



GOVERNMENT INSTRUMENTS TO SUPPORT OPEN INNOVATION-EXPERIENCES FROM EU COUNTRIES

■ **ABSTRACT:**

Open innovation requires cooperation between countries and learning from experiences of others. In this paper closed innovation will be compared with open innovation concept to lay foundation to later discussion. Also organizational vs. government level in open innovation will be considered along with presentation of some existing experiences and government instruments for supporting open innovation in EU countries (Netherlands, Belgium and Estonia). Most suitable instruments of government policies will be discussed.

■ **KEYWORDS:**

Open Innovation, Closed Innovation, Government Instruments for Open Innovation

INTRODUCTION

Open innovation, as the most important current trend, call for the transformation of innovation policies of firms and national institutions. It will significantly affect the transformation of many familiar drivers of innovation processes such as intellectual property rights and capital markets, cooperation between universities and companies etc. It will affect to the policy making instruments too. Open innovation requires cooperation between the countries. EU provides many instruments for this activity. After the introduction, the main conceptual issues about the closed vs. open innovation concept are mentioned. In the next part the organizational vs. government level in open innovation research is considered. Some existing experiences and the government instruments to support open innovation in EU countries are presented. How important Open Innovation should be to guide policymaking and which are the most suitable instruments used by the governments for this purpose are discussed in the conclusions.

CLOSED VS. OPEN INNOVATION CONCEPT

Traditional closed innovation model is based on an idea, where innovation takes place within a single company or research group, and protecting the innovation is the key issue. It is based on the idea that research and development is the key to innovations. That concept evaluated to more recent approaches such as the systems, interactive, view of innovation that rests on interdependencies in the innovation process. [1] Today it is increasingly recognized that innovation extends beyond formal

research and development activities. The ability of firms to innovate depends on their networks with other firms and actors.

For the most of the twentieth century enterprises [2] were closed enough to their own ideas, to their own manufacturing processes, to their own machines, to their own scientists and workers. They couldn't believe in a network of exchanging information and knowledge among the other companies.

Open innovation has emerged as a model where firms commercialize both external and internal ideas/technologies and use both external and internal resources. [3] The boundary between a firm and its surrounding environment is more porous, enabling innovation to move easily between the two. In an open innovation process, projects can be launched from internal or external sources and new technology can enter at various stages. Projects can also go to market in many ways, [4] such as out-licensing or a spin-off venture in addition to traditional sales channels.

Open innovation stands for opening up the innovation process to external parties. Firms aim to search for innovations and knowledge also from outside. In the closed innovation model firms suspend the ideas that do not fit their particular portfolio, whereas in the open innovation model they aim to sell or license them for others to capitalize while, at the same time, seeking seeds for innovation from the outside of the firm. The term open innovation was mentioned for the first time by Henry Chesbrough in 2003. He defines open innovation as [5] the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively.

Open innovation is described as [6] both a set of practices for profiting from innovation and also a cognitive model for creating, interpreting and researching those practices.

Open innovation are much widely used today then it was when the Chesbrough defined it for the first time. There is still limited number of empirical research about it and there is still lot of questions about open innovation that expect answers. That opens a lot of possibilities for further research and different levels of analyses.

ORGANIZATIONAL VS. GOVERNMENT LEVEL IN OPEN INNOVATION RESEARCH

Open Innovation so far has been mainly discussed at the enterprise level. First reason is that [7] innovation is traditionally conceived as the outcome of deliberate actions of a single firm, and thus research and development competition has also been stylized as an innovation race between two or more firms. Second reason is that [7] the value of a technical invention is realized only through a business model of a firm. However, neither the practice nor research on open innovation is limited to the level of the firm. Innovations are created by individuals or group of individuals, usually within organizations, so the sub firm level of analysis is particularly salient in understanding of sources of innovation. At the same time, firms are embedded in networks, industries and sectors, thus it is essential to consider these level of analyses. Finally, open innovation is practiced within the context of a given set of political and economic institutions, including regulation, intellectual property law, capital markets and industry structure. Understanding innovation as an open process, in which enterprises seek purposively for inflows and outflows of knowledge, has implications for the design and implementation of any kind of policy to support innovation. In a world of open innovation, policies must be aligned with the behavior of innovating enterprises and the external conditions which motivate enterprises to practice open innovation.

