

USING PRE-COMMERCIAL PROCUREMENT AS A DRIVER OF INNOVATION FOR THE REGIONAL PUBLIC SECTOR: THE CASE OF GREECE

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This article studies pre-commercial procurement (PCP) as a driver of innovation for public bodies and provides policy recommendations for the effective proliferation of PCP in Greece. Two main research methods were employed in this study. First an in-depth literature review focused on pre-commercial procurement and the relevant to it EU policy developments. Second fieldwork research based on semi-structured interviews with key stakeholders in a Greek region, namely West Macedonia, was undertaken to identify regional responses on PCP and assess the overall state of progress of the region and Greece in relation to the rest of the EU. The literature review reported a significant impact of PCP on the mid- to long- term efficiency of public services as well as on the innovation performance and competitiveness at regional level. The empirical findings of West Macedonia point to a more limited influence of increased awareness. Further uptake of PCP can be facilitated through an overhaul of oppositional institutional structures and targeted interventions of EU funds. The empirical part rests on the single case study of West Macedonia however the findings are generalisable to a regional level. Practical implications of PCP processes include assisting Greek regions deliver innovative public services, and induce structural adjustments to secure growth and jobs. This article is the first to report on preparedness for PCP in Greece and provide policy recommendations for integrating PCP in regional innovation policy-making.

Keywords

Greece, Innovation policy, Pre-commercial procurement, Regional public procurement

1. Introduction

Public bodies in the EU face important societal and financial challenges. There is a requirement for the regional public sector to exploit its budget, to impel innovation and growth in order to provide innovative public services. Public sector's needs require technologically demanding improvements that are either not available on the market, or existing solutions exhibit shortcomings which require new R&D. By looking for procurement strategies that address these challenges, the public sector can have a significant impact on the mid- to long-term efficiency of public services as well as on the innovation performance and competitiveness at regional level. The combined need to enact effective remedies for current societal challenges and secure an innovative competitiveness lead for the future has forced Western and EU governments to rethink their innovation policy mix. Demand-side instruments at the disposal of policy-makers comprise (i) systemic policies, (ii) regulation, (iii) public procurement, (iv) stimulation of private demand (1). Other scholars add university

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knowledge spillover, and R&D subsidies to the instruments available (5) but there is a wider consensus about public procurement and regulation being demand-side instruments.

This paper examines pre-commercial procurement, a particular form of public procurement for R&D services. It describes how the concept is defined in the academic and policy literature and gives particular emphasis on the approach put forward by the European Commission. In addition, it presents the benefits of PCP for the state sector, firms as well society and delineates pitfalls to avoid along the way of its implementation. The methodology of a case study in the Greek region of West Macedonia is discussed, followed by the empirical findings from the region in the context of wide-ranging procurement reforms under the EU-IMF-ECB adjustment programme. Finally, the article provides a number of policy recommendations for the successful participation of Greek public entities in PCP schemes.

2. Literature review on PCP

Economic rationales based on market and system failures stress that supply-side innovation policy is, on its own, insufficient to serve policy objectives (1). □any instruments affect innovation. The scale and characteristics of demand in a location are a determinant of competitiveness and innovation dynamics (2). The existence of a large group of innovative actors and enabling framework for learning-oriented interactions are central aspects from an innovation systems perspective. The need to optimise the interaction of the system components and demand and create innovation-friendly framework conditions are essential determinants of the success of innovation systems. Regulation, standards and the concept of promoting lead markets, which can be served through public procurement, are indispensable ingredients of demand side innovation policies (1).

Numerous studies have shown the comparative merits of public procurement. It has been suggested that public procurement provides a greater stimulus for innovation than R&D subsidies (3). An analysis of the quantitative and qualitative meaning of state demand concluded that procurement policy *'is a far more efficient instrument to use in stimulating innovation than any wide range of frequently used R&D subsidies'*(3). In addition, a comparison of R&D subsidies and state procurement contracts without direct R&D procurement has shown that in the long run state procurement prompted greater innovation tendencies in more areas than R&D subsidies (4). Research attests that the major positive effects of public procurement on innovation success may depend on firm characteristics. Research on German firms found heterogeneous effects of public procurement on firms' innovative performance, Public procurement was more effective in smaller firms, in regional areas under economic stress and in distributive or technological services (5).

