations. Further coordination within the particular priority setting team should then take place to achieve at least a minimum of consensus about Implementation/ 'Policy Objectives'.[21]

(ii) Priority Complexity [22] could Block effective Country Adaptation: Desirable New Rules & Institutions may call for Embedded New Rule Flexibility

The likely problems encountered when formulating or updating highly complex priorities (the narrative and/or the recommendations part) have an impact on the effectiveness of *downstream* country adaptation. Prior to analyzing them I would like to mention some successful examples of complex new priority making and/or priority adaptation in response to an external threat   e.g. the US during the post-Sputnick era(see Bonvillian 2012,2013 and Sections 3 & 9).

Bonvillian's research on Public Entrepreneurship with examples from the activities of DARPA/DoD in the US illustrates both the complexity and the potential impact of setting adequate priorities in new, emerging technology areas and of implementing them on the ground. DARPA as a Public Entrepreneur identified and developed a set of dual use technologies including Information Technology and the Internet; and set up an adequate institutional structure for an effective *interface* for dual use & shared *technologica*l & public-private *production* infrastructure and network .

Needless to say the complexity and non-linearity of the above processes could mean that, in many instances, Advanced Countries could fail to effectively harness such new technological possibilities, thereby reducing their potential for future growth and inclusiveness [23].

Key in the above adaptation are *changes in 'rules' (market and non-market) and in the underlying institutional framework*. Adaptability in the Bonvillian example included

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[21] See Innes and Booher 2012 for their insights on coordination during priority formulation of semi-complex, relatively specific priorities e.g. water supply and use in California. A key point in their analysis is how the 'priority setting process' & member interaction could bridge what initially were diverging views both about the priorty's narrative and about its Policy Objectives/Recommendations profiles

[22] Either inherent in the nature of the priority's narrative, or the outcome of dissimilar priority setting agents with different & competing preferences.

[23] Absence of sophisticated Defense-related needs/priorities might make it more difficult for some countries to harness new, dual use, emerging technologies for civilian uses. There are other factors, however, which might also block success. It is even doubtful whether the above instance of Public Entrepreneurship and even of an Entrepreneurial State (Mazzucato 2013) in action could be repeated in the US nowadays given the significant dis-functionalities currently characterizing that country's System of Government (several sources including The Economist Nov/Dec 2014)

the relative freedom DARPA had in setting its strategic priorities as well as that agency's relative autonomy (compared to other agencies) in making even important management decisions; the possibility of undertaking risky investments and of failing; and the possibility of undertaking investments in the above-mentioned, joint public-private, technological and production network which interfaced between R&D/technological development on the one hand and Design/Production/Diffusion on the other.[24]

I mentioned that effective country adaptations to significant changes in the environment may require a strategic re-orientation expressed by a new set of priorities in certain key areas e.g. the Economy, Defense and International Relations; and even concerning what could be termed (the Structure of) 'Federalism' i.e. the link between the Federal or Supranational level (as in the US and in the EU) on the one hand and the states/nation level on the other. However, while sometimes the required change in priorities may be formulated without substantial changes in the underlying formal institutions, in other cases the complexity of the switch could require that in some areas, effective priority changes must be underpinned by new or reformed formal institutions associated with strategy making and/or priority- policy coordination and/or competition & interaction both in the market and in the political sphere. Examples are new institutions and rules for countries at war can be observed e.g. in Germany during WW I and in the US during WW II; or in periods of deep crisis e.g. the US during the 1930s.

The above and the current EU crisis seem to highlight the importance of a distinction between 'rules' applicable during "normal" periods and rules for periods of "deep and extended crises". This could be another way of stating that 'adaptation' of "rules" may be important during periods of deep crisis.

A deep crisis may or may not spur adequate adaptations at the system and government/state levels. This depends on country and other contextual factors as well as on the complexity of the prevailing System of Government including its institutions and rules. The deeper the crisis and the higher the complexity, the more important a change in rules/institutions may be; but also the more difficult it may be to change them (and the associated new National/Federal Strategy).

The above outcome derives from the fact that there are 'winners' and 'losers' from implementing change, with a lot to earn and lose both economically and politically. Opposition might be great, at least at the beginning. However, if an agreement among the parties fails, so may the existing System of Government and even the nature of the Federal or Supranational State, with great loss to every state/country respectively and to most of its inhabitants .[25] [26]

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[24] The latter went against the traditional view of economists at the time who regarded building such an interface as an area where market forces (rather than Government) should operate. See G. Tassey ??

