Are the Poor Better Off with Public or Private Utilities ? A Survey of the Academic Evidence on Developing Economies

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A survey of the academic evidence on developing economies[1]

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Abstract

The paper surveys the evidence for developing countries of the relevance for the poor of the ownership choice (i.e. public vs. private vs. mixed) in electricity and water & sanitation utilities. It shows that most of the still widely quoted evidence is outdated (based on pre-2010 data) and fails to reflect the longer term evolution of the ownership choices of the 1990s. The most recent data suggests that it matters less to social outcomes than regulatory governance and market structure. It makes the case for an ownership choice more coherent with the context and capacity constraints of countries and sectors. It also identifies significant knowledge gaps on the ways in which social considerations can be addressed under any ownership type and this defines a new research agenda.

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1. Introduction

The world has now about 30 years of experience with the latest wave of public-private-partnerships (PPPs) to deliver infrastructure services.[2] These add up to a large sample of experiments that can be used to assess how private firms and public-private partnerships (PPPs) perform when compared to state-owned enterprises (SOEs) in similar contexts. Yet as discussed below, the majority of countries still rely on SOEs to deliver the bulk of these services, in particular in developing countries. A recent study disentangling public and private contributions to infrastructure investments finds that, at the project level, investments by the public sector and SOEs accounted for more than three quarters of total infrastructure projects (see World Bank and PPIAF, 2019). Globally, only countries able to provide enough financial guarantees to private operators and investors are able to rely on private partners for the financing and/or management of the main infrastructure services.[3] This excludes many of the poorest countries of the world.

The analysis of the outcomes of these heterogenous experiments has led to many (unsettled) debates on the relative effectiveness of public and private operations of infrastructure services. These debates started enjoying a high global profile in policy and academic circles with a few conflicts in developing economies. Those most covered by the media were the nationalization of two water utilities in Bolivia in 1997 but there were others. For instance, in 2000, Senegal cancelled a partnership signed with Hydro-Québec and Suez Lyonnaise des Eaux just a year earlier. Tensions with private utilities in Uruguay resulted in a 2004 amendment to the Constitution making the private provision of water illegal. Ecuador also introduced a 2008 amendment to the Constitution making the State the only institution in charge of investing in the electricity sector. And at about the same time, in Mali, the complex relationship between the private operator and the regulator ended with the nationalization of electricity company (EdM) in 2005.[4] According to the World Bank PPI database, the total number of projects either cancelled, concluded and distressed has reached a peak in the early 2000 and while significantly reduced has occurred in period of crisis, particularly in the electricity sector). The evaluation of these privatization and nationalization experiences have all contributed to develop evidence allowing a comparison of the ownership choice in terms of efficiency, as well as fiscal and governance effects.

In this paper, we focus on the empirical economic evaluations of the social effects of the mode of service delivery across income classes in terms of access and affordability of service. This is a concern initially noted in case studies of slums/favelas/villamiserias/bidonvilles in the poorest regions of the world. These populations had often been left out of the packages prepared to attract private actors as already discussed in the late 1990s (see for instance Estache et al., 2002) for a longer early discussion). The concern was then fueled by the slow progress observed in achieving the

[2] It may be useful to put the discussion in context to remind the reader that the wave of reforms in the 1990s started as a way to transform sectors operated by underperforming SOEs in a context of the fiscal constraints and subject to significant political interference and corruption. See for instance Vagliasindi (2011) for some SOE governance related issues in utilities according to ownership.

[3] In practice, discussions of the relative importance of public and private actors omits that significant shares of the activities managed by public enterprises are often implemented by private contractors competing through public sector procurement processes. In many ways, the policy choices should be more about the way competition is introduced in the sector, whether the political decision is to privatize somehow or to continue to rely on a public enterprise. Procurement processes and their impact on a wide range of outcomes, often broader than those linked to the sector, have long been and continue to be underestimated and yet they are significant as see in the data reported in World Bank (2017c).

[4] As these debates started to heat up, they also became increasingly ideological.

access rates associated with Millenium Development Goals (MDGs) and now the Sustainable Development Goals (SDGs) as noted by Herrera (2019) in the case of water.[5]

The 2008 crisis progressively provided additional concerns as it increased the number of "energy-poor" in both developed and developing countries. The crisis was particularly effective at increasing the awareness in some policy circles of the risks that affordability may be just as important an issue as access. The Covid-19 crisis has further strengthened this awareness since the associated explosion of unemployment and the matching loss of income for large shares of the population that in many countries have limited their ability to pay for utilities services.[6] As a result a number of emergency policy responses were taken either in the form of more targeted support to the most vulnerable residential users or as deferment in payments for business users. These crises have shown that affordability can be an issue whether the service providers are public or private. All of this suggests that ownership may not be always the main issue as suggested by many of the debates surrounding failures to progress on access rates.

This changing social context and the growing record of conflicts and contract renegotiations have led opponents to the original reforms, and others disappointed with their outcomes, to be increasingly vocal about the need to improve the way in which the needs of the poor and most vulnerable population are being addressed.[7] The calls for change ranged from requests to changes in tariff and subsidy designs to changes in the choice of technology to get service at a lower cost, even if at a somewhat lower quality. Many have also argued to give more leverage to alternative local community-based providers. The most drastic change requested is the strengthening of the existing SOEs or the nationalization of private operators unable to deliver on access and affordability. Since the 2008 crisis, many cities have actually (re-)municipalised their water services for instance, including cities such as Paris, Lyon and Marseille in France, home to three of the largest private operators in developing and emerging economies.[8]

The push for nationalization or for an increased role for SOEs is often more ideological than analytical. But it is anchored in five observations that deserve fair analytical evaluations. The first is the assumption that public providers are more effective at catering for the needs of the poor. This would be explained by the fact that social concerns are a much more robust part of their mandates than the universal service obligations imposed on private operators since these are often imperfectly regulated and financed. The second is that the private sector has not been able to enter many of the markets despite repeated efforts to attract their expertise and financing capabilities. This would have now become an issue because trying for too long to wait for a deal to work is imposing delays in improvements that are much more penalizing to the poor than to those who already enjoy access. Third, even when the private sector does enter, critics of this approach argue that improvements in access are not always to be expected for the poorest and most vulnerable because cream skimming by private operators among the potential clients is much more common than hoped for by the reformers.[9] Too many poor in Africa, Central America and parts of Asia are indeed still not getting

[5] As of 2017, 29% of the global population still did not have access to safe water and 55% to decent sanitation facilities. Access to electricity was not available to 11% of the global population but in sub-Saharan Africa that share stood at 56%.

[6] In developing countries, according to Bagnoli et al. (2018), the lowest quintile has to spend twice the share of their expenditures the top quintile has to spend on electricity and 10% more on water and sanitation. And this ignores the fact that the lowest quintile is usually rationed on both services.

[7] Hall, Lobina and their other colleagues at Greenwich University were among the first economic academics to raise concerns with the process. See for instance, Hall et al. (2010).

[8] Saur/Bouygues, Suez and Veolia.

[9] Doll and Pachauri (2010) offer this explanation for the slow progress of getting access in Sub-Saharan Africa.

the access promised since the launch of the MDGs simply because their needs have been implicitly or explicitly excluded by contract with the private actors. These exclusions have often been the result of biased project preparations intended to maximise the odds of being able to account for the risk perception of potential investors.[10] Even when service obligations are imposed, private operators may often also have too much margin to decide on the timing of the investment to meet the poor's needs.[11] Fourth, since the SOEs, and quite often alternative formal and informal providers, end up anyway covering the needs of the poor and the most vulnerable, governments might as well internalize this upfront in the definition of mandates in the sector to avoid further implemenation delays. The social opportunity cost of doing nothing or delaying intervention in the hope of some form of PPP as an alternative to an SOE is usually simply ignored or underestimated both in ex-ante and ex-post evaluations of policies.[12] And finally, the ability to address the weaknesses associated with SOEs that helped make the case for PPPs in the 1990s has significantly improved. The SOEs of the 21st century need not be those of the 20th century.[13]

Each of these points deserves attention, both in theory and in practice, to be able to get a sense of the drivers of the relative effectiveness of alternative provider types in terms of their distributional impact. But there are other factors. The first underestimated drivers of the choice are the role and relevance of the institutional and governance framework that make a difference to the effectiveness of service providers from a social perspective.[14] The evidence reviewed in this survey suggests that these characteristics unrelated to ownership impact the poor much more than ownership. An SOE can be as "good" or as "bad" at delivering water or electricity fairly to the lower income classes. The empirical evidence shows that how firms are regulated, how they are financed, how sectors are (re-)structured to make the most of the opportunities to gain from competition, and how committed governments are to address corruption, including through its procurement processes, all make a difference to the optimal ownership choice from a strict social perspective. In a nutshell, *context matters*.

A second relevant factor is the political economy of the decision to address social and fairness concerns and their relative importance as compared to other policy goals. The ranking of policy goals should be driven in each context by a combination of fiscal/financial, efficiency or equity concerns. Besides the obvious ideological influences in this debate initially launched by the Pinochet and Thatcher reforms over 50 years ago now, respectively in Chile and the UK, the political case made for giving up on public ownership had generally been based on fiscal considerations while the critics

[10] See for instance Bakker (2014) who shows that PPP designed to improve services for the poor in the poorest and less stable countries have not been common.

[11] Delaying an investment deemed to be risky is an easy way to increase short term returnsto match the cost of capital. Since the return is based on the net present value of net revenue, postponing heavy capex is an easy way to produce the short term cash needed to pay dividends as seen for instance in the recent regulatory discussion of the excess dividend in the British water sector (see Helms, 2018 for instance).

[12] Related to this is the de-facto progressive replacement of social cost-benefit analysis by private cost-benefit analysis to support lending operations and investment decisions by many of the largest lenders and investors in infrastructure, distributional weights have long been ruled out in these assessments as many other social concerns, with the exclusion of environmental risks.

