Degree in Management
Governance of Science, Technology and Innovation

You have 180 min to complete this task.

Read the article and analyze it critically in English. As guidelines use the questions below, at the end of the article.

Innovation Policy or Policy for Innovation?
- In search of the optimal solution for a policy approach and organisation -

The contribution of innovation to improving societal welfare is without any doubt an important one. Over time, numerous concepts and policies have been developed and implemented all with the aim of building and maintaining the capabilities of market economies - to generate innovation. Although much work has been done to understand the process of how innovation - defined as a new product or a new process – has evolved, the underlying motivations for entrepreneurs to seek to innovate has been neglected in the broader research.

Nevertheless from the perspective of policy making, the importance of innovation has been stressed over and over again that the term 'innovation policy' has become a fashionable expression often used by politicians and administrative bodies sometimes without properly delineating the role of government in the process. In some case references are made to improving the framework conditions which are conducive to innovation. But so long as no consideration is made of the underlying motivations of society to develop and accept innovations, policy actions are very likely to remain at interventions at the invention stage rather than the innovation hence ordinary people thus taxpayers will ask for justification of such activities. In practice, the decision to accept innovation is generally with the user and not with a government or similar body although user is not limited to private end user but understood in a broader scope as the 'innovation applying entity or individual'

So the question is what should governments do about innovation? Should they care about it at all or simply sit back and wait of what comes from the market? Given the high social rates of return associated with innovation, governments have found justification for intervention due to the existence of market failures (e.g. spillovers that limit the appropriability of the returns from innovation) or so-called systems failures arising from weakness in innovation systems (e.g. low levels of collaboration between industry and universities). The market and systems failures have justified the development of innovation policies and related measures. The issue however is that although the term " innovation policy" is an often quoted as a way to support innovation there is little understanding of what constitutes an " innovation policy" beyond the stated goal of generating more innovations. Consequently the lack of understanding can be exploited by various actors in the government or the private sector. Any measure supporting innovation in any respect usually receives a warm welcome (Johansson et. al 2007). It often seems sufficient to use the terms "innovation" and "innovation policy" to generate awareness and acceptance. Announcements are certainly necessary, but at some stage action should follow announcement. So long as the term "innovation policy" is not clearly defined and communicated misuse and false expectations are likely to arise as seen in the proliferation of structures and programmes with vague aims of enhancing the rate of innovation.

In contrast a discourse around "policies for Innovation" supported by the efficiency considerations encourages the shifts in policy design towards more concentrated and targeted initiatives. Traditional levels of regulation (see Table 1), such as particular institutions of national innovation systems (NIS) at the macro level (e.g. Public R&D, Private R&D, Technology markets, Higher Education and others), industries and specific sectors of economic activity, administrative regions, rely more and more heavily on the detailed understanding of existing practices. Limited resources for innovation policy call for the focusing attention on

excellence-based approaches, such as supporting specific Technology platforms instead of broad sectoral interventions, or raising/incubation of regional clusters with rich externalities as opposed to pursuing average intensity of regional innovation (Laranja et. al. 2008).
If one considering the aggregate country performance as the combination of diversified regions one must consider in detail the variance in regional strengths, weaknesses, competences and potential.

Table 1. **Approaches to policy targeting**

Level	**Specialization type/underlying concepts**	**Policy substance**	**Limitations**
Macro	National innovation system	• Increasing aggregate performance. • Large scale sectors (Science, Business, Education, etc.)	• Weak focus on the underlying mechanics • Prevailing concentration of framework conditions improvement as a contrast to specific practices and points of excellence • Blurred prioritization and unclear sequencing
Meso	Sectoral innovation systems	• Support of innovation within specific sectors of economic activity	• Focus on industrial sectors and lack of account for technology and business model shifts • Isolation of sectors
	Regional innovation systems: geographical proximity	• Fostering regional innovation performance and development	• Assumption that all the regions are innovative; unification of development strategies. • Poor linkages in both horizontal and vertical contexts
Micro-based	Technology platforms	• Optimization of capital, technology and skills flows within identified networks of enterprises	• Limited scale of effect • Bias towards high-tech sectors
	Cluster approaches	• Optimizing strategic priorities and competence development • Linkage building	• Questionable externalities
	Smart specialization of regions	• Distinguishing regional competitive advantages	• Excessive challenge of consensus development and the coordination of particular policies
	Functional approach to NIS performance	• Identification of NIS bottle-necks based on understanding of its core functions	• Theoretical model of NIS is still underdeveloped for strict formal application
	Behavior-specific policy instruments	• Addressing the heterogeneity, support of specific	• Weak methodology for identification and evaluation of the essential groups of

		types of behavior	actors • Lack of methodology to link to other levels of analysis

