



# Innovation and public procurement: Terminology, concepts, and applications



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## ABSTRACT

The growing awareness of public procurement as an innovation policy tool has recently sparked the interest of both policy makers and researchers. While an increasing number of studies is being published every year, an overview of the field is missing. Researchers, practitioners, and policy makers are often using ambiguous wording and have not yet reached consensus on the terminology and concepts involved. This state of affairs leads to research fragmentation and lack of knowledge convergence. For the purpose of contributing to knowledge synthesis and consolidation, this article provides a structured review of the literature on innovation in public procurement. From categorizing publications based on innovation drivers, concepts, and research approaches, the emerging structure of the field is described and synthesized into a framework of innovation in public procurement. The proposed framework differentiates between literature streams on (1) innovations in the public procurement process, (2) innovation of public services by means of procurement, and (3) the use of public procurement as a tool for demand-side innovation policy-making. For each of these streams of literature, different focus areas as well as research gaps and opportunities for future research are identified. Based on analysis of existing research, the proposed framework provides an overview of state-of-the-art knowledge, a unified terminology, and a holistic understanding of innovation in public procurement. The framework is both a point of departure for future research and a source of knowledge for practitioners.

## 1. Introduction

Procurement of products and services by public institutions—public procurement—is recognized as a major market force. OECD member states spend on average 13 per cent of their GDP on public procurement, accounting on average for 29 per cent of total government expenditures (OECD, 2015). In most countries, (government) regulations are in place to ensure that this money is spent "with high standards of conduct" (OECD, 2015, p. 136). This has led to the prevailing notion of "efficiency in procurement [...] as a way to obtain the desired goods or services at the lowest price" (European Commission, 2015).

Aside from the primary purpose of public procurement to fulfill the needs and demands of the public administration, policy makers show an increasing interest in utilizing the massive buying power of the public sector as a tool to support secondary goals and policy initiatives, e.g. green and sustainable procurement, support for small- and medium sized enterprises (SMEs), and innovation. More than 90% of OECD member states have initiated policies or strategies pursuing such initiatives, though reports on the results are missing (OECD, 2015, p. 138). In this article, the focus lies on innovation initiatives within

public procurement.

Balancing the efficiency and cost-effectiveness on the one hand and innovation on the other hand often leads to situations of conflict. Moreover, regulations and control mechanisms in public procurement limit buyers' freedom of action. While private sector investments in innovation sometimes follow "trial-and-error" patterns, public spending is often subject to rigid rules and a demand for traceability and accountability, which pose major challenges for policy makers who want to invest in innovation.

In recent years, the academic community has shown an increasing interest in the topic (Rolfstam, 2012a). Research on innovation in public procurement constitutes an emergent, practice-oriented and inherently interdisciplinary field. Thus, current research is scattered across different reference disciplines, which calls for knowledge synthesis and consolidation.

In addition to traditional supply-side measures such as research funding and technology transfer, previous research has focused on public procurement as a demand-side tool for fostering innovation in the market place. Public procurement as part of the innovation policy mix (i.e. the set of laws, policies, and regulations designed to foster

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innovation), often referred to as "public technology procurement", has been the subject of in-depth investigations (see, e.g., Edquist et al., 2000; Edquist and Zabala-Iturriagoitia, 2012, 2014). However, researchers have pointed to limitations in the way innovation effects are conceptualized and measured, which focus too much on "celebrated examples such as the internet and semiconductors" and do not provide insights into innovation with regard to common goods and services. The full potential of innovation in public procurement is therefore not disclosed (Uyarra and Flanagan, 2010).

Following this argument, this study provides a structured review of the academic literature on innovation in public procurement, guided by the following three research questions:

- What is the current academic body of knowledge on the role of innovation in public procurement? [Review]
- How can existing research on innovation in public procurement be synthesized? [Synthesis]
- What are the limitations of current research and promising avenues for future investigation? [Directions]

This article contributes to extant research in two ways. First, by analyzing existing literature, three separate streams of research that lack integration are identified. In addition to the mainstream debate on public procurement as a demand-side tool in the innovation policy mix, two related literature streams are discussed: the use of procurement for public service innovation, and innovative methods and procedures for public procurement, such as pre-commercial procurement (PCP) and public-private partnerships (PPP). Based on a discussion of similarities and differences across these research streams, the article reveals gaps in state-of-the-art knowledge and proposes avenues for future research, adding to those mentioned in (Uyarra and Flanagan, 2010). Second, a synthesized conceptualization of innovation in public procurement is proposed, including a common terminology and definitions of key concepts. Based on an analysis of state-of-the-art knowledge, the study discusses strengths and weaknesses of the current academic discourse, i.e. knowledge gaps, and carves out potential avenues for future research.

