THE DEMAND-SIDE INNOVATION POLICIES IN THE CONTEXT OF SMALL EU MEMBER COUNTRY[1]

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Abstract

Demand-side innovation policies, in the form of regulations, public procurement, subsidies for private demand, and other measures, are often viewed as valuable additions to more traditional supply-side policies. The demand-side innovation policies should enable to facilitate the emergence of vital and sustainable links between innovation outputs and various markets. However, without sufficient institutional framework and policy experiences such measures could also contribute to new market distortions or crowding-out effects, which do not facilitate sustainable growth in innovations. The charting of possible risks of such policies should help to outline the criteria for aiming at sustainable effects. The purpose of this contribution is to offer suggestions about preconditions and policy characteristics, which should help to avoid the misuse of demand-side measures and facilitate the sustainability of desired changes in society. It is predominantly conceptual contribution but draws also extensively on case evidence about the effects of relevant policies and their discontinuation.

Keywords: demand-side innovation policy, small country context, EU

JEL Classification: O38, O31, O33

Introduction

Traditionally innovation policies tend to focus on the supply-side measures. These include for example financial support in terms of public venture capital, corporate tax reductions, research funding, support for training, and other measures. In addition governments offer several information and brokerage as well as networking services also by fostering regional and national innovation systems.

Although, these policy measures are very important in terms of increasing the innovative potential of organisations embedded into an innovation system, the diffusion of innovations along with the desired growth in productivity is more facilitated by demand-side innovation policies. Still, it is important to stress that demand-side policies should not be viewed as substitute for supply-side measures.

Thus, the demand-side innovation policies are to be viewed as valuable complementary additions to more traditional supply-side policies. Demand-side

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measures can be taken in the form of regulations, public procurement, subsidies for private demand, and other measures. The principal idea and goal behind such policies is either the creation of lead markets for innovation or at least facilitation of their emergence. Therefore, the demand-side innovation policies should enable to facilitate the emergence of vital and sustainable links between innovative solutions and their potential markets.

However, without sufficient institutional framework and policy experiences such measures could also contribute to new market distortions or crowding-out effects. Then these policies might fail to facilitate sustainable growth in innovations or productivity levels. In a worse case, this can result in creating only temporal interest in certain innovation activities that fades away as soon as the policy measure is discontinued. In other words, the policies facilitate artificial demand, which does not develop towards self-sustaining private market for innovative solutions. The public policy might even damage the evolutionary process of private interest by providing disincentives for private venture capitalism.

This is not to say that demand-side innovation policies should not exist. The critical perspective is needed in order to chart the possible risks and cons of such policies. This should help to outline the criteria for aiming at sustainable effects, which would indeed increase the level of innovativeness in society.

The purpose of this contribution is to offer suggestions about preconditions and policy characteristics, which should help to avoid the misuse of demand-side measures and facilitate the sustainability of desired changes in society. The catalytic effect of such innovation policies vs. short-leaved and perhaps wrongly placed boost depends on various aspects, which should be taken into account in a coordinated manner.

The structure of this analysis is following. The discussion starts with an introduction of theoretical concepts and earlier studies that discuss or at least incorporate demand-side innovation policies. In the section to follow we outline some specific features of small country in EU. Thereafter, we discuss the usage and problems of demand-side innovation policies in Estonia in greater detail and develop set of suggestions. The concluding section outlines the main results, limitations, and ideas for future researched.

The theoretical background, EU policy and practices of other countries

Innovation policy focuses on those elements of science, technology and industrial policy that 'explicitly aim at promoting the development, spread and efficient use of new products, services and processes in markets or inside private and public organisations' (Lundvall, Borrás 1999: 37). This widely-used definition of innovation policy is also somewhat restrictive. It tends to exclude more implicit policies that might explicitly target some other areas, but induce innovative solutions as positive side-effect. The diffusion of new solutions serves also higher purpose of economic and societal development, which is left out from this targeted definition.

The development of innovation policy is closely related with the evolution of innovation theory and models (see also Mytelka, Smith 2001). Edquist and Hommen (1999) review these logical connections in greater detail. The earlier linear innovation models saw technology push from supply-side as the main catalyst of innovations. More contemporary systemic views support the idea of close interaction between various system members as the driving force behind innovative growth. The mentioned authors outline the role of demand or producer-user interaction in several well-known concepts related to innovation system approach. The demand-side is incorporated into chain-linked model, distributed process model (see also von Hippel 1988 below), interactive learning theory, network analysis, and development block theory (for more detailed discussion see Edquist, Hommen 1999).

This list of theoretical concepts is by no means exhaustive. The elements of demand are either explicitly or implicitly discussed in the context of several other views. One might argue that even earlier more linear approaches, like the S-curve diffusion model introduced by Rogers (see Rogers 2003) do not totally disregard the demand-side. The idea of producer-user interaction is reflected by the vital role of lead users.

Von Hippel (1988) went even further by outlining that the functional sources of innovation may differ depending on situation. He showed on the basis of various tests how some innovations are user-driven, while others are initiated even by the suppliers of producers. Thus, it is not just technology-push or demand-pull, but the initiative might be sparkled in any point of the supply chain. This work about distributed process model discussed also shifts in sources of innovation and implied that in this light innovation policy needs to find new tools to appropriately handle such context of various sources (von Hippel 1988). It could be said that this understanding paved the way for the emergence of even more interactive and systemic views later on.

The differentiation between supply-side policy and demand-side policy is by no means unique to innovation context. For example, Lindbeck and Snower (1990) discuss the mix of supply-side and demand-side policies to increase employment; Kandil (2009) analysis the role of demand-side stabilization policies; and Minford (1999) offers support for stringent monetary control and supply-side macroeconomic policy. These random examples highlight the fact that supply-side and demand-side policy division has been one of the major elements in macroeconomics. However, in innovation policy context contemporary views do not favour substitutability between the two, as perhaps neoclassical and Keynesian views in general macroeconomics do, but see them as complements.

Edler and Georghiou (2007) show that at least public procurement as one form of demand-side innovation policy is not novel idea. Already in 1970s and 1980s several studies discussed public procurement has a policy measure that can impact innovations. Along with the elements of systemic view, this offers further evidence that the elements of demand-side innovation policy have been discussed for decades. Still, the contemporary views on subject do add considerable value by taking more

interconnected and interactive standpoint. Thus, each policy measure should be viewed in a broader context, which tries to account for the holistic impact of the entire innovation policy. It means that demand-side innovation policies are viewed both – separately with their own narrower focus as well as elements within the wider policy context. The public procurement as demand-side policy measure is being viewed as separable field of focus even now. Rolfstam (2009), for example, discusses the role of institutions in using public procurement as policy measure.

Edler (2005) defined demand-side innovation policy as 'set of public measures to induce innovations and/or speed up diffusion of innovations through increasing the demand for innovations and/or defining new functional requirements for products and services' (Edler 2005: 3). These measures are often linked to sectoral policy aims like sustainability, energy efficiency, infrastructure, or health care system (*Ibid.*). Later this definition has been somewhat refined. In Edler (2009) demand-side innovation policies are 'a set of public measures to increase the demand for innovations, to improve the conditions for the uptake of innovations and/or to improve the articulation of demand in order to spur innovations and the diffusion of innovations' (Edler 2009: 5). The new wording is in some respect more general and yet more precise by introducing the aspects like *the conditions for the uptake* and *improved articulation of demand*. Thus, the refined definition emphasises framework building and demand clarification as central functions of demand-side innovation policy.

The rational to use demand-side innovation policies is based on (see Edler 2009):
1. Innovation policy needs to help overcome market and/or system failures;
2. Societal goals and policy needs determined for example by elected politicians;
3. Industrial/economic policy that calls for modernisation via innovations;
4. Industrial/economic policy to incentivise forefront innovation production with local, national or regional companies and to create lead market potential.