At the same time, large scale actor-based studies (e.g. firm-level or PRI-level surveys, analysis of bibliometric and patenting data on excellence and co-operation in the R&D sector, extended Foresight projects) demonstrate the heterogeneity of the innovation process even within particular sectors and regions. The data not only support the idea of the inefficiency of generic measures aimed towards sectoral/regional averages, but also provides new directions for improvement.

Observations on the particular components of the innovation process highlight the importance of targeted interface management and robust and manageable instruments (e.g. innovation vouchers). Identification of existing types of innovation actors within the NIS (e.g. distinguishing firms targeted at innovation through imitation as opposed to radical innovation development, enterprises that successfully co-operate with public research sector vs. in-house inventors) helps to decompose and reconstruct the actual demand for policy intervention.

Understanding the micro-level behaviour of NIS actors also leaves space for broadening the scope of innovation-related objectives from the sole economic effects. There is an increasing tendency to expand the foci of policy instruments to increase social benefits at all levels. . Thus, the trade-off between "Innovation for Business" and "Innovation for Society" is becoming more and more intense. In some cases, such as widely spreading programs for inclusive innovation, these trends evolve synergistically, providing business with new markets and enabling the participation of specific social groups. In others they struggle – e.g. making the whole topic of intellectual property on media/entertainment and other information-related activities highly debatable. Only the systematic analysis of the actual arrangement of interests of innovative actors within the economy and society, followed by the intelligent targeting can lead to fruitful shifts of the resulting socio-economic "equilibriums".

But what does this all mean in reality and everyday life? It's well known that an innovation friendly environment requires more than policy initiatives that aim at research and development and the transfer of knowledge between industry and public research. Most policy initiatives and institutional set-ups in countries do not even allow a policy conducive to innovation since too many parties are involved and to many wishes and ambitions are expected. Besides R&D as a key driver of innovation, other relevant policy fields include migration policy, tax policy, education policy, regulations and standard settings, labour market, family and economic policy to name a few. In practicable terms all policy fields are affected to certain extent by policies supporting innovation. Thus innovation policy is a combination of different policy fields. It follows that by its nature innovation policy would require an appropriate political set-up eventually resulting in one political unit (e.g. ministry) which designs and co-ordinates all measures accordingly. Such a unit would be an outstandingly powerful institution which, in democratic and market based societies, would surely not be accepted by either politicians fearing to loose power, administrative bodies or by society. To overcome such fears some countries have established ministries for innovation or the like with the aim of supporting innovation at national level. However reality shows that such institutions are mainly responsible for research and development done in the public sector and industrial research, and not for innovation in the broad sense.

Also the issue arises about how to design framework conditions and in which regional context (Laranja et. al. 2008). R&D and innovation especially is becoming ever more expensive. Assuming that R&D is one of the major drivers of at least radical innovation, the costs for research at early stages are exploding not only because of the costs certain science and research fields cause but because of the fact that so many different sciences hence research fields are interconnected today. That fact forces scientists, researchers and innovators to cooperate more

between different fields. However it would be not rationale to assume that such cooperation is cooperation between fields of expertise which can be merged together into one without additional effort and cost. Practice shows that this is a cost intensive undertaking and moreover an undertaking which consumes a substantial amount of time (Lundvall, Borrás 2005).

That might be an effort to bring together very different policy arenas which are affected by innovation and more precisely R&D but it does by no means mirror the reality of how innovation growths. The ambition of pioneering nations is to bring the responsibilities for research, esp. publicly funded research with blue sky ambitions and the more applied oriented forms of research under one roof in one hand. The idea itself is certainly one which everybody will appreciate. But first of all innovation is something which results from more than research activities in any sense and secondly innovation does not stem from national efforts but is the results of entrepreneurs and actors in sub-national geographic regions which are in regular contact with other actors (i.e. suppliers, institutions, and consumers) in other regions (Doloreux, Parto 2005). Increasingly communication technologies, freedom to move and all different aspects of globalisation contribute to an effect which can be considered a "solve a problem" competing with the standard "let's solve a problem together as we know each other". ICT is the driver of co-operation between people from different places in virtual communities. We are only at the starting point of this … the last years can be considered the experimental phase whereby virtual collaborations emerged. Following this early people got used to this new form of interaction and technology progressed driving down the costs of virtual and networked collaboration further.

