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Public–private partnerships and beyond: Potential for innovation and sustainable development

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In recent years, public–private partnerships (PPPs) have become widespread for the creation of public–private investments in various sectors, ranging from construction to transport infrastructure and culture (Grimsey and Lewis, 2007; Hodge et al., 2010; Kort et al., 2016; Reeves, 2013; Regan et al., 2011; Roberts and Siemiatycki, 2015; Siemiatycki, 2015). In many countries, their use has been encouraged in order to facilitate the growth of innovation and development processes in times of crisis and public budget constraints (Roumboutsos and Saussier, 2014). In Europe, for example, a recent EU directive concludes a path of reform started in the first half of the 2000s, which had simplified the regulatory framework imposed upon the procurement of public works (Directive 2014/24/EU). In addition, with the Smart Specialization strategies, the European Union encourages member states to use the old procurement tools in a new sense (smart procurement), emphasizing the role that public demand can play in supporting the development of sustainable innovations (Edler and Georghiou, 2007; Edquist and Zabala-Iturriagagoitia, 2012; Edquist et al., 2015; Foray et al., 2012).

The new measures fit within a broader collaborative framework and/or network-based approach to public policies (Klijn and Koppenjan, 2000, 2016). A particular feature of the policies that are developed within the collaborative framework is that the role of the policy-maker – both at national and at regional level – is not simply to provide funds, issue call for tenders and select the best projects. Policy-makers are required to exercise a strategic action

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aimed at pursuing innovation and development goals in all phases of design and management of the policies. Different strategic choices (e.g. in terms of institutional arrangement) will have different outcomes in terms of innovation and development (Beisheim and Campe, 2012; Kort et al., 2016). Finally, the collaborative framework requires both the use of new policy tools and a change of strategy and vision in the use of old tools. Therefore, economic agents are required to make an effort in learning how to use the new tools and the new strategic and operational management frameworks in order to plan the development of new strategies (da Cruz et al., 2013; Pryke, 2004, 2005, 2012; Regan et al., 2011).

The new forms of public procurement – but also the new context in which the traditional forms have to be realized – bring some changes in terms of knowledge management in projects, planning, governance, and innovation policies that have yet to be investigated. We take a step in this direction with the articles included in this special issue.

A bibliometric analysis of the literature on PPPs and procurement

In order to contextualize the special issue in the existing literature, we propose below a short bibliometric analysis, complemented with the tools of social network analysis.

Our starting point has been a search on the Scopus database, through which we have collected all articles published in academic journals from 1985 to 2015 that have PPP* or procurement* in their keywords, abstract or title.[1] After having cleaned our database, excluding a few cases in which the term public–private partnership is anything but a generic form of (desired or actual) collaboration between public and private actors, we get 2156 articles, published in 757 journals.

Most of this literature has been published since 2000. Since the early 2000s, the number of articles published on the topic of PPPs and procurement has grown at a steady pace and has spread to a growing number of journals and disciplines.

In order to describe the content of the literature on PPPs and procurement, and its evolution over time, we focused on keywords that authors used to describe their work. This choice differentiates our work from other bibliometric analysis on PPPs (Ke et al., 2009; Marsilio et al., 2011).

We performed a longitudinal analysis of the keywords, considering three periods: the first half of the 2000s, the second half of the 2000s and the most recent five-year period, 2011–2015 (Table 1).[2]

Usually, authors use a string of keywords to describe their work. To maintain this relational structure in our analysis, we used some simple social network analysis tools. In particular, we built a three networks – one per each time period described above – that tie together each article in our database with its keywords, then we transformed it into one-mode networks made of keywords only. In these latter networks, two keywords are linked if they are cited together by the same article(s).

In order to identify the keywords that, in the observed periods, play a leading role, we developed a simple analysis of centrality.

For each time period, we consider three common measures of centrality, which capture different aspects of the same phenomenon: degree, closeness and betweenness. The first type of centrality measures the number of direct linkages each keyword has with other keywords. Closeness centrality considers both direct and indirect linkages. It is the average length of the shortest path linking the keyword with all other keywords in the network (Sabidussi, 1966). Betweenness refers to a concept of centrality that measures the number of times a keyword acts as a bridge between two other keywords in the network (Freeman, 1977).[3] Table 1 shows the result of the centrality analysis.

