

12. POLICY IMPLICATIONS

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1. INTRODUCTION

Our investigation and analysis of public technology procurement has demonstrated that, as argued in Chapter 1 of this book, it is a concept with salient features. These distinguish it from other types of public procurement. With this particular type of procurement, policy makers are faced with new challenges. The reasons pursuing for public technology procurement, and consequently its processes and rules, are different from those of the usual, off-the-shelf, or 'regular', public procurement. Rules and procedures for conducting the latter kind of procurement are by now well tested and internationally established. But public technology procurement, as *procurement under uncertainty*, runs the risk of failing to meet the initial milestones set for it. In particular, the chances of total failure are often much higher than the average decision maker in the public service would be willing to bear. Generally, utility managers and the public service are risk-averse. They therefore tend to disregard the likelihood of potential above-average (or even spectacular) returns, which can be realised in the form of social and economic benefits from the rapid introduction of technological change and its 'spillover' effects.

Our previous analysis (in Chapter 11) demonstrates that public technology procurement can in specific cases be an effective innovation policy tool for enhancing economic growth. Certainly, adopting a positive attitude and special procedures for public technology procurement under all circumstances and at any cost would be a mistake. But what we argue here is that it would be equally a mistake not to take advantage of this instrument. It should not be ignored simply because the behaviour of policy makers implies their lack of will to experiment with such a tool. We have, on the one hand, recognised the basic risk aversion of policy makers. On the other hand, we have identified the parameters and potential benefits of both 'ideal' and 'real' cases of public technology procurement. We now pose some key questions for policy making. These concern whether, how, and under what circumstances, one may introduce formal rules and/or incentives that would facilitate active public technology procurement policies.

2. ALTERNATIVE APPROACHES TO PUBLIC TECHNOLOGY PROCUREMENT POLICIES

Let us, for a moment, postpone making specific public policy prescriptions and, instead, consider the standpoint of policy makers. When it comes to technology procurement, specific demands or proposals reflecting genuine social needs for larger, not yet developed, systems are put forward. In this situation, policy makers seem to have three options: A) postponing procurement, B) borrowing procedures, or C) deciding under uncertainty.

- *A) Postponing procurement:* This first option is consistent with risk aversion. The policy maker *postpones the decision* for technology procurement until the private sector or other countries have undertaken the necessary research and development. Then, innovations come to the market for which the policy maker is responsible as standardised and mature, rather than innovative, products. The benefit of this approach is the absence of risk. At the same time, of course, there is an opportunity cost. However, due to the uncertainty circumstances, nobody can easily quantify this cost and thus no policy maker can readily be held accountable for it. The opportunity cost is that the introduction of technological change is delayed, allowing competitors (other countries, regions or firms) to take the lead in capturing its economic and social benefits.¹ Alternatively, the opportunity cost is that the innovation does not materialise at all.

There are, of course, no statistics on how many cases of public technology procurement have been conceived as ideas and then abandoned. Similarly, there are no figures for how many ideas could be generated if the environment were conducive. But if at world level all policy makers would act according to the 'postponement' principle, it is very likely that technological change on the world scale would be significantly slower. By this we do not mean to suggest that every public service should try to maximise its involvement in public technology procurement. On the contrary, our analysis indicates that in many cases such involvement would have a high likelihood of failure. The same logic applies in the private sector. But we argue here that involvement in public technology procurement must be a deliberate decision, rather than a non-decision based on inertia. There are many cases where the skills of the public agencies and the political environment are not favourable to public technology procurement.