This list shows that demand-side policies serve more purposes than just helping to overcome deficiencies of private market for innovative solutions or systemic problems in initiation or diffusion of innovations. However, some of these aspects like for example societal goals and policy needs, involve considerable risks. Because of their subjective nature, there is also potential for emergence of biased solutions and corruption.

These dangers suggest that such goal-setting should be very transparent and based on well-founded principles and procedures. The experiences from other national innovation systems might also give some guidance. Yet, the replication without adaptation is not the path one should consider. Each local, national or regional context has some important differences related to path-dependencies and other factors. Although these might seem minute at first glance, they might still render replicated measures inappropriate and useless. Therefore, the solid foundation in terms of transparent and well-founded decision mechanisms should gain priority over policy learning which tries to replicate best practices. It is not to say that policy learning should not be part of decision mechanism as perhaps one of the stages.

Innovation policy as part of the wider industrial and/or economic policy can contribute to the increase in productivity by encouraging companies to modernise their production systems. New innovative processes based on leading-edge technologies render companies and as a result the economy more effective. However, the industrial policy that favours innovative solutions should analyse beforehand the capability of domestic companies to participate in such process. If the local innovative potential is low, (perhaps due to insufficient supply-side measures) then the demand-side policies might contribute more to the import than to the development of national business setting. Such knowledge transfers from abroad along with possible spillovers are important, but ultimately the national policies should still create conditions for domestic innovations as well. (see also Edler, Georghiau 2007; Edler 2009)

In recent years the demand-side innovation policies have seen renewed attention also at the EU level. During Finnish presidency in 2006 the expert group led by Mr. Esko Aho released a report which outlined the need for fostering the demand-side initiatives, especially the creation of lead markets, by (Aho *et al.* 2006):

- creating a harmonised regulatory environment across the EU that would favour innovations and predict the future needs early on;
- the use of standards-setting powers to require high technical performance levels and a reorganisation of the processes so that agreements on new standards are reached quickly and efficiently;
- the use of public procurement to facilitate the demand for innovative goods, while at the same time improving the level of EU's public services;
- building a globally competitive intellectual property rights regime that requires the Community Patent to be achieved and, in the short term, finalisation of the draft European Patent Litigation Agreement;
- a cultural shift which celebrates innovation, using the media and other means to encourage citizens to embrace innovative goods and services in order to develop Europe as natural home for innovators.

In short, this EU report highlighted five key issues: harmonised regulations, standards, public procurement, intellectual property rights, and innovative culture. The regulatory setting includes in this view also the early articulation of innovation demand. Although in essence somewhat declarative, this report, along with other documentation from same era (see Moran *et al.* 2007; Zuleeg *et al.* 2007), is a clear step toward EU-wide recognition of a need for improved balance between supply-side and demand-side innovation policy measures. Shift to demand-side is needed.

Figure 1 offers a summarising overview of various supply-side and demand-side policy measures. Although it captures perhaps the main elements of policies on these two sides, it has to be reminded that as far as national innovation systems differ so should be different appropriate innovation policy measures. Even if in most cases these variations are likely to concern the balance between various policy measures, some situations call for specific policy tools not reflected in current division.

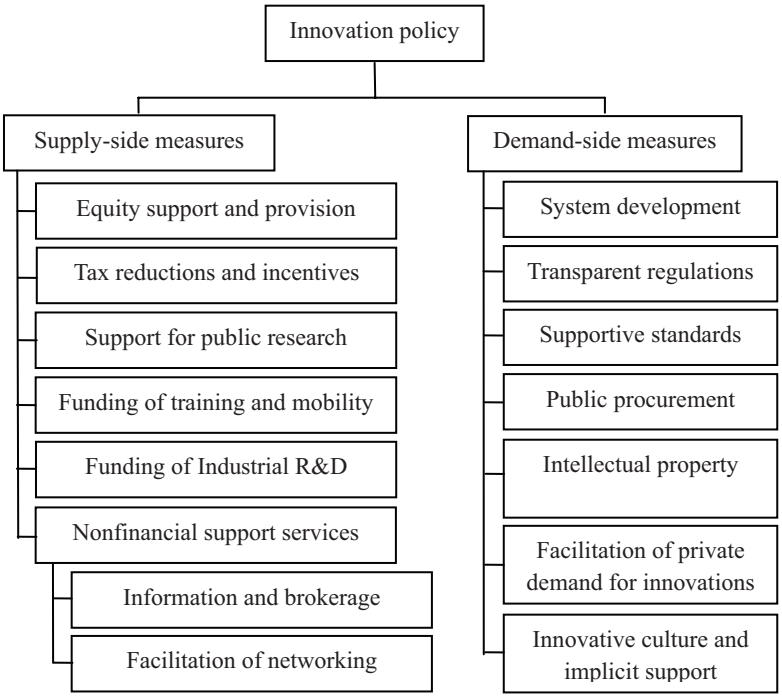

Figure 1. The division of innovation policy measures. (Based on Aho *et al.* 2006; Edler, Georghiou 2007 with author's changes and amendments)

One reason for paying increasing attention on demand-side innovation policies relates to the phenomenon that has been called 'Swedish paradox'. Sweden is one EU country, which excels in terms of financial contribution into innovation inputs. Yet, the outcome in terms of innovativeness among companies is not as good as in some other countries, where the contributions into research and development are far smaller. Thus, the monitoring and governance of the links between innovation inputs and outputs is very important in order to avoid the situation where large contributions fail to produce efficiency in outcomes. (see also Ejermo, Kander 2006)

Appelquist *et al.* (2009) outline as well that demand for innovation-based solutions needs to be stimulated by appropriate lead market policies. The focus should be on introduction of demand-side policy measures, such as novel ways of using public procurement and support for user-driven innovation projects. The innovation policy should have speed and synchronisation. This means quick reaction to emerging problems and reduced complexity of the policy portfolio, while widening the scope.
Unlike Sweden, the neighbouring Finland has been much more proactive in understanding the need to develop demand-side innovation policies. It could be said that Finland and UK are the leaders of demand view among EU members (Edler,

Georghiou 2007). There are several recent reports (Evaluation... 2009; Government's... 2009) that clearly incorporate demand- and user-driven innovations into Finnish national innovation strategy. These reports suggest, however, that public promotion of these aspects should be based predominantly on indirect support measures in order to remain impartial to the initial source, type, and application domain of innovation. The authors even urge to readjust the system in case there are violations of such impartiality (see Evaluation... 2009).

The reports suggest also application of broad-based innovation policies, which should pay more attention to service innovations, organisational innovations (the policy analysis of these innovations can be found in Ramstad (2009)), and demand side. However, they outline as well that such broad-based concept has several risks related to possibility of mismanagement. Reporters argue that the rationality of public intervention must be considered using three conditions (Evaluation... 2009, p. 34):

1. Private organizations are unable or unwilling (because of high risks or the inability to benefit from the innovation) to achieve, or be unsuccessful in achieving, the policy objectives, in the simplest form the most efficient allocation of resources. Hence, a problem exists.
2. The reasons for the problem can be analyzed and understood.
3. The government (national, regional, local) and its public agencies can solve or mitigate the problem, that is, a government failure does not exist.

Only under these conditions the public intervention is sufficiently justified. Here also, the streamlining or reducing overlaps in service provisions by various public organisations is outlined as an important issue.