[13] See for instance the various chapters on SOE management in Bernier et al. (2020).

[14] And for each types of ownership there is also a good volume of research of the drivers that explain why some firms are better than others. In the case of SOEs for instance, the degree of autonomy or the degree of adoption of business techniques or the specific design of the governance structure in which they operate makes a difference (see for instance, Van Thiel et al.,2019).

have emphasized its costs in terms of equity issues.[15] Few empirical papers have actually studied specifically the fiscal impact and the possible trade-offs with equity considerations in the context of ownership choices. Most have focused on the longer term effects of contract renegotiations showing that these contractual adjustments often imply new tax or debt financed subsidies.[16] The regressivity of the tax system of a country would then contribute to the incidence of the ownership choice in the delivery of infrastructure services.

There is thus a lot we do not know collectively on the poverty and distributional effects of ownership switches in the sector. But there is also a lot we know about the choice between SOEs and PPPs and some of this is relevant to the discussion of social concerns. Of all the political promises made to argue for utilities privatizations, the impact of ownership on efficiency has attracted most of the attention among academics and policy observers, much more so than the social impact. For over 25 years now, efficiency drivers have been studied by multiple papers, including various meta-analyses.[17] Most provide static comparisons of public and private actors in similar activities in terms of specific performance indicators. Unfortunately, these indicators often differ across studies with selections biases that can be used to predict reasonably well if the authors are likely to argue in favor or against one form of ownership or another.[18] So it is somewhat hard to use that evidence to argue clearly one way or another only on efficiency grounds.

Some of the reasons for this uncertainty on efficiency spill over to the social diagnostic. The first is the solid evidence that the specific choice of the social performance indicators matters and that omitting key dimensions can bias the ranking of firms according to their ownership. It also teaches the analysts that ignoring the extent to which short term performance can fluctuate over time under any provision model can influence the ranking as well.[19] A recent study of the long term experience of the private model in the British water sector conducted by a consulting firm on behalf of a water producers association (Water UK) suggests that private operators improved performance over operations by SOEs initially but these improvements eventually reached a ceiling and in some cases were eventually partially reversed.[20] Any of these insights should be addressed in public vs private comparisons.

The second set of insights from efficiency diagnostics is more directly relevant to the identification of differences in social implications of the ownership choice. The most obvious one is that performance differences between ownership types are often driven by differences in employment level and in technological choices. Private firms tend to function with fewer workers and, often also, more up-to-date technologies.[21] These two choices can indeed have social effects. These are particularly obvious when the difference in employment impacts mostly the least qualified workers who also tend to belong to the poorest income classes (i.e. Chisari et al., 1997).

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[15] Many of the initial reforms have been conducted in the context of fiscal adjustments. For an early discussion summarized by the IMF, see for instance, Hemming and Mansoor (1998)

[16] See Guasch et al. (2014) for recent evidence.

[17] As of 2010, Berg and Marques (2011) counted there were well over 250 publications comparing the efficiency of public and private providers of water utilities services.

[18] If the analyst wants to show that privatization is a source of problem, the focus will be on employment level; if this analyst wants to show that it has advantages, the focus is on labor productivity. Same data, different perspective.

[19] The results produced by Andres et al. (2006) show that for the Latin American Electricity Distribution sector that payoffs are real, but short lived.

[20] Frontier Economics (2017) focuses on the British experience.

[21] Note that any efficiency study that focuses on labor productivity that ignores the differences in outsourcing between public and private providers after a privatization runs the risks of overestimating efficiency gains.

The social consequences of the ownership choice are clearly much broader than those related to jobs. They also reflect changes that are simultaneous to the privatization decision such as average price increases reflecting the more systematic effort to recover costs and/or the end of subsidies governments can no longer afford. It is only in the aftermath of the 2008 economic crisis that these social consequences have made it to mainstream academic publications. The topic, indeed, has started to become academically popular with the growing political and policy concern associated with energy poverty, including in developed economies. Most OECD countries have now a formal policy view on this dimension of poverty and dozens of academic publications have been debating the proper way of measuring poverty in this context.

Despite the explosion of research on social issues, mostly in sector specific field publications, the volume of analytical research providing robust quantitative evidence on their links with ownership in infrastructure industries is really quite modest, as discussed later in the paper in comparison to its political and ethical importance.[22] However, it is large enough to reveal, as in the case of efficiency, a clear heterogeneity of results across studies matching the heterogeneity of context. We will see that the regulatory design and institutions, the fiscal capacity, or the organization of policy and procurement processes are among the key factors driving social outcomes, rather than the specific ownership choice, echoeing the results noted for the efficiency diagnostics. And these dimensions are just as important for SOEs as they are for private providers as nicely summarized, for instance, by Herrera (2019) in the case of water, and Jasmab et al. (2017) for electricity. To provide a full sense of the policy relevant results produced by research, the survey will also discuss, as needed, the trade-offs between equity and efficiency to highlight the scope and limits of efforts to achieve gains in terms of both policy goals.

To provide details on these insights, the paper is organized as follows. Section 2 is a broad overview on the stylized facts on the relative importance of public and private provision in developing and developed countries in electricity and water and sanitation activities. Section 3 discusses how the links between social concerns and ownership have been addressed methodologically in the empirical literature. Section 4 summarizes the evidence on the (ir-)relevance of ownership for social goals. Section 5 provides the main emerging take-aways. Section 6 concludes with suggestions for a new research agenda.

2. Some stylized facts on the sectors.

To put things in perspective, it may be useful to provide a basic snapshot of the relative importance of public and private distribution utilities for electricity and for water and sanitation. There is unfortunately no official dataset that collects this information globally across these sectors, despite almost 30 years of policy discussions around this topic. Most of the effort of the international community has focused on the extent to which these sectors have attracted some form of PPPs. This

[22] In a recent survey, Bacon (2018) identifies oly 26 studies that relied on a formal econometric test of the impacts of reforms in the electricity sector performance in developing countries. Only 4 of them measured the impact on a variable with a social dimension (i.e. access rates), namely Andres et al. (2006), Balza et al. (2013), Ba and Gasmi (2011) and Vagliasindi (2012b). Three of these find that the privatization increased access and one rejects that result. None look at affordability or even at the average price level. And it is only recently that the impact on households has been addressed economically. Access and affordability have usually been dealt with through alternative analytical approaches (general equilibrium models (i.e. Chisari et al. ,1999) or more standard public economics incidence analysis (Wodon and Estache, 2014).

is well documented by various sources.[23] For the survey conducted here, this information is at most second best since countries without any type of PPP are not recorded in these databases. But this information can end up being very useful as an alternative to no information at all. The following summary of stylized facts makes the most of the information available from various public sources.

(i) The electricity sector

In a recent paper, Küfeoğlu et. al (2018) compile information on the distribution systems in 175 countries covering 99.4% of the world's population. They document for each country the number of distribution companies, the legal structure, the market structure and the ownership of the operators as well as various technical characteristics. As of June 2018, they identified 7,621 distribution system operators (DSOs) and distinguished between fully private, mixed ownership and public DSOs. For 55% of the countries, there was only one operator. For the rest of the sample, there were at least 2 DSOs and often many more since they include small scale integrated companies as well.[24]

Table 1 focuses on the share of countries according to the specific type of DSO ownership. It shows that only a few countries have only fully private DSOs (7% of the full sample, 6% in the 125 developing economies sample and 12% in developed economies).[25] For the full sample, 63% have purely public DSOs (76% for the countries sample and 30% in developed countries).[26] These are defined as DSOs with more than 50% ownership by state or other public entities. Countries with a combination of public and private ownership, i.e. mixed ownership, add up to 30% of the total sample, 18% in developing countries vs 58% in developed and transition countries. They are defined as DSOs in which there are both private and public shareholders in the same distribution company.

Table 1: Share of countries according to their specific type of Electricity DSOs ownership

	Total	LDCs	Developed economies
Public	63%	76%	30%
Mixed	30%	18%	58%
Private	7%	6%	12%
	100%	100%	100%

Sources: Based on Küfeoğlu et. al (2018) raw data

The main relevant insight of this table for this survey may be that the public sector continues to dominate the provision of electricity distribution in many countries. What the table does not show is the diversity of market structures in which this happens. Monopolies still dominate the distribution activity since 55% of the countries have a single DSO. Moreover, some form of vertical integration continues to prevail to the extent that over 75% of all the countries allow DSOs to also operate transmisions and/or generation facilities. When a DSO is public, it is also very likely to function with some degree of vertical integration (in over 90% of the cases in both developed and developing

[23] For developing countries, PPIAF is the most popular source. At the global level, i.e. with data on developed economies, Infra PPP is a very useful commercial source.

[24] Almost 70% of the DSOs are concentrated in 4 countries (USA (with 3,112 operators), Switzerland (900), Germany (875) and Spain (340)). In many of the countries with a large number of DSOs, these include small scale municipal and cooperative distribution companies.

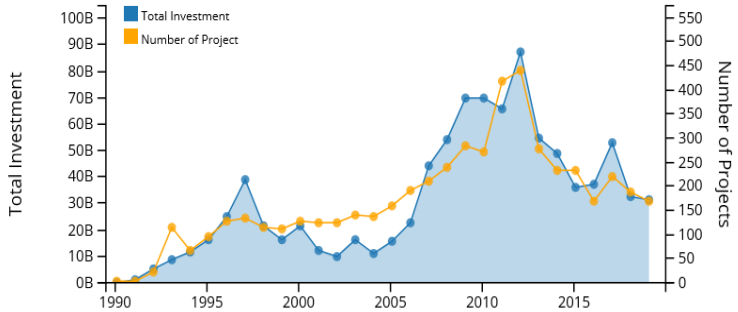
[25] Urpelainen and Yang (2019) look at reforms from 1982 to 2013. They had already noted that privatization lagged behind other reforms in the sector, but found that this was more common for relatively poor and authoritarian countries with low institutional capacity.