Some critical views on the role of public procurement as a policy instrument that can be used to stimulate innovation have also been expressed. Public procurement has been portrayed as the least important factor for the origin of innovations (6). Moreover, despite emphasis on the demand-side in the literature, reception of such approaches has not been equally popular with policy-makers and some policies appear to be serving contradictory goals. For instance, the introduction of stricter competition rules in the EU has been considered a major factor behind the declining use of public procurement for innovation (1). Scholars recognise other risks associated with R&D procurement such as the risk of idiosyncratic demand for R&D products, the risk of R&D failure and the under-researched role of public procurement as a tool to enhance innovation and make firms more successful (5).

Although criticism exists, public procurement remains 'the cornerstone of a coordinated and technology or sector-specific mix of policies' (1). As a public policy tool procurement is used (i) to provide and enhance the supply of public services and (ii) to serve political goals by

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stimulating demand (5). The use of innovations by the government sends positive messages to the private sector and facilitates the dissemination of innovations. Interaction between demand and supply has crucial implications for innovation dynamics. A main task for systemic innovation policy is the opening of a discourse involving, users, consumers and others affected by innovation (1). An alternative approach draws parallels between public procurement for innovation and the older concept of public technology procurement, and locates the rationale in the generic need to satisfy human needs and solve societal problems but also meet needs of public agencies themselves; it stresses that Public Procurement for Innovation (PPI) can address aspects of greater societal challenges (7). Procurement is categorised in antithetical poles as (i) general versus strategic, (ii) direct versus catalytic and (iii) commercial versus pre-commercial, without the antithetical couples being exactly watertight (1). General procurement is carried out by centralised procurement bodies with recent trends showing some form of 'mainstreaming' of innovation (at least in the UK). On the other hand, strategic procurement is focusing more on sectoral concerns and catalytic procurement, with an aim to establish lead markets, is an approach pioneered in Sweden which comprises awareness raising measures, organised discourse between users and the state but sees the purchased innovations ultimately used exclusively by the private end user.

Beyond the instrumentalised view of procurement as a vehicle of innovation, public procurement in the EU is a subject of sheer economic importance. Public procurement accounted for almost 20% of EU-27 GDP in 2010 (8). However, the lack of R&D procurement contributes to a sizeable amount of the EU's R&D gap with the USA. The situation has prompted EU member states to consider a more proactive procurement policy for innovation both at the national and EU level. Some member states have followed a more structured approach and in general the EU has also moved towards a more structured position on innovation procurement. The UK was an early starter in terms of innovation procurement with a government report stressing the increasing research and innovation impact of public procurement as early as 2003 and the NHS and DEFRA procurement being prominent operative-level cases. Likewise Ireland and Spain have made similar moves while Germany followed a more cautious approach by examining the prospect of encouraging innovation dynamics from the marketplace through general strategic procurement (1).

At the EU level, in 2004 a common report from French, German and UK governments supported the use of procurement to stimulate innovation. The subsequent 'Kok report' again saw procurement as a vehicle to 'pioneer markets for new research and innovation-intensive products'(9). The 2005 European Council focused on growth and jobs and prompted member states to reaffirm their attention to the procurement of innovative products and services. The European Commission assigned an expert group to study issues of procurement and innovation (10) and issued a research investment action plan to meet the target of 3% R&D expenditure. Subsequent action involved the dissemination of information to public buyers and 'initiative to set procurement in the broader context of policy mixes thereby exploiting synergies with other research and innovation policy measures'(1). Aho *et al*/ built up a momentum for the use of procurement for innovation that showed the limits of the R&D-driven strategy and recommended using public procurement to boost demand for innovative goods and explore further opportunities of using procurement for innovation and growth in new lead markets (11, 12). The report focused precisely on (i) creation of innovation-friendly markets, (ii) strengthening R&D resources, (iii) increasing structural mobility, (iv) fostering a culture that celebrates innovation. Seven key sectors for intervention were identified: e-Health, Pharmaceuticals, Energy, Environment, Transport and Logistics, Security, and Digital Content. The 2006 Finnish presidency of the Council emphasised demand as a driver for innovation and examined horizontal measures to stimulate the first. More concrete developments were triggered at that juncture as the EU initiated studies on public procurement and the European Commission issued a policy paper that underlined the

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importance of public procurement for innovation and the creation of lead markets especially in fields of significant government purchasing.

