Possibilities for Using Public Procurement for Innovation in Small Transition Countries

Kristina Detelj

University of Zagreb, Faculty of Organization and Informatics, Varaždin, Croatia kristina.detelj@foi.hr

Tanja Markovič-Hribernik

University of Maribor, Faculty of Economics and Business, Maribor, Slovenia tanja.markovic@um.si

ABSTRACT

This paper reviews the state of the art in the field of using of public procurement as an innovation policy instrument which is in the literature known as the Public procurement for innovation (PPI). The modern state has the task to enable the favourable conditions for achieving of satisfactory level of economic growth which reflects in growth of standard of living. Innovation is extremely important in achieving of higher international competitiveness and many states use public funds to support creation of innovation. But recent financial and economic crises have induced austerity measures in public budgets, which forces the state to use public money more wisely and in more efficient ways.

Developed countries have been directing public procurement into purchasing of innovative products, services and works for a long time. This has been the subject of growing research in last 15 years, whereas it has not been the case in less developed countries. Our analysis of the recent research shows that the most of the reviewed literature applies case study method for exploring of PPI and this cases come mainly from the most developed countries. Research on the bigger sample are scarce, but they all indicate that PPI could be more effective way of inducing innovation compared to the other more often used instruments (e.g. R&D subsidies). Only the small number of existing studies focuses on the smaller and less developed countries. Therefore, our aim is to draw attention of the researchers, and also of the policy makers, to the possibilities for more efficient financial support for creation and diffusion of innovation, especially in the context of small transition countries.

Key words: public procurement, innovativeness, competitiveness, innovation policy instruments, small transition countries

INTRODUCTION

One of the most important tasks of each country today is to create the conditions that support an adequate level of economic growth, which then helps their citizens to achieve a satisfactory standard of living. A lot of available studies deal with the issue of competitiveness, one of the most famous being the survey performed by the World Economic Forum – the Global Competitiveness Report. In the period from 2014 to 2015, it covered 144 countries (WEF, 2014). WEF uses a complex system of assessing competitiveness, based on the twelve pillars of competitiveness. The eleventh pillar stands for business sophistication and the twelfth for technological innovation, and in the long run they are the most important ones of all the twelve pillars for achieving a higher standard of living (WEF, 2014).

The European Commission has a special section which deals with the competitiveness of European enterprises in the world market – Directorate General for Enterprise and Industry (EU E&I, n.d.). This section is responsible for a variety of initiatives and policies, such as the Lisbon Strategy for Growth and Jobs (EC, 2000), which was created as a response to globalization and strong competition of the US, Japan and, in recent years, even the emerging Chinese economy. A new strategy called Europe 2020 (EC, 2010) is now focusing on the following five general objectives: 1) strengthening the industry and the transition to clean technologies, 2) encouraging innovation, 3) supporting small and medium-sized enterprises (SMEs) and promoting an entrepreneurial culture, 4) ensuring an open internal market and 5) supporting breakthroughs in European space research. In order to reach these objectives, the EU devotes a lot of attention, resources and activities to innovation, as an important component of achieving greater competitiveness.

Understanding the role of government in promoting innovation is a very important issue, especially in times of crisis, when countries have limited financial resources at their disposal. In such circumstances, growing deficits impose additional requirements on various bodies that manage public funds. In the process of achieving the objectives of state economic policies, the main emphasis then lies on cost savings and more efficient allocations of the remaining money. That is why a country's public procurement system must achieve value for money. The results of several studies (e.g., Aschhoff & Sofka, 2009; Guerzoni & Raiteri, 2012; Slavtchev & Wiederhold, 2011) suggest that the public procurement of innovative products and services could be an appropriate tool for effectively achieving higher levels of innovativeness (of companies and countries) in comparison with the currently used instruments (R&D subsidies, fiscal stimuli, etc.).

In the next chapter, we review the literature that shows an emergence of the concept of using public procurement as a tool for promoting innovation. After that we present an analysis of PPI case studies based on their focus area (a general PPI program or a focus on particular innovative product or service) and the geographical dispersion of these cases. We then discuss the implications for policy makers and present our conclusions.

