

**EXECUTIVE
BOARD
MEETING**

SM/20/68

CONFIDENTIAL

March 11, 2020

To: Members of the Executive Board

From: The Secretary

Subject: **April 2020 Fiscal Monitor—Chapter 3**

Board Action:	Executive Directors' consideration (Formal)
Tentative Board Date:	Wednesday, April 1, 2020
Publication:	Yes, it is intended that the full set of the Fiscal Monitor documents will be released to the public at the time of the press conference, tentatively scheduled for Wednesday, April 15, 2020 .
Questions:	Ms. Patillo, FAD (ext. 37319) Mr. Medas, FAD (ext. 38288) Mr. Raylea, FAD (ext. 38055)
Additional Information:	The paper will be revised for publication in light of the Executive Board discussion. If Executive Directors have additional comments, they should notify Ms. Patillo, Mr. Medas, and Mr. Raylea by 5:30 p.m. on Friday, March 27, 2020 .

State-Owned Enterprises: The Other Government

Prepared by the Fiscal Affairs Department
In consultation with the other departments—
Approved by Vitor Gaspar—March 11, 2020

Contents	Page
I. Introduction.....	3
II. SOEs' Evolving Landscape.....	3
A. SOEs are Diverse and Dominant in Core Sectors of Modern Economies	4
B. The Largest SOEs have Become Global Players	5
C. The Evolving Nature of SOEs Exacerbates Policy Challenges.....	7
III. Achieving Policy Objectives	8
A. Struggling to Meet Policy Mandates.....	8
B. Network Sectors: Special Challenges	10
C. Are Public Banks an Appropriate Tool for Macro-Fiscal Management?.....	12
IV. Are SOEs Performing Efficiently?	13
A. SOE Financial Performance	14
B. The Role of Economic Sectors and State Ownership in SOE Performance	14
C. Fiscal Costs and Risks to the Government	16
D. Reforms can Help.....	17
V. How to Get the Most Out of SOEs	19
A. Aligning SOE Activities with Public Sector Goals	19
B. Strengthen Institutions	21
C. Being a Good “Global Citizen”	24
VI. Conclusion	26
References.....	29

Boxes

Box 3.1. Experience with Privatization.....	27
Box 3.2. State-Owned Banks	28

Figures

Figure 3.1. SOEs' Share of Infrastructure Investments in Emerging Markets and Low-Income Countries	4
Figure 3.2. Public Banks' Share of Banking System Assets, 2016	5
Figure 3.3. Share of Nonfinancial SOEs among the Largest Firms.....	5
Figure 3.4. SOEs' Share of Assets, by Sector.....	6
Figure 3.5 Multinational SOEs around the World.....	6
Figure 3.6 Top 50 Nonfinancial SOEs	7
Figure 3.7. Private Firms' Interest Premium, 2000–17	8
Figure 3.8. Objectives of SOEs in CESEE Countries	9
Figure 3.9. SOEs Power Generation Capacity, 2017.....	10
Figure 3.10. Gap Between Costs and Electricity Tariffs	10
Figure 3.11. National Oil Companies Productivity and Employment.....	11
Figure 3.12. Change in Loan Growth over the Cycle.....	12
Figure 3.13. Bank Holdings of Government Bonds in Countries with High Public Debt	13
Figure 3.14. SOEs' Performance Relative to Private Firms	14
Figure 3.15. Relative Performance of SOEs, by Sector	15
Figure 3.16. Degree of State Ownership and Firms' Performance	15
Figure 3.17. Governance and Firms' Performance	16

Figure 3.18. SOE Debt Vulnerability	17
Figure 3.19. Impact of SOE Reforms 2002–17	18
Figure 3.20. Fiscal Coverage beyond the Central Government in Sub-Saharan Africa	20
Figure 3.21. Gearing SOE Oversight to Capacity	24
Figure 3.2.1. Financial Performance of Public Relative to Private Commercial Banks	28

Table

Table 3.1. Competitive Neutrality: Some Basics	26
--	----

Online Annexes

Online Annex 3.1. China: State-Owned Enterprises Remain Key Players	37
Online Annex 3.2. Brazil: A Complex and, at Times, Turbulent Relationship Between SOEs and the Government	41
Online Annex 3.3. Public Banks: Revisiting Their Role and Financial Performance	44
Online Annex 3.4. Assessing the Determinants of SOEs' Performance	55
Online Annex 3.5. Ghana: Risks in SOEs Can Spillover to Other Sectors and the Budget	65
Online Annex 3.6. The Impact of SOE Reforms	68
Online Annex 3.7. How to Get the Most Out of SOEs: The Nordic Example	73

I. Introduction

State-owned enterprises (SOEs) influence the economy and people's lives through the provision of goods and services in ways that are distinct from, and more varied than, the direct action of governments.¹ In many countries, SOEs provide basic services such as water, electricity, and transportation to people and firms, as well as loans to businesses. SOEs are diverse varying in size, sector of operation, complexity, sophistication, and extent of government ownership and control. Some are essentially an arm of the government, whereas others have a mix of public and private owners (mixed ownership) and a greater commercial focus. Many SOEs are among the largest companies in low-income developing countries, emerging markets, and advanced economies.