[26] Purely public DSOs are defined as DSOs with more than 50% ownership by state or other public entities.

economies). While the proportion drops to 48% and 23% for the full sample of countries when a DSO is respectively mixed or private (61% and 29% for the developing country sample). The heterogeneity of context should be a factor to account for in any comparison of the relative performance of SOEs and private firms.

The changes in the relative importance of public and private actors in the sector are also implicit in the evolution of the number of PPPs recorded by the World Bank PPI database. Despite the fact that it does not allow to control explicitly for public ownership, it confirms a declining trend in PPPs in the electricity sector since 2012, both in terms of total commitment in investment as well as in terms of the number of projects as seen in Figure 1.

Figure 1 PPPs in the electricity sector (1989-2019)



Source: World Bank PPI database

In addition, it is worth mentioning that 72% of the share of all public infrastructure-project investment commitments to electricity projects were undertaken taken up by SOEs. The private sector supported more generation projects than either the public or SOE sectors, with a relatively small average project size. In distribution projects, private investment was provided for relatively few projects, but with a larger average project size. Public/SOE-financed energy projects attracted however the largest amount of commercial debt (around 16%).

Recent geospatial analysis also shows that the relative importance of large scale utilities are losing importance in many of the poorest countries. It suggests that decentralized technologies, including mini-grids and off grid devices, will be the most cost-effective solution to deliver electrification for at least two thirds of rural households projected to gain access by 2030 (Baker and Alstone, 2011). Just to provide some reference, in 2017, the global off-grid solar sector is providing improved electricity access to an estimated 73 million households, or over 360 million people, thus transforming lives that were previously reliant on kerosene and solid fuels for most of their lighting needs. Sub-Saharan Africa has become a testing ground for many of the new business models that tap into digital and renewable decentralized solutions. Roughly 10% of those who gained access each year between 2012 and 2015 in this region did so from renewables-based off-grid sources, a major step up from the 0.4% that gained access via this route in 2000-2012 (Lighting Global, 2018). This trend reached a peak with 8.5 million off-grid solar lighting products and 1.2 million appliances were sold throughout 2019.

(ii) The water and sanitation (W&S) sector

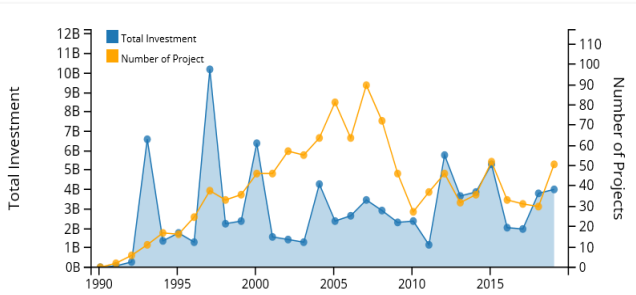
Providing a snapshot of the W&S sector is significantly more complex. The extreme heterogeneity of its governance options makes it much harder to have a clear perspective of the relative importance, let alone the specific nature, of SOEs in the sector. The traditional choice between large public and private firms to ensure the delivery of water and sanitation service continues to enjoy a high profile, in particular in medium- and high-income countries. But in many ways, it focuses more on the relative importance of the two approaches in the management of the service rather than on their ability to finance the necessary investment of the sector. Many countries have adopted partnerships between the public and the private sector, but these differ enormously in terms of size, specificity and financing sharing.

A survey of the governance choice in 174 countries of the world in 2018 suggests that 90% of the countries have adopted the PPP approach in some way, sometimes only for specific contracts.[27] But out of these, no more than 22% have managed to get private investment associated with the contract. This is consistent with the data collected for the 1990-2002 period conducted by Gassner et al. (2009). Their sample of 977 water utilities in developing countries counts only 15% of non-SOE providers.

In other words, in most countries, most of the investment of the sector is financed by the public sector. Management contracts dominate concessions or divestitures and many exclude the poorest regions or the rural areas. The main evolution of the sector is towards decentralized and/or community-based solutions, cooperatives and other forms of autonomous local operations (which can include smaller PPPs), precisely to address the needs of those often left out by the larger firms, whether public or private. In the poorer regions of the world and in many other areas these approaches have, over time, essentially already taken over the responsibility to deliver these services.[28]

As in the case of electricity, the data on PPPs points to a declining trend in PPPs in the WSS sector since 2012 with some modest recent increases since 2017 terms of the number of projects. A marginal increase in terms of total commitment in investment is also evident, driven by some large scale projects, as seen in Figure 2. In relative terms, though, these investment commitments continue to be much lower than those needed to meet the access gaps noted in the monitoring of the SDGs.

Figure 2 PPPs in the W&S sector (1989-2019)



Source: World Bank PPI database

[27] Bertomeu-Sanchez and Estache (2019).
[28] See Adams et al. (2019) for a useful and insightful discussion in the context of SSA.

W&S projects have traditionally been primarily sponsored by the public sector, as high input costs and long or low-cost recovery rates make such projects unviable from the private sector's perspective. Over 90% of water-sector investments were implemented by the public sector, within which the majority is undertaken by the public sector rather than SOEs. Commercial debt is also extremely limited, amounting to only 3%.

This governance heterogeneity is important to recognize in the context of this survey of the social incidence of the choice between SOEs and private operators because this choice is probably often the result of voluntary or involuntary selection biases. The SOEs end up with the challenge of financing the investments needs of the poor as a default option rather than a choice simply because the private alternatives do not materialize. Often also, they end up with the management of the most difficult situations in which the ability to pay of users and the margin for subsidies is the narrowest. In Mali for instance, the failed privatization experiments had started with an exclusion of some of the poorest regions of the country.[29] This type of cream skimming is also part of the challenge in the design of governance and in the packaging of mandates to organize procurement processes in the sector.[30] And it is bound to influence any assessment of the relative effectiveness of public and private provision of the service.[31]

(iii) So what do these stylized facts imply?

All this evidence adds up to a strong case for a careful internalization of fiscal, governance, institutional, market, political and social context in the assessment of the relative effectiveness of SOEs and private suppliers. There is enough evidence across countries and across sectors to argue that these dimensions can impact the average incidence performance across income classes or consumer types (rural vs urban). As discussed next, they should be part of the policy frameworks adopted to reform the sectors and to ensure that the optimal choice of ownership is made accounting for the way these choices influence the efficiency-equity-fiscal viability trade-offs that seem to be the norm in these sectors.

3. How are the links between ownership and social goals being assessed?

The modest contribution of the economic literature on the interactions between the ownership choices in infrastructure and the social concerns defined broadly to include distributional concerns is not really representative of the otherwise large volume of interesting and useful non-economic research on the topic.[32] Sociologists, anthropologists, political sciencists and other social scientists have produced many detailed insights in their case study diagnostics that are not always reflected in the economic evaluations. We will not explicitly do justice to these contributions in this paper, but many have already been implicitly internalized in the economic diagnostics, in particular when the data to do so was available. However, it is useful to keep in mind that the omissions of some of the variables not considered by economic researchers may lead to biases in the estimation of the effects of ownership if they are not well correlated with some of the control variables accounted for in the economic evaluations. It is probably one of the factors explaining why the comparison across

[29] Estache and Grifell-Tatje (2012).

[30] See Estache and Iimi (2013) for detailed evidence on biases in procurement processes and Estache (2020) for a discussion of the biased in the efforts to match procurement processes with institutional characteristics in infrastructure.

[31] See Sen et al. (2018) for an illustration in the context of non-OECD Asia.

[32] For a recent review of some of these alternative perspectives, see Conca and Weinthal (2018) and Grimsey and Lewis (2017).

assessments can produce incoherent results. Despite these limitations, the economic literature has produced diagnostics with useful results to guide further policy discussions of the optimal choice of ownership from the viewpoint of social concerns.

(i) What are the main social indicators considered by the empirical literature?

Researchers have focused mainly on two types of social concerns: poverty and distributional effects, although poverty has dominated the literature. Impact evaluations have relied on two main outcomes indicators: measures of access (i.e. shares of the population connected to a service) and measures of affordability (which are much less homogeneous across evaluations). The access indicator is mostly a technical one describing whether households have a connection at home (or close to home in the case of water).[33] It says nothing of the extent to which the access is cheap enough or excessively expensive. The affordability indicators pick up both the connection and the usage charge since most tariffs in these sectors include a connection and a consumption component.

In most papers, these indicators are reported as national, subnational or city/local averages for a representative consumer. It is only in the papers focusing on the distributional effects of the ownership choice that these measures are reported at an income class level. Increasingly also, as a result of the growing role of decentralization, some of these indicators are computed at the regional or local level to allow assessment of inter-regional fairness in the consequences of reforms, including privatization (Herrera and Post,2014 in the case of water).

The data on national access is relatively easily available since it is reported by international organizations such as the World Bank in its Development Indicators. The data on access per income classes is less easily available in a strictly comparable way across countries, for various reasons, including the fact that it is extracted from household surveys which are not always timed and structured in coordinated ways and the fact that it does not adjust for the quality of service provided (i.e. 24 hours or fewer of service per day?). Many other dimensions related to quality across countries and within countries pose additional challenges. The definition of access may include very different technologies, many of which do not correspond to home connections for some users. An additional concern is linked to the fact that many authors focus on the existence of a connection from a specific utility rather than access by the population in an area supposed to be connected by that utility. Measuring increases in connection without correcting for increases in population is a common issue in the empiriical literature. Indeed, even when a reform leads to an increase in the number of connections, the number of connections per capita or per household may actually be declining.[34]

The proxies used to assess affordability are even more confusing. First, there is little agreement on a general definition of affordability for infrastructure services. For instance, the debates on a reasonable definition of energy poverty are still very intensive as discussed by Culver (2017). Second, the evolution of the proxies used to assess affordability makes comparisons of results of older papers and more recent papers quite challenging. Less than 10 years ago still, it was common to rely on the impact of privatization on average price to get a sense of the impact of a change in ownership on the affordability of a service. In practice, however, the effective average price paid by each type of consumer in each income class is driven by the tariff structure instead. Third, it is often unclear

[33] The access indicator ignores some of the key dimensions that define the quality of access. Whether a household get to use the connection 3 hours a day or 24 hours is not really picked up by these measures.