So what does this mean for the national and regional context of research and innovation? *Firstly* it needs to be remembered that efforts towards innovation are undertaken by entrepreneurs and not by societies or nations as a whole. Thus federal or national ministries will be limited in their ability to activate a process that in practice is driven by the regions. Thus innovation policy on national level is likely to remain on a more strategic level. What counts finally is not the naming of a policy field with the respective organisational setting behind but it's far more about the political concepts which will support a nation build of several regions to remain or become strong in innovation. A ministry or related public body which aims at innovation and all the relevant policy areas thus is likely to be an institution which is busy with internal procedures coordinating all relevant policy fields but not having special knowledge of any of the related areas any longer. It turns out that such will create artifical bodies with convincing aims and missions but no real power as the competences needed to design relevant policy measures are likely to be lost over coordination and negotiation procedures internally. Moreover such an institution will be faced with requests from numerous stakeholders and lobby groups especially. Why is this? It's because to design and implement an innovation policy it needs a body responsible and accountable for that.

Secondly simply defining a national innovation policy but not naming a responsible to implement such policy is probably a nice political game but certainly not effective and efficient. Thus the according infrastructure needs to be developed and set up. But that is contradictory to the idea of policy which is conducive to innovation, e.g. policy for innovation (Woolthuis et al. 2005). To be effective such a complex policy needs competences and special expertise from so many policy fields. Hence policy for innovation creates different requirements towards policy making and the co-ordination of individual policies.

*Thirdly i*t's important to maintain and keep the balance between expertise and work in special fields relevant to innovation and negotiations / co-ordination procedures one the other hand. Policy for innovation thus should follow the overarching aim of supporting and making possible innovation on a national scale but not interfere actively in the design of single policy measures in different fields. Thus it seems appropriate to develop governance mechanisms (e.g. councils) that can represent different stakeholders and have oversight over different policy measures Good governance of innovation requires institutions with the competences to have a

systemic views of the overall national system, including its linkages at international level. Such an institution should also have a strong co-ordinating role and bring together the stakeholders from industry, science, policy and administration. Such institution can be kept lean in resources terms but it needs to have decision rights rather than a pure consultative role. Many governance institutions exist in different countries which are either of scientific nature or industrial nature but governance institutions which combine more than the usual research and development policy related aspects are the exception rather than the rule (Kuhlmann 2001).

Consequences

Changing the thinking about innovation seems a logical consequence from increasing efforts by many nations but especially when considering the implications resulting from globalization on science and industry but likely even more important from new communication tools for society which allow the exchange of knowledge, experiences and ideas on a global scale real time. In addition as knowledge and technology remain on their path to become more complex and specialized at the same time it seems logic that work to generate knowledge and technology is shared not by disciplines but by locations increasingly. It is common knowledge that innovators need to and will continue to use competences and capacities. Such competences are likely to grow and prosper at locations which focus on designing policies for innovation rather than innovation policies.

The difference between the two is that innovation policy is more or less policy designed and implemented top down instead of reflecting the nature of innovation which was and still is bottom up. Here policy needs to respond accordingly. Such response does not mean financial support rather it asks for a broader understanding of framework conditions e.g. responding to changing societal developments, needs and requirements. Moreover it became evident recently that even products needed for daily life are increasingly offered and supplied by multinational companies which in turn make use of extensive networks of small and medium sized local suppliers along the value chain in the respective markets. That of course generates employment in certain stages of the value chain but the major share of revenues from such activity is likely to remain with one actor (e.g. MNC) although the physical value is generated but local SMEs (Thite et. al. 2012). What counts for the final user (consumer) is the brand name the end-user consumes. National or regional policies aiming at supporting innovation are hence less visible in the respective regional or national context since the final product incorporating innovations is assembled and developed at any place in the world. Thus policy measures aiming at enhancing innovation need to consider economic policy measures increasingly among others. The final consequence is that innovation policy itself is not likely to create sustainable impact but policy for innovation requires a systemic view and respective responses in organization of policy making processes and institutional design. New approaches towards both are hence precondition for an economy to maintain sustainable economic competitiveness.