SOEs have become more prominent in global markets, stimulating renewed interest and debate about their international impacts. Although a few SOEs have had operations abroad for decades, especially in the natural resources sector, SOE cross-border activity has diversified and increased in this century (Cuervo-Cazurra and others 2014). The growing internationalization of SOEs has fueled apprehension about their potential pursuit of noncommercial objectives or unfair competition given that they often benefit from government support, including subsidies or cheaper finance.

At the same time, many governments struggle to manage SOEs effectively. Widespread concerns exist that many SOEs are inefficient, involve significant risks to government budgets, and are a conduit for corruption (April 2019 *Fiscal Monitor*; Musacchio and Pineda Ayerbe 2019; OECD 2018b; Richmond and others 2019; Transparency International 2018). Getting the most out of SOEs is critical because many governments rely on them to serve their citizens and to foster economic and social development. Drawing from countries' experiences with SOEs, this chapter focuses on how to use them wisely and improve their performance and addresses the following questions to guide the discussion, analysis, and recommendations:

- Do SOEs deliver value for taxpayers' money? Specifically, are they fulfilling their economic and social policy mandates, while operating efficiently and not burdening the budget? Are policy mandates well defined, adequately funded, and contributing to economic and social goals?
- How can governments manage the challenges and risks associated with SOEs? Do governments have clear strategies and institutions with which to regularly evaluate SOE performance and assess whether each SOE is the best tool to achieve a policy goal?
- Does the internationalization of SOEs bring new challenges? SOEs frequently benefit from explicit or implicit government support. Does this support compensate only for the cost of pursuing policy mandates, or does it give SOEs competitive advantages over private firms? Can SOEs contribute to other global goals (for example, curbing domestic pollution and mitigating climate change)?

II. SOEs' Evolving Landscape

SOEs grew in size and importance throughout most of the twentieth century. European governments began nationalizing key industries in the early 1900s (France, Germany, Italy, Spain, United Kingdom). The trend continued in Central and Eastern Europe in the aftermath of World War II (Allen and Vani

¹ Although no commonly accepted definition of an SOE (European Commission 2013; IMF 2014; OECD 2015) exists, there are some shared elements: (1) the entity has its own, separate legal personality; (2) the entity is at least partially controlled by a government unit; and (3) the entity engages predominantly in commercial or economic activities. As noted in the *Government Financial Statistics Manual 2014* (IMF 2014), assessing government control of an entity involves judgment. A government may exercise significant influence over corporate decisions even when it owns a small number of shares. For the quantitative empirical analyses in this chapter, a firm is considered state owned if the government owns at least 50 percent of its equity; in some exercises, the analysis focuses on cases where the governments owns at least 20 percent.

2013; Musacchio and Lazzarini 2014) and in Africa and Asia with the end of colonialism in the 1950s and 1960s. By the early 1980s, SOEs accounted for 8 percent of output, on average, in advanced economies and 15 percent in developing countries (Sheshinski and Lopez-Calva 2003).

Beginning in the 1980s, disappointment led to efforts to introduce a profit motive in SOEs through corporatization (that is, incorporating SOEs under the same commercial laws as private firms) and partial or full privatization in many countries. The transition to market economies that followed the dissolution of the Soviet Union in 1991 reinforced these trends. More recently, China's rapid growth combined with the large presence of SOEs in its domestic economy has generated renewed interest on whether SOEs can be used as vehicles for development. In contrast, other countries have recently announced new privatization plans (Brazil, Egypt, India, Morocco).

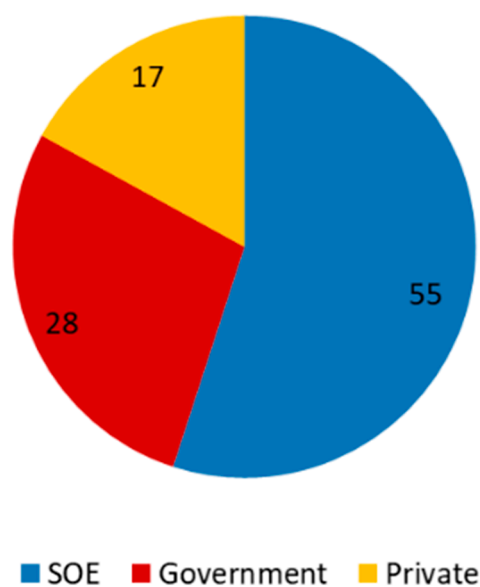
A. SOEs are Diverse and Dominant in Core Sectors of Modern Economies

SOEs operate in virtually every country in the world. In some, they number in the thousands (China, Germany, Italy, Russia, Sweden, Ukraine) and are owned by national or subnational governments. SOEs owned by subnational governments, such as local bus, sewer, and water services, often outnumber SOEs owned by the central government. SOEs are among the largest corporations in some advanced economies (as in France, Italy, and Norway) and comprise a third or more of the largest firms in several emerging markets (China, India, Indonesia, Malaysia, Russia, Saudi Arabia, United Arab Emirates) (Kowalski and others 2013).