Table 1. Centrality indices for the keywords used in 2001–2005, 2006–2010, 2011–2015.

Keyword	Degree centrality	Keyword	Closeness centrality	Keyword	Betweenneess centrality
		2001–2005			
Supply chain management	38	Governance	0.423	Governance	0.188
PFI	31	Project management	0.370	Participation	0.041
Supply chain	26	Public sector	0.369	Urban regeneration	0.027
Governance	22	Intra-coalition networks; social network analysis	0.366	Partnering	0.021
Value for money	21	Consortium; negotiation	0.365	Developing countries	0.017
Auctions; partnering	19	Supply chain	0.362	India	0.016
		2006–2010			
Governance	93	Governance; risk management	0.445	Governance	0.038
PFI	90	India	0.431	Risk management	0.029
Supply chain management	63	Innovation	0.430	Private sector	0.019
Private sector; risk management	61	Infrastructure; trust	0.429	PFI	0.017
Purchasing	60	Private sector	0.429	Infrastructure	0.016
Infrastructure	49	E-Government; local government	0.424	Innovation	0.016
		2011–2015			
Infrastructure	170	Infrastructure	0.444	Governance	0.032
Governance	129	Governance	0.427	Infrastructure	0.031
Collaboration	106	risk allocation	0.419	Collaboration	0.018
Innovation	87	Collaboration	0.419	Innovation	0.014
Australia	79	Australia; China	0.416	Privatization	0.012
China; supply chain management	78	Sustainability	0.414	China	0.011

Note: Degree centrality is given by the number of ties a node has. Closeness centrality of a node *a* is given by the reciprocal of the sum of all distances between *a* and all other nodes. Betweenneess centrality of a node *a* is given by the sum of the shortest paths from any couple of nodes in the network that pass through *a* with respect to the total number of shortest paths from any couple of nodes in the network. We have excluded the keywords procurement and PPPs.
PFI: private finance initiative.

To give meaning to individual keywords, we also analyzed the combinations of words that are more frequently found together.

In general, we observe a high dispersion of the keywords. Given the variety of disciplinary approaches and specific topics covered by the different contributions, it is easy to understand why different authors choose different keywords. However, since the early '2000, some keywords become relatively widespread, such as those related to supply chain management, governance issues, and auctions mechanisms. Also 'private finance initiative' (henceforth: PFI) is a frequently used keyword, and is testimony to the growing interest of the literature for this particular type of PPP. Governance and supply chain are also among

the most important bridging keywords, which connect management and economics approaches to the analysis of PPPs and procurement. Other bridging keywords are urban regeneration and developing countries. The keywords that are most frequently mentioned together are those related to supply chain management.

Governance, PFI, and supply chain are on the top list of the most widespread keywords also in the second half of the 2000s (2006–2010). Besides these well-established keywords, this time period witnesses the emergence of some innovation-related terms. Even the keyword 'local government' enters the short list of the most central keywords. On the other hand, keywords such as 'value for money' or 'auctions', which were quite common in previous periods, are now in a backward position. The keyword 'governance', which has the highest betweenneess centrality, is a bridge connecting a large variety of studies, including those on government accountability in procurement procedures, regulation of procurement, risk management and supply chain management in PPPs. Also in this time period, the keywords that are most frequently mentioned together are those related to supply chain management issues.

In 2011–2015, the discussion centered on supply chain management becomes relatively less widespread, while innovation-related keywords gain importance. Moreover, the terms 'sustainability' and 'collaboration' enter the restricted top list of most used keywords. The keyword 'collaboration' bridges different strands of literature, such as those related to buyer–supplier relationships and supply chain management in PPPs, the analysis of coalition functioning and community partnerships in PPPs or the analysis of public procurement through the lenses of the transaction costs approach. The keyword 'sustainability' is a catchword that lies at the crossroad of a variety of studies addressing economic, environmental or social sustainability. The keywords that are most frequently mentioned together are those related to governance and collaboration.