- *B) Borrowing procedures:* The second option for policy makers is to treat technology procurement in the same way as their familiar practice of 'regular', off-the-shelf procurement. In that case, according to current EU legislation, processes and decisions are based on the rules of pure competition: There is an auction for a fixed anticipated price and quality. Policy makers are likely to follow this approach, which consists of borrowing rules from a fundamentally different kind of process and applying it to public technology procurement. Their propensity for doing so arises

¹ This approach is reminiscent of J. M. Keynes's comment that 'it is better to fail conventionally...'

for one or another of two reasons: Either policy makers don't recognise the specificities of public technology procurement, or, even if they do, the borrowed procedure at least protects them from sharing the responsibility for failing to meet milestones. The benefit is that the policy makers cannot be accused of favouritism, lack of transparency, or nepotism and corruption. But, again, there is an opportunity cost: Technological change will be treated as linear and predetermined, flexibility will be minimal and no 'value-added', synergetic benefits, or feedback relationships can be expected. Thus, important opportunities to enhance technological capabilities and enter the market with first mover advantages are lost. In a sense, we can argue that in this case the risk of failure is not reduced. On the contrary, it is increased, because there is no interaction to help eliminate bottlenecks. At the same time, the benefit itself is reduced, since the selection mechanism does not take innovative potential into consideration.

In the past, governments have often decided to award contracts to national companies in order to gain competitiveness benefits. Their actions have had the effect of triggering the protectionism debate without generating really beneficial forms of user-producer interaction. Instead, they have merely offered the benefit of lucrative contracts to 'national' producers. Their hope has been that this would automatically result in economic development that would ultimately benefit the country. In some cases, when the national companies selected were competent and able to learn, the experiment succeeded. In others, it failed.

Unlike the 'postponing' option, which has a sound rationale that in many cases should be followed, the 'borrowing procedures' option is, in our view, an approach to be avoided. As the protection argument is no longer valid in the EU it does not make sense to use a procedure that amplifies risks and reduces profits, unless there are serious suspicions of incapability or corruption. In the latter case the best policy is to remedy such problems.

- *C) Deciding under uncertainty*: Finally, the third option for policy makers is to make decisions based on the recognition that public technology procurement is a specific case that merits its own treatment. The right procedure in this case would be to adapt the basic principle of competition. That is, the policy maker or public agency responsible should launch an open, competitive bid, but then undertake to select the winner based on its innovative capabilities and abilities to interact, rather than on the basis of a pure price competition. The range of potential benefits in such a scenario is indicated by the accounts of successful cases of public technology procurement that are included in this volume (Part II) and analysed above (Chapter 11). However, costs encountered in this context may be considerable. They are associated with the potential inability of the public agency acting as procurer to monitor the process, and also with the discretionary freedom involved. The latter, especially, leaves open many possibilities for inefficiencies, nepotism and corruption in systems where trust and interaction are not deeply rooted.

We base the framework that follows on the above options. The framework tries to suggest how policy makers should act to facilitate the introduction of public technology

procurement and to trigger a new mentality when necessary. The baseline is that policy should be decided on the basis of knowledge and decision criteria, rather than inertia or risk aversion.

3. A FRAMEWORK FOR POLICY ORIENTATION

We now turn to the policy questions raised at the outset of this book. Our point of departure for policy orientation is that there are environments – sectors, regions and countries – where the conditions for technology procurement are favourable, whereas in others they are not favourable. These can be termed 'innovative' and 'immature' environments, respectively. In innovative environments, the general conditions for innovation policy have matured and are already present, so that concrete policy instruments for improving efficiency and effectiveness can be discussed. In immature policy environments, which are usually associated with less developed economies, technology procurement is far less likely to occur in the private sector, and there is thus an especially strong justification for public technology procurement. Government has a key role to play in creating an environment more conducive to economic growth based on innovation, but it will be constrained to introduce the concepts of innovation policy incrementally, in relation to specific demonstration projects. In public technology procurement, this means proceeding to select cases with a high likelihood of success. The concepts of timing, competence and interaction remain crucial in both types of environment.

3.1 Immature Environments

Our analysis has demonstrated that in the most successful cases the informal contacts between actors were established first, often in the context of public technology procurement directed primarily towards adaptation. It is out of those contacts that development has sometimes followed. One barrier, thus, in immature environments is that the *informal contacts are considered as inhibiting the impartiality* of the public agency acting as procurer. Therefore, they are avoided. The need to safeguard competition in a strict sense, together with the drive to avoid potential accusations of favouritism, often leads public services and agencies to view with suspicion any interaction that goes beyond formalities. Needless to say, this attitude has not always prevented corruption.