GOVERNMENT INSTRUMENTS TO SUPPORT OPEN INNOVATION IN EU COUNTRIES

The European Innovation Scoreboard shows that [8] Europe is already today the continent with some of the most innovative countries and regions of the world. It can be seen that these countries are usually spending above the average for education, training and lifelong learning, have the highest share of research and development (R&D) spending in GDP and have instruments to support the uptake of new technologies and products in the public and private sectors. [8] Experience also shows that these countries are better prepared to make use of the exchange of best practices and to learn from others. The challenge today is to replicate these success stories through the EU.

The role that public authorities play for innovation is very important. Member State's innovation policies show a tendency to a broadening of the scope of their

innovation strategies and a trend towards measures with wider societal goals.

A number of initiatives have been undertaken at the EU Community level with the aim of synergies between policies and instruments at different levels. [8] The coordination of policies to support innovation at regional, national and EU level has to improve significantly and a better governance system is needed, based on the principles of subsidiarity, but better exploiting the added value of setting common objectives, agreeing on common actions and sharing best practices among Member States. Cooperation with third countries and in particular best practice exchange with the US should also be substantially enhanced.

According to the research on stimulation of open innovation in the Netherlands [9] it is identified that mostly used instruments for this purpose are: regulations, public ownership, taxation and subsidies. With these instruments the government tries to influence the needs for open innovation and to stimulate the necessary characteristic of open innovation collaboration.

The use of regulation allows politicians to act and receive credit for action while simultaneously avoiding most of the associated costs. [9] Regulatory instruments include three dimensions. First regulatory instruments exercise a symbolic function, as they are an attribute of legitimate power and draw their strength from their observance of the decision-making procedure that precedes them. Second regulatory instruments have an axiological function; they set out the values and interests protected by the state. Third regulatory instruments fulfill a pragmatic function in directing social behaviors and organizing supervisory systems. policy is aimed. Fourth, regulation has a reactive character.

Concerning the relation to government and public ownership as the other government instruments it might be said that [9] private ownership should generally be preferred to public ownership when the incentives to innovate and to contain costs must be strong. Many of the concerns that private firms fail to address to social goals can be addressed through government contracting and regulating, without resort to government ownership.

Taxation is the instrument used to raise the money that government spends. Taxes are generally unpopular, and the more visible they are, the less popular they appear to be. Examples for the innovation policy are investment allowances, research allowances and allowances for medical expenses.

There are many situations in which a subsidy and a regulatory tax can be considered as alternative instruments to attain the same policy objective. [9] In reality is observed that politicians often prefer subsidies to taxes, because of the attractiveness from an electoral point of view.

A group of researchers within the VISION Era-Net project [10] "Policies for Open Innovation: Theory, Framework and Cases" have identified a list of policy



areas which are influential and need to be addressed related to open innovation. That framework was applied in three Era-Net countries The Netherlands, Flanders (Belgium) and Estonia. The aim of the study was to identify the best practices that could be used for the others from comparison between these countries. The study made inventory of policy measures which are the most relevant for open innovation policy in these countries.

The case studies revealed strengths and weaknesses which were fairly unique for specific countries. [10] Dutch policies for example pay much attention to the migration of knowledge, while in Flanders this topic is only modestly covered. Likewise, the Estonian case shows that relatively many Open Innovation guidelines are not or slightly reflected in the current policy mix, but as a consequence of the still emerging status of its innovation system and specific features of local industries (i.e. many enterprises operating on low value-added basis), the priority of Open Innovation guidelines needs to be regarded as diverse.

Dutch policy measures [10] very well reflect some of the Open Innovation guidelines, e.g. stimulate private research and development, interaction between the actors in the innovation system, entrepreneurship, and higher education in science and technology disciplines.

In Belgium, due to the regional differences the current policies and governance structures are too distinct from one another to apply the Open Innovation policy assessment framework to the whole country. [10] As for the federal government, it has little experience with proactive innovation policies, but it did initiate changes in the fiscal system to stimulate innovation and research and development by means of a series of additional or revised reductions in tax and social security contributions for enterprises and their employees. Although the Belgian education system is performing well, there is evidence for an innovation skills mismatch. There is a challenge to preserve the country's good position to attract and retain innovative enterprises. There is also a need to boost entrepreneurship, especially the rate of creation and growth of high potential knowledge-intensive enterprises.

Estonia, as a transition state, has gone through rapid development of its basic institutions and specific policies. [10] In addition to nation-state policies, the pivotal influence on Estonian policy-making has been the accession process to the EU. Financing possibilities and conditions provided by the EU and its financing schemes had to be considered. Concerning the open innovation policy instruments [10] there are only a few impact assessments and evaluations of the 2004-2006 policies while most 2007-2013 measures are still in their design phase.