[34] Some of the papers deal with this concern by adding a time trend since it is highly correlated with population growth, but it is then not used in the interpretation of the results.

whether papers look at the final prices inclusive or exclusive of taxes. Yet, the price of electricity, for instance, is often subject to national and sometimes subnational taxes. Since these taxes are often adjusted after privatization to allow the state to recapture some of the rent expected to be created by private operators (as was the case in many Latin American countries), even effective average prices can be misleading if the tax bias may not be accounted for. Finally, Bagnoli et al. (2018) show that a comparison of commonly adopted international affordability threshold with actual spending across regions and income categories would suggest that very poor households do not usually spend more than the affordability threshold on electricity and often on water. They explain that the most plausible explanation is that the very poor have no other way to cope than rationing.

All this implies that any effort to assess affordability has to be quite explicit on a wide range of dimensions that may influence impact evaluations. When these dimensions have not been made explicit by the analyst, it is important to be somewhat cautious with the interpretation of the estimated impacts of ownership on affordability. And this is certainly needed with comparisons across papers when these do not provide explicit discussions of these dimensions.

It is worth mentioning that some of the studies have produced estimations of the impact on social welfare rather than on access and affordability (e.g. Bensch et al.,2015, 2016 for surveys). Among those, the most relevant ones in the context of this survey are those unbundling consumer and producer welfare as well as those interested in comparing the payoff to consumers, workers and (domestic and foreign) capital owners. Any of these approaches can be useful to get a sense of (re-) distribution among economic actors resulting from ownership changes. Only a few have further unbundled the consumers' welfare effects into income classes.

(ii) What are the main methods used?

Before getting to a review of the evidence, it is also important to briefly mention the diversity of methods that have been adopted to assess the social incidence of reforms, including changes of ownership.[35] In the next section, when we report the results, we will classify them according the three most common methods adopted in analytical assessments to highlight any systematic bias that could be linked to the methodological approach to produce the comparative assessments of the social effects of ownership over time or across countries: econometric, index number based and computable general equilibrium models.[36]

The most common approach is regression/econometric based as seen in the inventory produced by Bensch et al. (2015, 2016) for electricity, and Herrera (2019) for W&S. It is useful, in particular when the link between ownership and social outcomes needs to account for control variables reflecting the heterogeneity of the context in which the ownership decision takes place. Some of the most careful papers add interactive terms between the ownership variables and the control variable to identify the factors strengthening or weakening the importance of the ownership variable.[37] These

[35] It is useful to keep in mind also that in this field as in many other concerned with empirical evidence on the impact of a policy, there can be significant reporting or publication biases reflecting the fact that that results unsupportive of a pre-conceived idea of the expected relevance or sign of a variable may not be reported and/or published as often as supportive significant results.

[36] The survey does not cover case studies or more narrative assessments based on simple statistical tables without robust statistical tests. These are useful to provide context but do not provide reliable evidence of relative performance effectiveness even if they are quite common in wider audience publications.

[37] Nagayama (2007; 2010) or Sen et al. (2016) for example use this to argue the necessity of assessing reforms in bundles rather than in isolation. More technically, the adoption of interaction terms is needed to minimize the risks of specification error since the combinations of ownership with other policies and institutional arrangments is quite heterogenous as seen in the discussion of the stylized fact in section 2.

papers tend to rely on panel-data. The fact that the panels can be global or region specific is quite useful since it informs on regional differences in the way public and private providers compare. The specialized journals such as Energy Policy, Utilities Policy and Water Policy have also published many country-specific studies. These inform on the relevance of local specificities. Some of these country specific studies rely on time series for the few countries with a record long enough to provide robust results. But they are a minority. A few have also relied on spatial econometric assessments, notably those interested in the relevance of decentralisation for the impact of reforms, including changes in ownership.

It is worth mentioning that the way the public and the private options are modelled tends to be quite simple, maybe simplistic. Most papers rely on a dummy to distinguish between the two options. Vagliasindi (2012b) is one of the few studies, relying in addition to a privatization dummy for the generation, transmission and distribution electricity sector also on an indicator of concentration for each subsegment of the sector. In some cases, they rely on a set of dummies to account for the various types of PPPs. Some of the papers have been somewhat more detailed and have unbundled private participation according to the contract types (i.e. management, BOTs, concessions or full divestiture (i.e. Gassner et al., 2009). As mentioned by Nagayama (2007, 2009, 2010), ideally, the diagnostics should account for the investment level since access is a lot about investment. And when the two options are used in the same country, relative share of investment should be used. This data is generally not available (except for Latin America since the IDB has recently produced the necessary dataset for the region).

A second approach that has occasionally been used in recent years, is the reliance in synthetic index numbers to internalize the multiple dimensions that need to be considered jointly with the ownerhip choices to assess their social outcomes (e.g. de Halleux et al., 2019 or Foster and Anshul, 2020).[38] It comes in many forms and shapes. Their main weakness is that they can only deliver correlations as such. They do not establish causality between ownership and social outcomes. It is however useful to conduct international benchmarking exercises. Non-parametric efficiency measures, for instance, can be designed to relatively easily produce benchmarked comparisons of public and private provision of a service in a cross-section or in a panel of data.

The final common approach is the reliance on simulations approaches. The most popular one is to rely on computable general equilibrium models to quantifiy the impact of switches in ownership. Somewhat oddly, the discussion of this approach is often explicitly excluded from surveys on reform impacts. Yet, while the approach is often more demanding of details than partial perspectives driving the other approaches, it has the advantage of tracking both direct and indirect effects. It is particularly useful to track the effects of changes in ownership on the labor market where workers losing their job can easily become part of those facing affordability constraints for instance.

None of the methods are perfect. And many of the papers, across methodology, reviewed next have actually been used to deliver correlations. This is also the case for a wide range of older papers relying on econometric techniques that failed to address the endogeneity problem in the estimation of the impact of ownership on the lack of access and affordability of service in many of the poorest

[38] This category includes the use of non-parametric methods that can be used to assess the extent to which firms are efficient at meeting jointly several goals such as efficiency, access and affordability targets. See for instance Mbuvi and Tarsim (2011) in the case of the Ugandan water sector.

countries. This is not a minor limitation.[39] Yet tested correlations are often useful to identify policy challenges by simply pushing the burden of proof onto the policy makers and their advisors, even if they do not pass the robustness tests expected for many academic publications.

4. What does the evidence show on the links between ownership and social goals?

This section is divided in three parts. First, it discusses the evidence on the access outcomes of the ownership choice. Second, it does the same for the much more modest literature on affordability. The final section focuses on the distributional consequences. In going through the summary of the results, it is important to keep in mind that many of the papers have not really been too concerned with a key selection bias in the way the ownership choice was made. In many of the cases, SOEs are in charge simply because the private sector was not interested in view of the risks inherent to investment in some countries or regions. The allocation of mandates to SOEs or private operators within countries and across countries has often been the explicit or implicit outcome of cream skimming by the private actors.[40] The issue is much better addressed in the theoretical research on the topic (i.e. Laffont, 2004) and Estache,2020) for surveys) than in the empirical research.

(i) Access

Access is the best covered among the social dimensions in the academic literature comparing the relative effectiveness of SOEs and of the various types of PPPs on social matters. Raw access measures or proxies are particularly common in panel regressions conducted at the country level. Proxies are more common when the assessments are conducted at the utility level. The number of connections has been quite useful when the focus was on the effectiveness of performance contracts with explicit connections targets imposed on operators for instance. But it can also offer only a partial biased perspective on performance when the model specification used to assess the marginal effect of the choice of ownership ignores the relevance of the extent to which connections growth matches, surpasses or lags population growth as mentioned earlier. Timing and speed of connection matter indeed and only a few assessments look at these dynamic aspects (notably Gassner et al., 2009 and Andres et al., 2008). Service quality also matters to the measurement of access. Getting access 24 hours a day is not the same as getting access less than 8 hours a day. This is however easier to control for since there are reasonable databases to cover that dimension.

If this limitation due the differences in the specific definition of access is ignored for a moment, the main message that comes across the empirical evidence is that there is no clear difference related to ownership. The only case in which the access rate can be improved over SOEs'past performances is for specific types of PPP contracts (i.e. Gassner et al., 2009). The only PPP type doing better than SOEs on access is the concession contract which often includes specific investment programs and/or connection targets.[41] But even this may be an overstatement of relative effectiveness as we will see in the details of the sector specific surveys.

[39] The current publications standard imposes experimental (randomized controlled trials; RCTs) and non-experimental approaches anchored in instrumental variable (IV) estimation, difference-in-differences (DID) and fixed effects (FE), propensity score matching (PSM), regression discontinuity designs (RDD) and Heckman selection models. Many of the papers published from the 1990s to about 2010 did not meet those standards but continue to be widely quoted and included in meta-analysis.

[40] Doll and Pachauri (2010) offer this explanation for the slow progress of getting access in SSA.

[41] It is worth mentioning that before the privatization wave started, it was common to impose on SOEs contracts (contract-plans) but their failures linked to political interference were one of the reasons why altenatives based on private sector management were considered in developing countries. For an overview, see Gomez-Ibanez (2007).