LITERATURE REVIEW

A historical review by Mowery and Rosenberg (1979) presents ten empirical studies on innovation dating from the 1960s through 1970s. Although the authors criticized the conclusions of these studies, they more or less agreed on the importance of understanding user needs and meeting anticipated demands for successful innovation (Mowery & Rosenberg, 1979). However, their conclusions are directed more towards the need for active supply-side government policies. Demand-side policies are mainly seen as the best way of diffusing innovation. For years, this review has been the basis for supply-side innovation policies until Edquist



and Hommen (1999) re-invoked some powerful arguments in favor of demand-oriented interventions. The linear approach sees innovation as a process that has a starting point in science, which then leads to the development of technologies that could potentially satisfy market needs. In contemporary conditions, without a feedback loop, this approach is not satisfactory. This is why the authors recommend a systemic approach that takes into account various interdependencies and the importance of feedback, and uses the method of attempts and failures (Edquist & Hommen, 1999). Therefore, there are lots of arguments in favor of both supply-side and demand-side innovation incentives.

Since public procurement accounts for a large proportion of total demand – around 16% of gross domestic product (GDP) (Rolfstam, 2009), this can also be a strong pull factor for innovations. In the literature, we have found a number of observations regarding the use of public procurement as a tool for promoting innovation. Rothwell and Zegveld (1981) compared the effect of R&D subsidies and public procurement on innovation and concluded that public procurement was a more effective incentive for innovation in the long run. Geroski (1990) adds restrictions to this view by listing the specific conditions under which it holds: when the strict standards are present, when the needs for innovations are clearly expressed, and when there is a guaranteed market for innovative products and services at an early stage of the life cycle. He points out that the public procurement system could be abused if its objectives are not clear and if the policy protects domestic entities or national champions. The role of government is also discussed by Rothwell (1994), who believes that PPI has maximum impact on goods and services, where the state is the largest consumer and a catalyst that promotes the diffusion of innovations.

Edquist and others (2000) focus on the formerly neglected aspect of demand by emphasizing the importance of public procurement as an environmental factor that supports innovation in the field of modern technologies. They state that the "... public technology procurement occurs when a public agency places an order for a product or system which does not exist at the time, but which could (probably) be developed within a reasonable period" (Edquist et al., 2000, p. 5). Recently, this concept has become widely recognized in the literature as the "public procurement for innovation" (PPI). In 2005, the European Commission working group created a report on PPI policies in response to the growing interest at the EU level. It was aimed at establishing an environment conducive to innovation by using public procurement, at all government levels and in all member states (Edler et al., 2005). The empirical part of this report provides practical case studies from different EU countries. Additional case studies can be found in the later Aho Group report (Aho et al., 2006).

Edler and Georghiou (2007) provide an overview of innovation policies applied at the EU level and conclude with an observation that all of them are still supply-side oriented. The EU innovation policy is composed of capital incentives (public and mixed venture capital funds, guarantee schemes); fiscal measures (R&D tax incentives); R&D funding in the public sector (e.g., through universities and institutes); government support for industrial R&D; information needed for the collaboration and meetings of organizations engaged in R&D; and various integration measures. The authors suggest the use of demand-side measures, which have so far not been systematically applied. These include a systemic policy (focused on the supply chain and clusters); legislation (standards that require innovation, technology platforms); public procurement of innovative goods; and supporting private demand (consumption subsidies for innovative goods, tax incentives for users that would increase their awareness of potential innovations, etc.). Also, Edler and Georghiou differentiate between multiple types of procurement that are available for promoting various stages in the development and diffusion of innovation. Firstly, they distinguish between general PPI, which sees innovation as the central goal of public procurement processes, and strategic procurement, which focuses on specific sectors. Secondly, they differentiate between direct procurement of innovative products for use in the public sector, and indirect procurement (catalytic procurement), in which the public sector is an intermediary in the transfer of ordered products or services from suppliers to end consumers. The third distinction is based on the characteristics of procured goods. A type of procurement associated with the supply of already developed innovative products or services is called *commercial procurement*. The other type is called *pre-commercial procurement*, whereby the state promotes innovation through public procurement, but this process does not result in final products or services.

The importance of total demand (both public and private) for innovation was later thoroughly examined in the NESTA (2010), with an emphasis on recommendations for policies that would involve potential bidders early in the process of public procurement

in order to accelerate companies' innovation activities. But not all types of public procurement encourage innovation. The object of purchase should have certain characteristics of novelty, whereas the regular public procurement of products and services (such as paper, pens, cleaning services, etc.) does not support innovation. From the level of the EU as a whole, interest is transferred to the level of particular EU member states through the directives of the European Commission. In the area of PPI, some older member states are particularly active, such as the United Kingdom (CBI, 2006; OGC in DBIS, 2009) and Ireland (DETE, 2008; 2009); but there are also some new member states, such as Poland (ME Pl in PPO Pl, 2008). Due to the relevance of the topic, researchers have been devoting increased attention to this issue in recent years, which has resulted in a growing body of literature.

