Public-Private Partnerships in an Economist's Eye: a gleam or a beam?*

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Abstract

The chapter outlines an economics perspective on public-private partnerships (PPP) and discusses the missing blocks needed for a comprehensive economic theory of PPP. It highlights the gap between the coverage of the PPP in economics and that in public administration literature and draws parallels between the two subject areas in terms of the topics of interest around the PPP. In economics, incomplete contracts justify PPPs as institutions distinct from other forms of public good provision, yet most research narrowly focuses on long-term infrastructure projects, often a concession. Public administration offers a broader view on PPP projects, yet lacks definitional consensus, which appears to impede the adoption of this broader view by economics. A comprehensive economic theory of PPPs as institutions, elaborating the aspects of the relationship between the public and the private partner that overcome the deficiencies of incomplete contracts, is highly desirable and is on approach.

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Introduction

Several disciplines claim interest in the subject of public-private partnerships – including medicine, healthcare, public administration, management, economics, urban studies, accounting, law, and other, in no particular order. Academic texts that use "public-private partnership" and simultaneously one of the above discipline names (as a proxy for a subject inclination of the text) grow exponentially and roughly at the same pace across all subjects, see Figure 1(a). The interest in this topic of major publishing houses that print academic journals also seems to be roughly equal (Emerald being the only exception) – Figure 1(b) shows the percentage of papers that mention "public-private partnership" steadily grows from 1980s onwards. All this might give a happy and glamourous picture of a sustained growth in interdisciplinary research on the topic, uniformly covering a variety of perspectives and critical angles.

[INSERT FIGURE 1]

Reality is far less glamourous if we look at the top journals in respective subjects. We took the journal ranking of the Chartered Association of Business Schools (UK) and selected the top-ranked journals in the disciplines of accounting, economics, finance, management, social sciences, and public administration.[1] For each of them we searched for articles that contain "public-private partnership". Our search returned 4 results in the *Quarterly Journal of Economics* and in *Accounting, Organizations and Society*, 3 – in the *Strategic Management Journal*, the *Academy of Management Journal*, the *Academy of Management Review*, and in the *Administrative Science Quarterly*, 2 – in the *Journal of Management* and in the *Journal of*

Accounting and Economics, 1 – in the *Review of Economic Studies*, the *Review of Financial Studies*, and in the *Journal of Financial Economics*. Full stop. Other top journals return the disappointing "no results found". This refers to all years and issues, and all mentions of public-private partnerships. The top-field *Journal of Public Economics* returns 13 papers in all issues ever. At the same time, *Public Administration Review* has 76 papers on the topic, and the *Journal of Public Administration Research and Theory* lists 93 of them, each of these two journals having at least twice as many publications on the topic as top accounting, finance, management, and economics journals altogether. Why such a disproportion? Do economists ignore public-private partnerships as something not worth studying, or did they just overlook them so far and now show the first sparks of interest? Is there anything an economics perspective can add to the understanding of PPPs in the neighbouring field of public administration? These are the questions we wish to address in this chapter.

Public-Private Partnerships versus other forms of public good provision[2]

As the name suggests, a public-private partnership is a form of public good provision jointly by the public sector and private businesses. Key elements here are "*a* form" (there exist other forms, ways and approaches to provide public goods), "public good" (something of a value for the society, that many could use; involvement of the public party in the partnership implies there should be public interest in it, hence public good), "jointly" (which implies cooperation / collaboration) and "partnership" (apparently something beyond mere collaboration, otherwise how does it differ from other forms?). "Partnership" is admittedly a rather elusive term, interpretations of which are numerous, "ranging from informal, oral understandings to formal agreements" (Erhard and Brigham, 2006, p.4), often encompassing agreement on values and

objectives (Brinkerhoff, 2002) and good relationships between partners, typically stronger than may be achieved through a purely contractual collaboration. In what follows, we outline an economics argument that helps formalize this distinction between a PPP and other approaches to produce public goods.

Provision of public goods without and with partnership

Public goods may be produced by the public sector itself (public provision), by cooperating with the private sector through outsourcing (contracting out, whereby some tasks are commissioned from the private sector), or by moving their provision to the private sector completely, as it happens in privatization (Joha and Janssen, 2010, Stiglitz, 2002). Public goods are non-excludable in consumption (everybody can consume the good or service) and non-rivalrous (nobody is worse off if an additional member of society begins consuming it). These two properties generate the free-rider problem (if nobody can be excluded from consumption, why pay for it?), leading to a market failure (nobody wants to finance the public good provision). For private goods with positive externalities (typical examples would include street lights, greening or gentrification) a common outcome in a competitive environment is underprovision (the amount provided is lower than socially desirable). This brief account of the well-established core of public economics (e.g. Laffont, 1988) justifies delegating the provision of public goods to the state and financing them through taxes. (See, however, a note on complete and incomplete contracts below.)