SOEs provide goods and services in almost all sectors of the economy but are especially prevalent in the key network sectors—banking, utilities, and transportation. They also manufacture everything from shoes to locomotive engines, manage real estate, and provide phone services. In Africa and Asia, SOEs dominate power generation. SOEs accounted for more than half of all infrastructure project commitments in emerging market economies (EMEs) and low-income developing countries (LIDCs) in 2017 (Figure 3.1). Moreover, SOEs account for 40 percent or more of banking system assets in the BRIC economies (Brazil, Russia, India, China) and some LIDCs, and one-third or more in Germany and Portugal among advanced economies (Figure 3.2).

Figure 3.1. SOEs' Share of Infrastructure Investments in Emerging Markets and Low-Income Countries

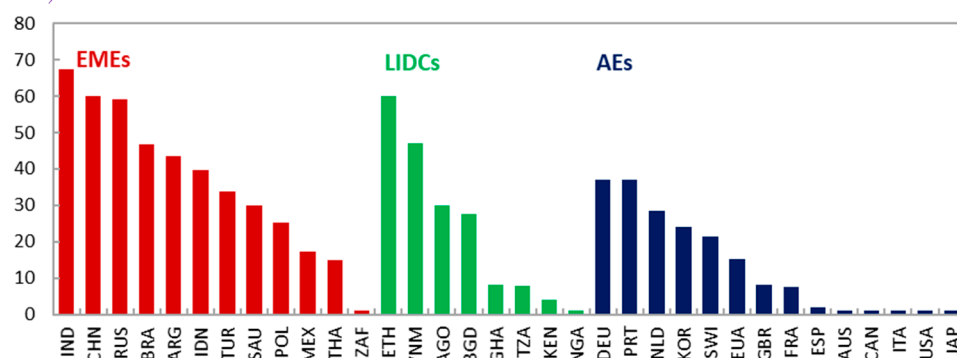
(Percent of total investment value, 2017)



Source: World Bank 2017.

Figure 3.2. Public Banks' Share of Banking System Assets, 2016

(Percent)



Sources: CEIC (China); Central banks (Ethiopia, Italy, Japan); World Bank, Bank Regulation and Supervision Survey 2019.

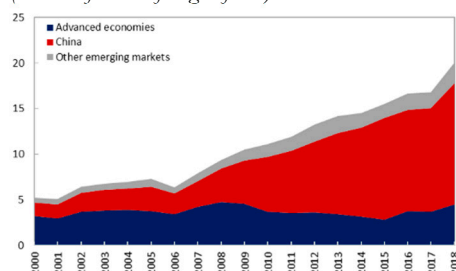
Note: State-owned banks are those with at least 50 percent of equity owned by national or subnational governments. Data labels in the figure use International Organization for Standardization (ISO) country codes. AEs = advanced economies; EMEs = emerging market economies; LIDCs = low-income and developing countries.

B. The Largest SOEs have Become Global Players

Over the past decade, the share of SOE assets among the world's 2,000 largest firms has doubled to 20 percent (Figure 3.3). At \$45 trillion in 2018, these assets are equivalent to 50 percent of global GDP. An important factor has been the relatively high economic growth rate of EMEs and especially of China, where SOEs still play a large role in the domestic economy (see the country case study in Online Annex 3.1). However, the balance sheet expansion also reflects international activities, for example SOEs have accounted for 5–15 percent of annual cross-border acquisitions since 2008 (UNCTAD 2019). The same dynamics are behind the doubling of SOEs' share of revenue and debt of the world's largest firms since early 2000 (Figure 3.3.2). The debt of the largest SOEs is \$7.4 trillion, compared with \$1.4 trillion in 2000. SOEs have become big players in global corporate debt markets. They now comprise one-third of the entire emerging market sovereign hard currency debt tracked in the most widely followed emerging market sovereign bond index (October 2019 *Global Financial Stability Report*). In terms of sectors, large SOEs are especially active in banking, energy, industrials, and utilities (Figure 3.4). For example, national oil companies are among the biggest oil companies in the world and control more than half of the global oil and gas production.