[25] Further theoretical and case study work is required to understand such a process as well as to consider the possibility that decline might eventually stimulate the emergence of 'solutions' e.g. new political leadership with a new Vision and National/Federal strategy.

[26] There seems to be a dearth of analyses dealing with required country and Supranational/ Federal 'Adaptations' dictated by the changing global (and internal) environment, certainly in the context of continued globalization under conditions of global economic crisis. The reason why there seems to

There would seem to be two ways to overcome the above impasse or 'stagnation'. The first one is *political leadership*; the second one, *ex-ante provision of (or "embedded") "rule" flexibility* i.e. 'rules' for changing 'rules'.[27] Both are difficult to analyze and cannot be dealt adequately here. I will only note that embedded rule flexibility may depend on whether or not politicians and policy makers are aware of the above distinction-rules for normal periods versus rules for periods of deep crisis .

I conclude that the increased complexity of supranational rules in complex Government Systems/States and of their 'Adaptation' enhances the importance of providing effective 'embedded rule flexibility'. Such flexibility should be 'robust' i.e. should effectively relate to a set of possible futures rather than to a single future; and to a number of key priority areas such as taxation and distribution of tax proceeds, currency/exchange rates, immigration, natural disasters, security, etc. Given the enormous cost of non- or imperfect adaptation in the future, the inevitable difficulty in sanctioning 'embedded rule flexibility' should not deter actual priority setters nor policy-makers from proceeding to fulfill such a goal. They should be aware of two things: first, their responsibility towards future generations; second, that the required rule-setting activity is not 'more of the same' *policy* nor 'more of the same' *politics* .[28] [29]

(iii)Meso-Macro Links/Policy Mix and Coordination

These lie at the heart of a S/E approach. The links between the meso-and macro levels of analysis are two-way. By way of example, the successful policy targeting of a new high tech entrepreneurial cluster may–through sales of high tech products and through capital inflows originating in IPOs and M&As- directly or indirectly increase the flow of resources both to individuals and firms in the country as well as to the Ministry of Finance (MOF), which, together with the Central Bank, constitute a country's key macro-level institutions. The enhanced public and private revenue could support both *Indirect* Policy Targeting (focusing on creation of pre-emergence conditions for new industries) as well as targeting the National Innovation System (NIS) which-together with Advanced Industry-could then become an Innovation and Science/Technology/Higher Education platform for future SC options.

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have been little anticipation of the need for rule (and institutional) changes could have been the implicit assumption that the democratic process would be capable of adapting to such changes. This need not be true. There are examples which illustrate how such a process in some countries or Federal/Supranational States has become dis-functional (for a summary of the situation in the US see e.g. The Economist, Nov.Dec 2014)

[27] The latter Supra-rules alternative would substitute for traditional majority voting determining whether and how rules change (or not). In this sense it parallels or is consistent with an independent priority setting mechanism for setting or re-setting complex priorities with a continuously changing narrative and a continuously changing set of future options for action.

[28] Assuring such an awareness and acting in an anticipatory fashion may be facilitated by a reformulation of Economics e.g. it might have to include explicit meso-macro links as well as allow both virtuous and distortive Business-Politics links. No doubt this would require deeper multi-disciplinary integration of Economics with Political Science, Public Policy, etc.

[29] Note that the re-formulation of rules/institutions to assure high adaptability nowadays must also consider the link between States and MNEs (Dahlman…). This means that effective adaptation may also depend on 'global cooperation' and 'global coordination' of rules (analysis of these issues goes beyond the current memorandum being summarized here).

Note that the resulting enhanced SC-based growth need not be 'policy driven' in the sense of requiring *Direct* Policy Targeting of the relevant new meso-level entity. In other words SC-based growth could then be the outcome of the _endogenous_ emergence of such entities (whether or not this resulted from past *Indirect* Policy Targeting e.g. of the relevant pre-emergence conditions). Whatever the role of policy on Emergence, the outcome could be setting the stage for a new round of meso-macro-meso links; and even inducing for a time a continued process of SC with a cumulative impact on growth, employment and other national Overarching National Goals (see Sections 1 & 9).