A public enterprise is socially oriented, solves the problem of negative externalities but usually exhibits low efficiency compared to profit-oriented private businesses, especially in a competitive environment (Boardman and Vining, 1989; Vining and Boardman, 1992) typically

due to a lack of incentives for managers either to reduce production costs (Bos, 1991) or to properly monitor the efficiency of the use of human and other resources, in particular because the objectives of public enterprises often lack precision and are frequently changing (Alchian and Demsetz, 1972). A review of literature on advantages of private businesses as compared to public ones is in Megginson and Netter, 2001; in a later work, Bartel and Harrison, 2005, explicitly show that in comparable conditions performance of public sector enterprises is below that of their private-sector peers.

The state can exploit the efficiency benefits of private businesses by outsourcing the provision of public goods. This differs from the private provision of public goods in that the public body decides on the quantity, thus solving the underprovision problem. Allowing for more collaboration between the public and the private parties, we may introduce a consolidated public-private enterprise, which assumes provision of resources by all parties and the coordination of the parties' actions when implementing the project. Consolidation is justified when parties have comparative advantages in the provision of various resources, where each party should supply the resource that it can provide at a lower cost. Contributions of the public and of the private parties do not need to be limited to labour, capital and materials; additionally, the private party provides valuable managerial skills ensuring efficiency. The most common resources supplied by the public partner include land, access to funding, and human capital that brings in specialized knowledge and expertise (Besley and Ghatak, 2001) as well as administrative experience and skills (Mahalingam et al., 2011), particularly with respect to reducing compliance and red-tape costs (Vinogradov et al., 2014).

Does it matter who owns the enterprise that provides the public good? In a world where everything may be specified in a clear and comprehensive contract (*complete* contract), and all

contributions of parties involved may be guaranteed in full and on time, ownership makes no difference (Hart, 2003): the government can commission the required public good from the private provider and get exactly the same result as if that good is produced within the private sector at a state-owned enterprise, or by a joint venture between the government and the private business. The difference only arises when contracts are *incomplete*, i.e. when not all contributions can be specified, not all situations can be foreseen by the contract, or when enforcement does not work. In a world with incomplete contracts, state ownership or co-ownership of enterprises producing public goods is justified by the ability of the government "to keep things under control", because, strictly speaking, the owner has the residual property rights. For projects that fully depend only on the private sector contribution, having a complete contract, although not always possible, is more likely than for projects that involve several parties. In many cases, the public sector also has an input; as projects become increasingly collaborative, the incompleteness of contracts becomes even more relevant. A good review of PPP-relevant literature elaborating complete and incomplete contracts can be found in de Bettignies and Ross (2010).

We have thus covered "a form", the "public good", and the "jointly" components of our definition; the remaining component is the "partnership". The *partnership principle* assumes partners mutually agree on their objectives and rationally decide how to achieve them (Brinkerhoff, 2002). Hodge and Greve (2007) note that the interdependence and equality in decision-making as well as equal benefits to parties, constitute an important aspect of partnerships. From an economics perspective, if contracts are incomplete, objectives of parties may diverge, which helps justify partnerships by their ability to "increase efficiency by aligning the incentives of the parties" (Grout, 2003; Vinogradov et al., 2014; Vinogradov and Shadrina,

2018a).

Contractual relationships and feasibility of collaborative projects

The core of the *collaborative* projects approach is contracting under asymmetric information (Roels et al., 2010; Kim and Netessine, 2013). A project is characterized by inputs (contributions) of the two parties and by the *sensitivity*[3] of the project to the parties' inputs. As an illustration, using lower quality building materials would require more frequent repair, and result in a higher maintenance cost of a road or other infrastructure objects, thus lowering their social value; these projects may be referred to as sensitive to the private party input. In addition, they are also sensitive to the input of the public party, which usually contributes at the planning and design stage. For the sake of exposition, we understand sensitivity in a very intuitive sense, as in "the project's success to 40% depends on the public input and to 60% - on the private input". If the sum of sensitivities (to both inputs) cannot exceed 100%, any project can be depicted as a point in the space of sensitivities, within the triangle constrained by conditions that sensitivities cannot be negative and cannot exceed 100% in sum, as in Figures 2 and 3. Within this project space, we wish to discriminate between (a) projects that can be implemented by having some type of a contractual agreement between the parties, and (b) projects for which even an optimal contract cannot guarantee sufficient profitability of the private partner (infeasible projects), and (c) infeasible projects that can be implemented under a partnership principle, i.e. when some benefits of cooperation exist but are not contractable.