The initial work on PCP was undertaken by an independent expert group assisting the ad hoc national IST directors forum working group which gathered information of underutilisation of R&D in Europe (13). The idea discussed at EU level was modelled on US approaches that have been implemented for many years by US multi-stage and multi-competitor R&D programmes in defence, energy, transport, and Small Business Innovation Research (SBIR) (1). In December 2007 the European Commission issued a communication and working paper on pre-commercial procurement which outlined the barriers to PCP and included an example of PCP procedure. Following policy dialogue with other EU bodies the first calls for EU projects raising awareness for PCP were published in the end of 2008 (14). A 2008 study for the Commission on the opportunities for public technology procurement in ICT including PCP showed how PCP had been underutilised in the EU for sharing IPR with suppliers and the development of parallel solutions (11).

2.1. Defining Pre-Commercial Procurement

PCP is the phase of procurement that concerns the R&D phase before commercialisation. Its scope is limited to R&D services only, while risks and benefits are shared at market conditions between public authorities and industry. PCP can involve the designing, prototyping and testing of new products. It is a competitive process designed to exclude state aid (15). However, the official definition given by the European Commission differs from the process followed in practice by the EU. It is noted that PCP schemes cover phase 1 to 3 of the innovation cycle from solution exploration definition to the production of test series and field-testing just before the commercial stage (16).

However, doubts have been expressed about the demand-side nature of PCP. One of these accounts distinguishes PPI from PCP and considers the latter not a demand-side innovation instrument but a supply-side R&D contract and suggests that the older term pre-competitive procurement should be preferred to describe the phenomenon (7, 17). Nevertheless the discussion at the EU level seems settled around the premises that PCP is a mutual learning process for procurers, users and suppliers, both about the functional needs on the demand-side and capabilities and limitations of new technological development on the supply side (16, 18). The EU also stresses the complementarity of PPI and PCP while for the OECD PCP seems to be crucially a demand-side innovation policy instrument (14,19).

2.2. Features of PCP

Particular advantages of PCP for the procurer are the freedom of selection and definition of the desired R&D services and the interaction with the suppliers. This relates the justification for PCP, as R&D-intensive procurement requires more intensive interaction and cannot be concluded on the basis of written specifications and proposals. Competition rules are satisfied when at least two competitors enter the field-test stage. An additional advantage of PCP is that innovation risk at procurement is reduced since it takes place more upstream from the procurement. The innovation risk of PCP can be reduced through the parallel award of multiple R&D contracts and the gradual verification of the optimal solutions based on interim evaluations and selections (20). Innovative solutions have the potential to enhance the quality of public services delivery in IT-related fields such as e-Government, e-Health and e-Education. Besides the supplier gains a boost in public reliability from large orders by reliable public authorities (5). PCP as a form of procurement offers a number of benefits to the market. It can stimulate local demand which is a key determinant for the competitive

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advantage (2); and through the promotion of lead users it establishes lead markets (21); and it is an effective means of targeting market and system failures (1). Experts suggest that national governments in Europe should exploit every opportunity to share risks and benefits of promoting novel services with the providers, as 'a European dimension on pre-commercial procurement would build critical mass on the demand side, stimulate competition and exploit economies of scale and scope for the benefit of innovative services' (22).

PCP itself constitutes an additional challenge for procuring government bodies. Agencies procuring innovations may face public obstruction when suppliers from abroad win the contract and when novel technologies do not provide immediate returns. The administrative cost of engaging in PCP schemes, co-ordinating the large number of stakeholders involved, overseeing and monitoring overly technical PCP stages is also a potential disincentive for procuring agencies. Organisational change and learning is a prerequisite for involvement with novel processes. In leading PCP countries these issues have been addressed through embedding inter-ministerial coordination in the procurement process and a cultural approach of systematic orientation towards innovation, which is served through the bundling of competences. In the current climate of economic downturn enterprises and lending institutions remain highly risk-averse and the implementation of financial adjustment programmes has not been spearheaded by emphasis on innovative procurement.

