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Public Procurement of Innovation: Proposal of a New Model

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Abstract

Public procurement, which is a considerable part of the local demand, may have favorable effects on the national innovative capacity. But traditional public procurement model is quite far from encouraging innovative procurement. In this sense, this article mainly aims to discuss elements of a new model for public procurement which stimulates and facilitates procuring innovative goods and services. In the paper, we initially argue the importance of demand for innovation. Subsequently, we examine the public procurement process and put forth the rationales for applying innovative public procurement. Then, we compare the current point of views about the issue between EU and Turkey. At last, we propose a new model for public procurement process by considering the shortcomings of current model and conclude the paper with policy recommendations for future.

Keywords: Public procurement, Innovation policy, Demand-Oriented innovation JEL classification: H57, L38, O32, O38

1. Introduction

Since firms innovate in collaboration and interrelation with other organization, the innovative behavior of organizations is affected by many kinds of institutions-such as laws, rules, norms and routines which generate incentives or obstacles for innovation (Fagerberg, 2005). So, it is not so easy to assess the requirements for successful innovation and to specify an optimal design for system of innovation. But examining all dimensions of innovation exhaustively would be useful in order to define the determinants of innovation (Kline and Rosenberg, 1986; Edquist, 2005). In this sense, analyzing the effect of public procurement on

innovation would refer a great sense, because it constitutes a significant part of the local demand which is considered as one of the leading stimulators of innovation.

Using public procurement to promote innovation is also high on the agenda of European policy-makers. This debate triggered number of inquiries, reports and policy documents in EU (Uyarra and Flanagan, 2010). According to the European Commission (EC), with an estimated 16 percent of the European Union's GDP, public procurement has a significant potential to attract EU innovations to the market, support lead customer and provide competitiveness to innovative firms in the global markets (EC, 2010). On the other hand, there is restricted interest on this issue at Turkey level. But the value of public procurement which reached approximately 6,3 percent of the Turkish GDP with US\$47,9 billion in 2012- comprises considerable opportunities for increasing the quality of public services and innovative activities of firms.

This paper is an attempt to promote a model for public procurement of innovation through summing up and criticizing the studies about the issue. In the paper, we initially highlight the importance of demand for innovation. After that, we examine the relation between public procurement and innovation. Subsequently, we refer the studies and policies of EU and Turkey about the matter. Lastly, we present a new model in order to accelerate the innovative effect of public procurement. We conclude the paper with research and policy recommendations for future.

2. The importance of demand for innovation

Because the process of innovation is complex, variegated and hard to measure (Kline and Rosenberg, 1986), defining the origins of innovation has been a topic for many attempts in recent years. In these studies, the triggers of innovation have been taken into account most generally under two subheadings: "technology push" and "demand pull" (Mowery and Rosenberg, 1979). Technology push policy accepts innovation as driven by accumulated knowledge associated with basic science, applied research, design, manufacture, and production. In this model, scientific and technological knowledge is the main source of new discoveries and innovation capacity. On the other hand, demand pull policy considers the importance of demand characteristics in shaping the innovation (Fabrizio and Thomas, 2012). In this paper, we mainly discuss the demand-oriented measures in order to examine the infrastructure of the interaction between public procurement and innovation.

From Von Hippel (1976) and Mowery and Rosenberg (1979) to many contemporary studies, it has been argued that one of the major aims of innovation policy-makers should be

analyzing the relation between users, consumers and others affected by innovations in order to clarify the role of demand on the market. (Edler and Georghiou, 2007). In this sense, lots of studies are conducted to examine this relation, but Malerba (2007) argues that although demand has received much attention in the literature, many details about the influence of demand on innovation during the evolution of an industry still remain indefinite.

According to Edler (2010), there are three political objectives of activating demand for innovation: First, in the economic dimension, the demand-oriented policies intend to contribute to economic competitiveness and growth. Second, in the social dimension, the governments may use the demand to obtain some kinds of social goals such as sustainability, efficiency and mobility. Third, demand plays an important role on creating lead markets (Edler, 2010). Especially the lead customers can provide the market to stimulate the economy and increase competitiveness of firms in global markets. Early users tend to take the risk of working with a new and not fully optimized technology in order to access before their competitors or achieving a desired solution to a problem more quickly. In this context, new innovations may occur through the learning and feedback of these users. In such cases, the learning and feedback benefits of lead users may also provide reduction of risk in the investment on R&D (Edler and Georghiou, 2007).