The focal elements of Finnish innovation strategy can be summarised as follows (Peltonen 2009; Lehto 2009; Government's... 2009):

- Building a *competence base* using four guiding principles
    - World without boarders
        - Mobility and attractiveness
        - Participation and contribution
    - Demand and user orientation
        - Lead markets
        - Co-innovation
    - Systemic approach
        - Broad-based innovation
        - Leadership and change management
    - Innovative individuals and communities
        - Individuals and entrepreneurship
        - Innovation communities and hubs

Although with some possible overlaps, these choices and key areas provide clear understanding of the need for further fine-tuning in an already advanced system. Nikulainen and Tahvanainen (2009) introduce in their study special bodies for demand-side facilitation of innovations in Finland - Strategic Centres for Science,

Technology and Innovation. In each such centre companies, universities, research institutes, and other partners will reach agreement about joint strategic research agenda, which is basically a vision of the projected needs of companies regarding the development of technology and innovations five to ten years into the future. Thereafter the agenda is jointly organised into several long‑term research programs and subsequent into individual projects.

The third Nordic country Norway does not set so much stress on demand-side innovations as perhaps Finland. Still, the supportive role of public procurement is explicitly acknowledged as well as the need to facilitate creative culture (An Innovative... 2009). More attention is given to increased focus on SME-s and to the growing role of interactive learning in innovation policy setting (Isaksen, Remoe 2001). Thus, the innovation policy of Norway does include demand-side measures, but not as prominently as similar policy in Finland. This can be explained by differences in social context and industrial profile of these countries.

Cutler (2008) offers his views on Australian innovation system, which is besides US one of the countries outside Europe taking strong interest in demand-side policy measures. He starts from the logic that innovation has three facets to be balanced: creativity, entrepreneurship/commercialisation, and diffusion/adaptation. It is this third facet that spreads high potential innovations across industry or the community, thus capturing national benefits. Following this theoretical path, the suggestions to improve Australian innovation system include building a culture of innovation, accelerating the take-up of new technologies, using public procurement, developing industry-academy pathways, and increasing efficiency by reducing duplication (Cutler 2008).

The analysis of US Innovation Policy by Rycroft and Kash (1999) does not explicitly incorporate the entire demand-side innovation policy. However, they do point out enhancing markets for complex technologies as one of the focal policy aims. The innovation policies in US and Europe are to some extent compared by Smits *et al.* (2008). Although this study focuses on technology assessment the user- and demand-orientation is contextually highlighted via the notion of strategic intelligence for improved innovation policy. 'Strategic intelligence deals with the questions who needs what kind of information in order to let actors maximise their innovation efforts and how can this information be produced?' (Smits *et al.* 2008: 11). The process dimension of this intelligence involves articulation of demand, mobilising creativity, facilitating activities, user involvement, and other elements characteristic to demand-side innovation policies. In more general terms, the innovation policy in US is demand-oriented especially because of numerous and well-functioning regional producer-user clusters and networks. The federal nature of the country somewhat prescribes the regional differences in policy making.

The innovation policy studies about Ireland and Greece (Collins, Pontikakis 2006), France (Chabbal 2000), China (OECD 2007), or Asian countries in general (Chaminade, Vang 2007) do mention demand-side aspects only very briefly. This can be to some extent interpreted as evidence about the demand-side innovation

policy as being more characteristic to advanced innovation systems (where supply-side capabilities already exist) and subsequent innovation policies. Indeed, the innovation policy studies about Central and Eastern European economies like Poland (Jasinski 2003), Hungary (Inzelt 2008; Havas 2002), Slovenia (Bucar, Stare 2002), Czech Republic (Müller 2002), or more generally about the entire region (Radosevic 2002) either do not explicitly mention demand-side innovation policy measures at all or conclude that the policy measures oriented on diffusion of new technologies and innovation have been non-adequate (see Jasinski 2003). Similar study about even less developed transition economy of Armenia (UNESCO 2009) confirms the dominance of supply-side focus. The evolutionary nature of innovation policy is discussed in greater detail in Nill and Kemp (2009). They focus, however, more on the dynamics in general than on changing role of demand-side in particular.

The demand-side innovation policies are gaining importance especially in interconnection with environmental policies and so called eco-innovations. Van Humbeek etal. (2004) discuss the linking of innovation policy with environmental policy in Flanders Belgium. They discuss Innovation Platform for Environmental Technologies as an important new governance tool that explicitly incorporates demand driven policies, like public procurement, regulations favouring innovation, and new financial instruments. These measures together with supply-side policies and coordinating actions (steering and action plan) are simultaneously interrelated with innovation policy, environmental policy, and energy policy. In such regional level the platform is directly or indirectly influenced also by other policies as well as EU- wide and national level policies. The regional innovation strategies, to integrate regional, industrial, and innovation policy, are in more general terms discussed by Michie and Oughton (2001).

One of the key issues in stimulating eco-innovations is expansion of demand-side policies and especially catalytic procurement, where public measures boost the emergence of private demand (Key Policy Issues... 2009). In order to facilitate the commercialisation and diffusion of eco-innovations governments should support the formation of potential customer groups for an innovation to indicate future market demand and not act as buyer (Ibid). This catalytic role would help to reduce the risk that public demand suppresses private interest. Negro *et al.* (2008) investigate somewhat similarly how to use the innovation policy in stimulating renewable energy technologies. Discussion of alternative policy mechanisms for stimulating the 'green' technological innovation is offered also by Norberg-Bohm (1999). Among these mechanisms the demand-side aspects feature already prominently.

Van den Ende and Dolfsma (2002) show on example of computing industry how the general assumption that new technological paradigms emerge only from advances is science and developments in technological knowledge, while demand simply influences the selection among rivalling paradigms or the course of paradigm, can be misconception. They demonstrate that in the development of computing technology a distinction can be made between periods when demand and/or knowledge development was the main enabler of innovation. New technological paradigms or sub-paradigms emerged even in these demand-pull periods. This study offers yet

another important argument for usage of demand-side innovation policies. However, it also indicates that the importance of demand facilitation may be dynamic over time and across sectors. Thus, such policies should be subject for periodic revisions and readjustments.

Kuhlmann (2001) defined three possible scenarios for future governance of innovation policy in Europe (Kuhlmann 2001: 967):

1. Increasingly transnational and centralised and European innovation policy arena, where EU-level dominates. This scenario assumes weakened national authorities and partially strengthened regional autonomy.
2. Progressive decentralisation and open competition between repositioned national or regional innovation systems and related policies.
3. From EU-level centrally mediated mixture of competition and co-operation between diverse national or regional innovation cultures. In other words, multi-level governance based on a problem-based redistribution across levels.

Due to the strong interconnections with EU-level standards, procurement guidelines, and industrial policy regulations, we can expect that demand-side policy measures are to some extent governed union-wide. Yet, as we stressed before, the national innovation potential can be effectively facilitated only by using agile systems and good responsiveness to contextual changes. Thus, in terms of demand-side innovation policy, third scenario is more realistic option than the first overly centralised policy development scenario.

The discussion of theoretical underpinnings and practical experiences of demand-side innovation policies showed interrelations with innovation system developments on regional, national, and supranational level. The demand-side policies are important complements to the more traditional supply-side measures. The latter tend to dominate in less advanced innovation systems and policy settings. However, in EU one of the major innovation policy challenges is to achieve the shift towards better balance between supply-side and demand-side measures. It is challenging tasks also because of the various risks and problems related to public procurement, demand articulation, regulatory environment, and standards that would facilitate demand for innovation. In the following short section we describe the specific features of small EU member country in using demand-side innovation policies.

The features of demand-side innovation policies in small EU country

A small country or economy is usually defined by its economic size, whereas the population and the gross domestic product (GDP) are commonly used key indicators (Forsyth 1990). The differences in the size of population are proxies for differences in market sizes, different scales of indigenous industries, different scopes of specialization as well as for differences in aggregate levels of savings and investments (Forsyth 1990).

According to Forsyth (1990) there is growing consensus among international organizations and development bodies and also development economists and

planners that a population of 5 million is a limit below which the economy and institutions tend to be severely constrained and some national institutions, infrastructural arrangements, and services may become uneconomic.