Furthermore market failures due to information asymmetries and system failures due to poor interaction explain why the successful execution of PCP schemes relies on seamless inter-departmental coordination. However the tools employed for increasing guidance and awareness during early encounters with PCP processes cannot indicate the trends of future performance. A key is to define early on which markets and technologies to tackle and use foresight strategies between procurers and users (1). The conventional wisdom of lowest initial cost rationale for most economically advantageous tender (MEAT) does not lend itself to the inducement of innovation and tenders should be defined based on functionality rather than design and tender submissions assessed according to life-cycle costs.

Based on the CORDIS data EU member states are grouped in three categories with regard to the diffusion of PCP processes: (i) frontrunners, (ii) followers and (iii) laggards. The *first category* comprises EU innovation leaders such as the UK and the Netherlands, Nordic countries and other major European states (Germany, France, Italy). Partners for the four PCP projects co-financed by the EU through FP7 (CHARM, SMART@FIRE, V-CON and SILVER) are drawn from the same pool of countries. The *second group* consists of countries that are working on the framework of PCP or are preparing pilots. A common characteristic (except Ireland) is that their GNI is less than 90% of the community average and are eligible for Cohesion fund support. Hungary stands out here as it is the first of the 2004 EU Enlargement countries to investigate the feasibility of incorporating PCP in the Észak-Alföld Regional Operational Programme and prepares to launch a PCP pilot. *Lastly* eleven countries still in an awareness raising phase form a sizable group with representatives mainly from the South and Eastern Europe, which find themselves in a less favourable economic position characterised by structural and cultural barriers to innovation and PCP in particular. On the basis of the innovation decision process (23) the last group of countries are in a knowledge or persuasion stage, the intermediate group is in a decision stage and the first group in an implementation or confirmation stage. However it should be noted that the adopters groups are not internally homogeneous especially with respect to different sectors and that the categorisation constitutes ideal type construction.

The European Commission has followed a proactive stance with regard to PCP and co-finances the creation of cross-border procurer public networks at 100% through the 7th Framework Programme for Research (FP7) and the Competitiveness and Innovation Programme (CIP) (24). The first calls for proposals on networking for PCP opened in 2009 and in the 2011-12 work programme for ICT, EU supported joint PCP proposals; and there

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are ongoing calls promoting PCP. Furthermore EU regions can apply for structural funds support for PCPs(24). The Commission’s proposal for Horizon 2020 introduces PCP in all areas of research and innovation (25). EU support groups of procuring entities from the member states and EU funding bodies can engage in PCP with groups or individual member states. Lastly, the new EU public procurement directives for government authorities and utilities currently under legislative process maintain the exemptions for R&D services which form the legal basis for PCP as was also the case with the defence procurement directive which was revised in 2009 (26).

3. The methodological approach

Two main research methods were employed in this study. First desk research undertaken from September 2012 to January 2013 focused on a thorough literature on pre-commercial procurement and global best practices. Second, taking into account the desk research results fieldwork was carried out for the case study of West Macedonia. In West Macedonia twenty semi-structured interviews with key stakeholders were conducted in November 2012 broadly based on pre-identified themes and concepts which were developed by the Andalusian Institute of Technology in the framework of IKTIMED phase 3.3. Purposive and availability sampling was used to select (i) procurement departments of organisations covered by public law, (ii) local businesses –suppliers and (iii) research institutes consultancies and RDAs. The responding institutions are listed in Table 1. The fieldwork study provided empirical evidence on the status of implementation of innovative pre-commercial procurement measures at the regional level in the case study. A qualitative data analysis approach was followed both for fieldwork interview material, notes and documentary resources. Methodological constraints encountered were the self-reported and subjective assessments. Scarce previous research containing outputs on Greece makes triangulation of empirical findings more difficult as for example a very rare EU survey on PCP received only partial replies from Greece (27). To resolve the issue, detailed definitions and examples were used to increase response accuracy as suggested in the literature (5). Future research may face difficulties in measuring outputs of innovation activities for PCP.

Table 1 Respondents of the West Macedonia case study.