Under asymmetric information, parties do not freely observe each other's inputs. To give an example, a commissioning authority may be unaware of the exact number of workers employed or of the amount of materials used to construct a bridge, yet can obtain this

information at some cost, for instance, through monitoring. If a party provides less input than contractually agreed, it is subject to penalties. Penalties can be monetary or non-pecuniary, associated with the loss of reputation and foregone future profit opportunities. For the private partner the penalty may include the value of their physical assets (bankruptcy value). The harshest penalty that can be imposed on a public partner is the exhaustion of their reserves and the dismissal of the relevant public managers.[4]

A *contract* between the public and the private party specifies their respective inputs, the remuneration to the private partner, the liabilities of the parties (in particular, penalties), and, in the framework used here, the type of reporting on costs and contributions (input verification). Three types of contracts are conceivable: those where only public input or private input is verified respectively, or where no input verification is done. The verification of both parties' inputs is unnecessary because knowing the outcome of the project and the credibly verified input of one party should suffice to establish whether the other party underprovides.[5]

The public partner designs the contract with an objective to maximize the project's social value, minus the costs of its provision and the related verification costs. A contract with the verification of the private party's input will specify that the private partner is only paid once inputs are confirmed; we refer to it as an *input-contingent* contract (IC-contract). An alternative arrangement is when the private partner is paid only if the project is successfully completed. In this case, there may be a need to verify the contribution of the public partner. If the exact contribution of the private partner cannot be credibly established, the success of the project (achieving the target value) implies agreed resources were delivered in full, and hence payment is due. If the project fails, and it is established that the public partner delivered in line with the agreement, this implies that the private partner failed to meet the terms of the contract, and

penalties are imposed. Alternatively, if the public party failed to deliver, it is accordingly penalized in favour of the private party. This type of contract is referred to as *output-contingent* (OC-contract).

Instead of verifying the inputs, a third type of contract creates incentives for the private partner to properly contribute to the project. This can be achieved by making the remuneration dependent on the value that the project generates. Theoretically, contracts of this sort (*performance-based*, PB-contracts) are justified in microeconomics (e.g. Bhattacharya and Lafontaine, 1995; Kim and Wang, 1998) for the cases where each party has an incentive to minimise their inputs and let their counterpart bear the costs. Practically, this corresponds to the concession approach often used in PPP: the private party operates an infrastructure object and derives profit from payments by the end users or by the government, proportional to the actual usage of that object (see, e.g., Iossa, 2015, for a detailed description and examples of concessions and revenue generation mechanisms in the design, construction, maintenance, and operation of the transport infrastructure.)

A project is *feasible* if both parties agree to implement it by entering one of the above contractual agreements. The optimal contract is chosen by maximizing the total surplus generated by the project under different contractual provisions. In the input- and output-contingent contracts input verification raises the effective cost of resources. One has therefore to compare the cost of the project *with* and *without* verification. An important parameter for this comparison is the verification cost *relative* to the provision cost, i.e. by how much more expensive (in per cent) in total would be a particular resource if one has to monitor its provision. This is what we understand under the *verification cost*. For example, a complex bridge incurs higher costs of resources (per unit) than a road because a bridge would involve unique solutions,

while constructing a road involves a repetition of more standard techniques at each segment of the road. At the same time, it is easier to verify the quality of the bridge and the resources used by parties, as it is a localized object, while it is more expensive to monitor the actual provision of resources for each mile of a road. For these reasons, the verification cost (relative to the provision cost) is expected to be lower for the bridge and higher for the road. Even if resources of both parties have identical provision and verification costs, different contracts imply different *effective* cost. In the OC-contract it is the public input that is verified and therefore becomes more costly than the private input. In the IC-contract (private input verified) the private input will be more expensive when verification costs are considered. The sensitivity of the project to inputs determines then the type of the optimal contract: the OC-contract (public input verified) is preferred to the IC-contract (private input verified) if the project is less sensitive to the public input than to the private input, and vice versa. This is because choosing a contract that incurs verification cost for the input of the public party (OC-contract) reduces the optimal amount of this input (due to its higher overall cost compared to the contract with no verification of this input), which does affect the final value of the project, yet this impact is smaller if the project has lower sensitivity to this resource. In Figure 2, OC-contracts are optimal for projects with low sensitivity to public input and high sensitivity to private input (vice versa for IC-contracts).

Unlike IC and OC contracts, verification does not take place in the PB-contract. There is a trade-off between paying for information verification but achieving maximum value out of the project and saving on the verification cost but reducing the project's value (incentives without verification are weaker, hence the contribution of the parties within a PB-contract is lower than in the first-best case). If verification costs are high, a PB-contract would be preferable to both IC and OC. However, this would only hold true if the sensitivity of the project to the inputs is rather

low, otherwise even a small reduction in the input due to weaker incentives would lead to a severe loss of the value for the project. For this reason, PB-contracts cannot outperform IC and OC contracts at higher values of sensitivities. In Figure 2, therefore, PB-contracts are shown optimal only for projects with rather low sensitivity to inputs.

Not all projects are feasible even if contracts are optimally designed. One reason for this is costly verification. Projects with high sensitivity to both inputs and with relatively high verification costs are likely to be impractical because they become too costly with IC- and OC-contracts and generate a too low value with a PB-contract. Additionally, projects may be infeasible due to the remuneration of the private partner., for whom there exists a *participation threshold*: even if the required input is small, a private partner would not be interested in taking part in the project if the payoff is below their acceptable threshold. The value of the project may be insufficient to justify high payoffs to the private partner, thus making the project. Note that these projects despite not being financially viable may still be socially desirable.