The general level of GDP is also a reasonable indicator for evaluating the size of economy. However, in most situations it would be reasonable to adjust this figure in order to account for the differences in purchasing power. GDP *per capita* is a useful tool for differentiating between economies on various development levels. This is important addition to the population data because certain disadvantages of smallness can be overcome by the high development level of the economy. Countries such as Kuweit and Singapore are small in terms of population, but belong into the group of high-income economies (as indicated by GDP *per capita*). This allows them to take advantage of benefits coming with smallness like certain flexibilities, while offering them better opportunities to build support frameworks for innovations and for economic development in general.

Due to the partially ongoing economic transition process in some European regions and neighbouring regions, there is also considerable research gap concerning the specific nature and problems of small-scale systems that experience rapid adjustment processes. Baltic countries (including Estonia) and some other new EU member states that joined in 2004 are in certain respects even now influenced by the path-dependent institutional and infrastructural problems rooted in socialist development era.

However, the comparison with the experiences of national innovation systems especially in Singapore and Ireland lets to draw some important propositions about the specific nature of small-scale innovation systems (based loosely on Wong and Singh 2008; O'Malley *et al*. 2008):

1. The small-scale national innovation systems are relatively more dependent from the inflow of foreign direct investments, because local levels of investment capital are insufficient.
2. The rapid development of small economies and their subsequent innovation systems is at least initially based predominantly on inward transfers of knowledge and technologies.
3. The small-scale national innovation systems require well-developed policy schemes and integrated efforts in order to enhance the development of domestic R&D activities, innovations, and entrepreneurship.
4. The international cooperation and foreign openness along with enhanced gross-boarder network ties beyond FDI and knowledge inflows are essential substitutes for restricted capabilities of domestic support.
5. The success of small-scale national innovation systems is inherently more dependent on using limited resources and capabilities for well-defined and focused scope of innovation activities than that of larger systems.
6. The small-scale national innovation systems should build predominantly on human and social capital in order to cope with inherent financial constraints.
7. The small-scale national innovation systems offer flexible policy adjustment opportunities.

These notions about small-scale innovation systems give some insights into the specific features of innovation policy in a small country context. The agile and flexible nature of small systems allows adjusting innovation policy measures to the changes in innovation context much faster than in large-scale systems. During fast economic growth the need for public support was in many fields somewhat smaller than in times of economic downfall. At the time economic difficulties increase the incentives for innovative activities. In a small country public sector has better opportunities to re-adjust the policies quickly. Some of these re-adjustments, however, might be also determined by the smallness.

Unlike larges countries small countries tend to have less policy options available in terms of fiscal leverage and dept-based financing schemes. This somewhat prescribes the knowledge-based or intelligence-based solutions rather financially expansive development schemes.

Small countries are often very open to the foreign trade and investments, because domestic resources are too restricted to allow balanced societal development. This openness helps to attract important additional financial and knowledge contributions from abroad. Thus, the innovative capability in a small country setting is inherently related to the absorptive and complementary capabilities of various organisations.
The restricted domestic market potential offers one more argument in favour of extensive international cooperation.

In the light of demand-side innovation policy, these positive (flexibility) and negative (restricted resources and capabilities) features of small country setting suggest that even demand facilitation cannot have solely domestic focus. Perhaps, instead of trying to achieve technological supremacy in selected target fields, the more appropriate demand-side policy mix would support both domestic and foreign agents. This would mean enhancing the market opportunities and system capabilities in close interaction with regional (in case of Estonia with Nordic), EU-level, or global partners. The added value for partners could be derived from flexibility, transparency, and agility of these policy schemes, while complementarities would exist not only between supply-side and demand-side measures, but across borders.

Thus, demand-side innovation policies in small EU country should incorporate not only the facilitation of domestic innovation activities, but inward-outward FDI and their linkages, EU funding schemes, participation in joint research and development, and other international dimensions. Despite such multilevel focus, the dominant idea behind the demand-side policy measures should still relate to fostering domestic innovation and absorptive capabilities. Therefore, articulation of demand for innovative solutions should follow broader international context, but local companies should be able to benefit as well by making key contributions into the solution provision. In the next section we investigate one example of small EU economy. This country is not only small, but has recently gone through transition to market economy.

The demand-side considerations of innovation policy in Estonia

According to Reid (2009) the adoption of the first Knowledge-Based Estonia strategy for 2002-2006 and the first round of EU Structural Fund support 2004-2006 led in Estonia to the initiatives of increasing the existing small funds for supporting enterprises seeking to develop new products or services. The general innovation awareness and university-industry cooperation were also fostered. This strategy focused also on developing R&D infrastructure in universities (centres of excellence program). Thus, by 2004 Estonia was seen from EU level as the leading innovation policy developer in the Baltic region and among new CEE Member States in general. However, later on the momentum has been somewhat lost, because as Reid (2009) indicates second Knowledge-Based Estonia strategy for 2007-2013 predominantly describes the continuation of activities established in earlier strategy. Although some new initiatives, like Development Fund, have emerged as well other countries have considerably closed the policy development gap by introducing their own innovation strategies and policy measures. The initial leader position was to some extent related with wide-range of learning experiences gained from policy development co-operation with Finland.

The main innovation policy activities in Estonia are based on economic development plans, application plans of Knowledge-based Estonia strategy 2007-2013, and on plans developed by Estonian Ministry of Economic Affairs and Communications. The Ministry has outlined four main activity groups (Estonian Ministry of Economic... 2010):

I Technological upgrading of enterprises, the increase in their development capability and productivity growth
- R&D support measures for product development in SME-s that includes support for pilot studies and applied research projects
- Innovation vouchers for SME-s via Enterprise Estonia to support R&D projects in cooperation with labs or universities
- National Science and development programs (for example energy technology program, biotechnology program and others)
- Cluster development program to facilitate cluster cooperation for the provision of internationally competitive solutions
- Mobility program to hire foreign development personnel

II The inflow of new innovative business ideas and their growth into enterprises
- Entrepreneurship studies in universities and Development Fund
- Innovation support structures (science and technology parks) and half-industrial and test labs

III Knowledge and technology transfer
- Spinno+ program to facilitate commercial use of academic research
- Technology Development Centres program that promotes joint usage of competences in research institutions and enterprises

IV The development of innovative environment, creative industries, design and service innovation
- Innovation awareness

- Design and service innovation – focuses on development of designing competences and knowledge intensive services

Most of these activities reflect predominant focus on supply-side of innovations. Some programs, however, incorporate at least partial or implicit demand-side considerations as well. For example, innovation vouchers function to some extent also as enablers of projects, which might be otherwise disregarded. Science and development programs for energy technologies and biotechnologies facilitate also demand for innovative solutions in these sectors. Innovation awareness measures and screening studies initiated by Development Fund lay at least the path for increase in future demand. Still, the holistic picture of innovation policy mix is at present dominated by supply-side initiatives.

One of the main executive bodies in the support provision process is Enterprise Estonia. Enterprise Estonia (EAS) was established in 2000. Its general purpose is to promote business and regional development in Estonia. Subordinated to the Ministry of Economic Affairs and Communications, Enterprise Estonia is by now among the largest institutions within the national support system for entrepreneurship, providing financial assistance, advisory, cooperation opportunities and training for entrepreneurs, research establishments, public and third sector. With the accession of Estonia into EU, Enterprise Estonia became the implementing unit of the EU Structural Fund in Estonia. This increased considerably the funding opportunities. At present, majority of the programs and grants offered by Enterprise Estonia are co-financed from the EU structural funds. (EAS 2010)

Today Enterprise Estonia operates in the following support areas (EAS 2010):

- Increased sustainability and accelerated growth of start-up companies;
- Improved export and product development capability of Estonian companies;
- Greater impact of foreign direct investments on the Estonian economy;
- Increased tourism export and the development of domestic tourism;
- Promotion of regional development and civil society.