Edler and Georghiou (2007, p.952) define the demand-side innovation policies as "all public measures to induce innovations and/or speed up diffusion of innovations through increasing the demand for innovations, defining new functional requirement for products and services or better articulating demand" and they compile demand-side innovation policies under four main groups; systemic policies, regulation, public procurement and stimulation of private demand.

Although the taxonomy defines the types of demand-oriented innovation policies satisfactorily, many details of demand pertinent to innovation still remain uncertain. The main complexity for defining all innovative dimensions of demand may be the tacit characteristic of it. Knowledge about demand has characteristics similar to technological knowledge which is frequently tacit and difficult to codify and transfer (Polanyi, 1966; Foray, 2004). Because the conditions about market size and valued products reflecting preferences of consumers differentially known by firms or countries, the knowledge about the demand is generally accepted to be tacit (Fabrizio and Thomas, 2012:43). This tacitness of demand makes it hard to clarify the interaction between demand and innovation exhaustively. In this paper, we focus on public procurement as one of the leading demand-oriented innovation policy tool in order to codify some tacit knowledge of the demand.



Figure 1: Taxonomy of Demand-Oriented Innovation Policy Tools (Edler and Georghiou, 2007)

3. Public Procurement as a demand-oriented innovation policy tool

The interest to the components of demand has been increased with comprehending the considerable effect of demand on innovation. In this sense, public procurement, one significant element of local demand, has been discussed by some scholars as a major tool of demand-oriented innovation policies within the NSI and it is conceptually called as: "public procurement of innovation" or "innovative public procurement". European experts recommend that, public procurement should be used to 'drive demand for innovative goods, while at the same time improving the level of public services' especially for creating an innovative Europe (Aho et al, 2006:6). Public procurement, with an estimated 16 percent of the European Union's GDP, offers an enormous potential market for innovative products and services (EC, 2010).

Edquist and Hommen (2000, p.5) define public procurement of innovation as: "[it] occurs when a public agency acts to purchase, or place an order for, a product – service, good, or system – that does not yet exist, but which could (probably) be developed within a reasonable period of time, based on additional or new innovative work by the organizations undertaking to

produce, supply, and sell the product being purchased". Public procurement constitutes a major part of overall demand for goods and services and is increasingly accepted as an efficient instrument for achieving the goals of innovation policy. All kinds of public procurement have potential to affect the supplier's innovativeness by shaping the demand (Uyarra and Flanagan, 2010).

Edler and Georghiou (2007) emphasize the three main purposes of innovative public procurement policy. First, public procurement has a great role in the location decision of MNEs and in the inclination to generate innovations in a given location due to being major part of "local" demand. Second, public procurement may compensate the market failures (mainly information asymmetries) and system failures (poor interaction) which affect the translation of needs into functioning markets for innovative products. Procurers are often not fully aware about the details of products they want and the products which market could offer to them. On the other hand, suppliers often lack the knowledge on what customers exactly want and might want in the future. All this entails risk and uncertainty for suppliers. Public procurement which adequately applied with an innovative goods and services may cause to enhance the quality, effectiveness and efficiency of public services. Innovatively developed products and services may be the key factor of eliminating troubles and deficiencies in public administration.

Public procurement may cause all these benefits by demanding products (with new characteristics, lesser costs, better quality, minimized externalities, etc) whose production requires R&D and by providing an assured source of future demand with financial assurance to invest in R&D (via a long-term contract). In this respect, public procurement of innovation stimulates investment of R&D, disseminating of R&D results and reducing the costs and risks of innovation (Cave and Frinking, 2003:6). In the context of all these profits, procuring innovation can also be a tool of solving many kinds of contemporary problems of world -such as health, climate change, food security, sustainable agriculture, energy and transportation.