Insights on the electricity PPPs

Four recent surveys (Bacon, 2018), Bensch, 2019, Jasmab et al., 2017 and Lee and Usman, 2018) have identified a large number of studies assessing the impact of privatization and PPPs (as well as other reforms) on a wide range of performance outcomes, including access. Bacon (2018) and Lee and Usman (2018) produce narrative syntheses looking at multiple outcomes, including access rates. Jasmab et al. (2017) is also a narrative review but has the advantage of being much more detailed on the evidence on the links between energy reforms, including the ownership choice, and poverty reduction in developing countries.

Their collective reading of academic insights is that the long record of reforms anchored in some form of PPP in Latin America, Asia and SSA suggests that there is no significant difference with what was achieved by SOEs for electricity access, or at least as much as expected, and in particular in rural areas. Differences in effectiveness are largely driven by the rationality of the match of the ownership choice with local needs and constraints and in particular the adoption and implementation of complementary reforms (regulation, institutions, subsidies, pricing structure). In other words, these narrative reviews suggest that changing ownership only, either way, is not a sufficient condition to provide more access, however this improvement is measured. [42]

The more technical synthesis of the evidence published by Bensch (2019) largely validates this conclusion, although with a few more technical details. He works with two samples of publications produced between 2002 and 2018. The first sample is used to synthesize the results of 27 quantitative studies (12 cross-regions, 8 on Latin America, and 7 on Asia). The second offers a synthesis of 43 qualitative studies.[43] Almost half of the quantitative studies were published before 2010 (i.e. with pre- 2008 crisis data). Only 3 of the quantitative studies were published after 2014. For the qualitative studies the proportion is roughly the same. This implies that these evaluations are likely to be outdated in some dimensions.

Most of the papers included in the surveys are conducted at the country or regional level rather than at the global level. Latin America and Asia dominate the sample. In Latin America studies include both cross-country panel and country specific papers (dominated by the Argentinean experience). The Asian sample is biased towards country specific studies of large countries (China, India and Pakistan, with India dominating the sample). Sub-Saharan Africa (SSA) is less well covered and better covered by the qualitative than the quantitative sample. As mentioned by Bensch himself, the transferability of the conclusion across regions is unclear given the significant cross-regional differences.

Bensch's treatment of the data suggests weak or inexistent improvements in access when measured at the country level, but modestly positive improvements when measured in terms of increased utility connections. The main mechanism is that the entry of private operators is expected to increase the availability of financial resources for system expansion when this is enabled by more competition where possible and better regulation. These regulatory improvements did not happen as expected and the outcome in many countries has been a decline in private investments (Erdogdu (2014)) and hence on the speed with which countries where closing their access gap. Bacon (2018),

[42] For instance, Vagliasindi (2012a) had already shows in lots of details that, often, the presence of a supportive regulatory framework influences only the entry, but not necessarily the level of investment of the private sector, and hence the access level expected by the population.

[43] The quantitative studies are assessed using meta-analysis and meta-regressions, with standardized effect sizes and when possible pooled effects. Qualitative studies are synthesized with an iterative logic model approach.

Jasmab et al. (2017) and Lee and Usman (2019) largely confirm these conclusions in the reading of the results of the different samples they reviewed (often overlapping).[44]

Bayer et al. (2019) also validate many of these conclusions but provide an alternative perspective on the access diagnostics as they focus on the methods adopted to assess the impact of access, including changes in access rates, on development. They only find 31 out of 7,247 studies interested in "energy access" published since 2000 that have been conducted using formal statistical tests of impacts of policies on access and only 7 draws on a randomized experiment designed for causal inference. Besides the obvious underrepresentation of statistically robust assessments in diagnostics of the access outcomes associated with reforms, the main new insight to retain in the context of this survey is that the method matters to the conclusion. More specifically, the standard econometric approaches adopted by observational or quasi-experimental studies (i.e. those most commonly quoted in policy discussions) are more likely to lead to positive impact than randomized experiments.

The second insight offered by Bayer et al. (2019) is that even when cultural, country, and policy contexts are accounted for, meaningful comparisons across studies are not trivial. This is their justification for avoiding producing a comparison. But their concern and decision show that there are good reasons to be cautious when considering exporting the policy implications from one country or one context to another.

Insights on the water and sanitation sectors

For the water sector, John et al. (2015), and the matching more detailed version by Thillairajan (2016), are the only relatively recent comparable technical surveys of the evidence synthetizing the papers analysing the impact of ownership changes on access rates or connections in infrastructure. Their meta-regression analysis of 90 observations from 17 econometric studies covers electricity, telecoms and water. For the water sector, they show that the ownership change had, on average, a negative impact, even if not significantly so, for the sample they synthetised.

A notable difference with the research on electricity is that most of the widely quoted quantitative cross-country studies on ownership changes in W&S utilities are outdated as they all deal with data collected prior to 2010 (Andres et al. (2008) or Clarke et al. (2009) on LAC, Bayliss (2003a, 2003b) or Kosec (2014) on SSA, or Gassner et al. (2009) covering a global sample).[45] For some time now, research has focused instead on other policy options such as decentralization and on the reliance on alternative smaller scale providers (see Herrera, 2019) an encompassing overview). Even if this debate also includes a discussion of the relative effectiveness of public and private actors, it focuses on a much smaller scale of operations and is hardly comparable to the assessment conducted here. The impact of the ownership choice on social outcomes does not seem to have been "fashionable" in the empirical academic literature on the water sector for about a decade.

Despite the limitations from the need to rely on dated evidence, the results are still quite useful to rethink some of the policy choices linked to ownership currently under debate. The messages from the most technically robust studies of the differences in access outcomes associated with ownership appear to be generally quite robust, even if not as clear cut as desirable to be able to make simple policy choices. This is also argued by Bakker (2014) in her survey of various meta-analyses of the old

[44] Each add a twist in their own additional comments on the mismatches between the growing role of PPP and the other reforms that have been adopted in the sector. But these go beyong the scope of this survey.

[45] Ownership is also an issue for the management of systems where the choice between community-based organizations and private operators, in particular in SSA.

assessments of privatization and PPPs outcomes in the sector in developing countries. She concludes that the choice of ownership is less important than the choice of governance if the targeting of access improvement is to be more effective.

These conclusions have been reached in a wide range of regional diagnostics but some of those most quoted in the literature have focused on case studies of the SSA experience. Bayliss (2003a, 2003b) was among the first to argue that there was no evidence that ownership matters to access in her study of a large sample of African countries at different stages of their reform process. She was also already arguing then that the key was to account for social, political, governance and economic context when considering the attractiveness for private operators. Since Bayliss, many case studies and official reports have been relying on less technical assessments (simple before and after PPPs or with vs without PPPs without relying on control variables) to argue that there were access improvements in the sector following privatization or some forms of PPP. Some have provided very detailed discussions of the impact of ownership changes (i.e Banerjee and Morella, 2011) for an overview of cases in SSA). But any generalization of their results would be statistically less reliable, as their robustness and key contextual dimensions remain largely untested statistically.

More technical regression-based cross-country assessments have offered more reliable and robust evidence. Most focused on average access rates and only a few tested the distribution of access changes across income classes. The early research validated the initial enthusiasm for PPPs as compared to SOEs. The most recent one provides a much weaker case with respect to a supposed advantage of PPPs in terms of improvements in coverage.

Two of the studies finding an advantage for PPPs include Kosec (2014) for SSA and Clarke et al. (2009) for LAC. Kosec (2014) estimated the effects of ownership changes in the urban piped water sector, in 39 African countries during the 1986–2010 period. She found that, for that period, swiching to PPPs increased the use of piped water by 14 percent (in addition to improving children health). In addition, she pointed out that the benefits of this increase were largest for children in the poorest households. Clarke et al. (2009) worked with multi-year household survey data at the city and province level in Argentina, Bolivia, and Brazil. Their analysis suggested that connection rates could improve with or without PPPs, suggesting that ownership was not the main driver of change.

The more recent research relying on more recent data points reinforces the sense of the irrelevance of ownership as a determinant of the evolution of connection rates for the poorest households. Marson and Savin (2015) analysed the evolution of access in 25 SSA countries from 1996 to 2012 and show that access to water depends upon financial results, but not linearly. Important access increases can take place at relatively low levels of capital cost recovery while they can deteriorate beyond a certain threshold. Although they do not address the ownerhip, their results are useful to explain how the improvements in costs recovery can be counterproductive in terms of access (without subsidies). They argue that it illustrates the likelihood of potential conflicts between financial and social objectives in the water sector. Increasing the average price to improve cost recovery will have a negative social impact without any adjustment to the price structure or to subsidies. Stutsman et al. (2016) assess how drinking water coverage is impacted by ownership (private, public and decentralized) with a sample of 144 utilities across 33 countries collected from the International Benchmarking Network for Water and Sanitation Utilities (2015). They find that all regimes can lead to improved water coverage, although it is not necessarily noted for the same performance measures.

In the research providing country specific evidence, the results are equally mixed. It is hard not to mention the Galiani et al. (2005) paper on the Argentinean privatization experience. Even if it is also somewhat dated now, it is still widely quoted as evidence that the water utilities in that country led to improvements in access (more households with piped water) as well as in health of children and to better quality of water services. Yet the paper has often been criticized by practioners for not recognizing selection bias built in the cream skimming that characterized the design of the contracts. They intended to reduce the risks to which private operators and investors were exposed, leaving the risky and costly responsibilities to the public operators.[46] The generalization of these results was also questioned in a couple of academic papers. Borraz et al. (2013) did not reach the same conclusion in their assessment of the effects of the sequence of privatization and renationalization experiences in Uruguay. They showed that the privatization had resulted in a deterioration of water quality, and the subsequent renationalization in an improvement. Granados and Sanchez (2014) analysed the reforms adopted by Colombia for its water sector and also rejected the conclusions on the inferiority of SOEs reached by Galiani et al. (2004), raising important doubts on the global relevance of these results.