Figure 3.3. Share of Nonfinancial SOEs among the Largest Firms**1. Emerging market economies account for the increasing importance of SOEs**

(Percent of assets of largest firms)

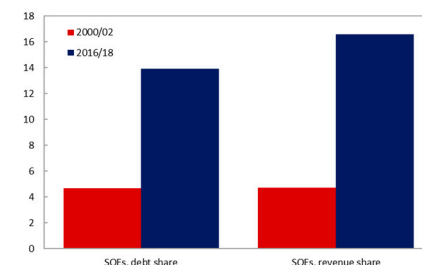


Sources: S&P Capital IQ; UNCTAD; S&P Global UDI World Electric Power Plant database; and IMF staff estimates.

Note: Figure 3.3.1 shows the share of SOE assets among the world's 2,000 largest firms. Figure 3.3.2 shows aggregate average values of SOE debt and revenue among the world's 2,000 largest firms. The latter is a composite ranking of separate rankings of 2018 revenue and assets obtained from Capital IQ.

2. Debt and Revenue of the Largest SOEs

(SOEs' share of debt or revenue of largest firms)



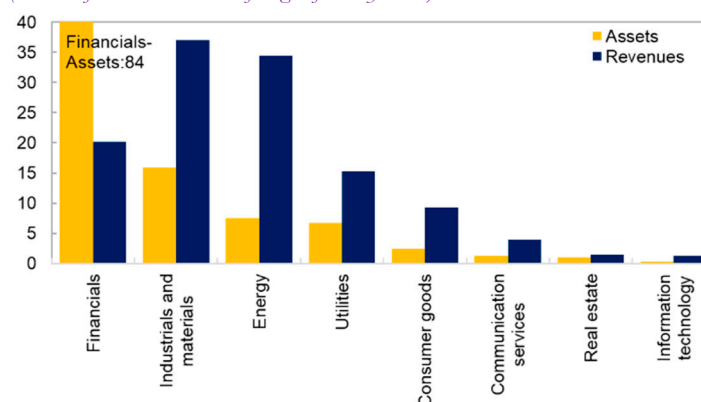
Sources: S&P Capital IQ; UNCTAD; S&P Global UDI World Electric Power Plant database; and IMF staff estimates.

Many SOEs are no longer wholly owned by the government. Among the largest SOEs in the world, almost 60 percent have a mix of public and private sector owners. Greater prominence of mixed ownership originates in the European privatization strategies that began in the 1980s, in which governments chose to preserve a majority, or in some cases minority, position in the firms (OECD 2016a).^{2, 3} This approach to privatization subsequently gained traction with emerging markets (for example, Brazil and China) and developing economies.

Today, many of the largest SOEs are also multinationals (state-owned multinational enterprise, or SOMNE) several with mixed ownership. A SOMNE is an SOE that controls assets of other entities in countries other than its home country. SOMNEs are spread around the world (Figure 3.5), but most originate in China, members of the European Union (EU), India, Malaysia, Russia, South Africa, and the United Arab Emirates (UNCTAD 2019).⁴ Some are regional, whereas others are global players. In 2018, half of the top 10 (as measured by revenue) nonfinancial firms globally were SOMNEs. The list of the largest nonfinancial SOEs includes China National Petroleum, Volkswagen AG, Saudi Arabian Oil Company, and Russian firms Gazprom and Rosneft (Figure 3.6). SOEs evolve into SOMNEs for various reasons. Some desire higher profitability, secure access to natural resources, or obtain technological knowledge. In other cases, some authors (for example, Cuervo-Cazurra and others 2014) have suggested that the objectives may have been partly political, as the business case seemed to be limited.

Figure 3.4. SOEs' Share of Assets, by Sector

(Percent of assets or revenues of largest firms by sector)

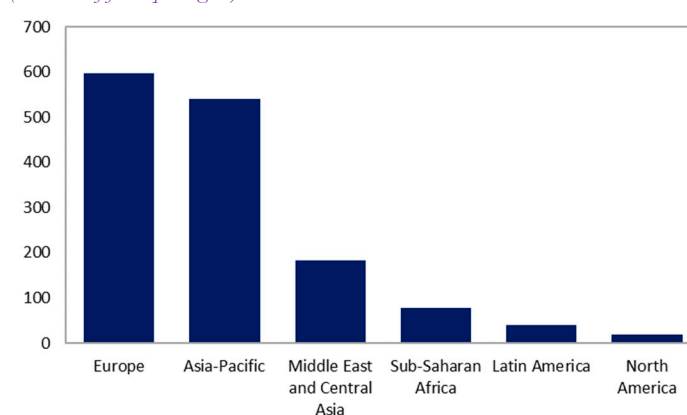


Sources: S&P Capital IQ; UNCTAD; S&P Global UDI World Electric Power Plant database; and IMF staff calculations.