Procuring entities (7)	Local businesses - contractors (7)	Research institutes, consultancies & RDAs (6)
-Region of West Macedonia -Kozani municipality -Eordaia municipality -Municipal Water and Sewerage Utility of Kozani -Municipal District Heating Company of Ptolemaida -University of West Macedonia career service; research committee	-Public Power Corporation (PPC) -Mpetokat S.A. -DIADYMA S.A. -AT Brushes -Polydynamiki construction company -Kountis mechanical engineering and construction company - Georgiades electromechanical company	-ANKO S.A. -MELLON Ltd -TRC -Institute for Solid Fuels Technology and Applications -Balkan Business Centre of West Macedonia -Arailopoulos consultancy

4. The case for PCP in West Macedonia in the context of national governance challenges and sluggish regional innovation

The speed of PCP adoption in Greece is negatively affected by the country’s overall macro-economic and governance condition. Under the ongoing programme of macro-structural and

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financial stabilisation, Greece has pledged to overhaul its public procurement structures and systems and downsize its procurement spending. The existing procurement market is unfavorable to the use of procurement to trigger innovation, and can benefit greatly from tightened controls, accountability checks and more transparency. Reforms comprise e-procurement and centralised procurement as well as initiatives to promote green procurement. Progress in these fields can provide solid ground for the subsequent development of PCP initiatives as instruments developed in one field can lead to positive innovation spillovers in other domains (28). It is remarkable that 'there is enormous scope for Greece to enhance the efficiency of its public procurement markets'(29). The size of the Greek procurement market is small relative to OECD average, slightly less than 11% of the Greek GDP per annum is spent on the acquisition of goods, services and works (8). The efficiency of (above threshold) public procurements in Greece is also one of the lowest among the OECD countries: a procedure for award of public contract lasts on average 230 days, more than twice the EU average, and involves the investment of 60 person days -40 for the firm and 20 for tendering companies-(30). The European Commission and IMF attribute this underperformance in procurement to some structural conditions: (i)extremely complex and gold-plated legislation, (ii)overlapping competences between different government ministries and agencies, (iii)insufficient control of procedures by management authorities, (iv)excessive exposure to litigation, (v)tenders which frequently do not result in contract award without clear justification (29, 30) (vi)payment arrears of public sector bills and tax refunds inflate procurement costs and damage corporate sector liquidity (31).

The painful process of fiscal and structural adjustment in Greece may prove a mixed blessing. If the necessary political will and steering both from the EU and the Greek authorities are sustained throughout the implementation phase of the new public procurement architecture in Greece, heavy investment and technical support can pay off. Substantial benefits include increased transparency and supervision of public purchasing, lower expenditure and better procurement outcomes, and better operating conditions for business as simplified legislation will make procurement faster and more transparent and reduce the administrative burden (32). The end result of a highly reliable public procurement system utilising e-procurement and IT tools to enhance needs awareness and risk assessment will also create an appropriate institutional environment for mobilising procurement resources strategically, showing aptitude to engage in and coordinate pre-commercial procurement schemes.

West Macedonia is a landlocked, border region of Greece in the North-West of the country. In economical and employment terms it has been traditionally based on energy generation. Lignite coal extracted from fields in the region fuels locally located power plants of the Public Power Corporation, the production of which accounts for half of the country's energy output (33). Environmental and health externalities are the other side of the coin while regional market needs, dominated as they are by the energy sector, have not encouraged dynamism in terms of R&D and innovation. In fact from 2000 to 2008 gross domestic expenditure on research and development (GERD) was only 0.2% of the regional GDP and business enterprise expenditure on research and development (BERD) stood at a negligible level of 0.03% (34). This is an outlier even by the already low Greek standards of a GERD stagnating around 0.60% of GDP until 2011 (35). Institutions established in the region (University of West Macedonia, Technological Education Institute, etc) constitute an attempt to recover some of the lost ground in research, development, technology and innovation (RDTI). The bulk of regional RDTI activities focuses on energy production, clean energy, greener solutions and biofuels (33, 34). Nonetheless, the economic crisis resulted in rapid decline in the already low private R&D investment in the region leaving as a main source of funding the 2007-2013 ROP although only 1.2. of the 12.2 million euros earmarked for RDTI had been absorbed until the end of March 2012 (9.8% absorption rate) (34). Given that the

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OECD forecasts a decline in R&D spending in Greece and considers the EU structural funds as the only reliable source of funding (35), the increase in EU co-financing to 95% for the Greek 2007-13 programme and the proposed halving of EU Cohesion policy envelope for Greece in 2014-20 can only result in shrunken regional R&D spending.