The overview of the measures in three countries is presented in the following tables:

Source: De Jong, J.P.J., W. Vanhaverbeke, T. Kalvet & H. Chesbrough (2008), Policies for Open Innovation: Theory, Framework and Cases, Research project funded by VISION Era-Net, Helsinki: Finland.

Table 1. Inventory of Open innovation policies for Netherlands

Policy areas/guidelines		Policy areas/guidelines	
1	WBSO R&D promotion act	19	Venture capital scheme
2	SBIR - Innovation procurement	20	New Entrepreneurship Action Plan
3	Innovation Performance Contracts	21	Lumpsum research funding
4	Innovation Programs	22	NWO funding
5	IOPLTI - Publicprivate partnering	23	Incidental research funding
6	OCNL Netherlands Patent Office	24	Technological institutes
7	Patent information project	25	STW - Technology foundation
8	NEN Standard Setting Organization	26	Leading Social Institutes
9	Standards Awareness Project	27	Opportunity Zones
10	OASE - Open Source Software	28	Valorization grant
11	Syntens - Intermediaryorganization	29	Technological Sciences Platform
12	ROMs Regional development agencies	30	Lectureships
13	Innovation vouchers	31	Project Learning and Work
14	RAAK - Public privatepartnering	32	Entrepreneurship Education ActionProgram
15	Peaks in the Delta	33	Casimir - Mobility scheme
16	Innovation credit	34	Knowledge Migration Desk
17	Techno Partner	35	NMa Netherlands Competition Authority
18	BBMKB SMEs creditguarantee		

Table 2. Inventory of Open innovation policies for Belgium

Policy areas/guidelines		Policy areas/guidelines	
1	Tax exemption for researchers employed by enterprises	18	One off Innovation Premium
2	SME Program	19	Applied Biomedical Research with a Primarily Societal Finality
3	Knowledge transfer instrategic areas	20	Flemish Cooperative Innovation Networks VIS
4	Research mandates	21	University interface services
5	Poles of Excellence/ Centers of Excellence	22	Tax deduction for R&D investments and patents acquisition
6	Strategic Basic Research SBO	23	OPRIDIE Office for Intellectual Property
7	Action Plan for Science Information&Innovation	24	R&D projects of companies
8	Growth subsidy	25	Tax deduction for increase in R&D personnel
9	TETRA Fund	26	Tax deduction for patent income
10	Financial support for industrial estates and science parks	27	R&D Tax Credit
11	VINNOF	28	Mentorship Programs
12	Industrial Research FundIOF	29	Hercules Foundation
13	Entrepreneurship Action Plan	30	Special Research Funds
14	NRC Fund	31	Flemish Young Enterprises VLAJO
15	ARKimedes	32	Methusalem
16	Winwin loan	33	Odysseus
17	Young Innovative Companies	34	Economy Education Bridging Projects

Source: De Jong, J.P.J., W. Vanhaverbeke, T. Kalvet & H. Chesbrough (2008), Policies for Open Innovation: Theory, Framework and Cases, Research project funded by VISION Era-Net, Helsinki: Finland.

Table 3. Inventory of Open innovation policies for Estonia 2004-2006

Policy areas/guidelines		Policy areas/guidelines	
1	R&D Financing Program	12	KredEx credit and guarantee organization
2	Competence Centers Program	13	Export Plan Program
3	Estonian Patent Office	14	Startup Program for Enterprises
4	Enterprise Incubation Program	15	Centers of Excellence Development
5	Estonian Centre for Standardization	16	Research Funding Schemes
6	Spinno Program	17	Archimedes Foundation
7	Inno Awareness	18	Programs Vocational and higher education and R&D institutions
8	Innovation Audit Program	19	INNOVE Lifelong Learning
9	Enterprise Estonia - support organization for enterprises	20	Program for educational system providing labor market flexibility, lifelong learning, access
10	Training Scheme	21	Program for equal labor market opportunities
11	Mentoring/Counseling Program	22	Estonian Competition Authority

Source: De Jong, J.P.J., W. Vanhaverbeke, T. Kalvet & H. Chesbrough (2008), *Policies for Open Innovation: Theory, Framework and Cases*, Research project funded by VISION Era-Net, Helsinki: Finland.