For these reasons, the first act for national and regional authorities or the lobbies of public utilities that are interested in pursuing public technology procurement in such environments is to *raise the issue*. Public technology procurement is a seldom used instrument and is therefore mostly unknown to the public. Raising the issue means, on the one hand, creating a committee to study its characteristics, inform potential actors in procurement, and set the rules. On the other hand, it means promoting an awareness campaign that would make politicians and the general public less suspicious. In other words, the first task of policy makers is to try to change informal rules, slowly but

coherently. This is the main practical difference distinguishing 'immature' from more 'innovative', environments. In the latter, the informal rules are more favourable. Established procedures and learning from experience dictate the policy priorities.

Once this double awareness-raising at the two levels of relevant actors and the general public is completed, cases with a high likelihood of success can be selected. To help them meet their targets it is important to strengthen the public agency that is to act as a procurer of new products or systems. Specifically, competencies should be developed in terms of:

- *timing*, i.e., providing agencies with the necessary legal and administrative framework to decide rapidly and flexibly; only then can they be held accountable for delays.
- *creating technical competence* inside and/or outside the procuring organisation. It is very clear from our analysis how important competence is as a basis for interaction. In many cases, depending not only on the overall level of development of the country but also on that of the specific organisation, state-of-the-art knowledge and learning abilities are limited. In those cases the potential benefits of the procurement will not be fully achieved unless the technical competence is created, early and ambitiously. This can be done either through internal measures, such as recruitment, or through the formalisation of external co-operation with competent advisers. It goes without saying that the technical advisers should not necessarily come from within the country or region. Rather, they would have to be selected on the basis of their ability to interact with both the procurer and the supplier, i.e., to play a bridging role.
- *developing organisational competencies*. Finally, technical competence is not the only need, since organisational skills are at least as important as technical ones for public technology procurement. A significant difference is that organisational skills are less specific than technical ones. Thus, if countries decide to adopt public technology procurement policies, organisational skills may be developed centrally and made available to the procurers as needed, on a case by case basis.

It may be argued that in immature environments the case for public technology procurement is not worth debating. Such objections could be based on the unduly pessimistic view that public technology procurement is simply not possible within an economy unused to innovation and a political system unfamiliar with innovation policy. Yet we have evidence from the case studies that if public technology procurement is well and timely managed, the benefits can be considerable in such contexts. Moreover, there is also theoretical argumentation concerning the creation or speeding-up of diffusion and spillovers that explains the rationale for introducing public technology procurement policies. Arguably, immature environments are those in which such policies can be most beneficial, provided that they can be introduced successfully. It is a matter of judging specific opportunities to decide whether, in an immature environment, the first initiatives taken under such policies should be as ambitious as targeting developmental procurement, or might better start with the less demanding objectives of adaptive procurement.

3.2 Innovative Environments

Innovative environments spare policy makers the full effort of awareness-raising that we have called for as an initial stage. But things are not always smooth in such environments either. Our case studies demonstrate overwhelmingly that even the most successful public technology procurements could not respect their original budgets and schedules. However, the returns on both private and social investment for the successful cases were so high that they made the exercise more than worthwhile. It follows that policy makers in innovative environments need to:

- strengthen the mechanisms that may help reduce the danger of going overboard with time and money
- realise the fact that under uncertainty one may decide for procurements which may be unable to respect initial plans. Allowing for this possibility does not ipso facto mean mismanagement or corruption.

In innovative environments it is easier to place innovation and learning processes at the centre of focus. It is also easier to accept the complex relations that support successful innovation as necessary forms of collaboration, rather than as dangers to competition. Laws, regulations and informal rules are more favourable in innovative environments, at least to the extent that they allow for the implementation of a technology procurement perspective. Thus, as indicated by the discussion of 'private technology procurement' in Chapter 1 (part 3), technology procurement based on close relationships and interactive learning among private firms is a common occurrence in innovative environments.