In sum, for the case of W&S, as in the case of electricity, the impact of choice of ownership on the evolution of the access rate is still unsettled but the most recent research leans towards the irrelevance of ownership on its own. The main forces driving the effectiveness of any ownership type are the efforts to match the choice of regulation and governance with the context in which the reforms take place. The accumulated evidence that many of the reforms focusing on ownership have at best underdelivered improvements in access in a reasonable delay helps understand why the policy debate and the choices on the ground have moved onto much more local modes of delivery. Slow decision making and slow implementation of reforms are a big part of the problem for any of the ownership options. The demand for improvements is increasingly pressing for many of the unconnected poor for many reasons, including the growing concern for local water scarcity.

(ii) Affordability

Before discussing the evidence on the role of ownership in the determination of affordability, it is useful to briefly discuss the complexity of the definition of affordability. This is subject to an intensive debate that would go well beyond what we can cover in this survey. But it may be useful to keep in mind that the definitions adopted across papers are often not strictly comparable. Most of the papers reviewed here ignore quality of service access by different income classes for instance. This reflects a bias in the way the standardized data collection processes. Indeed, they usually do not track detailed quality data such as the reliability of the access is available.[47] Low levels of expenditures may simply reflect low levels of consumption resulting from limited access during significant parts of the day. Affordability may sometimes thus reflect rationing rather than what is commonly understood by affordability.

Maybe because it is quite difficult to measure affordability precisely, the academic literature on the impact of the ownership choice on affordability is much more modest than on access, surprisingly so in view of the political and ethical relevance of the issue. Moreover, it is just as dated as the majority of papers on access since a majority of the papers focusing on the links between ownership and

[46] Contract misspecifications are still a common issue in the preparation and implementation of PPPs which explains why contract renegotiation or penalties for non-compliance on costly requirements continue to be an issue, including in developed economies as indicated by various national auditing courts.

[47] See Hutton (2012) for a useful overview in the context of water for instance.

affordability were published before 2010 or with data collected prior to 2010 (for instance, Bayliss (2003a, 2003b), Birdsall and Nellis (2003, 2005), Coudouel and Paternostro (2005), Estache et al. (2002) and Ugaz and Waddams-Price (2003) are among the few providing cross country comparisons of the impact of privatization and ownership changes). The most encompassing in terms of country coverage is still Gassner et al. (2009)) while for SSA, Banerjee and Morella (2011) and Estache and Wodon (2014), for Latin America, Andres et al. (2008) and for Asia Sen et al. (2018) are the most recent sources allowing comparisons across countries for the two sectors. The discussions of the nexus between affordability and ownership choices have mostly focused on tariff designs and subsidies rather than on ownership itself. The average price of services for which ownership was changing has been the main indicator used to assess the odds of an impact on affordability. As for many of the issues discussed in this survey, the multiplicity of dimensions (i.e. control variables) to take into account in any diagnostic on the effects of changes is such that it is not surprising to note that there is disagreement among researchers. Those focusing on the impact on the poor are likely to emphasize that there are many reasons why prices will increase with the reforms associated with ownership changes (i.e. Nagayama,2007, 2009). They usually explain that it is due to the end of subsidies tolerated under public ownership or due to increases in taxes resulting from the efforts made by government to recapture some of the efficiency gains produced by reforms. Others argue that prices are likely to fall as a result of changes in the degree of competition (i.e. Urpelainen and Yang, 2019) or may fall if improvements in regulatory designs are implemented (Chisari et al., 1999).

It would be beyond the scope of this survey to review that evidence, but it is useful to recognize that the focus on prices in the context of debates on ownership is largely driven by an analysis of the effects of the decisions to end of subsidies that were simultaneous to the decision to privatize in many of the reforming countries.[48] These decisions had affordability impacts that also differed across income classes as suggested early on by Chisari et al. (1999). But they were seldom discussed precisely enough because of major data gaps on household expenditures. Despite these limitations, as discussed in more details later, a lot of the evidence of this literature on subsidies and tariffs designs in the two sectors of interest hints at their regressivity, in particular in cases in which subsidies focus on service use in countries in which the poorest actually do not have access to the subsidized service. In sum, this regressivity is usually not due to the ownership choice but the simultaneous decisions made with respect to regulation and in particular pricing.

Beyond questionable targeting, the subsidization of utility services, which shifts their operations away from a cost recovery model towards social services provision, can reduce service quality and performance (McRae, 2015). This is the key reason why, beyond utilities, many governments need to consider how to best support the non-network electricity services which fall outside of the conventional utility model. There is indeed a growing debate about whether subsidies are needed in this space or whether they simply undermine the market.

The targeting performance of connection subsidies depends strongly on how the roll-out of new connections is made. In countries with low existing connection rates a roll-out policy that mirrored the existing pattern of household connections would tend to be regressive since these will tend to be the rich. In the case of electricity for instance, grid-based roll-outs that concentrate on connecting households in areas where there is already access (densification) are likely to be considerably less expensive per connection than roll-outs that seek to expand the area covered.

[48] See Nagayama (2007, 2009) for instance shows how unbundling the electricity sector or introducing a privatization can lead ot price increases in some regions and drops in others.

There are alternatives that work whether the providers are public or private. In Lao PDR, a power-to-the-poor program provided eligible households with a no-cost basic meter (low voltage) together with interest-free credit to cover additional costs of installation resulted in the connection rate increasing from 78 to 95%, and from 63 to 90% among female-headed households (Boatman and Chanthalinh, 2009). Kojima et al. (2016) recommended some solutions, based on evidence from household expenditure surveys since 2008 in 22 Sub-Saharan African countries. Regulators could request from utilities, public or private to include installing individual meters and subsidizing their installation. They could encourage prepaid metering also so as to avoid disconnection and reconnection charges and ease reformulating lifeline blocks and rates as appropriate, while stamping out corruption to eliminate bribe-taking can all help the poor. It is notable that there is no evidence on the extent to which these creative solutions are more likely to be adopted by public or private providers without a specific mandate.

There is however evidence on other ways of getting a sense of the difference ownership makes on the pricing decisions. In the last 10-12 years, more precise analytical evidence has started to emerge on the explicit interactions between ownership, subsidy or tariff design and affordability. Most are country specific. The remarkable (and remarkably sad) fact is that most studies on the incidence of subsidies reductions in these sectors associated with privatizations show no significant progress. About 20 years since the first diagnostics of mistargeting, explicit and implicit (through tariff designs) subsidies following the switch from SOEs to various forms of private provision continue to be quite regressive as seen in the evidence detailed below.

The new data allows a much more careful recognition of the heterogeneity of situations faced by the poorest as illustrated by Lin (2018) for instance in the case of energy. This research has been quite effective at showing how matching designs of regulation and subsidies and ownership changes can help improve welfare improvements as already pointed out by Chisari et al. (2007a and 2007b) relying on computable equilibrium models.

Insights on the electricity sector

To set the stage on the ownership assessment, it is useful to get a sense of the extent to which prices continue to be an issue in the sector after close to 30 years of reforms. As seen in the stylized facts collected by Foster and Witte (2020), affordability has apparently been formally addressed by reforms in the design of tariffs. About three-quarters of countries adopt either increasing block tariffs (IBTs) and/or separate social tariff schedules with a view to safeguarding affordability for low income customers. In practice, however, these changes have not delivered. Only one-third of countries manage to keep average electricity bills within 5 percent of household income. Foster and Witte (2020) also argue that this is related to the need to improve cost recovery as the correlation coefficient between the affordability indicator and limited capital cost-recovery lies at 0.8. The main point of these stylized facts is that it is unlikely that the ownership alone will make a difference to the affordability outcomes. And this is confirmed by the more analytical treatment of the data.

Although the use of IBTs as a cross-subsidy mechanism is often justified on social grounds, the current evidence suggests that they are rarely much more effective at targeting resources to the poor than a straightforward, subsidized, linear volumetric tariff would be when there is a fiscal

margin to do so.[49] There are additional reasons to believe that IBTs do not effectively target subsidies to low income customers in developing countries and that this matters much more than the ownership choice. First, reinforcing the earlier literature on the incidence of any subsidy to consumption, IBTs are only available to households who have a connection to the grid network, therefore excluding the poorest households who often lack access to electricity services. There is inequity across consumption levels, stemming from the prevalence of fixed charges or minimum consumption charges. These charges have a stark impact on households consuming less than 30 kWh a month (which constitute about 30% of all households below the poverty line). Pargal and Banerjee (2014) showed that, in 21 Indian states, the average household consuming less than 30 kWh a month paid more per unit of electricity than the average household consuming 30–100 kWh. [50]

Second, low-income customers are typically more likely to have a shared connection than wealthier customers and thus often face the highest price in IBTs whether the service provider is public or private. The average unit tariff of multiple connected households is likely to be considerably higher than if each household was individually metered since they appear in the blling process as a single household consuming a lot. Poor households can end up paying much more for consuming the subsistence level of electricity.[51] Kojima et al. (2016) explain that in Ethiopia, where the lowest connection fee of US$ 76 represents 130% of monthly household income, the number of grid-connected households outnumbers utility customers two and half times over. In contrast, in Senegal— where the connection fee is waived if the household is within 40 meters of the grid—the degree of shared connections is the lowers in the region . In both cases, the provider is public, illustrating the irrelevance of the ownership dimension.

Finally, recent research also suggests that irrespective of the ownership choices, cognitive biases in the consumers' evaluation of the pricing options they face are also likely to lead to social issues. For instance, almost 20 years ago, Liebman and Zeckhauser (2004) already argued that when the cost of understanding complex pricing is substantial, consumers respond to the average price of total payment as an approximation of their marginal price. Ito (2014) provided evidence of this behavior in California. Once again, these sorts of distortions that influence affordability have been noted both with public and private utilities.