In terms of support to innovation, Enterprise Estonia is responsible for the governance of several policy activities outlined above, including product development grants, technology development centres program, job creation for development personnel, innovation vouchers program, and test labs program. Finished programs include facilitation of science and technology parks and innovation awareness projects. The training and consultation services relate even at the present also to the innovation awareness, while other key areas include provision of space technology components by Estonian companies in association with European Space Agency, energy technology program, and biotechnology program. Many of these support measures like product development program, technology development centres program, and half-industrial or test labs program engage not only enterprises but research institutions as well. The Spinno+ program is the follow-up policy measure to support the diffusion of academic research results into business practice via spin-off enterprises and other transfers. In addition Enterprise

Estonia publishes variety of periodicals that focus on entrepreneurship and innovation. (EAS 2010)

Because Enterprise Estonia has such a prominent role in providing support measures, it could be said that to some extent the efficiency of Estonian innovation policy is dependent on the organisational efficiency of Enterprise Estonia. This includes the competence level of the personnel, transparency and clarity of evaluation procedures concerning project applications, and quality of coordination between different divisions. Recent study of foreign owned enterprises included also questions about Enterprise Estonia. Respondents saw it as highly bureaucratic yet innovative and developing, consumer friendly, solution seeking and cooperative. The answers revealed certain need for greater flexibility in project evaluation in order to account better for project-specific features. At the same time majority of respondents agreed that some level of bureaucracy is inevitable due to the regulations set for the distribution of EU funds. (Foreign Investor 2009)

The second important branch in Estonian innovation policy is governed by the Estonian Ministry of Education and Research. Here the main focus is on funding and other project predominantly aimed at the development of research, teaching and training capabilities and opportunities. The main bodies subordinated to this ministry that govern research funding are the Research Competency Council and the Estonian Science Foundation. More diversified research and educational programs are governed by Archimedes Foundation, while Innove Foundation promotes lifelong learning. There are also other more specialised foundations like Tiger Leap Foundation and Estonian Information Technology Foundation aimed at facilitation of IT development in Estonia. Some units focus also on youth work or on popularisation of science. (Estonian Ministry of Education... 2010)

The Estonian Ministry of Education and Research with its foundations has very important role in research funding and infrastructure development. Yet, this branch in Estonian innovation system is even more supply-side dominated than the activities of Enterprise Estonia. Perhaps popularisation of science and to some extent youth work can be interpreted as implicit measures of demand-side innovation policy. However, Tiger Leap program and the subsequent foundation are clearly demand-side measures.

“The Tiger Leap program is a national specific program launched by the Estonian Government with an aim to increase Estonian school education quality utilizing modern information and communication technology. Focus of the (follow-up program) Learning Tiger development plan 2006-2009 is mainly on e-learning and various e-learning related content services development. Main objective of this development plan is to increase curriculum quality and effectiveness utilizing information and communication technology and introducing e-learning as a part of daily curriculum.” (Tiigrihype 2010)

The Estonian Research and Development and Innovation Strategy “Knowledge-Based Estonia 2007-2013” does outline in section concerning policy-making aimed

at the long-term development of Estonia the stimulation of demand for new technologies primarily through public procurement (Estonian Research... 2007). In policy practice, however, the explicit demand-side innovation policy measures are still at the infant development stage.

There are, however, some notable cases of innovation procurement initiatives. Best known is perhaps multifunctional personal identification card that serves as substitute for passport, but also as an electronic tool for participating in e-elections, logging into the e-bank or into other ID-based web services, and buying e-ticket for municipal transport. One of the newest procurement and development cases is the introduction of compulsory taxonomical webpage financial statement submission system for enterprises that should reduce the cost of data interchange and database formation in various statistical purposes. Other examples include changes in regulatory environment and subsidies to boost the usage of local energy resources, like wooden pellets instead of imported gas and oil. Also other eco-innovations, like the collection of used packages, wind energy production, and changes in waste collection have been supported by public procurement and regulatory initiatives. Some of these examples are directly reflecting the impact of EU-level policies on local standards. Thus, they are novel in the context of Estonian market, but not so much internationally. Table 1 reflects innovation support according to CIS2006.

Table 1. The innovation support from public sector to enterprises in Estonia 2004-2006 (percentages of respondents)

Did your enterprise receive financial support for innovations in 2004-2006?					
From local government	From government (inc. public foundations)		From European Union		
0.7	9.4		3.7		
		How important was the support?			
The form of supported activity:		High	Average	Low	
Intra-corporate or purchased R&D		20.5	19.7	3.9	
Purchase of other knowledge for innovation		3.9	15.7	3.1	
Innovation-related training activities		9.4	24.4	4.7	
Market introduction of the innovation		9.4	13.4	5.5	
Innovation cooperation		7.9	12.6	4.7	
What result did the financial support for innovations in 2004-2006 have?					
1.Faster innovation process	51.2	2. Reduced cost of innovation		55.9	
3.Increased innovation quality	48.8	4.Reduced risks of innovation		40.2	
5.Other impact on innovation	33.9				

Source: Community Innovation Survey 2006: 2004-2006, 2008.

Table 1 reveals that only small number of respondents (total number was for Estonia 1068) had received financial support for innovations in 2004-2006, whereas government and its foundations were the dominant source for such support. About 40 enterprises or 3.7 percent received support directly from EU, while the role of local governments was almost non-existent. The support was most important for R&D activities. In terms of market introduction in total 22.8 percent of enterprises

who had received support found it either highly or averagely important. This shows that demand-side aspect had some merit, but was not paramount. The importance of public support for innovation cooperation proved to even lower. The impact of financial support reduced costs and increased the speed of innovation processes, while the increase in innovation quality or reduction of risks was slightly less common. Yet, 40.2 percent of support recipients noted reduction of risks as the result of financial support. This aspect can be seen as implicit or indirect contributor to the improved demand conditions.

The topic of innovations was also included into the recent study of foreign owned enterprises in Estonia that was made during fall 2009 by the University of Tartu. When asked about the obstacles to innovations, the respondents saw low profitability on innovation projects and unstable or lacking demand for new products and services has quite important obstacles (the respective average Likert scores 2.77 and 2.54 in 5-point scale, where 5 denoted very important obstacle). Thus, the demand-side deficiencies are relevant for foreign owned enterprises. In interviews the managers argued also that some innovation support measures could have wider focus than just SME-s, because larger producers might be more likely to achieve the relevant innovation capabilities. (Foreign Investor 2009)

In order to monitor and develop the Estonian innovation policy schemes the Ministry of Economic Affairs and Communications has initiated several evaluations and studies. The evaluation of Technopolis published in 2005 reveals that in Knowledge-Based Estonia strategy for 2002-2006 the identified key areas are not always accompanied by particular policy mechanisms. The innovation policy practice has been too focused on limited number of high-tech sectors and attention to low-tech sectors, which is stated in strategy, has been minor. The evaluators suggest as well that attention has been predominantly on development of infrastructure, while the human capital and development personnel deserve more direct policy attention. They suggest that for the period 2007-2013 infrastructural investments should require more active participation of enterprises as users in order to ensure more demand-driven approach. (Evaluation of the design... 2005)

More contemporary evaluation from 2007 suggests that more attention should be devoted on demand-side because the planned increase of R&D expenditures as percentage of GDP might be dangerous in a situation where demand for innovations is relatively low, as it is the case in Estonia. In this document, the opposition from the academic sector against more demand-oriented innovation policy developments is seen as potential threat. The low demand by enterprises and small financial rewards for cooperative activities characterise also science-industry linkages. Both, the absorptive capacity and demand for new technologies are in Estonia limited by the level of development and the industrial structure of the country. GDP per capita in Estonia is remains significantly lower than in the EU-25. The economy is dominated by SME-s from low- to medium-tech sectors, business expenditure on R&D is very low and economic growth is primarily driven by exports from traditional economical sectors. The evaluators outlined also occasional coordination problems and proposed voucher system. (Evaluation of Estonian... 2007)