Yet, even in such environments, institutions are different and path dependent. Thus, each system will need to build on its own strengths. We provide no general recommendation on 'one best way' of how to organise competence or increase responsibility and accountability. Similarly, we identify no 'typical' nodes and links (i.e., kinds of intermediaries, numbers and size of players). However, it is an important task for the development and application of public technology procurement as a policy instrument to identify nodes and links that suit the national/regional system. There is, according to our analysis, a need for balance and complementarity between the competencies of 'buyers' and 'sellers'. It is also of particular importance for a given system to identify potential 'development blocks' and to respond to these perceived structures of opportunity by forming 'focal organisations'.²

Asking policy makers for such initiatives may appear to entail an element of illusion. But new situations require new policy capabilities and ultimately policy makers always work with incomplete and imperfect knowledge (Edquist et al., 1998: 17). Sometimes, however, they act deliberately. At other times, policy is made by default, i.e., by postponing or altering decisions. There is no doubt that there are also dangers associated with public technology procurement in innovative environments: Timing, from

² See the discussion of the concepts of 'development block' and 'focal organisation' in Chapter 1 of this book, sections 3.2 and 4.4. See also Chapter 11, section 3.2.

an historical perspective, assumes more and different dimensions. Life cycles become shorter, and positioning in the global market acquires an explicitly strategic character. And, last but not least, the creation of lock-in situations is also a potential danger for public technology procurement in innovative environments.

4. COMPETITION RULES, LEGAL ISSUES AND THE EU FRAMEWORK

4.1 The Interpretation of Competition

Our suggested policy measures depend on the targets of the policy and may thus differ very widely in application, according to the goals set by policy makers. For example, as we point out in our 'conclusions' to the preceding chapter (Chapter 11, part 4), the broader strategic orientation (or 'vision') guiding a particular initiative in public technology procurement can be one of the main factors determining whether the procurement will be primarily 'adaptive' or 'developmental' in character. The assumptions on which our recommendations to policy makers are made are the following:

- policy makers are interested in long-term and not only short-term growth, so that
- innovation plays a central role in their model, and
- competition is not viewed as an end in itself, but as one way to increase efficiency.

The two first assumptions can hardly be disputed theoretically. The extent to which they are not true 'in practice' is related partly to the inefficiencies of public administration. It is also related to the fact that politicians (who are not necessarily policy makers) tend to have a short term perspective, i.e., they often want to see results before the next election. But the third assumption is much more controversial. It expresses views that are not compatible with the current orthodoxy. If price competition is the only determinant of public policy, then public technology procurement is not the correct instrument to adopt. But we argue here that if quality is taken into consideration and the introduction of innovative products becomes a priority, then *too great a stress on 'perfect competition' can undermine competitiveness* (Edquist et al., 1998: 8).

There are many areas where economics identifies price competition as being a less-than-ideal tool, even an inappropriate one. In particular, this is the case when dealing with asymmetric information and adverse selection of risk. As pointed out in the earlier discussion of 'auction theory' the assumptions that standard economic theory applies to such situations do not adequately take into account the 'knowledgeability' of buyers or the need for collaborative interaction between users and producers of new products (Chapter 1, section 1.4). Arguably, rationing, rather than auctioning, works best in such circumstances (Yotopoulos, 1996).

There is often a conflict between institutions designed by policy makers and evolved 'co-operative' institutions concerning relations between buyers and sellers. The rules designed by policy-makers promote anonymous 'market' relations and 'perfect competition'. The evolved institutions reflect close co-operation between procurers and suppliers, which is a necessary element in effective technology procurement and, more

generally, in many innovation processes (Edquist et al., 1998: 7). Our analysis indicates a considerable degree of tension between the EU procurement rules and the need to accommodate informal co-operation in the form of user-producer interaction related to technical change. Our point, however, is not to suggest a reversion to protectionist policies. Rather, we warn against allowing the ghost of protectionism to undermine future-oriented policies.