It is worth mentioning that such induced meso-macro links could strengthen current efforts in Europe (based on 'structural reforms' and, recently, on Quantitative Easing i.e. Monetary Policy, emphasized by economists like Krugman) to stimulate the economy. However, an even higher impact may result from complementing the existing Macro-economic perspective with an explicit Macro-Strategic perspective (ONGs/Vision and priorities)[30]. Needless to say, such a 'radical' change would also require an enlightened political leadership who is willing to take risks and formulate a new Vision for the relevant supra-national entity, Moreover, implementation would require creating an institutional framework for identifying and explicitly formulating a new set of strategic priorities as well as arrangements for their *downstream* implementation in terms of policies on the ground .

I conclude that a key requirement for effective meso-macro links would be a broader 'Government Policy' conceptual framework [i.e. a well functioning *Priorities/Strategy and Policy System*] which would explicitly consider the role both of National Strategy and of Policy Targeting of innovation-based SC/growth (rather than focusing on macro-economic variables with a focus on Debt-reduction and a limited set of 'reforms'). These could become central in the reformulated *Theory of Economic Policy*, particularly during periods of crisis .

The proposed Systems-Evolutionary view of innovation and SC-based growth including its emphasis on meso-macro links, could strengthen existing views (Krugman, ECB and others) on how to promote a faster and more steady recovery in Europe.

(iv)Evolutionary Phases and Dynamic Sequences

In the memorandum, *Evolutionary Phases* are used either to analyze the process leading to emergence of a new meso level entity (see Sections 1 & 6 for the Israeli example) or, alternatively at a higher level, to analyze phases in the evolution of countries from Take Off to Catch Up, from Catch Up to Steady Middle Income status, and from the latter to sustainable Advanced Country status (Section 9). Each Phase could involve one or more Dynamic Sequences; and a phase shift might involve a shift to a qualitatively different dynamic sequence (e.g. possibly through bi-furcation of a particularDynamic Sequence). The idea of dynamic sequences appears (and probably originated) in A. Smith's description of the process of Division of Labor and the cumulative process that ensues. Both A. Marshall (early 1900s) and later A. Young (late 1920s) further develop the idea of cumulativeness and Dynamic Increasing Returns at the firm, industry and industrial district level(see also Nelson and Winter

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[30] By enabling a better estimation of _Dynamic Alternative Costs_ at the macro-level, meso-macro links might enhance the likelihood that a simultaneous policy focusing both on debt-reduction <u>and</u> on stimulating recovery/growth could be identified and implemented.

1982)

 A key characteristic of the Phases/Dynamic Sequences in the monograph is the focus on Policy and Policy related variables. The key ones are *National Strategic Priorities and various forms of Policy Targeting* including of new SC/meso level entities (strong & weak, direct & indirect) or targeting of a country's Physical Infrastructure or its National Innovation System (NIS). Frequently, Policy Targeting is preceded by the generation of *policy targeting options* either alternative meso-level entity priorities or alternative formulations or narratives of a given meso-level entity priority. In this connection, it is important to consider 'experimental policies' (Section 5) whose prime objective is to help define or clarify the underlying Priority particularly its Policy Objectives/Recommendations Profile prior to the implementation of *bona fide*, 'regular policies'.

I mentioned that the changing *dynamic sequences* will also consider *the changing set of priorities through time*. Thus a key aspect of the process leading to Israel's VC/EHTC during the 1990s was the metamorphosis of an agent-based innovation priority into that country's VC/EHTC priority. A related link is that among policies through time e.g. support of the NIS during the CU phase of countries may have the effect that Middle Income Economies (MIEs) would experience continued growth of total factor productivity .

The analytical power of thinking in terms of Dynamic Sequences as formulated in Section 9 of the memorandum is limited in terms of the set of variables to be included and in terms of the nature of the evolutionary path taking place (we call these *Simple Dynamic Sequences)*. Still, it has clear advantages since it is a framework for considering the dynamic interaction among various variables considered as central (even if unconventional) such as the mutual links between National Priorities and policies in particular countries or contexts (see 'Think Pieces' below).