There may also some unexpected results of public procurement of innovation process. For example, due to paying more money for innovative product compared to standard one, the public procurement of innovation process may be valued as "public loss" by some auditors they simply apply the current legislation-. In this case, public personnel may consider about public procurement of innovation as "high risk low gain" and they would be unwilling to procure innovative products in following procurements. However, it may be possible to overcome this challenge by making comprehensive legislations which considers all risks and possibilities. Another critical aspect about the issue is that, according to an EC report (2009), companies within the European Union feel that new demands from public sector have less influence on their innovation activities than new demands of commercial clients. 49.2 per cent of the innovation drivers of European firms are originated from new demands of the commercial side in comparison to only 16.1 per cent accounted to the demand from the public. This point clearly emphasizes the unused potential of public demand for innovation and highlights the need for a well-organized approach for innovative public procurement (Kaiser and Kripp, 2010). In this sense, we intend to propose a new model in this paper to increase the effectiveness of public procurement as an innovation tool. But before discussing our model, it would be useful to examine the policies and cases about the subject at EU and Turkey level.

4. An overview of EU and Turkey policies about the issue

The use of public procurement as a demand-oriented engine for innovation to promote national innovation capacity is highly on the agenda of European policy-makers at recent times. In the literature, it is possible to read number of papers, inquiries, expert group reports and policy documents related to this issue.

The debate starts at EU level with European Commission's Research Investment Action Plan to raise R&D expenditure to the 3% Barcelona target. This report has been accepted as the first to take attention to procurement for innovation at EU level (European Commission, 2003; Edler and Georghiou, 2007). The issue gained more interest within Europe when three governments issued a position paper to the European Council which included a call for using public procurement across Europe to spur more innovation (French/German/UK Governments, 2004).

After that, the "Kok Report" emphasized a need to use public procurement to promote innovation, by providing lead markets for new research and innovation-intensive products (Kok et al., 2004). Subsequently, European Council endorsed the mid-term review of the Lisbon strategy and the proposal to renew their focus on public procurement of innovative products and services. (European Council, 2005). In addition, Aho Group Report (Aho et al., 2006) emphasized a need to promote policies for driving demand for innovation including public procurement. Experts have also recommended that public procurement should be used to improve the level of public services (Aho et al., 2006). In this respect, the EU Council called again for the support of markets for innovative goods and services including public procurement within the framework of Aho Group Report (European Council, 2006).

Further action at EU level (Edler et al., 2006) included a comprehensive study on public procurement activities across Europe and in selected non-EU countries that feeds into a Commission Handbook on Public Procurement for Innovation published in spring 2007 (European Commission, 2007). In September 2006, the Commission submitted a strategic innovation policy paper highlighting the importance of public procurement for innovation and the creation of lead market, especially in sectors in which the state is an important purchaser (European Commission, 2006).

Lastly, EC submitted a report in 2010 which examines, discusses the risks that public procurers encounter during the innovative procurement processes. 12 case studies have been conducted by an expert group and five types of risk were defined: technological risks, organizational and societal risks, market risks, financial risks, turbulence risks. At last, report draws recommendations for procurement personnel to overcome these risks (European Commission, 2010).

As it is seen above, there is a great interest to the debate at EU level. EU still continues to encourage examining the cases which were conducted in EU countries for taking the lessons learned. Edler and Georghiou (2007) attribute this matter to the insufficiency of traditional supply-side innovation policies to meet the challenges of competitiveness. On the other hand, despite this rising interest at EU level, the issue hasn't been on the agenda of Turkey so intensively. However using public procurement as an innovation policy tool is highly on the agenda of EU, the interest to the subject at Turkey level is not strong enough. The first attention to the issue has been taken in the document of "National Science, Technology and Innovation Strategy 2011-16", which is published in 2010. In the report, the subject has been embodied with the aim of "enhancing the public procurement system to include R&D and innovation components".

Besides that, in the final report of the 23rd meeting of "The Supreme Council for Science and Technology", it has been stated that cirrent legal regulation about public procurement is not encouraging for innovation. In addition, the Commission concluded to set up an expert group to address the needs of legislative amendments to stimulate R&D and innovation. In this respect, a study group has been established with the participation of relevant institutions and organizations and this group has proposed four legislative changes at the end of their study (TÜBİTAK, 2012). The effect of this regulation of course will be seen in the future but in addition to changing the procurement law, as Rolfstam (2009) emphasized, different kinds of coordinated activities should be done to stimulate the public procurement of innovation. In this respect, we will propose a new organizational model to increase the innovative effect of public procurement.