Partnership vs. contractual relationships

The partnership principle either brings extra benefits to the private partner, for which reason it can lower the participation threshold, or improves productivity of resources due to a deeper cooperation and thus saves on the production cost. A reduction in the information and production cost may come through close cooperation and aligned objectives. The partnership element also facilitates co-production through improved communication and knowledge spillovers. These benefits are unlikely to be contractually binding, stressing the incomplete contracts point in the justification of PPPs.

Reduced participation threshold and lower information and production costs enable the

implementation of projects that would be infeasible under standard contract conditions considered above. This aspect of PPP is demonstrated in Figure 2: infeasible projects here are those that cannot be implemented even through a PPP, while the area denoted as “PPP projects” corresponds to those that would have been infeasible if relationships between the parties were limited to “working to contract”. Note that the set of contracts that can be used to form a PPP is the same as the one used for contracting out: IC-contracts are optimal for projects with higher sensitivity to the public input, OC-contracts for projects with higher sensitivity to private input, and PB-contracts outperform the two for projects with low sensitivity to both inputs. In Figure 2(a), verification costs and the participation threshold are small, for which reason the benefits from a PPP are rather small: establishing a PPP would enable implementation of a small number of specific projects that were not otherwise feasible. When, however, information costs and participation threshold are high, establishing a PPP can be highly beneficial for a large number of otherwise infeasible projects, as in Figure 2 (b).

[Insert Figure 2]

A PPP is thus a better option than outsourcing only if the verification cost and the participation threshold are relatively high. Moreover, a PPP is optimal only for projects with relatively high sensitivity to inputs of either or both parties. This is because when the sensitivity of the project to inputs is small, parties can employ less resources that are too costly to verify, without a significant impact on the project value. In contrast, projects with relatively high sensitivity to both inputs incur high verification costs, and can become infeasible, which is where a PPP can help.

In this section, we have outlined, in a non-technical way[6], a model that formalizes and justifies public-private partnerships from an economics perspective. Extending the informal definition from the beginning of this section, the model defines a public-private partnership as a consolidated (joint) enterprise that enables a reduction in the information and transaction costs (through strong relationship, trust, and lower administrative burden) to improve contractual feasibility of otherwise non-contractible public projects. Clearly, developing strong relationships is per se costly and cannot be done on a large-scale basis. Fortunately, not all projects would fall in the subclass of those that need to be run through a PPP: all other subclasses should fall under standard public procurement contracts if they cannot be efficiently delivered by the public sector on its own.

Towards the economics of PPPs

The economic analysis of PPPs widely uses the mechanism design and contract theory approach, exemplified above. A significant strand of literature investigates, for example, whether some or all tasks within one, typically infrastructure, project should be *delegated* to a single private partner (Hart, 2003; Bennett and Iossa, 2006; Martimort and Pouyet, 2008; Maskin and Tirole, 2008; Chen and Chiu, 2010). "Bundling" consecutive tasks creates incentives for the private partner to perform well during the earlier stages of the project as this influences the outcomes at later stages, affecting the same private partner and creating incentives as in the PB-contract above. At the same time, this approach "unbundles" contributions of the public partner from the project, and ignores benefits potentially arising through close collaboration, covered in the previous section.

An aspect we only slightly articulated in the previous section, is uncertainty. Some

uncertainty, relating to the efforts exercised by the parties, can be resolved by obtaining information at a cost. There is therefore a trade-off between the level of trust parties show towards each other and the cost they wish to bear to verify each other's inputs. A different type of uncertainty refers to productivity shocks. Idiosyncratic shocks having an impact on the PPP project can range from natural catastrophes to miscalculations or unexpected findings (such as an ancient Roman mosaic underground, requiring application of special heritage preserving regulation). Lewis and Bajari (2014) investigate moral hazard in public procurement and the efficiency of penalties in preventing it. In their analysis, if unanticipated production shocks distort the initial schedule of the road construction works, project managers exert efforts to adjust the construction plan in such a way as to remain on schedule. Moral hazard manifests when managers do nothing or very little, if penalties are not high, which is especially true for very large and costly projects. Reducing moral hazard through penalties is an approach known since Becker (1968): the theoretically optimal punishment should be as high as possible. But the upper limit of the fine is different for different people. Moreover, having fines too high may deter potential contractors, especially if they overestimate the likelihood of being punished (Vinogradov and Shadrina, 2018b); more generally, "the fine should fit the crime" (Andreoni, 1991). The result of Lewis and Bajari (2014) thus has a practical dimension of finding the efficient penalty rule for specific contracts; this result naturally extends to the public-private partnership context, since public procurement and PPPs function under the same contractual arrangements. Unobservable efforts can have a different angle: if implementing new projects requires innovative solutions, how should innovation be rewarded? The problems here are similar to those above: efforts of contractors and their research cost are not directly observable. Weyl and Tirole (2012) justify the PB-type contracts in public-private partnerships by the

consideration of offering a sufficient reward for innovation.