The main studies that looked specifically at the nexus between affordability and ownership through more analytical approaches have been reviewed and summarized by Jasmab et al. (2014). They confirm the irrelevance of the ownership dimension. For a very heterogenous sample of studies ranking from global to region or to country specific diagnostics, the ownership choice is seen to have had little effect on affordability for the poorest household. This conclusion stands for the sector also when the redesign of electricity rates to reflect more efficient cost structure is accounted for (Burger

[49] The discussion on tariff structures is important but often ignores the very basic technical observation that there is no evidence that the marginal cost depends on the level of a customer's monthly consumption. Yet, this is often the basis for applying non-linear pricing. In other words, low consumers are necessary a good proxy for low income consumers.

[50] Note that Burger et al. (2019) and Levinson and Silva (2020) show that regulators can fine tune the tariff structures to improve the targeting of the needs of the poor.

[51] Levinson and Silva (2020) for instance rely on a new dataset of 1,300 utilities across the US to show that utilities whose ratepayers have more unequal incomes charge less to low users and more to high users and use this to develop a new measure of the redistributive extent of utility tariffs (the "electric Gini"). Utilities with higher electric Ginis (more redistributive tariffs) shift costs from households that use relatively little electricity to households that use more. However, since electricity use is only loosely correlated with income, that redistribution does not meaningfully shift costs from households with low incomes to those with high incomes. They do not distinguish, unfortunately, according to ownership in assessing the extent to the tool is used.

et al., 2019) or when secondary effects such as rationing or market exclusions are analysed (Estache and Wodon (2014)).[52]

Nepal and Jasmab (2007) or Tischler and Woo (2007) confirm that, without a well targeted effective design of regulation focusing specifically on the needs of the poor, affordability remains an issue under any type of ownership. As suggested by Gugler et al. (2013), if the reforms lead to higher prices, the additional resources generated could be used by either SOEs or private operators to reduce subsidy costs but also to finance network expansions that get to areas where the poor live since these are often out of service range prior to reforms. But this will not be done if the regulatory mandate is not designed to do so or simply not enforced even when designed correctly.

Insights on the W&S PPPs

Once again, it is useful to start with a discussion of subsidies allocated to the W&S sector, whether service providers are public or not. The stylized facts on subsidies are well documented by the World Bank's International Benchmarking Network for Water and Sanitation Utilities (IBNET) database. According to that database, in 2017, 86% of the 1,589 utilities with the necessary information rely on subsidies (only 35% are able to recover at least their operating expenditures). This implies that we should expect that affordability concerns are internalized by a majority of countries. But it does not say much of the extent to which the subsidies are well targeted.

The evidence reported by Andres et al. (2019) suggests that on average 56% these subsidies are captured by the wealthiest 20% of the population. Only 6% are used to finance the needs of the poorest. Abramovsky et al. (2020) provide additional similar evidence for a number of case studies, although the diagnostic does not address the relevance of ownership in this case. Nauges and Whittington (2017) show, conceptually, why the most common pricing approach, increasing block tariffs (IBTs), are a significant part of the problem. They fail to target low-income households regardless of the magnitude of financial subsidies that a utility receives from high-level government. They also show that when cost recovery is low, which is one of the problems characterizing many SOEs, the distribution of subsidies under IBTs is even worse if the correlation between water use and household income is high. Fuente (2019), in his systematic review of 44 studies analyzing tariff design in details finds that only 10 touch upon explicity on affordability issues and out of these only one is for a developing country since 2010 (Jordan). Unfortunately, these conceptual and survey papers do not provide an explicit discussion of the relevance of ownership in their assessment.

The only peer reviewed publications we found providing robust evidence on data collected since the early 2010s (i.e. less than 10 years old) are two country specific papers. They concern Brazil and Malaysia. For Malaysia, Lee (2011) finds no difference in affordability (nor access) between the public and the private providers of the services. The author argues that this is the result of the active regulatory intervention in terms of tariff regulation and universal service provision. For Brazil, Barbosa and Brusca (2015) show that the water supply and sanitation tariff levels were higher for privately managed corporations than for SOEs.

[52] Secondary effects are usually ignored by the most common econometric treatments of the data. They are best accounted for through computable general equilibrium models. These can be quite data and assumption intensive tools, but can deliver evidence on the impact on affordability through a wide range of channels, including through the effects across income classes on the demand for labor resulting from privatization associated with significant labor reductions in the short term, and possible recovery in the medium to longer turn. Boccanfuso et al. (2009a, 2009b) or Chisari et al. (1999, 2003) all provide evidence on the negative short-term effects on the lowest income classes associated with both price increases and labor demand effects.

In sum, the big picture that emerges from the modest academic evidence available is that there is no detailed monitoring of the relevance of ownership for affordability in the most widely quoted academic journals on developing economies or in the main policy-oriented think tanks. There are enough, however, to conclude that the evidence is generally mixed. And this includes the cases in which efficiency gains were achieved by ownership changes. Indeed, unless regulation is properly designed, there is no reason to expect increased efficiency to translate automatically in a price decrease, as the transition to private participation has often occured in a context of prices that were set well-below cost recovery levels.

(iii) Distributional effects

When the ownership choice makes a difference to access and/or affordability, it is likely to have a distributional impact across different income groups and sometimes across consumer types (i.e. rural vs urban). The analytical approach most commonly used to assess this impact is the reliance on computable general equilibrium models (CGEs) since it can account for the multiple ways in which the welfare of the poor can be influenced.[53] Chisari et al. (1999) were the first to rely on CGEs to provide quantitative evidence on the relevance of these multiple interactions for Argentina. More recently (although not that recently), Solaymani et al. (2014) for Malaysia, Boccanfuso et al. (2009a) for water privatization in Mali and Boccanfuso et al. (2009b) for electricity reform in Senegal have all provided equivalent results on the interactions between ownership and important distributional effects that go beyong the impact of the regulated service price. In all of these cases, it is not the ownership that drives the change, but various forms of failures to design and implement regulatory adjustments that would ensure that any distributional gain or loss associated with the change would be mitigated.

One of the most common ways in which ownership makes a difference, when it does so, is with respect to the targeting of expansion. In many of the countries covered by these papers, most of the poor are simply not connected to the network. This explains why, when price increases take place, they seem not to have an impact on the poorest household. However, the poor get hit through the repercussions of regulated services prices through the labour market. Many unskilled workers were dismissed both in the public administration and in the newly privatized company. Solaymani et al. (2013) add evidence for Malaysia that the rural households can suffer more, notably due the removal of subsidies, but that this can happen whether the providers are public or private (as suggested by Lee, 2009 already in a much more aggregate evaluation of the Malaysian experience).

While CGEs have so far been the most common way of looking at distributional implications resulting from the various feedback effects of ownership choices, other approaches can also be useful to track distributional effects of policies such as ownership changes. One of the underused approaches in the field of regulation is frontier analysis.[54] It is relatively easy to track the possible trade-off between efficiency and equity goals from non-parametric approaches for instance by looking at the way a country decides to get closer to the frontier. It measures explicitly the relevant preference for one policy over another one by tracking the direction chosen to catch up joint efficiency and equity gaps. This has been done in the context of tax policy (Andersen and Maibom, 2020) and in the context of energy efficiency policies (Whaleer et al., 2014).

[53] For a detailed discussion of the potential use of CGEs in the context of regulatory evaluations, see Chisari et al. (2007a).

[54] For a recent review of the latest research on the topic, see Grifell-Tatje et al. (2018).

An alternative decomposition of performance that can used to track efficiency and equity trade-offs as well as distributional implications is a decomposition of changes in the business profits and losses in a sector into the sum of a price and quantity changes which can be assigned to each one of the key stakeholders of a sector. This is how Estache and Grifel-Tarje (2013) show that, in the Malian water-sector conflict between the regulator and the private operator, the taxpayers and the rural users were disandvantaged while the foreign investors and even more, the connected users in Bamako (the capital city) benefited through lower real water prices.

More recently, the combination of better datasets that allow the use of more advanced econometric techniques also makes it possible to analyze the incidence of ownership changes and other institutional reforms across income classes (i.e. Jimenez and Yepez-Garcia, 2017 and Bagnoli et al., 2020 through regression-based techniques). While this research has not yet produced much more than interesting correlations of the impact of the ownership choice across income classes and the role of other policy reforms such as the creation of autonomous regulatory agencies and the choice of the regulatory regime, it seems to offer a promising new way of producing results able to inform policy decisions on the packages that make SOEs or PPPs more effective.

Overall, this brief review offers somegood news and a couple of bad news. The good news is that the methodological progresses offer new ways of tracking the distributional implications of ownership changes. There is also bad news, however. The first is that this is an understudied topic both by academics and institutions contributing to define and implement policies. The second is that the little evidence available is that gains tend not to be evenly distributed. Moreover, current policy packages adopted by too many governments are unable to guarantee that efficiency improvements can be shared across users according to their income level or according to their type (residential vs non-residential), across workers (skilled vs unskilled), across economic agents (workers vs asset owners) or across regions within a country (rural vs urban).

5. What are the main take-aways on the relevance of ownership for social goals?

The paper started with a brief review of the main working assumptions dominating the debates of the relative effectiveness of SOEs and various forms of PPPs when social goals are the main policy concern. The overview of the evidence focused mostly on outcomes. Yet, the accumulated evidence and a recognition of the evolution of some of the original results allowed by the longer time span covered allows a more precise evaluation of the underlying assumptions. In particular, it provides a better sense of the relevance of policy and contextual dimensions in the assessment of the ownership choice. This section summarizes the main policy-oriented take-aways of the survey on the main common prevailing assumptions about the relevance of ownership choice for social outcomes.

(i) Are SOEs and PPPs just as (in-)effective at catering for the needs of the poor?

There is little evidence that ownership matters to social goals. Public and private operators can be just as good or just as bad at addressing these goals. But after over 30 years of experiences, we now have a better sense of the differences in context and political commitment to the necessary institutional and regulatory reforms that explain differences when they arise.