The visibility analysis of support measures for investments into technology suggests that such support should be oriented first of all to enterprises and entrepreneurs who aim to increase productivity and export quality or intend to extend markets and to enter into new target markets. The analysis points out that the investment program alone is not enough to achieve such goals, but extensive coordination with other policy measures is required as well as the involvement of decision makers with sector-specific competences (Ettevõtete... 2008)

The weakness of industrial demand and participation in the competence centres is evident also from mid-term evaluation of the competence centre (elsewhere described as technology development centres) program. For example, in the field of nanotechnology scientific expertise is there, but industrial linkages are weakly developed. This is further evidence about the dominance of supply-side, while market development lags behind. (Mid-Term Evaluation... 2008)

Somewhat indirectly the reduction of costs for employing R&D personnel is seen as one catalyst for increase in demand for R&D. Indirectly therefore, that in many respects this could be seen as supply-side policy measures. Recent study suggests numerous tax incentives (including reduced personal income taxes for R&D employees) as one potential policy measure. (An Analysis... 2010)

This broad discussion of Estonian innovation policy and demand-side aspects in particular helps as make following suggestions:

- Even supply-side innovation policy measures should be provided first of all to users and sectors who can facilitate demand for innovations by seeking and creating new market opportunities;
- The interlinks between supply-side and demand-side can be reinforced by measures oriented to human capital and research personnel (employment subsidies and tax incentives);
- The human capital policy for scientific institutions should target the employment of commercialisation experts, because that seems to be the weakest link;
- The low profitability of innovation projects or in other words low return on innovations suggests needs for targeted public procurement initiatives, which can be later transformed into catalytic initiatives;
- Public procurement as an important demand-side innovation policy measure should be integrated with other innovation policy measures in order to avoid danger that separated governance leads to detrimental side-effects;
- The smallness of Estonian market prescribes the need to facilitate the regional or EU-wide demand for (Estonian) innovations by more extensive and broad-based engagement into intra- and inter-regional industrial cooperation (public support for such cluster and demand development);
- Demand-side innovation policies (procurement, regulations, standards, intellectual property developments, awareness projects etc.) should not be adopted as a shift towards demand, but as considerate additions to the supply-side measures by taking into account the capacity development;

- The use of regulatory and standard setting power should be more essential part of the innovation policy mix, but it has to be based on industry studies, roundtable results, and regional clustering consideration rather than on political preferences;
- The transparency and flexibility balance of innovation policies could be achieved through establishment of industry-specific applications evaluation commissions;
- Sectoral innovation policies should devote more attention on user-driven positioning of the applied research efforts and investments to incubate science-industry links based on market impulses;
- More attention is needed on low- and medium-tech sectors, because these sectors are larger and potentially more capable for supporting private demand for innovations, than high-tech fields with non-existent local market;
- The policies for high-tech sectors should develop from predominantly supply-side measures, like infrastructure development, into market-seeking policies;
- The usage of EU structural funds should be important, but at the same time in accordance with the development of demand-side capabilities in order to make the usage both extensive and efficient.

The development of Estonian innovation policy is currently in a state, where the continuation on the path of supply-side development, while increasing the public and private financial contributions, might bring structural imbalances and overinvestment tendencies. The demand-side policies are needed in order to draw more attention on market development and commercialisation. The innovations and patents do not gain value without the appreciation of users. The last decade has revealed considerable progress in supply-side policy development. Now it is time to complement these measures with demand-side innovation policies. However, this has to be done cautiously, in order to avoid replacing private markets with publicly regulated ones just when private competition emerges.

Conclusions and implications

The changes in innovation policy are closely related to the development of innovation theory and models. Contemporary systemic views support the idea of close interaction between various system members as the driving force behind innovative growth. Thus, the innovation systems involve capabilities enabling innovation on the supply-side and markets for innovations on the demand-side. These two sides are interlinked by producer-user interactions, which are influenced by various innovation policy measures. The differentiation between supply-side and demand-side is not unique for innovation policy, but used generally in economic policy and theory.

Some demand-side innovation policies like public procurement of innovative solutions are not novel, because they have been discussed in a literature for decades. The modern views of demand-side policies add value by taking more holistic and interconnected perspective. The demand-side innovation policies help to overcome market and system failures, achieve societal goals, modernise economy, and to

establish lead market potential. These policies are context specific and should be adapted based on experiences rather than replicated.

The renewed interest in demand-side innovation policies on EU-level was sparkled during Finnish presidency around 2006, when so called Aho report outlined steps for facilitating the demand for innovations. Various demand-side policies are also needed in order to avoid situations like 'Swedish paradox' where innovation inputs are not matched by the expected level of marketable output.

From Nordic countries the demand-side policies are most explicitly incorporated into innovation strategy and policy in Finland, where demand and user orientation forms one of the key elements. Other leading policy developers are for example Australia and US. In other countries the demand-side policies are far less common or implicit. In most Central and Eastern European countries the innovation policy development is still at the stage of supply-side domination. The demand-side innovation policies are gaining importance especially in interconnection with environmental policies and so called eco-innovations, but other industries can have demand-led development periods as well. The theoretical concepts and practical experiences of demand-side innovation policies reveal interrelations of innovation system developments on regional, national, and supranational level.

The demand-side innovation policies in small EU country should incorporate also inward-outward FDI and their linkages, EU funding schemes, participation in joint research and development, and other international dimensions. However, the dominant idea behind the demand-side measures should still relate to the facilitating domestic innovation and absorptive capabilities. Articulation of demand for innovations should commence in international context, while allowing local companies to benefit from making key contributions into the innovative solutions. The small country policy systems are flexible, but restricted by limited resources.

After the accession to EU, the innovation strategy and policy making in Estonia has somewhat lost its momentum, because the follow-up strategy for 2007-2013 does not provide many novel policy ideas, but represents mostly continuation of earlier initiatives. The innovation policy implementation in Estonia takes place via two main branches – Estonian Ministry of Economic Affairs and Communications with its foundations like Enterprise Estonia and Estonian Ministry of Education and Research (also with various foundations).

Even Estonian supply-side innovation policies should account more with demand-side considerations, while human capital development measures can bridge the two sides. These policies should help to hire R&D personnel in enterprises and commercialisation experts to scientific institutions. Public procurement initiatives could help to increase returns on innovations, but have to be integrated with other policy initiatives. The policy should not shift from supply-side measures to demand-side measures, but add the latter to holistic policy mix. Regulatory and standard-setting power should be used more extensively but with consideration of expert opinions, while developing transparent and flexible decision making procedures.

Better balance between low-tech and high-tech support is needed, while science-industry links are to be developed from user-driven or industrial perspective.

The results of this policy paper are limited by the lack of focused survey on the demand-side innovation policies. The available evaluative reports and other sources might not capture the entire complexity of the demand-side needs. The reports and survey results provide preliminary generalizations, but the true interaction and impact of demand-side measures are often embedded in the context of particular sectors, regions, and policy goals.

The theoretical implications from this discussion are related to a need to refine innovation system theory towards more dynamic approach that would reflect the changes in supply-side capability development and demand-side market building roles over time and within various contexts.

Managers can benefit from this study by starting to pay more attention to the demand-side factors of innovations and by understanding the innovation policy development logic from the viewpoint of their particular business area. The involvement of managers into the public discussion about the demand-side innovation policy measures is very important to achieve public-private synergies.

The future research could focus on providing more detailed analysis of the risks and obstacles of implementing demand-side innovation policy measures. Another research venue relates to the efficiency of demand-side innovation support measures in small open economies. The changes in the roles of various support organisations induced by introduction of several demand-side innovation policies deserve also more research attention.