5. Innovative Public Procurement Model

It is not so easy to implement an innovative public procurement process for public organizations especially because of the institutional and legislation barriers. Public procurement personnel may face "lots of risks but little gains" through an innovative public procurement process. In this sense, designing a new organizational model which considers the risks and possibilities may have a great sense for enhancing the innovativeness of public procurement.



Figure 2: Standard Model of Public Procurement

There are four main steps in the standard model of public procurement process. At first step, public institution determines the quantity of needs mostly for one-year or less time period. After that, they prepare the contract which must exactly define the all characteristics of the need. Subsequently, they declare the documents in order to call the bids for the decisively defined needs. At last, a contract is resigned between public institution and the bidder who offers the lowest price for the need.



Figure 3: Innovative Public Procurement Model

Because the standard model is insufficient for stimulating the innovative public procurement, promoting a new model is necessary. In our innovative model, we only focus on the procurement of innovative products. According to our model, IPP model should be carried out through four steps:

- Forecast of 5-Year Needs: Because an innovative procurement process entails a time period, it would be better to define approximate quantity of public needs for at least 5 years. This matter provides significant data, types and quantities of public needs, for the second stage.
- Identifying the Appropriate Goods for Innovative Procurement: After defining the types and quantities of public needs totally at first stage, it would be easier to assess the favorable goods for innovative procurement. But the main aim of this stage should be assessing the deficient and unsatisfactory aspect of the needs. The public organization should only specify the functional requirements and the improvable points of the product rather than concentrating on the technical characteristics of it. In addition, concentrating on the specific sectors which the government is an important purchaser such as ICT, defense, transportation and infrastructure would be useful to identify the goods which are open to innovation
- **Tendering For Innovative Product:** The public organization should use all kinds of tools -such as newspaper, web pages and billboards- for informing the all potential suppliers. All illuminating details should be included in the announcements in order to direct suppliers truly. Suppliers, who intend to offer innovative solutions to the public needs, submit their innovative solutions and bids to the public organization within the frame of these details.
- Execution of the Bids by Experts and Contracting with the Innovator Firm: The most challenging step of this process is, in my opinion, deciding about the most appropriate bid and supplier. The bids should be examined by the experts exhaustively and if there is an appropriate supplier, the last step would be making a contract with supplier.

Of course, because the current procurement laws don't welcome this innovative model, there should be some changes in the procurement laws in order to respond the requirements of the model and make the process legal. Additionally, procurement personnel ought to receive additional education about the application of this new innovative model. Additionally, all kinds of risk analysis should be conducted to provide the effectiveness of the procurement processes. And the results and the challenges of the applications should be noted to take into consideration in subsequent applications.

6. Conclusions and Remarks

In recent years, there has been increasing concern about developing policies to use the public procurement as an innovation policy tool, especially at EU level. Public procurement deserves this interest with its significant share on the local demand. Though it is not the main aim of it, innovation effects of public procurement ought to be considered by public managers and policy makers for the purpose of creating lead markets, providing the settlement of MNEs, enhancing public services and increasing the innovation proensity of firms.

In the context of using public procurement as a demand-oriented innovation policy tool, we proposed an innovative public procurement model in this paper. This model is constituted mainly for enhancing the two dimensions of contemporary public procurement processes. First, standard public procurement process which is required by current procurement laws doesn't answer the needs of innovative public procurement processes. Public personnel may face some considerable risks when they try to apply an innovative procurement process. In this sense, changing the procurement law in accordance with our model will provide it to be stimulator of innovative procurement. Second, our model will permit to make plans for all needs of public. Because applying innovative processes individually will be hard for all public institutions, our model offers to establish a central structure which conducts innovative procurements for the aggregated needs of all public institutions. In this respect, innovative procurements will be carried out by more specialized personnel in order to plan more exhaustively and diminish the risk.

Of course, as all models do, our model may have some critical and inadequate points and it is open to progress. In this sense, new case studies which assess the shortcomings of current procurement law and our model can be conducted in order to develop more innovative model for public procurement.

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