Future work will explicitly consider the following path characteristics of <u>*Complex*</u> Dynamic Sequences: <u>*Feedback Effects*</u> of various kinds e.g. from 'experimental policies' to upstream priority formulation/definition; <u>*Phase Transitions*</u> or the opposite, namely, <u>*Truncation*</u>; and <u>*Bifurcation*</u>, as an indication of successful adaptive behavior when confronted with unexpected exogenous events. I will focus on the four "Valleys of Death" confronting countries. They include one blocking the shift from accumulation-based SC/growth to innovation-based SC/growth a key challenge for MIEs (see OECD, op. cit); another blocking emergence of Entrepreneurial Clusters (a key policy concern of several countries in the East as well as increasingly in Europe); and a third one for Advanced, Western Economies involving a combination of enhanced complexity and dysfunctional Political System which, in the presence of new challenges from the global or domestic environments, would *hinder 'country' (or supra-national) Adaptation.*

<u>*(v)*</u> <u>*Coordination Issues*</u> **TO BE FURTHER DEVELOPED**
The S/E conceptual framework emphasizes the **importance of non-market coordination** e.g. in the setting/formulation of national strategic priorities; in linking priorities upstream to *downstream* policies on the ground; in inter-ministerial policy coordination etc. Non-market coordination would also seem to be crucial during the pre-emergence phase of a process leading to a new meso-level entity (frequently, institutional changes can facilitate such coordination even in the absence of well

established markets) e.g. in setting the appropriate 'institutional and regulatory' framework for the new industries.

A key coordination need is **macro- level coordination**, both *Economic* and *Strategic* e.g. if a country nowadays wants to reduce its deficit without stunting growth it should first-reformulate its growth promoting priorities to adopt them to the current crisis; and then, should cut expenditure in those areas with lower Dynamic Alternative Cost (which reflects the social value of promoting growth at the expense of other priorities) rather than cutting what is easy to cut and what is politically desirable to those that hold power and their acolytes.

(vi) Why a Think Piece ?

Think pieces are critical during *periods of paradigmatic change and/or periods of deep crisis*, like the current one facing the global system. Why is this so? There are a number of reasons--

(1)Normal' policy-impact assumptions need not work. Thus while budget cuts need not reduce Debt e.g. by weakening support of vocational training or other critical expenditure items, they may have an immediate effect in reducing employment and output (thereby deepening the crisis and the capacity to repay Debt);

(2)The effectiveness of the standard 'model' of reality which guided policy is weakening. It is gradually being replaced by a more complex 'model in the making'. This means that policy decision making on the ground, at least during the 'interim' period, have to be less bureaucratic and access more *new knowledge* than what was customary in the past;

(3)The dynamics of Globalization and the increasingly complex World System that follows is compounding the enhanced importance of Type 2 uncertainty ('wild randomness/radical uncertainty) relative to Type 1 uncertainty (calculable randomness or 'risk'). This has radical implications for an emerging Priorities/Strategy and Policy System (since most such systems have been built with Type 1 rather than Type 2 uncertainty in mind);

(4)The increasingly recognized need (and associated enhanced complexity of) that policy making should be oriented not only to sustainable growth but also to inclusive growth. There is increasing evidence that sustainable and inclusive growth could go together;

(5)Countries may have to adapt their Vision and Overarching National Goals e.g. from sustainable growth to sustainable and inclusive growth. This would involve a more explicit and broader National Strategy; and an expansion of the Policy Targeting framework to consider, side by side with Structural Changes (new sectors, industries, clusters) the *Targeting of disadvantaged socio-economic and ethnic groups* (Section 11, in process).

An implication of (1)-(5) is that there is much more that policy makers must learn to be effective compared to what it was in 'more normal times'. The non conventional research undertaken by Think-Pieces would seem to be one social mechanism to enhance awareness of this fact even when in most cases, they are not directly applicable on the ground. This is because *Think Pieces are part of a knowledge*

creating process which might underpin the eventual emergence of a creative path to social and economic recovery .

More specifically, Think Pieces could stimulate policy makers, politicians, academics and other groups to identify key questions and problem areas that might require further understanding and research. In Evolutionary terms, they are part of a process of *Variation* [in terms of <u>new</u> *rules/institutional change*-including those concerning the System of Government- *and policy* <u>options</u> for effective economic and social reform or 'adaptation']. While *Selection* & *Reproduction/Diffusion* will depend on other factors such as new political leadership-- the timely availability of a pool of 'filtered' and coherent new up-to-date knowledge cannot be underestimated