4.2 The European Union's Legal Provisions

The legal system of the European Union's member states in matters of public procurement is adopted via transnational legislation.³ The essence of the framework is that contracts should be awarded after a formal tender, rather than being negotiated.⁴ There are only a few exceptions:

- Directive 93/36/EEC on the award of public supply contracts foresees in art. 6, 3b that contracting authorities may award contracts by negotiated procedure without prior publication of a tender notice when the products involved are manufactured purely for the purpose of research, experiment, study or development.⁵ Through art. 8, the directive implies that standards of some kind already exist and does not foresee a procedure for the case where standards do not yet exist.⁶

³ There are some areas in which the EU procurement rules do not apply. There is, for example, no application of the rules to items covered by Article 223.1(b) of the *Treaty of Rome* and maintained on the Commission's list of material "intended specifically for military purposes" — (although the rules do apply to procurement of dual purpose materials) (Business International Ltd., 1991: 19). Under Article 4 of Council Directive 93/36/EEC, which concerns international projects, other areas in which the rules do not apply include the following:

- (a) in pursuance of an international agreement concluded in conformity with the Treaty, between a Member State and one or more non-member countries and covering supplies intended for the joint implementation or exploitation of a project by the signatory States; all agreements shall be communicated to the Commission, which may consult the Advisory Committee for Public Contracts set up by Decision 71/306/EEC;
- (b) to undertakings in a Member State or a non-member country in pursuance of an international agreement relating to the stationing of troops;
- (c) pursuant to the particular procedure of an international organisation. (Westling, 1996: App. 5, 4)

⁴ See the discussion in Chapter 1 of this book, section 1.1. It describes three basic procedures recognised under the EU procurement regime: the open, restricted and negotiated procedures. Of these, the 'open' procedure, involving a formal, public tender, is the preferred procedure. The less common 'restricted' procedure, allowable only under certain circumstances, also involves formal tendering. In this case, though, tenders are only invited from a list of 'pre-qualified' bidders. Finally, there is the 'negotiated' procedure, which does not involve tendering but instead relies on closed negotiations. However, it is only allowed under exceptional circumstances.

⁵ This is the 'negotiated' or closed procedure referred to in note 4. It can be used only after the procuring agency has established adequate justification — e.g., following irregular tenders, or no tenders at all, in response to an open or restricted procedure, or for reasons of extreme urgency that would render the other procedures unviable. One of the main justifications for the use of the negotiated procedure refers to reasons of technical, artistic, or proprietary 'exclusivity', because of which only certain suppliers can be relied on to deliver the goods.

- Directive 93/37/EEC concerning the co-ordination of procedures for the award of public work contracts equally states that contracting authorities may award contracts by negotiated procedure without prior publication of a tender notice when the products involved are manufactured purely for the purpose of research, experiment, study or development and not to establish commercial viability or to recover research and development costs.
- Directive 93/38/EEC co-ordinating the procurement procedures of entities operating in the water, energy, transport and telecommunications sectors, i.e., the utilities primarily of interest for public technology procurement, does not foresee any similar exception.⁷

These exceptions would not apply to technology procurement as we have defined it, but to a sort of first stage of it, in which there would be insufficient cause or incentive for industry to take the necessary risks. The exceptions thus demonstrate that the legislator has been sensitised to the issue of innovation policy, but has not had either the means or the will or political possibility to go further than that.

In our view, the extent to which the present legislation allows for the introduction of public technology procurement at European Union or member state level is a matter of debate and interpretation. We suggest that if a formal tender were introduced specifying that its content refers to innovative products that have to be jointly developed, the EU level would be particularly appropriate. Suppliers from all member states

⁶Development projects, however, constitute an important exception to the rules regarding standards, which like the greater part of the EU procurement regime, have been devised for application in the public purchasing of already existing goods that are, or should be, standardised. As observed in section 5.2, under Council Directive 93/36/EEC projects of a "genuinely *innovative nature*" in which the use of existing European Standards or common technical specifications "would not be appropriate" are exempt from these rules. Nevertheless, just as in cases where a departure is made from normal (open) tendering procedures, it is necessary to record the reasons for not utilising European Standards. Paragraph 4, Article 8 of the same Directive (93/36/EEC) states:

... Contracting authorities ... shall record wherever possible the reasons for doing so in the tender notice published in the Official Journal of the European Communities or in the contract documents and in all cases shall record these reasons in their internal documentation and shall supply such information on request to Member States and to the Commission. (Westling, 1996: App. 5, 5)

Provided these conditions are met, the rules regarding standards present no hindrance to innovation. This is also the case for procurement by public utilities, which is governed by special provisions (see note 7, below).