Hence innovation policy needs to respond to numerous challenges. In course of the still progressing globalization of industrial R&D and the tendency towards open science the ultimate question arises of how sustainable local factors are which determine the attractiveness of innovation hubs for companies but also for public research institutes and eventually for human resources. A common policy maker perception here is that an open research and science base expressed by the Knowledge and technology transfer (KTT) activities is advantageous for the innovation location. This has been an issue for long time in different fora including the policy arena (Gustafsson, Autio 2011). However given the widespread of KTT discussions and support measures in place along with changing incentive schemes for researchers in public institutions concerns arise that HEI and PRO might run the danger of losing ground in the generation of new knowledge which has more groundbreaking character versus the generation of marginal new knowledge which is more suitable for KTT by public institutions. In this light the academic freedom - which is recognized and applied in most institutions – receives special attention.

Currently a tendency towards professional management approaches of HEI and PROs is growing which is by definition rather contradictory to R&D management approaches used in industrial R&D. Although such management approaches are forced and supported by policy makers in many countries there is no sound management concept theory thus far hence causing an urgent need for balanced management approaches for HEI and PRO considering the varied missions and visions of these institutions.

Countries often consider innovation related policy measures ‚one fits all solutions' for building and maintaining the economic strengths of disadvantaged regions. Numerous national innovation strategies developed and implemented by federal governments mirror this understanding. Still knowledge, technology and innovation are created a local or in some cases regional level hence the issue of the current governance of innovation system is in question with the major concern raised is innovation strategy an issue for a federal government at all (Edquist C. 2001).

It's widely recognized that education is a crucial precondition for knowledge, technology and innovation generation. Increasingly the outcomes from innovation activities are more complex solutions which in turn require users educational and training to an even larger extend. To support technology and innovation acceptance by society and industrial users governments are confronted with the questions, what role education but also further education play in the whole innovation landscape. Education of users is also in line with the fundamental question of the increasing speed of innovation diffuse and the willingness of societies to accept these developments and related changes at such speed. Moreover it can be assumed that the diffusion speed of innovation will continue to grow in the future since.

Finally governments strongly believe that public support to innovation funding is essential. In many cases this public support is justified by impact analysis of respective public support programs. However determining the performance of industry in the absence of public support remains a challenge since industry typically claims that it would not have done so without the motivation of public support. Since such public support is available in all countries global firms will rationally seek to take advantage of these support programs globally. One might consider a global co-ordinated approach towards public support of industry in innovation-related issues as a solution but such a potential concept contradicts the principle of competition for investment in innovation activities by countries. Hence public support for industrial innovation activities currently plays a major role and will continue to do so.

This chapter has argued that innovation is covering and partially integrating many different fields; management fields at company level, governance fields in the public sector or eventually policy fields at different levels. In this respect the term ‚innovation policy' has become misleading. Instead, the policy discourse should consider the concept of ‚policy for innovation' as a more appropriate framework with the added benefit of recognizing the heterogeneity of the process of innovation and its dynamic and systemic nature. In this regard the established concept of national innovation systems needs to be expanded and developed further (Todtling, Trippl 2005). Broadening the understanding of national innovation systems towards systems innovation includes different dimensions. One dimension is a clearer focus on the origin of innovation, e.g. regions and local innovation networks, another dimension is on the application of innovation by the eventual user and the value added generated. The traditional thinking of supply of input to generate innovation is expanded by the inclusion of the different innovation ecosystems which need to be developed with the help of policy measures or which emerge without policy interventions. Hence a new challenge arises for policy, the question is not how to intervene but if to intervene adding additional complexity to policy making and implementation. Regarding the latter, policy implementation, the overarching innovation governance systems need to be rethought, starting by policy making processes, policy intelligence and organizational setups in a country.

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Questions:

1. What is the main research question of the article?
2. Which research approaches or methods do you consider to be suitable for answering the main research question? Why?
3. What are the limitations of current research and what recommendations could be given for further research?
4. According to the main ideas discussed in the paper, what recommendations could be given for managers in corporations and policy makers?
5. What data do you consider is needed to measure the impact of policy decisions on company innovation?

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