Note: Figure shows the share of SOE assets and revenues by sector among the world's 2,000 largest firms. The latter is a composite ranking of separate rankings of 2018 revenue and assets obtained from Capital IQ.

Figure 3.5 Multinational SOEs around the World

(Number of firms per region)



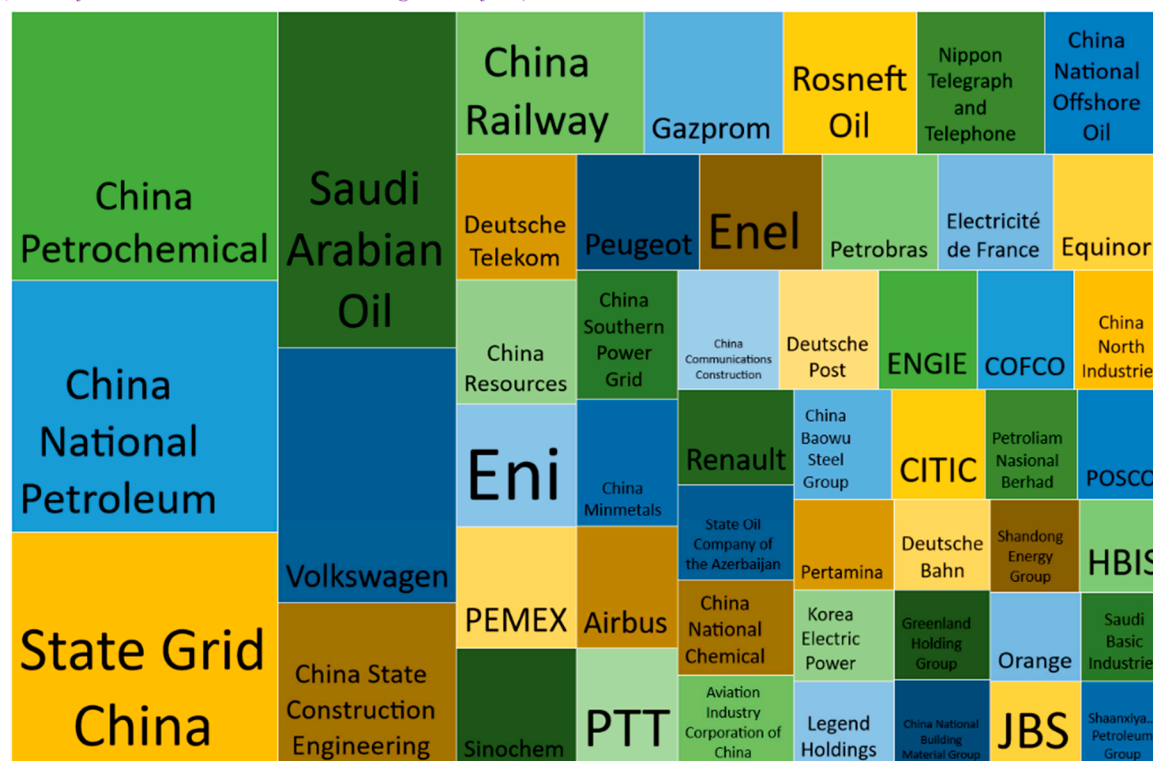
Sources: UNCTAD; and IMF staff calculations.

²The motivations for these approaches varied but included the intention to privatize gradually and to keep a presence in sectors viewed as strategic.

³ At the end of 2000, governments retained control of more than 60 percent of 141 privatized firms from developed economies that Bortolotti and Faccio (2009) analyzed.

⁴ The UNCTAD data set contains 1,500 SOMNEs identified by the United Nations as of 2018 and includes both publicly traded and non-publicly traded state-owned firms in 109 countries.

(Percent of revenues relative to total revenues in largest 2000 firms)



Note: The largest 2,000 firms is a composite ranking of separate rankings of 2018 revenue and assets obtained from Capital IQ.

The evolution of SOEs accentuates existing challenges. Mixed ownership blurs the distinction between *state owned* and *privately owned*—making it more difficult to ascertain when governments are influencing a firm’s business decisions. For example, the state may have only a direct minority shareholding in a company but exercise significant control over strategic decisions through a golden share, which can give it special voting privileges, or through other mechanisms (such as indirect ownership whereby the government owns stakes in public banks, public pensions funds, or sovereign wealth funds, that in turn own shares in a company).⁵

The growing global reach of SOEs means SOE-induced competitive distortions in the home market may be spilling over to the global market. Governments often provide support to SOEs to compensate them for pursuing policy goals. This support can be in the form of budget compensation (such as subsidies or capital transfers) but can also include cheap debt and equity financing, special tax and regulatory provisions, a privileged market position, superior access to information, and rescues from bankruptcy. However, government support may not be linked to a specific public mandate or may exceed the net cost of the mandate. In this case, government support can give the SOE a competitive advantage over private firms. For example, Deutsche Post (and its predecessors) over a period 25 years until 2000 used profits from its letter delivery monopoly to cross-subsidize below-cost selling in the market for business parcel delivery (Capobianco and Christiansen 2011). More fundamentally, public ownership itself can be a