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NÕUDLUSPOOLSED INNOVATSIOONIPOLIITIKAD EUROOPA LIIDU VÄIKESE LIIKMESRIIGI KONTEKSTIS

Tõnu Roolaht
Tartu Ülikool

Traditsiooniliselt kalduvad innovatsioonipoliitikad keskenduma pakkumispoolsetele meetmetele. Nende hulka kuuluvad näiteks rahalised toetused riikliku riskikapitali vormis, ettevõtete tulumaksu vähendamised, teadusuuringute rahastamine, koolituse toetamine ja muud meetmed. Lisaks sellele pakuvad avaliku sektori tugiorganisatsioonid mitmesuguseid informatsiooni- ja maakleriteenuseid ning samuti võrgustike soodustamise teenuseid edendades nõnda piirkondlikke ja riiklikke innovatsioonisüsteeme.

Kuigi pakkumise meetmed on innovatsioonisüsteemi kaasatud organisatsioonide innovatsioonipotentsiaali tõstmiseks väga olulised, soodustavad innovatsioonide levikut ning selle soovitava kaasnähtusena tootlikkuse kasvu veelgi enam nõudluspoolsed innovatsioonipoliitikad. Siiski on samas oluline rõhutada, et nõudluspoolseid poliitikaid ei tuleks käsitleda pakkumispoolsete meetmete asendajatena.

Seega on nõudluspoolsed innovatsioonipoliitikad pigem traditsioonilisemate pakkumisepoolsete poliitikate väärtuslikuks täienduseks. Nõudluspoolseid abinõusid võidakse võtta kasutusele täiendavate regulatsioonide, riigihangete, eranõudluse subsideerimise ja muus vormis. Selliste poliitikate põhiideeks ja sihiks on innovatsioonile juhtiva turu (*lead market*) või vähemalt sellise turu tekkimise soodustamine. Seepärast peaksid nõudluspõhised innovatsioonipoliitikad võimaldama soodustada eluliselt oluliste ja samas jätkusuutlikke seoste tekkimist innovaatiliste lahendite ja nende potentsiaalsete turgude vahel.

Ebapiisava institutsionaalse raamistiku ja väheste poliitikakogemuste puhul võivad seesugused abinõud aga hoopis kaasa aidata uute turutõrgete ja erainitsiatiivi väljatõrjumisefektide tekkele. Sellisel juhul ei tarvitse nad suuta tagada innovatsioonide või tootlikkuse taseme jätkusuutlikku kasvu. Halvimal juhul võib tulemuseks olla üksnes konjunktuurse ajutise huvi tekitamine teatud innovaatiliste tegevuste vastu, mis lakkab peatselt pärast vastava poliitikaabinõu lõpetamist. Teisisõnu, poliitikad soodustavad vaid kunstlikku nõudlust, mis ei arene edasi iseseisvalt erasektoris toimivaks innovaatiliste lahendite turuks. Riigi poliitika võib niisviisi isegi kahjustada erahuvi arenemise evolutsioonilist protsess vähendades eraõiguslike riskikapitalistide tegutsemishuvisid.

Eelöeldu ei tähenda aga sugugi seda, et nõudluspoolseid innovatsioonipoliitikaid ei tohiks kasutada. Seesugune kriitiline vaatenurk on vajalik hoopis selleks, et asjakohaselt määratleda niisuguste poliitikate võimalikud riskid ja vastuargumendid. See peaks võimaldama välja tuua ühiskonna innovaatilisuse taset tõepoolest kasvatavate jätkusuutlike mõjude saavutamise kriteeriumid

Käesoleva artikli eesmärgiks on pakkuda välja soovitusi eeltingimuste ja poliitikate tunnuste kohta, mis peaksid aitama vältida nõudluspoolsete meetmete väärkasutust ja soodustama soovitud ühiskonnamuutuste jätkusuutlikkust. Selliste poliitikate katalüütiline mõju või hoopis lühiajalise ja valesti panustatud tõukeefekti ilmnemine sõltub mitmetest erinevatest aspektidest, millega tuleks arvestada koordineeritult.

Muutused innovatsioonipoliitikas on tihedalt seotud innovatsiooniteooria ja mudelite arenguga. Kaasaegne süsteemne vaade toetab arusaama, et innovaatilise kasvu üheks peamiseks tõukejõuks on innovatsioonisüsteemi liikmete vahelised tihedad suhted. Seega innovatsioonisüsteemid hõlmavad nii innovatsioonivõimekuste loomist pakkumise poolelt kui ka turgude tekitamist innovatsioonidele nõudluse poolelt. Need kaks poolt on omavahel seotud tootja-kasutaja suhete kaudu mida mõjutavad omakorda mitmesugused innovatsioonipoliitika meetmed. Pakkumise poole ja nõudluse poole eristamine ei ole innovatsioonipoliitikale ainuomane nähtus, vaid majanduspoliitika ja –teooria valdkonnas üldkasutatav lähenemisviis.

Mõningad nõudluspoolsed innovatsioonipoliitika meetmed, nagu näiteks innovaatiliste lahendite riigihanked ei ole iseenesest uudsed, sest nende üle on kirjanduses diskuteeritud juba aastakümneid. Nõudluspoolsete poliitikate kaasaegsed lähenemised lisavad väärtust peamiselt terviklikuma ja meetmete vastastikkuseid seoseid arvestava lähenemisnurga abil. Nõudluspoolsed innovatsioonipoliitikad aitavad ületada turu- ja süsteemitõrkeid, saavutada ühiskondlikke eesmärke, kaasajastada majandust ning luua juhtiva turu tekkepotentsiaali. Need poliitikad on samas aga kontekstispetsiifilised, mistõttu neid tuleks teistest riikidest saadud kogemuste baasil endale sobivaks kohandada mitte lihtsalt järele teha.

Euroopa Liidu tasandil süttis uuenenud huvi nõudluspoolsete poliitikate vastu Soome eesistumisperioodi ajal 2006. aastal, kui niinimetatud Aho raportis toodi esile sammud innovatsiooninõudluse soodustamiseks Euroopa Liidus. Erinevad nõudluspoolsed poliitikad on olulised ka Rootsi paradoksina tuntuks saanud situatsioonidest hoidumiseks, kus innovatsiooni sisendpanused ei too kaasa loodetavas mahus turustatavaid väljundtulemusi.

Põhjamaadest ongi nõudluspoolsed poliitikad kõige selgemalt innovatsioonide strateegiasse ja poliitikasse lülitatud Soomes, kus nõudlus- ja kasutajaorientatsioon on üheks võtmeelemendiks. Teised juhtivad riigid innovatsioonipoliitika arendamise alal on näiteks Austraalia ja USA. Mitmetes ülejäänud riikides on nõudluspoolsed innovatsioonipoliitikad kas oluliselt vähemlevinud või varjatumalt esindatud. Enamikes Kesk- ja Ida-Euroopa siirderiikides on innovatsioonipoliitika arengutase endiselt pakkumispoole meetmete domineerimise faasis. Nõudluspoole poliitikad on omandamas suuremat olulisust eeskätt just vastastikkuses seoses keskkonnaalaste poliitikate ja niinimetatud ökoinnovatsioonidega, kui teisteski harudes ilmneb nõudluse poolt juhitud arenguperioode. Nõudluspoolse innovatsiooni teoreetilised kontseptsioonid ja praktilised kogemused toovad esile regionaalsete, riiklike ja rahvusüleste innovatsioonisüsteemide arengute vastastikkused seosed.