The remainder of the article is structured as follows. Section 2 describes the research methodology, detailing the literature search and analysis process. Section 3 provides an overview of extant literature and a descriptive analysis of the current body of knowledge. Section 4 contains a comparative, concept-based discussion of the literature streams identified, which focuses on synthesis of prior research, theoretical foundations, and conceptualizations of innovation. In Section 5, the consolidated findings of the study are presented and used to discuss ongoing developments as well as implications for future research. Finally, Section 6 concludes the paper by summarizing the key contributions.

## 2. Methodology

For the purpose of searching the literature, the Web of Science (WoS) and Scopus citation databases were used. Combining the two databases facilitates an in-depth review of the literature by ensuring broad thematic and geographic coverage. The two databases complement each other by spanning multiple subject areas (e.g. natural and social sciences) and including publications from 1869 to 2015.

Preceding a systematic search for literature, browsing through highly cited papers for commonly used terms and concepts helped to avoid limiting the search to contemporary buzzwords and ignoring the historical legacy of the field. In addition, discussions among the authors strengthened intercoder reliability by sharpening the focus on relevant aspects of innovation in public procurement by distinguishing between two areas of concern: procurement of innovation (i.e. innovative public procurement to modernize public services) and procurement for innovation (e.g. public procurement as an innovation policy tool). Later, a

third area was added - innovative public procurement (i.e. innovation of public procurement processes) - but initially not included for fear of broadening the scope too much by including publications describing any kind of change to public procurement processes.

### 2.1. Literature search

The literature search process followed nine steps.

**First**, a search for literature in Scopus using the following search string was conducted:

TITLE-ABS-KEY("procurement of innovation\*" OR "procurement for innovation\*" OR ppi OR ptp OR "public technology procurement" OR pcp OR "pre-commercial procurement" OR spp OR "sustainable public procurement") AND DOCTYPE(ar OR cp)

The search was limited to peer-reviewed academic contributions, including journal articles and conference papers (henceforth articles for short). While this limitation reduces the extent of the review, it enforces a focus on high quality publications within the field. This search yielded 44,442 documents.

**Second**, all abbreviations, i.e. "ppi", "ptp", "pcp", and "spp", were removed from the search string, since they yielded non-relevant articles within, for example, the field of medicine. The modified search returned 28 documents. 21 articles were selected for further study. The relevance of some articles could not be determined based solely on the title, which required a reading of the abstracts. Articles dealing with sustainable procurement were discarded due to their lack of innovation focus.

**Third**, the same search (step 2) was performed in WoS, resulting in 18 documents. However, due to overlap in search results across citation databases, no additional articles were added to the pool of relevant literature.

**Fourth**, the search was expanded to include additional publications on "innovative procurement" and "innovation procurement" while excluding articles from the initial search (step 2). Applying the updated search string in Scopus yielded another 51 documents—23 of which were selected for further study.

**Fifth**, repeating the same search in WoS resulted in 16 new documents—6 of which were selected for further study.

**Sixth**, having read the abstracts of the identified articles, a decision was made to include publications focusing on public-private partnership as an innovation driver in procurement. This search did not, however, provide any new articles.

**Seventh**, based on an in-depth discussion of selection criteria, articles dealing with innovative procurement concepts and methods were included, reversing the previous decision to discard articles focusing on innovation in procuring non-innovative products and services. Consequently, all previously discarded articles were evaluated again. This resulted in 11 articles being selected for further study.

**Eighth**, back- and forward searches were performed based on the previously identified articles. As a result, five articles were added to the pool of literature to be reviewed.

Fig. 1 provides an illustration of the literature search process.

The decision to include or exclude an article was made collaboratively following a process of "check coding" (Miles and Huberman, 1994), which brought clarity with regard to the selection criteria and strengthened the reliability of the coding process. It was, however, necessary to discuss the relevance of selected articles, for example articles focusing on public-private partnerships. These articles were only included to the extent that the partnerships were innovative in nature. Articles dealing with procurement in general rather than procurement of innovations were discarded. The degree of inter-reviewer reliability was measured using Cohen's kappa ( $\kappa$ ) (Spitzer et al., 1967), resulting in  $\kappa = 0,94$ , which indicates a high degree of agreement among the authors. Cohen's kappa was calculated as follows:

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