⁵ For example, the German state of Lower Saxony has only 20 percent of the voting rights in Volkswagen but, legally, has also a veto right over key decisions such as factory closures, mergers, and acquisitions (Cremer 2017).

source of implicit government support. Private creditors may offer more favorable terms to an SOE than they would to similar private firms and expect that the government would bail out the SOE if needed. IMF staff estimates based on a sample of SOEs in 65 countries suggests that SOEs benefit from lower debt financing costs, on average, relative to private firms (Figure 3.7).⁶

SOEs' government-bestowed competitive advantages can have economic and fiscal implications domestically and internationally. For example, they may distort competition (that is, tilt the playing field in favor of SOEs) or sustain inefficient SOEs, possibly lowering growth and tax revenues. The concerns with government support, for example, are present in the aluminum, semiconductor, and steel sectors. Recent studies of the aluminum and semiconductor sectors estimated that firms, including SOEs, in these industries received sizable government support through budget support, subsidized inputs, below-market loans, and equity financing (OECD 2019a, 2019b). Another study estimated that SOEs produced one-third of global steel output in 2016 amid private sector complaints that SOE peers received unfair government support (Mattera and Silva 2018). In all three sectors, overcapacity is a concern. Moreover, if foreign governments view SOEs' expansion abroad, either directly or indirectly supported by the home government, as a means to achieve foreign policy or national security goals, they may unilaterally take measures to counteract that expansion.

In the next sections, the chapter reviews international experience on the old and new challenges that governments face in managing SOEs. The chapter also discusses how countries can boost SOEs ability to meet their public mandates in an efficient manner, while promoting fair competition.

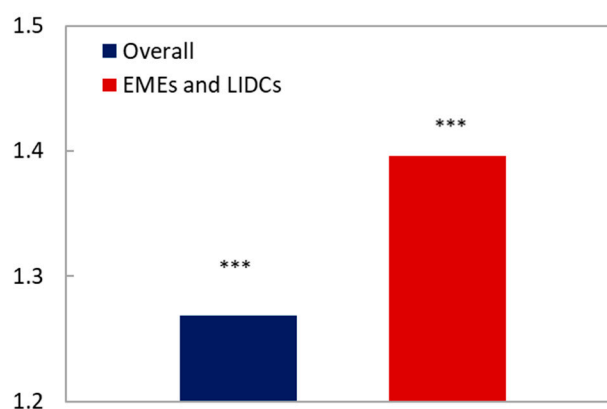
III. Achieving Policy Objectives

A. Struggling to Meet Policy Mandates

Governments mandate SOEs to pursue a diverse set of policy goals (Figure 3.8). In general, government intervention through SOEs is often justified to correct market failures. One example of market failure is a natural monopoly, where the initial cost of building the infrastructure to provide the good or service, such as water and sewer systems, is so large that private firms may be reluctant to enter the market. Another example is when it is not possible to charge individuals for use of the good (for example, street lighting), which means that private firms may not provide enough of it. In other instances, SOEs are established to develop new sectors, especially in developing countries, such as the copper mining sector

Figure 3.7. Private Firms' Interest Premium, 2000–17

(Percentage point difference to SOEs' interest rate)



Sources: Orbis; and IMF staff estimates

Note: The sample includes 65 countries, of which 37 are emerging market and developing economies. Interest was calculated as firm interest paid in (t) divided by the stock of debt in (t-1). The analysis controls for firms' size and economic sector. EMEs = emerging market economies; LIDCs = low-income developing countries.

*** indicates statistical difference from zero at 1 percent significance level.

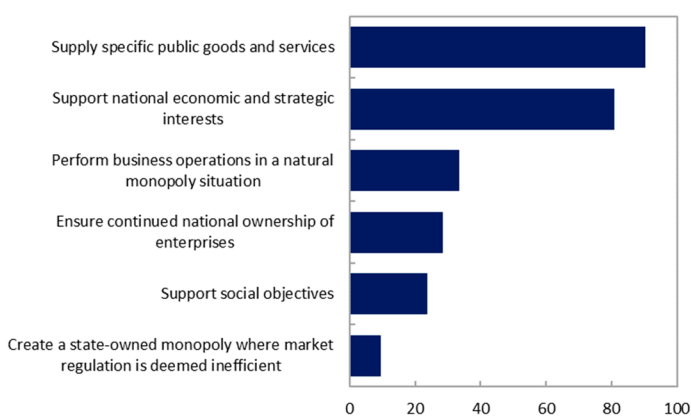
⁶ For example, in Vietnam, the state-owned bus company has higher operational costs than its private competitors but benefits from lower borrowing costs resulting from government guarantees (PPIAF 2016).

in Chile in 1976 or the oil and gas sector in Ghana in 1983. However, SOEs can also be found producing goods and services in a competitive environment (for example, soft drinks, cars, or cleaning services) without a clear, specific policy mandate. SOEs are sometimes used to pursue broad macroeconomic goals, such as promoting credit growth.