The articles in the special issue

The five papers collected in this special issue address some of the issues that emerge in the last five-year period analyzed. In particular, the contributions deal with innovation, governance (particularly the action of local governments), collaboration and sustainability issues, which are treated in a novel way. We analyze PPPs and procurement not only as efficient means for contracting out goods and services but also as tools to create innovation, promote sustainable development, and diffuse societal values. Numerous obstacles may, however, prevent the development of these practices, and the articles included in the special issue focus on some of the most relevant ones. As for innovation, the first step is that of understanding what we talk about when we talk about innovation in PPPs. Siemiatycki and Himmel address this issue in the field of public infrastructure projects. By surveying 50 projects delivered by Infrastructure Ontario, the agency responsible for PPPs in this Canadian province, the authors clarify what innovations have been achieved by the different projects. Their article shows that meaning of innovation – and also their potential benefits – varies according to the stakeholder considered. This ambiguity, together with the presence of constraints that are defined for each construction project can inhibit or reduce the scope of innovation, which will tend towards minor incremental innovations that are able to lower project costs and risks.

The ambiguity surrounding the conversation between the different stakeholders responsible for delivering public infrastructure projects is the object of the analysis of Caloffi and Gambarotto. Drawing on the concept of cognitive distance, the authors develop an original empirical analysis by assessing the size and characteristics of agents' cognitive misalignments that can prevent the public and private agents to interact fruitfully,

and complement their knowledge, competencies and system of objectives in order to generate innovation and societal values.

The contribution by van den Hurk and Willems focuses on how governments can manage PPPs to deliver societal values such as design, contextual fit, and multi-functionality. As also shown by our simple analysis of keywords, the attention of the literature has gradually shifted from value for money to other types of outcomes produced by PPPs, including social sustainability. However, it is still unclear how these results can be obtained. By focusing on four case studies from Flanders and Ontario, the authors show that a clear vision on the part of the government of the objectives that the PPP must pursue, as well as a strong control and coordination of the private partner, are key to obtain the desired outcomes. Since in many countries infrastructures of local scale are designed and managed by local governments, leadership abilities and other competencies must be available locally. Two papers in the special issue focus on the role played by local governments. Gori, Lattarulo and Mariani analyze the influence that a number of relevant buyers' characteristics may play on procurement performance in reducing or eliminating time delays. While previous literature has mostly focused on the effectiveness of auction formats in limiting project renegotiations, the authors show that local governments' expertise and experience can play an important role in ensuring that public infrastructures are delivered on time. Uyarra, Flanagan, Magro and Zabala-Iturriagagoiti reflect on the possibility that the procurement is used as a tool for promotion of local development and innovation. This possibility, which is increasingly being invoked by various policy actors around the world, does not come without pitfalls and risks. However, despite the growing interest in this topic, the literature has not yet produced an articulate reflection. The contribution by Uyarra and colleagues fills this gap. Opportunities and challenges related to a social and spatial anchoring of procurement are discussed through the concept of conversations, developing at local scale, which can shape successful innovations. The use of examples coming from the literature on procurement help clarify some aspects of these conversations.

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Notes

1. We performed the search separately for the two terms and then we put together all results. The search was performed in March 2016. We searched for regular journal articles or reviews that are written in English, and which belong to the subject areas 'social sciences', 'business' or 'economics'. Note that the subject area 'social sciences' includes environmental and planning studies, decision sciences, and others). In addition, we considered different spellings for public–private partnerships (e.g.: singular or plural, with or without a hyphen, short-term, or extended term). We have chosen the database Scopus (https://www.scopus.com/) because its relevance has increased in the last years, and because it covers a wide variety of quality journals. However, we are aware of the fact that it does not provide a complete picture of the literature.

2. We did not consider the keywords used in articles published until 1999, because they are relatively few and different from one article to another.
3. Centrality measures are calculated with the Pajek software (Batagelj and Mrvar, 1998; De Nooy et al., 2011).

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