As for the contribution of the public partner, a large strand of literature in economics and finance deals with state-owned enterprises and their efficiency. A particular source of inefficiency is political influence, as suggested by Shleifer and Vishny (1994). Maskin and Tirole (2008) derive optimal regulatory provisions to tackle the potential political bias in choosing the private partner for a PPP. Recently, Alok and Ayyagari (2020) empirically document that projects run by state-owned enterprises, especially in infrastructure, have more capital expenditure in election years, and in particular in districts with close elections and high-ranking politicians. If the inefficiency created by this political cycle is transferred to a PPP (e.g. by deterring public resources from a PPP project in favour of another politically motivated investment), what implications would this have on the private partner? The problem would be especially relevant for longer-term projects spanning over a few political cycles.

The collaborative model we outlined, depicts the economics view on PPP by focusing on social objectives to be achieved, contributions of parties and contractual arrangements to combine them. Economists study why various forms of public good provision [should] exist and in what sense they may contribute to social welfare. Economics offers insights into the type of contract that is suitable for a PPP project and into optimal methods to select the private partner for the collaborative project. Economics is also helpful for getting insights into the frictions (information, uncertainty) that impede project implementation.

Some important areas remain underinvestigated. There is so far no research on optimal funding schemes for a PPP, and this is where economics and finance could contribute: if choosing between debt and equity finance matters for corporations, what are the implications for ventures with public participation – should the private partner issue shares, or bonds, or apply for

a bank loan?[7] Or, maybe, emerging fintech solutions, ranging from crowdfunding to blockchain-based tokens and initial coin offerings, are more suitable? We somewhat touched upon a "strong relationship" and possible knowledge transfer within a PPP – this form of collaboration may have an indirect effect on the private sector, by transferring practices (e.g. sustainable procurement) the government wishes to promote. No research on changes in behaviour and performance of private partners after their cooperation with the government exists to date. Finally, given public procurement often aims at supporting small businesses, how does the PPP practice fit into this same objective? These are some of the issues yet unanswered with respect to PPPs, at least from an economics perspective.

A suitable parallel may be drawn between economics of PPP and that of financial institutions. Economic models of banks as institutions that improve the allocation of resources in the economy were first developed in 1980-90s, when the banking industry already existed for ages. The modern economics of financial institutions covers their *raison-d'être*, including why they co-exist with financial markets, the type and nature of contracts between all parties involved, risks arising from asymmetric information between parties and from exogenous sources, the role the industry structure (monopolistic or competitive) plays for banks' performance and stability, the role banks play for the economy as a whole, and relevant regulation to protect consumers and prevent banking crises. If PPPs earn attention as institutions that serve some purpose differently from and better than other existing arrangements (public provision of public goods or public procurement to outsource this provision), we may expect economics of PPP to develop in a similar fashion. Some economic analysis of the nature and rationale of PPPs, as well as the analysis of contracts [to be] used in PPPs, already exist. A comprehensive theory of PPP would need to complement them with the economic analysis of

risks, performance, effect on the economy, possible dangers arising from using PPPs and regulation to prevent them. Solid steps in this direction have already been made through books by Grimsey and Lewis (2005), de Vries and Yehoue (2013), Engel et al. (2014) and Saussier and de Brux (2018) – with a difference of just under 15 years, the former begins by saying "the literature is relatively new", while the latter opens up with a remark that the economics of PPP is "largely perceived as too difficult to understand by stakeholders outside of academia and/or the field of economics… [T]his is an incredibly extensive, heterogeneous, somewhat fragmented, and often very complex literature." (p.vi). They cover many of the topics we outlined above, including the nature of PPP, efficiency gains from it, incentives and contracts, as well as issues in governance and financing of PPPs, mainly with applications to infrastructure projects. We call for a generalization of this view on PPPs, there is still much to understand about them and the improvements they bring about, and not only in the infrastructure. Is there interest in these topics in the public administration research of PPP?

The economics of PPP and the public administration research

A review by Wang et al. (2018), using 186 articles in 56 journals listed under the subject area "public administration" in the ISI Web of Science database, identifies four key themes arising in papers devoted to PPPs: types of PPP, performance (efficiency), risk (types of risk and risk sharing), and drivers of PPP (factors of adoption of the PPP format). Cui et al. (2018) searched through 754 articles on PPP in infrastructure projects, among which 234 were in construction, 81 in public administration, 35 in urban studies, and 28 in economics, identifying a partially overlapping with above set of research topics: nature and rationale for PPPs, merit and worth, decisions to undertake PPPs, regulation and guidance, ex-post evaluations of PPP. By combining