SOEs, especially in EMEs and LIDCs, have faced challenges in trying to achieve policy mandates, often multiple ones, within a sustainable business model. A core problem has been that these mandates are not clearly specified or adequately costed. Another common weakness is limited transparency of SOE operations and their financial relations with government. These challenges lead to the following problems:

- *Unfunded mandates:* The lack of clear and funded mandates can weaken the financial health of SOEs.⁷ For example, firms' lack of freedom to set prices or tariffs to cost-recovery levels—in an attempt to ensure the affordability of goods or services—could lead to systematic losses. This can result in a buildup of SOE debt, including arrears, and inefficient provision of the good or service (such as deterioration of the railway network from lack of maintenance) or limited accessibility (for example, the electricity grid not reaching rural areas) (Ter-Minassian 2017). Similarly, if an SOE is asked to promote employment, higher labor costs may weaken the firm's efficiency and financial viability.

Figure 3.8. Objectives of SOEs in CESEE Countries
(Percent of respondents)



Source: Richmond and others 2019.

Note: Responses from governments of Central, Eastern and Southeastern European (CESEE) countries to a survey about the nonfinancial objectives of SOE ownership.

- *Government bailouts:* The expectation that governments will eventually compensate, or bail out, the SOE for losses may provide managers with incentives to not pursue efficiency, to take higher risks, or to borrow excessively.
- *Weak governance and oversight:* In many countries, government agencies do not have sufficient information or capacity to properly monitor SOEs, and others lack guidelines for financial reporting by SOEs (Allen and Vani 2013). More generally, weak governance and corruption are among the main sources of the difficulties that SOEs face (April 2019 *Fiscal Monitor*; Transparency International 2018).
- *Costly government dividend and tax policies:* SOEs should share their profits with the government; however, excessive dividend payouts, dictated by budgetary needs, could have implications for SOEs' ability to operate. For example, Argentina's state-owned oil company, YPF, paid dividends of \$602 million in 2016 despite incurring a loss of more than \$1 billion that year.

These challenges are particularly relevant in critical nonfinancial network sectors (power, water, ground transportation, energy) as well as public banks. The rest of this section delve into these sectors.

⁷ Petri and Taube (2003) estimate quasi-fiscal activities in the energy sector at 26.7 percent of GDP in Azerbaijan in 1999 and 6.5 percent in Ukraine in 2000.

B. Network Sectors: Special Challenges

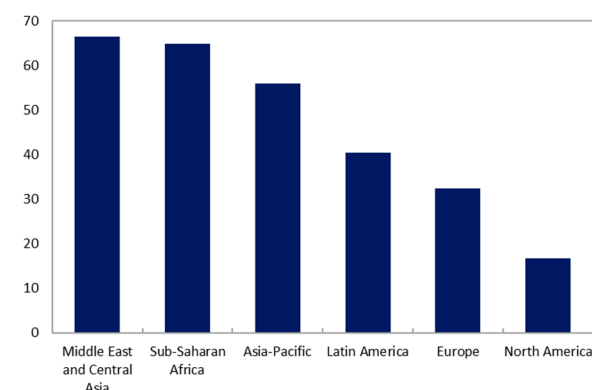
Network industries, sectors in which a fixed infrastructure and a degree of standardization is needed to deliver the goods or services efficiently to end users, are critical for generating economic growth and achieving the Sustainable Development Goals. Safe water is essential for life and health. Reliable electricity saves businesses and consumers from having to invest in expensive backup systems. Affordable transportation underpins business activities and is key to generating employment and advancing economic development. Thus, it is not surprising that the government intervenes in many of these industries, especially where the private sector has not begun operating.

SOEs dominate the power sector, especially transmission and distribution, given that these segments have characteristics of natural monopolies. Private investors are involved mainly in the generation of electricity, but SOEs are major players even there (Figure 3.9). In advanced economies, evidence is mixed on whether reforms, including privatization, delivered the anticipated efficiency gains (Gathon and Pestiau 1996, see Box 3.1). Government efforts to expand access and promote greater efficiency in power sectors in developing countries have yielded mixed results. Access remains an urgent challenge—notable progress has been made, but 840 million people live without electricity, most in Africa.⁸ Although private sector entrants contributed to expanding generation capacity, network expansion and access relied largely on SOEs. A common problem is the failure to achieve cost recovery (Figure 3.10). Below-cost tariffs reduce an SOE's capacity to invest—hurting access and growth—and weaken the financial situation of the firm.