Table 4. Inventory of Open innovation policies for Estonia 2007-2013

Policy areas/guidelines		Policy areas/guidelines	
1	National Technology Programs	18	Estonian Development Fund
2	Cluster Program	19	KredEx credit and guarantee organization
3	R&D Financing Program	20	Export Support Schemes
4	Investments in New Technology	21	Services for Foreign Investors
5	Competence Centers Program	22	Foreign Representative Offices
6	Estonian Patent Office	23	Mobility Program
7	Enterprise Incubation Program	24	International Cooperation Networks
8	Estonian Centre for Standardization	25	Startup Programs and Loan guarantees
9	Spinno+ Program	26	Centers of Excellence Development
10	Science and Technology Parks	27	Research Funding Scheme
11	Cooperation with Universities	28	Archimedes Foundation
12	Innovation and Entrepreneurship Awareness Program	29	Infrastructure development program for R&D and higher education institutes
13	Enterprise Estonia support organization for enterprises	30	INNOVE -Lifelong Learning
14	Innovation Vouchers	31	Programs to develop R&D human resources
15	Training Program (incl. training services)	32	Lifelong Learning Programs
16	Information Gateway for Entrepreneurs	33	Estonian Competition Authority
17	Mentoring/Counseling Program		

Source: De Jong, J.P.J., W. Vanhaverbeke, T. Kalvet & H. Chesbrough (2008), *Policies for Open Innovation: Theory, Framework and Cases*, Research project funded by VISION Era-Net, Helsinki: Finland.

CONCLUSION

From the very limited research on open innovation at the state level, it could be seen that current government policies in many EU countries already contain many elements to support it. The Open Innovation model inevitably influences to traditional policy making, but does not completely upset it. Current policies already reflect many aspects of Open Innovation. These are [10] policies to offer financial research and development incentives, to stimulate interaction between actors in the innovation system, to better secure innovating enterprises' access to finance, and to generally stimulate competition. Other guidelines which are frequently found are support for regional clusters and to organize the diffusion of scientific knowledge.

Open Innovation, from the other side, broadens the scope of policymaking. It is influenced by a rather broad set of policy areas outside the traditional domains such as labor markets and education. [10] It will be a challenge for policy makers to develop truly lateral policies and to find out how to effectively influence all policy areas.

Beside the traditional financial instruments to support innovation in general, open innovation ask for the other instruments such as subsidies, grants and guarantee schemes. In open innovation model it would be also necessary to develop alternative policies such as information services and legislation issues that are relatively scarce in current innovation policy. Opportunities for new policies are also present in the areas of [10] user innovation, technology markets, corporate entrepreneurship in incumbent enterprises, balanced (career and work) incentives for scientific researchers, and standard setting processes.

General question is how important Open Innovation should be to guide policymaking. The experiences of EU countries show tendency to a broadening of the scope of their policies towards support the open innovation model. These countries are usually spending above the average for education, training and lifelong learning, have the highest share of research and development spending in GDP and have instruments to support the uptake of new technologies and products in the public and private sectors. At the Community level it is also mentioned the importance of open innovation through many documents. The Business Panel on future EU innovation policy calls [11] to open up innovation to the creativity of broad range of people and ideas and to make a shift from closed processes to power of networks. It is noticed that [11] closed innovation system of laboratories, universities, research institutes, art schools, corporations, public administration, professionals are no longer a viable approach for future innovation. Openness call for collaboration that [11] requires a platform, often including government actors, to specify the rules of engagement to help incentivize an open exchange.



To accelerate this process it is proposed to [11] create, fund and network innovation labs, with localities creating spaces to enable interaction between large and small, low tech and high tech, arts and technology, public and private and not-for profit, supported by recognition and networking at European level. Innovation labs should help to develop, test and scale up solutions to implement the new orientations of EU innovation policy.

Developing countries, from the other side, have other priorities for policymaking due to the relatively under-developed innovation institutions. In such countries have to developed basic innovation and interaction instruments in the first phase. The next step should be more sophisticated instruments such as development of technology markets, stimulation of corporate entrepreneurship, etc.

Although the finance is one of the greatest obstacles by both enterprises and innovation support organizations to innovation in developing countries there are other instruments that government could use, even in the phase of the establishment of innovation system. In addition to measures that require financial resources, reforms in education and training, life long learning, as well as the promotion of entrepreneurial culture and better match between skills and labor market should be the measures that enable a good open innovation environment. Government instruments that facilitate the dissemination of good practice via networks and support to cluster development may also contribute to the process of open innovation without major investment.

Even from the very limited research of experiences in some EU countries could be concluded that open innovation trend will undoubtedly influence the policy making in future. Government instruments to support open innovation vary depending of the level of development of innovation system of the country, but exchange of good practice and experiences is the instrument that should be practiced at any stage and without major financial investment in every country.

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