⁷ Generally, it is accepted and anticipated in the EU procurement regime that public utilities will make wide use of the 'restricted' procedure and occasional use of the 'negotiated' procedure discussed in note 4. Public utilities operating in the water, energy, transport and telecommunications sectors have greater freedom in source selection and advertising than do public authorities. Article 20 of Council Directive 93/38/EEC states that "Contracting entities may choose any of the procedures described ... provided that a call for competition has been made" through notice, periodic indicative notice, or notice on the existence of a prequalification system (Westling, 1996: App. 5, 8). With regard to cases of innovation and departures from existing technical standards, the Utilities Directive (93/38/EEC), Article 8, Paragraph 6 states that "contracting entities may derogate" if:

(d) the relevant European specification is inappropriate for the particular application or does not take account of technical developments which have come about since its adoption ... (Westling, 1996: App 5, 5)

would be eligible to bid. There is no doubt that the prerequisite of joint development could be interpreted as favouring companies speaking the same language or being in geographical proximity. Yet this would not be as influential as innovative capabilities in many cases. Besides, the idea may be extended to include multinational co-operations covering combined needs. In such instances, consortia of European firms could respond, as is often the case in traditional or 'regular' public procurement. For communication and interaction across national borders, the EU is certainly the most appropriate level at which to introduce co-ordination and transnational consortia.

But, going beyond the legal aspects, present EU legislation merely allows interaction to take place – and then only in special cases. Under EU procurement legislation, collaboration between firms and public agencies has been only tolerated, not fostered. Implicitly, the legislation regards interaction as an aberration from 'normal' market relations. Possibilities for interactive learning have thereby been diminished. Yet, as we have shown, this type of relationship between buyers and sellers is crucial to the development of technological innovation. To remedy this problem, we suggest that a committee should be appointed to investigate possible revisions to existing EU procurement rules (Edquist et al., 1998: 8).

The restructuring process and the transition from old to new knowledge-based industries have experienced many difficulties in Europe. Innovative thinking in policy making is now required, if the EU, its member states, and their respective economies are to adapt better than in the past. Public technology procurement is one area in which a strong case can be made for this kind of policy innovation. To trigger the change at EU, rather than national, level would be both logical and appropriate, since innovation policy has been higher on the EU's agenda than in most of the member states.

5. CONCLUDING REMARKS: TOWARDS NEW LEGISLATION OR NEW INFORMAL RULES?

There is no doubt that what we call public technology procurement exists and that its practice will continue. More opportunities of this kind may occur in the near future, as technologies become more complex and systems more integrated. There is also little doubt that this type of procurement has attracted little attention because it is associated with uncertainties and risks. In this volume, we have tried to redress that problem, replacing neglect with critical attention.

Our main recommendation is that policy makers should take public technology procurement into serious reconsideration. This means analysing the ways in which this policy instrument could be used as a leverage for the development of new technological advantages. It also means taking account of the reasons why such options should – or should not – be exercised. This should be done on a case by case basis, depending on the features of the national innovation systems and the specificities of particular projects. Policy makers need, at least, to have an explicit policy based on good knowledge of the issues pertaining to public technology procurement – even though, in many cases, they may end up by not using it. In some respects, it may be necessary to adapt

or change the formal legal framework, as suggested above. But the most important consideration is to try to introduce new informal rules. Even in countries where legislation still permits protectionism, there is still widespread suspicion towards interaction and the formation of 'development pairs' between public agencies and private firms. This indicates that a very basic misunderstanding of public technology procurement, expressed as the fear of potential abuse of 'privilege', remains prevalent in public opinion and in the political arena.

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