merit and worth with ex-post evaluation, we come close to the performance (efficiency) topic in Wang et al. (2018). While Cui et al. (2018) omit the risk discussion (which may partly fall under merit and worth, and partly under decisions to undertake), they come up with an additional topic of regulation. To complement both analyses, we focused on three journals only – the *Journal of Public Administration Research and Theory*, *Public Administration Review* and *Public Management Review* – yet we extended the search to all papers that contain the phrase "public-private partnership" in any field, same as we did in the Introduction for other journals, and did not restrict it to infrastructure only. On top of the above topics, our search highlighted the discussion of the impact of politicians and the society on adoption and performance of PPPs (Boyer et al., 2016; Guo et al., 2019; Ghere, 1996), which some might place within "drivers" and "performance", and the discussion of the management of the overall project, its human resources, and relationships between the partners (Waring et al., 2013; Koppenjan and Enserink, 2009; Lippi et al., 2008; Vangen et al., 2015), which does not straightforwardly fall under any of the above. We therefore end up with seven main themes around PPP in public administration literature: (1) nature and rationale, (2) performance and efficiency, (3) risks and uncertainty, (4) drivers of adoption, (5) regulation, (6) management and relations, and (7) politicians and society. How do they fit in the economics perspective?

As we highlighted above, topic (1) – nature and rationale – is a key element of having a comprehensive economic theory of PPP. The contract analysis, widely undertaken in economics, adds to our theoretical understanding of optimal design to ensure performance and efficiency, signifying a contribution from economics to topic (2). Simultaneously, as illustrated in the collaborative model in the previous section, contract theory highlights the importance of relationships and their management, topic (6), yet more needs to be done in this direction. Topic

(3) – risks and uncertainty in PPP – has been poorly analyzed so far from an economics perspective: extant economics research mainly deals with counterparty risks within the asymmetric information approach, while other types of risks, provisions against them, and their assessment are not yet covered with respect to PPP. An important issue within the risk and uncertainty topic, from an economics perspective, is different degrees of aversion both to risks (those that can be measured with probabilities) and ambiguity (description of possible development of events where a unique probability measure cannot be conceived). The political dimension – topic (7) has received some attention in the context of state-owned enterprises, as well as in studies of corruption in public procurement. An economic judgment on drivers of PPP adoption and success (topic 4) requires a thorough workhorse model of a PPP, which to date does not exist. Similarly, an established workhorse model is needed to precisely pinpoint the deficiencies in the PPP arrangements that need addressing from the regulatory perspective (topic 5), and to distinguish them from those stemming from poor assessment of risks, suboptimal usage of contracts, etc.

As the field is growing, and the public administration literature emphasizes the need in further analysis, economics will hopefully respond. The key problem, as of now, appears to be the heterogeneity of views on PPP and the rather loose terminology used within public administration, across subjects, and across countries.[8] This lack of consensus impedes the perception of PPPs as distinct institutions. For example, Weyl and Tirole (2012) see PPP as an arrangement in which "the builder of the new infrastructure derives substantial revenue from its later operations" (p.1995), effectively synonymizing the institution (PPP) with a particular type of contract (concession). Engel et al. (2013) use effectively the same definition (although they acknowledge other definitions are in use, too), echoing Hart (2003). As a result, there is too little

novelty associated with PPPs from the perspective of the cutting-edge economics research: if it is a type of a contract – there is a large literature on contracts, where PPP would serve yet another example; if it is outsourcing – there is literature on public good provision by private sector, where PPP is again just an example; if it is a corruption scheme – there is literature on that, too, so why focus on PPPs specifically?

Conclusion

Public private partnerships are institutional arrangements in which the public and the private sector jointly provide public services, under "special relations" that govern their cooperation. The economics approach justifies "special relations" by considering the world with and without them, and by concluding whether the former is any better than the latter, in terms of the benefits for the society. Modelling a PPP as a collaborative project allows identifying in what situations and how "special relations" may help deliver public goods when other arrangements fail, i.e. when the public sector neither on its own, nor by contracting some tasks out to the private sector through traditional public procurement, can efficiently deliver a project of social value. This view neither confines PPPs to be "long-term" or "infrastructure" projects only, nor imposes any conditions on "risk-sharing", nor restricts attention to a specific type of contract. Rather, it highlights the distinctive feature of PPPs in general, which makes them stand out among various forms of public good provision.

Economic analysis of PPP is currently spread over social welfare (with respect to identifying the need in and the benefits of the public good provision), mechanism design (applied specifically to the optimal provision of public goods by private businesses jointly or on behalf of the public sector) and political economy (in what relates to politicians' objectives and their

impact on public sector projects). Extant mechanism design research focuses on types of contracts, information frictions (such as moral hazard) and optimal contract provisions (penalties and rewards) to overcome them and resulting implications for bundling or unbundling of tasks within one project. The political economy view suggests public projects are likely to be affected by political cycles, yet implications for PPPs are not well established. Some other questions gaining attention in economics and finance but not yet well investigated with respect to public-private partnerships, include, for example, optimal funding schemes for PPPs, including alternative finance and fintech solutions; optimal PPP governance and political connections; implications of uncertainty for PPP, including unquantifiable, Knightian uncertainty, and related notions of pessimism and optimism of decision-makers, among others.