Euroopa Liidu väikese liikmesriigi nõudluspoolsed innovatsioonipoliitikad peaksid hõlmama ka sissetulevaid ja väljapoole tehtavaid otseseid välisinvesteeringuid ning nende seoseid, Euroopa Liidu finantseerimisskeeme, osalemist ühises uurimis- ja arendustöös ja teisi rahvusvahelisi mõõtmeid. Kuid sellele vaatamata peaks nende nõudluspoolsete meetmete peamine idee seostuma kodumaiste innovatsioonide ja innovaatiliste teadmiste absorbeerimisvõimekuse soodustamisega. Innovatsioonide nõudluse määratlemine peaks toimuma küll rahvusvahelises kontekstis, kuid samas võimaldama riigi ettevõtetel nendesse innovaatilistesse lahendustesse võtmepanuste tegemise kaudu kasu saada. Väikese riigi poliitikasüsteemid on üldjuhul paindlikud, kuid samas ressursinappusest tingitud piirangutega.

Pärast Euroopa Liiduga ühinemist on Eesti innovatsioonistrateegia ja vastavad poliitikad oma arengujõulisust mõneti kaotanud, sest nii-öelda jätkustrateegia aastateks 2007-2013 ei paku kuigi palju uudseid poliitikaideid, vaid kujutab endast paljuski varasemate initsiatiivide jätkumist. Innovatsioonipoliitika elluviimine toimub Eestis peamiselt kahe suurema haru kaudu – Eesti Majandus- ja Kommunikatsiooniministeerium koos oma sihtasutustega, nagu EAS ja Eesti Haridus- ja Teadusministeerium (samuti koos mitmete sihtasutustega).

Eesti innovatsioonipoliitika ja eriti nõudluspoolsete aspektide laiapõhjaline vaade aitab meil sõnastada järgnevad soovitused:

- Isegi pakkumispoolseid innovatsioonipoliitika meetmeid tuleks eeskätt võimaldada neile kasutajatele ja sektoritele kes võivad soodustada nõudlust innovatsioonidele otsides ja luues uusi turuvõimalusi;
- Pakkumise poole ja nõudluse poole vastastikkuseid seoseid saab tugevdada inimkapitali arendamisele ja arendustöötajate palkamisele orienteeritud tugimeetmete kaudu (hõive toetamine ja maksusoodustused);
- Teadusasutustele suunatud inimkapitali arendamise meetmed peaksid olema suunatud kommertsialiseerimise ekspertide palkamise toetamisele, sest see paistab olema teadussektori nõrgim külg;
- Innovatsiooniprojektide madal kasumlikkus ehk teisisõnu innovatsioonide vähene tootlus viitab suunatud riigihangete initsiatiivide vajadusele, mille võib hiljem ümber kujundada katalüütilisteks riigiinitsiatiivideks;
- Riigihanked kui oluline nõudluspoolne innovatsioonipoliitika meede tuleks integreerida teiste innovatsioonipoliitika abinõudega vältimaks ohtu, et hanketegevuse eraldatud haldamine toob kaasa kahjulikke kõrvalmõjusid;
- Eesti turu väiksus tingib vajaduse soodustada regionaalset ja Euroopa Liidu ülest nõudlust (Eesti päritoluga) innovatsioonidele olles kaasatud laialdasse ja laiapõhjalisemasse regioonisisesesse ja regioonidevahelisse tööstuskoostöösse (riiklik toetus seesuguste klastrite ja nõudluse arengule);
- Nõudluspoolseid innovatsioonipoliitikaid (hankeid, regulatsioone, standardeid, intellektuaalomandi alaseid arenguid, teadlikkuse tõstmise projekte jne.) ei tohiks kasutusele võtta poliitika nihkena nõudluse suunas, vaid kaalutletud lisandustena pakkumispoolsetele meetmetele arvestades innovatsioonide tegemise võimekuste arengut;

- Regulatiivse ja standardeid kehtestava võimu kasutamine peaks olema senisest sisulisem innovatsioonipoliitika meetmete kogumi osa, kuid see peaks tuginema pigem harupõhistele uuringutele, ümarlaudade tulemustele ning regionaalse klasterdumisega seotud kaalutlustele kui lihtsalt poliitilistele eelistustele;
- Innovatsioonipoliitikate läbipaistvuse ja paindlikkuse tasakaalu saavutamiseks võiks luua haruspetsiifilised taotluste hindamiskomisjonid;
- Sektoraalsed innovatsioonipoliitikad peaksid pöörama rohkem tähelepanu rakendusuuringute alaste pingutuste ja investeeringute kasutajapoolsele suunamisele, et inkubeerida teaduse-tööstuse seoseid turusignaalide põhjal;
- Enam tähelepanu oleks tarvis pöörata madala ja keskmise tehnoloogilise tasemega harudele, sest need sektorid on siin suuremad ja nende potentsiaalne võimekus erasektori innovatsiooninõudluse toetamiseks suurem kui kõrgtehnoloogilistes valdkondades, millel kohalik turg sisuliselt puudub;
- Kõrgtehnoloogilisi sektoreid puudutavad poliitikad peaksid muutuma valdavalt pakkumispoolsetest meetmetest, nagu infrastruktuuri arendamine, turgude otsimist soodustavateks poliitikateks;
- Euroopa Liidu Struktuurifondide vahendite kasutamine peab olema oluline, kuid samas kooskõlas nõudluspoolsete võimekuste arenguga, et muuta see kasutus korraga nii laialdaseks kui efektiivseks.

Eesti innovatsioonipoliitika areng on praeguseks jõudnud seisundisse, kus jätkates pakkumisepoolset arenguteed koos riiklike ja erasektori rahaliste panuste kasvuga võime jõuda strukturaalse tasakaalustamatuse ja üleinvesteerimise tendentsideni. Nõudluspoolseid poliitikaid on vaja tõmbamaks senisest enam tähelepanu turgude arendamisele ja kommertsialiseerimisele. Viimase kümnendi jooksul on avaldunud märkimisväärne edasiminek pakkumispoolse poliitika arengus. Nüüd on käes aeg täiendada neid meetmeid nõudluspoolsete innovatsioonipoliitikatega. Samas tuleb seda teha ettevaatlikult vältimaks erasektori turgude asendamist riiklikult reguleeritutega just siis kui eraettevõtete konkurents on tekkimas.

Käesoleva poliitikaartikli tulemuste puhul on oluliseks piiranguks nõudluspoolsetele innovatsioonipoliitikatele keskendatud uuringu puudumine. Olemasolevad hindamisraportid ja muud allikad ei tarvitse haarata nõudluspoolsete vajaduste kogu keerukust. Raportid ja uurimistulemused toovad küll välja esmased üldistused, kuid nõudluspoolsete meetmete tegelik koostoime ja mõju seondub sageli konkreetse majandussektori, regiooni ja poliitikaeesmärkide kontekstiga.

Käesoleva analüüsi järelmid teoreetilisele kontekstile seonduvad vajadusega täiustada innovatsioonisüsteemide teooriaid dünaamilisema lähenemise suunas, mis peegeldaks muutusi pakkumispoolsetes võimekuste arendamise ja nõudluspoolsetes turu ehitamise rollides läbi aja ja erinevate kontekstide.

Juhid saavad käesolevast uuringust kasu hakates osutama enam tähelepanu innovatsioonide nõudluspoolsetele teguritele ja mõistes innovatsioonipoliitika arenguloogikat oma konkreetse ärivaldkonna vaatenurgast. Juhtide kaasatus

nõudluspoolseid innovatsioonipoliitika meetmeid puudutavasse avalikku arutelusse on riigi ja erasektori sünergiate saavutamiseks samuti ülioluline.

Tulevased uuringud võiksid keskenduda nõudluspoolsete innovatsioonipoliitika meetmete rakendamise riskide ja tõkendite detailsemale analüüsile. Üks võimalik uurimissuund seondub nõudluspoolsete innovatsiooni tugimeetmete efektiivsusega väikese avatud majanduse tingimustes. Mitmete nõudluspoolsete poliitikameetmete sisseviimisega tingitavad muutused erinevate tugiorganisatsioonide rollides väärivad samuti senisest enam uurimistähelepanu.