The studies of Rolfstam (2009), Edquist (2009), and Hommen and Rolfstam (2009) focus on the various possibilities of using public procurement as a tool for fostering innovation, based on different case studies. These papers deal with the importance of institutions for the support of a procurement system that promotes innovation; they develop a typology of policies that stimulate public demand for innovation (this process is called PDI); and they offer a new PPI taxonomy, which takes into account different environments/resources and is suitable for practical policy-making.

Even though many authors stress the importance of PPI, others, such as Uyarra and Flanagan (2010), have doubts about the possibilities of public procurement as a tool for promoting innovation. The reason for this is an inconsistency between the objectives of innovation and public interest. Therefore, they propose the development of more relevant taxonomies for PPI. They see the problem in the fact that most of the current research on PPI is based solely on case studies and not on statistical analyses of larger samples. Even Geroski (1994) wondered whether the research in the field of innovation would be better off using case studies or the concepts should be checked by using quantitative methods on larger samples. He also stresses that the case studies are relevant when it comes to researching radical (Schumpeterian) innovations, but when we are interested in how the public procurement market generally affects innovation, which means investigating incremental innovations, then it is appropriate to use the econometric model (Geroski, 1994, pp. 4-6).

Studies conducted on larger samples that examine the importance of demand for innovation and especially PPI are rare. The research of BDL (2003) shows that about 50% of innovations occur due to new requirements and market demands, while the development of new technologies is responsible for only 12% of innovations. Although the study does not deal only with public demand, its policy recommendations, among other elements, emphasize the importance of public procurement (BDL, 2003). Aschhoff and Sofka's paper (2009) compared the effectiveness of PPI with three other channels (cooperation with universities and institutes, R&D subsidies, and regulation) on a sample of more than 1,100 German companies. Their research showed that the public procurement and knowledge spillovers between the private sector and universities or institutes significantly affect the commercial success of innovation. A research conducted in the US incorporated PPI and R&D investment into a growth model (Slavtchev & Wiederhold, 2011). The results indicate a positive effect of PPI on R&D investment, which in turn leads to more innovation. Another study examined the impact of R&D subsidies and PPI on R&D investment (as an innovation input) and on the revenues from innovative products and services (as an innovation output) (Guerzoni & Raiteri, 2012). It provided evidence of PPI having a stronger impact on both compared to the R&D subsidies.

ANALYSIS OF PPI RESEARCH

As can be seen in the past century, in many cases the public procurement system was not used intentionally to stimulate innovation, but it happened accidentally (Nyiri et al., 2007; Tsipouri & Athanassopoulou, 2013). US agencies, mainly related to the military sector, usually published calls for tender in a way that enabled their procurers to create innovative solutions. Later, these innovations would diffuse from the defense sector to be used in the products or services of the civilian sector (e.g., the use



of microwaves in the household ovens, the internet, GPS system, etc.). At first innovations were not caused by either target or centrally defined policies, but by the actions of individual ministries and agencies in accordance with their own rules and policies (Edquist, 2009). Other developed countries have also adopted special programs, out of which innovative solutions emerged as a result of participating in public procurement. Examples from the book by Rothwell and Zegveld (1981) show numerous examples of public procurement having an impact on the promotion of innovation in the second half of the twentieth century.

As already mentioned, in the eighties and nineties of the 20th century, the interest for fostering demand-side oriented innovation policy measures somehow disappeared, but the papers of Edquist and Hommen (1999) and Edquist et al. (2000) once again drew attention to additional opportunities of such innovation policies. On the basis of these initiatives, at the beginning of the 21st century, the EU started a few projects to research this issue (Aho et al., 2006; BDL, 2003; Edler et al., 2005; EU & OECD, 2011; Georghiou et al., 2003; Nyiri et al., 2007). Since then, a growing number of national and international research institutions (DETE, 2008; FORA & OECD, 2009; MEE, 2010; ME Pl & PPO Pl, 2008; OGC & DBIS, 2009) and scientific papers (Arlbjørn & Freytag, 2012; Edler, 2009; Edler & Georghiou, 2007; Edquist & Zabala-Iturriagagoitia, 2012; Hommen & Rolfstam, 2009; Kalvet & Lember, 2010; Kattel & Lember, 2010; Lember et al., 2011; Uyarra & Flanagan, 2010) have explored different aspects and possibilities of the public procurement system which influence the formation of innovation in the economy.