A comprehensive economic theory of PPP, with workhorse models suitable for welfare, policy, and regulation analysis, is desirable. The wide interest towards PPPs in the public administration literature centres around the topics such a theory would cover. A necessary step towards that is finding a consensus on the nature of PPP interdisciplinarily, which would enable a spillover of the broad range of observations from public administration research to economics, and reciprocally of conceptual ideas from economics to public administration. Economists keep an eye on PPPs, and there is a gleam in that eye: more comprehensive research is ready to come once public-private partnerships are seen as a distinct large class of institutions, not many "classes of their own".

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[1] Admittedly, ranking methodologies differ, yet there is some consensus with respect to top journals.

[2] Parts of this section are based on Vinogradov and Shadrina (2018a).

[3] Sensitivity describes by how much the generated social value changes in response to a variation in the input of either party. In microeconomics, a traditional measure of sensitivity would be the factor elasticity of the output.

[4] See Vinogradov and Shadrina (2018a) for examples.

[5] This emphasises that mistrust between the parties, which makes them believe that there is a need to monitor actions of each other, leads to a suboptimal outcome, as in an equilibrium less resources will be provided in total, yielding a lower value of the project. For this reason, the benefits from a partnership in the framework employed in this paper would only become larger, as it is assumed that improved communication in a partnership contributes to developing more trust between the partners.

[6] An interested reader can find the formal model and analysis in Vinogradov and Shadrina (2016).

[7] Maskin and Tirole (2008) show the role of financiers in the PPP context may differ from that in traditional corporate finance, in particular, monitoring from an external financing body may mitigate inefficiencies arising due to political biases in partner selection.

[8] The heterogeneity of definitions and approaches in the public administration research has been highlighted, for example, by Wang et al. (2018).

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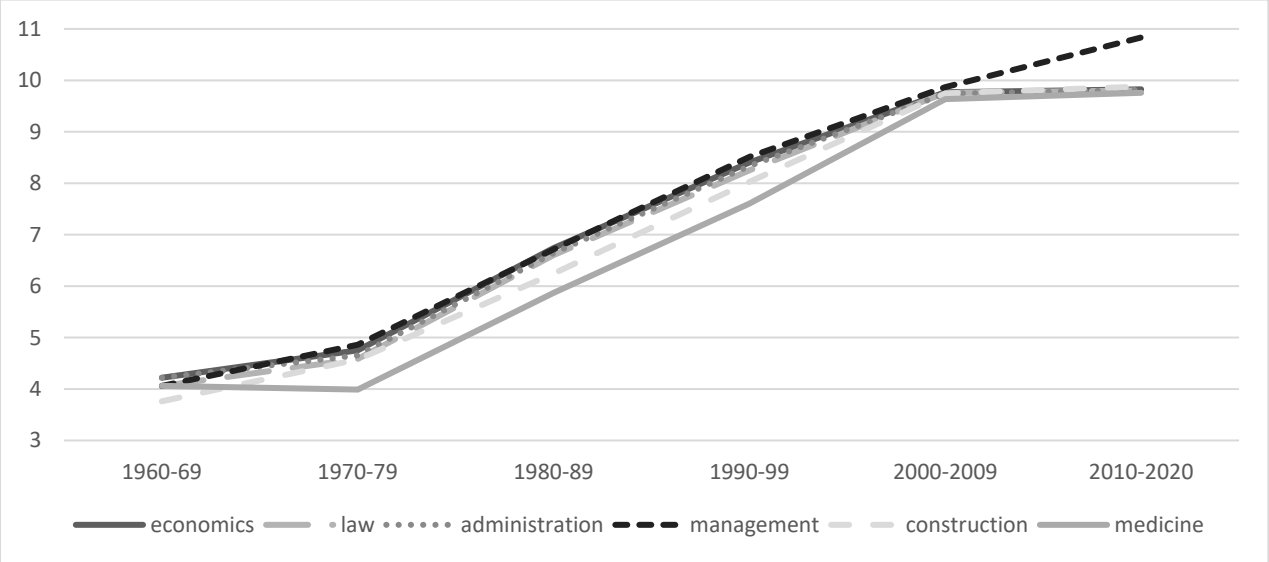
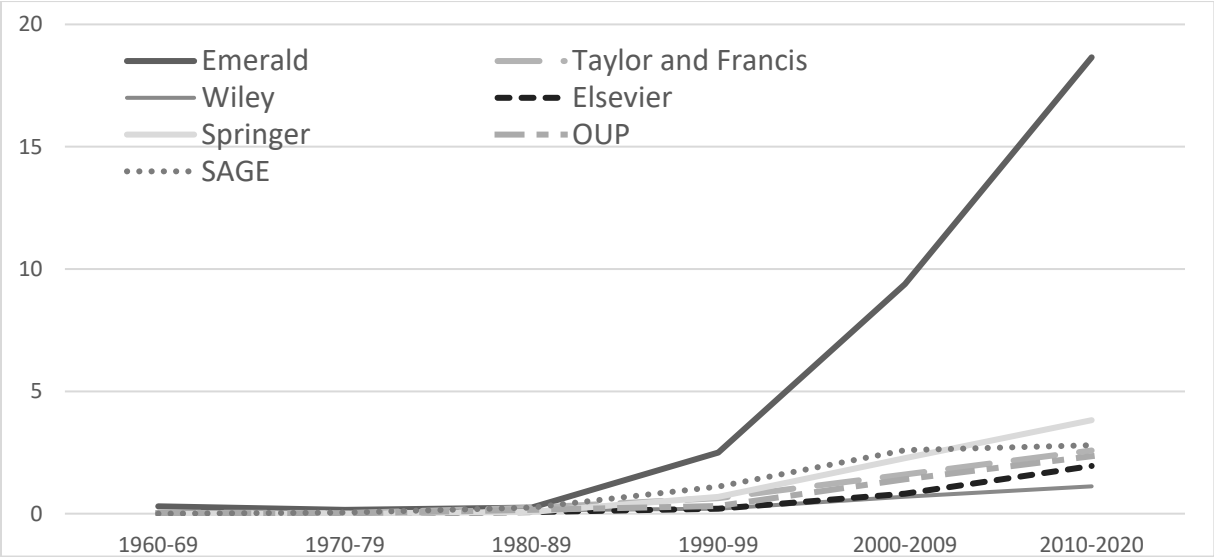
FIGURES