The responses to the fieldwork questions were quite differentiated among the three groups of respondents. First, the responses revealed limited general awareness of PCP processes at the regional level. All of the public entities' responses were in line with the EU definition of PCP as a service-only form of procurement. However more than a half of the business contractors and research and consultancy interviewees stated that PCP finds application in works or supplies, which is in stark contrast with the EU definition of PCP. Second, the interviews showed that a top-down approach to public procurement is predominant in the region. The public entities interviewed confirmed the limited familiarisation with ICT tools, and the non-existent networks of suppliers and procurers as well as organised discourse. With the exception of one business contractor, there was lack of interest in PCP processes across the board. Furthermore procurement needs were overwhelmingly covered by existing market solutions and although the vast majority of respondents reported themselves to be aware about innovation, there was no relevant strategic framework in the public entities examined. Lastly, almost all public entities cited bureaucratic and regulatory risks and time delays as major obstacles to PCP while the business and consultancy sectors stressed more financial mitigation risks and the lack of expertise.

5. Discussion and Conclusion

The findings from the case study of West Macedonia show limited awareness about PCP processes at the sub-national level in Greece. However this is mostly confined to public entities as among business suppliers and consultancy service providers, there seems to be lack of understanding of what constitutes a PCP process in EU terms. The empirical results show that regional public entities generally follow a top-down approach to procurement, networks of suppliers and procurers are nonexistent as is organised discourse. The needs of the public sector are wholly covered by existing market solutions and are not being instrumentalised to assist demand-side innovation. Capacity deficiencies exhibited at the subnational level can be associated with the limited resources available during a severe depression (evident in public service cuts, financial institutions and firm deleveraging) but may also be attributed to more structural aspects. Technical incapacity characterises the inability of sub-national bodies to engage in, monitor and coordinate procurement procedures involving high numbers of suppliers because of lack expertise in workload management and familiarisation with IT and e-procurement tools (traditional channels of communication). Furthermore cultural aspects of incapacity are also evident from the case study. The public entities examined were the least inclined to innovate of all groups and this lack of innovation culture can be a long-term obstacle to the implementation of demand-side instruments. The legalistic-bureaucratic culture poses emphasis on public services delivery as a quasi-judicial activity enshrined in law, therefore the adoption of processes such as PCP which are based on exemptions from EU law lies outwith standard procedures.

In Greece, the absence of demand-side innovation policies from the innovation agenda is not only a characteristic of the sub-national level but also of central government policy. At the regional level only one lead market initiative has been reported in Western Greece (28). As the policy literature review showed, the fragmented Greek public procurement market makes it difficult to stimulate demand for innovative products'(28). The new 'policy mix' adopted under the fiscal austerity programme is tackling structural barriers through centralisation, framework agreements, e-procurement, rationalisation of expenditure and

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capacity building. The challenge is for policy-makers in Greece to bolster PCP through the reform process. PCP is an effective mechanism of risk mitigation for SMEs and could be some solution of chronic problems of R&D underinvestment by Greek firms. PCP can be embedded in the new public philosophy, introduce innovation-oriented public procurement and improve the macro-economic attractiveness of the country to foreign investment (18).

Given Greece's lagging initial conditions, support from the EU level is crucial for the success of any attempt of demand-side innovation let alone PCP. Co-opting public procurement into the innovation policy without sufficient backing and follow-up can be counter-productive and a prerequisite for a successful policy are incentives, skills and capacity to 'allow public purchasers to make strategic decisions on a case-by-case basis that will also stimulate (or at least not hamper) innovation'(36). In this regard a feasible recommendation for taking PCP forward in Greece is to encourage the country's participation in joint schemes at EU level as the barriers to PCP in Greece are similar to those in the rest of the EU, albeit more protracted e.g. low risk procurement, lack of capabilities for complex procurement, unease with legislation, limited use of multiple suppliers (11). This will dispel fears that a North-South divide in innovation terms in Europe is perpetuated even through FP7. It is of critical importance to use every possible financial leveraging means at EU level for instance through the setting up of funds to assume risks or the establishment of special agencies in line with OECD recommendations (19). The European Commission proposals for Horizon 2020 incorporates this through the provision for an EU debt facility, but the Greek participation in EU PCP schemes requires concerted effort and a specific division of labour of EU institutions. In that case the future Structural Funds programmes may undertake intensive capacity building by emphasising the establishment of a stable regulatory and institutional framework, encouraging innovative procurement through learning by doing, and assisting in the mapping out of procurement needs and risks for Greek public entities.

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