After thoroughly exploring the listed literature on PPI case studies, we present the following results. The cases were divided into two major groups:

- 1) the first group comprises general policy measures (20 cases) aimed at creating an environment conducive to the emergence of innovation, as a result of public procurement processes;
- 2) the second group covers the creation of concrete innovative products and/or services that results from participating in public procurement (37 cases).

For each case, we determined the challenge/problem that an innovation or program solves (aging, ecology, sustainable development, health, etc.). In the first group, there was more effort to improve the competitiveness of enterprises, to build and develop a more efficient public procurement system and to systematically address environmental issues and energy efficiency. In the group of specific products or services, the most important issue was infrastructure (communications, information technology, transportation), followed by the so-called green innovation. It seems that the products/services related to caring for the elderly or sick people are not profitable enough and therefore the analyzed cases include less of these kinds of innovations. Examples from the defense sector are not so important because they only come from the USA, while most of these cases come from European countries. This is to be expected, since the USA is a military superpower, while the EU is primarily an economic community. The EU was also quite divided until recently, consisting of small states that would buy their arms from the major powers such as Russia and the USA.

A review of the geographical distribution of PPI cases shows significant imbalances between the developed countries and those that are at the middle stage of their development (e.g., transition countries). Examples come mainly from the United States, United Kingdom, Germany, the Netherlands and the Nordic countries. The practice of creating general policy measures and environments conducive to innovation is present mostly in the United Kingdom and slightly less in Denmark and the Netherlands, while the examples of creating individual products and services mostly come from the United Kingdom, followed closely by Sweden and Ireland. One probable reason for this is their awareness of the existence and the importance of PPI, which has been present for many years. Also, this analysis only occasionally mentions the countries of Central and Eastern Europe (CEE) that intentionally apply demand-side innovation policies (Edler, 2009). In those cases, we found only two innovations that were created based on PPI principles: one in Poland and one in Estonia. We noticed the same features after examining the papers from the May 2013 Conference on pre-commercial procurement and procurement of innovative solutions (PSNRW, 2013), which included only the cases from advanced (European) countries (Germany, the United Kingdom, Belgium, the Netherlands, Spain, France, Italy and the USA).

DISCUSSION AND CONCLUSION

Our literature review suggests that public procurement can indeed have a positive impact on the innovativeness of a company or a country. Until now, as the analysis shows, only more developed countries used this policy instrument intentionally. Most of the interested parties in smaller transitional economies remain unaware of such possibilities, even though occasionally some of them unintentionally create innovations as a result of public procurement processes.

The basic feature of public procurement is the focus on the equal treatment of all suppliers, effective competition and technical efficiency. This results in regulations and guidelines on how to act in public procurement procedures, such as the EU guidelines and regulations like the Government Procurement Agreement (GPA) of the World Trade Organization (EC, 2013; WTO, 2013). On the other hand, the policy to promote innovation through public procurement (PPI) is not strongly directed at ensuring maximum competition and a level playing field because it also strives to create novelties and positive externalities, which induces market inefficiencies. In order to achieve spillover effects from innovations, governments must be included in the interactive learning and collaboration market, which is contrary to the principles of the GPA (Kattel & Lember, 2010; Valovirta 2012). The mentioned authors point out the difficulties some EU member states face when trying to establish a clear PPI policy. PPI presupposes relatively high political and administrative capacities, which transition countries often do not have and cannot easily obtain because they have to comply with the WTO principles. In addition, PPI requires a high level of existing competition in public procurement in order to become a serious tool of innovation policies (Lember et al., 2011), which is often not the case in developing countries. Developed countries tend to have greater policy capacity and competitiveness in the market. Therefore, it is wise for them to continue with PPI policies, because they are more likely to be successful in the context of following the GPA and EU directives.

Our recommendation for smaller transition countries is to emulate the models that have already worked in practice in more developed economies, and to improve their procurement systems in the direction of incorporating PPI. The implementation of such an instrument could benefit both the suppliers, who would create innovations and improve their overall competitiveness, and the buyers, who would get access to more advanced products and services.

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