(a)



(b)

Figure 1. Academic interest in public private partnerships. (a) Frequency of documents (vertical axis, in log) in English that simultaneously contain "public-private partnership" and one of the terms economics, law, administration, management, construction, medicine, by decades (horizontal axis) since 1960. Data from Google Scholar, manual search. (b) Percentage of articles (vertical axis) containing "public-private partnership" in the total number of articles published by leading academic publishers by decade (horizontal axis). Data from publishers' web search engines, manual search.

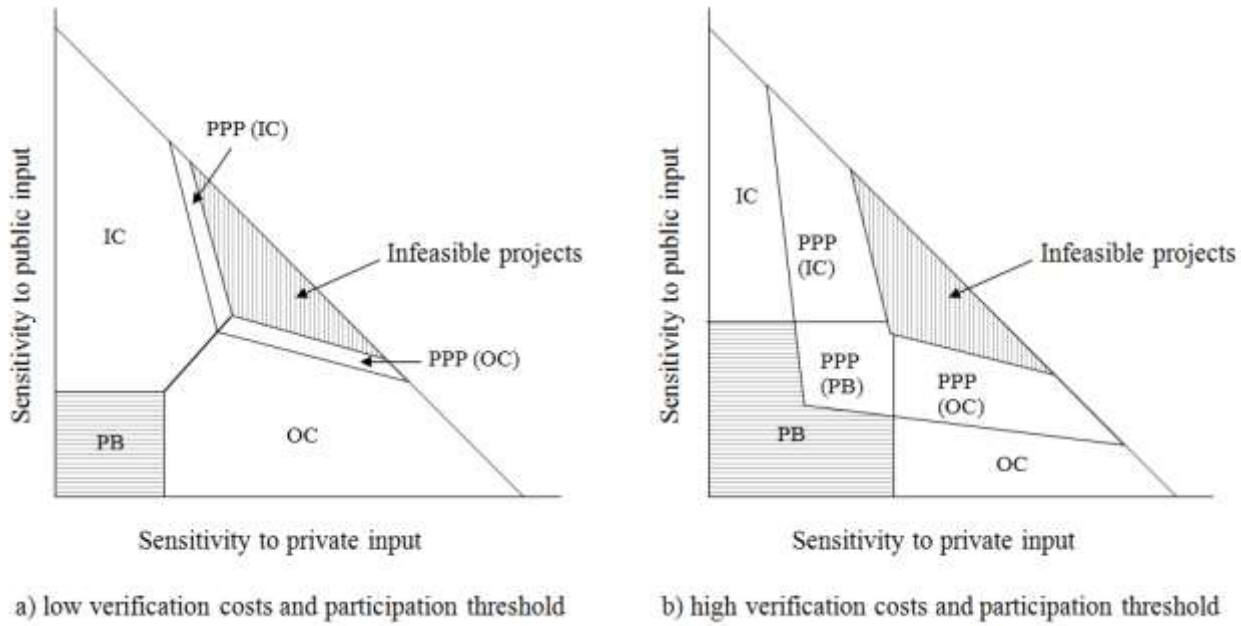


Figure 2. Joint public-private projects (IC, OC and PB contracts) versus public-private partnerships (PPP).