First is the clarity of the specification and the enforcement of service obligations as part of the contractual mandate assigned to an operator, whether public or private. The availability of much more precise households survey data should allow a much better targeting of investment obligations

imposed on service providers as well as better targeted pricing and subsidy designs. This has been addressed by theoretical publications for over 50 years at least (i.e. Laffont, 2004) for an early survey) and empirical evidence of the social incidence of the failures for both public and private provision options have been documented by empirical research for over 30 years now. This research shows, as in the case of the Malaysian experience mentioned earlier, that the needs of the poor can be addressed by both public and private operators, if the rules of the game are clear for all parties. Additional research reviewed here in the discussion of pricing and subsidies techniques shows that both public and private operators can be quite creative in meeting these obligations.

The second explanation for differences in social performance observed in some studies across ownership types is thus the extent to which a country or a region (when decentralization prevails) has properly mandated its regulators or its reform teams to identify specific service obligations, pricing rules and subsidies strategies to define the terms under which they can get the operators to deliver on the social goals, accounting for fiscal constraints. It is quite puzzling to have to note that over 30 years of academic evidence demonstrating the continuous inability of regulators to get firms to deliver on these goals, it has still not been addressed in practice. There is significant room to internalize what we know about what works and what doesn't in the design of new contract designs or in the many contract renegotiations that still take place. There is quite a lot of knowledge and room or cross-fertilization that is not being used, quite ununderstanbly.

The gap between what we could do on the ground based on the lessons from research and what we actually do collectively in procurement, in contract design, in staffing skills or in quantitative tools adoption is not shrinking as it should to address social concerns properly. The sequences of economic crisis since 2008 have made the social needs much more explicit but the solutions are at best short term bandaids than structural adjustments to an institutional and technical capacity problem increasingly better documented in the context of SOEs by over 30 years of research.[55]

(ii) Are SOEs and PPPs just as likely to have to cater for the needs of the poor?

The answer is again negative. The SOEs (as well as smaller alternative providers) are more likely to get stuck with the responsibility of having to cater to the needs of the poor than large scale private providers. They are expected to do what others are not willing to do. There are exceptions, of course, but the odds of finding an SOE (or small alternative providers) in charge when poverty is a concern are much higher than the opposite.

The evidence is provided by the large share of the poorest countries that have failed to attract private financing to develop their distribution capacity. And many, when they managed to do so, exclude from the mandate of the private operator the need to cater to the regions or neighbourhoods with high concentrations of poor because of a perceived risk that cost recovery will be more difficult. Cream skimming continues to be an issue underestimated by performance evalutions. And yet, it helps understand differences in performance according to ownership.

(iii) Are the poor more likely to get service faster from an SOE or from a private operator?

There is no evidence either that, under the right regulatory environment, there is a difference according to ownership. Many many poor in Africa, Central America and parts of Asia are indeed still not getting the access promised since the launch of the MDGs, whether the main providers are

[55] See Estache (2020) for a survey of the multiple sources of institutional weaknesses in infrastructure.

public or private. The evidence reviewed here suggests three underused tools if efforts to address social needs by SOEs are to be improved fast enough.

First is the inclusion of timing in the definition of the mandate assigned to providers. The anecdotal evidence of the 1990 and early 2000s suggests that when the large utilities do not have a clear mandate in terms of timing of coverage, the odds that the poor will be served are low, whether the utilities are public or private.[56] The more formal evidence published in peer-reviewed academic journals has only been able to document this issue when it made explicit comparisons of the differences in the evolution of the general access rates of the population and in the connection rates. But when this dimension has been considered, the evidence on the payoffs to explicit mandates and on the cost of omitting them has been quite robust (i.e. Estache and Grifell-Tatje, 2011 in the case of Mali).

Second, underestimating the arguments for a more formal use of alternative small-scale public and private providers as complement to the SOEs has been an issue. Ignoring their potential role can explain the slow progess in improving access rates, as seen in the many papers that look at the impact of these options (i.e. Herrera, 2019)). When the needs are pressing, alternative smaller providers tend to be much more effective at catering to the needs of the poor as a complement to the general mandate assigned to large utilities whether they are public or private. There is already quite a long record of evidence of the comparative advantage of these alternative providers relying on alternative technologies. In the Northeast of Brazil, for instance, the large foreign opertors were very effective in the late 1990s at relying on small solar plants in regions too costly too connect to the regular network. The technology allowed meeting the high rate of time preference for formal access revealed by the willingness to pay studies conducted as part of project preparation by international organizations. A similar conclusion was reached in the North of Tanzania in the same sector.

This fine tuning of the design of the mandate of SOEs is important to reduce delays in improvements that are much more penalizing to the poor than to those with the opportunity to rely on more expensive alternative costly technologies on their own. The less pressing budget constraints also make time less pressing for the higher income classes than for the poorest one. The social opportunity cost of doing nothing or delaying intervention by the SOE in the hope of some form of PPP is too often ignored or underestimated both in ex-ante and ex-post evaluations of policies.

(iv) Are institutional weaknesses penalizing the poor easier to correct for SOEs or for PPPs?

Institutional weaknesses picked up in the control variables of the many papers relying on econometric techniques show that institutions broadly defined largely drive the ability of countries to meet their social goals. To make the point as concrete as possible, it may be useful to quote Iman et al. (2019).[57] Their results offer a very recent typical example of the main insights to retain when assessing the need to address institutional weaknesses. They are among those finding that the privatization policies in the electricity sector of SSA have had not significant effect on electricity access between 2002 and 2013. But they also find that the creation of autonomous regulatory agencies has reduced the negative impact of corruption on access rates, whether the provider is public or private. The joint presence of an autonomous regulator and of a private operator is however associated with reductions in electricity access as compared to the case in which the

[56] This has been the experience of one of the authors when working on contract (re-)negotiations or contract audits in Asia, Latin America and SSA during that period in countries as different as Argentina, Guinee, Mali or the Phillipines.
[57] Early discussion of these issues include Vagliasindi (2008) and Andres et al. (2011).

autonomous agency co-exists with an SOE. Institutions thus matter to social outcomes differently according to ownership. Other studies have reported comparable results for some time. For instance, Vagliasindi (2012b) relied on a panel of 22 countries over 20 years (1989-2009) to show the much higher impact on performance of a sound regulatory framework and of the reduction in the degree of concentration of the generation and distribution segments of the market than the change in ownership per se.

The evidence available is however again quite outdated since the data used in empirical work is often close to 10 years old and often older. It is also quite partial as it only focuses on a limited number of institutional characteristics. But the sum of these partial perspectives is quite useful in defining the agenda for a follow up review. The effectiveness of an SOE in meeting its social mandates is driven by all of the institutional, regulatory and policy dimensions that define the context in which the firm does what it is expected to do from a social perspective. None of the papers reviewed here takes this global perspective and yet it is necessary. A full diagnostic demands a careful review of all stages of the project or policy implementation cycles, and in particular, the adaptation of the procurement and contract designs to institutional capacity constraints. One size fits all does not work for SOEs either. And when this is ignored, it is unlikely that the social goals will be met.

6. So where do we go from here?

Besides the relatively strong evidence on the irrelevance of ownership, this overview leads to a number of suggestions which could define a useful research agenda to produce much more updated and specific policy guidance on SOEs anchored to up to date information. More specifically, t-his agenda should address at least the following issues.

First, it should deliver a systematic assessment of the relevance of ownership for each of the social dimensions discussed here (access, , affordability and distributional indicators). It is surprising how some of the outcomes of ownerhip changes have been understudied. While there is some reliable evidence on access, despite some of the difficulties associated with the specific measure of access, affordability assessments are largely indirect and based on the impact on prices.

Second, the impact of reforms, including the ownership choice, on the quality options available to households is largely ignored as well by the literature. We know that when the large incumbent utilities do not deliver, alternative providers often take over and that their technologies are often associated with different quality of access and service. But this is seldom addressed specifically as a part of a menu of options which could drive a different choice between SOEs, PPPs and alternative delivery systems. Such a choice would be driven according to the willingness to pay of the various income classes and to their rate of time preference (i.e. how pressing is the need to improve service delivery). In this context, quality can be seen as as excessive (too expensive or too slow to come) or insufficient (representing a health risk). Whether there is a predictable bias according to ownership that could be addressed as part of the reform is unknown.

Third, it is also suprising to note how outdated the literature is. A vast majority of the widely quoted studies are based on data 10 years old or more. This fails to recognize that firms and market structures have changed in the last 10 years. The global financial and govenance context in which they operate has changed as well with no minor consequences on the optimal ownership choice as risk levels are quite different than what they were just before the Covid crisis. In addition, many of

those papers also ignore the fact that SOEs still dominate these markets, because private alternatives failed to materialize.

Fourth, it would also be useful to assess the extent to which, in view of the differences of objectives according to ownership, prices and subsidies should not be designed to reduce the risks of trade-off or mismatches between the often excessive number of goals in environments with only limited financing and pricing tools. We now have enough evidence to argue that too often the social goals are mistargeted by well intended design choices. But we do not know the extent to which ownership should drive the optimal solutions for addressing the mistargeting problem.

Finally, based on a more systematic empirical evidence and case studies, it would be useful to identify whether there are some prerequisites in the overall governance and regulatory framework both at the country and sectoral level to ensure improve performance of SOEs. Some of the currently proposed solutions have been designed with the objective of attracting the private sector rather than tailored to the public sector.

Surely there are other dimensions to include in the agenda, but addressing the five issues raised here would produce an up-to-date information concerning providers that cater services to a vast majority of the electricity and W&S actual or potential consumers seem to be a reasonable agenda to consider. It may be time to consider a new research agenda that informs policy makers in developing countries on how to improve the performance of their SOEs.

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