Specific features of the water sector also provide a rationale for government intervention (Menard and Peeroo 2011; World Bank 2004). Delivery systems require major investments in infrastructure, and potable water and adequate sewerage are essential for public health. Most countries have opted for a high degree of public provision through SOEs. Among advanced economies, public provision is dominant in the majority (for example, Australia, Germany, Japan, and the United States); only a few rely significantly on private providers (for example, Czech Republic, France, and England) (Perard 2009). Recently, Paris (France), Berlin

Figure 3.9. SOEs Power Generation Capacity, 2017

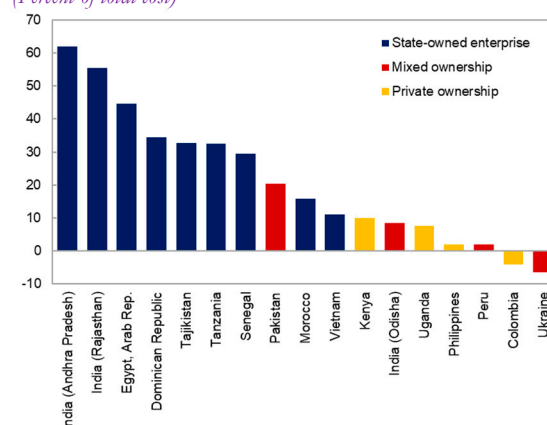
(Percentage of total by region)



Sources: S&P Global; UDI World Electric Power Plant database; and IMF staff calculations.

Figure 3.10. Gap Between Costs and Electricity Tariffs

(Percent of total cost)



Source: World Bank 2019.

Note: Percent of total cost is the gap (the difference between total cost and the tariff) divided by total cost.

⁸ See <https://www.worldbank.org/en/news/press-release/2019/05/22/tracking-sdg7-the-energy-progress-report-2019>

(Germany), and several US municipalities have remunicipalized water management (Chabrost and others 2017; Warner and Aldag 2019).⁹

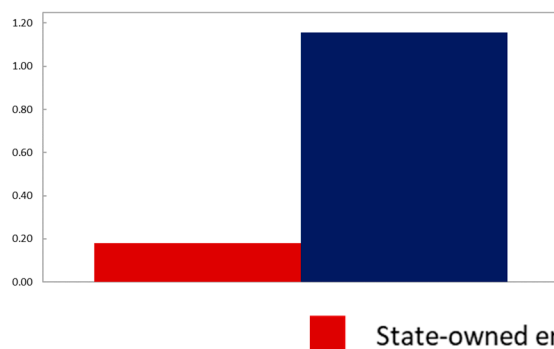
In developing countries, the challenge in the water sector is staggering. More than 2 billion people lack safely managed services, partly reflecting weak SOE performance (WHO and UNICEF 2017; World Bank 2004). The solutions are not easy but possible. There is growing awareness of the need for cost recovery, to ensure sustainability and improve service, while safeguarding provision to the poor. For example, in Burkina Faso, the public water utility has been instrumental in doubling the population's access to drinking water over the past two decades by introducing a progressive tariff grid (IMF 2015). In Mali, however, a private concession on water and electricity failed, despite having an independent regulator, owing to disagreement over the level of tariffs, political interference, and the government not paying its own utility bills (Balance and Tremolet 2005; Estache and Wren-Lewis 2009).

Transportation is another crucial sector for economic activity and public well-being. The provision of public transportation, especially at the local level (trains, subways, buses), has involved significant government intervention justified by the need to ensure affordability as well as to address congestion, pollution, or accidents. Local SOEs commonly provide ground transportation in advanced economies, whereas informal private transportation services—often less safe and pollute more—are widespread in developing and emerging economies. Allowing SOEs (or even private operators) to charge prices that cover investment and maintenance needs has proven challenging.¹⁰

Figure 3.11. National Oil Companies, Productivity and Employment

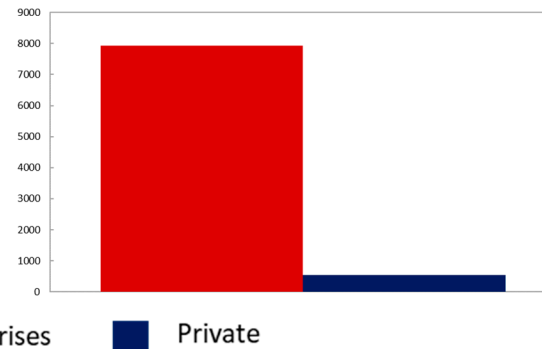
1. Labor Productivity

(Million US dollars per worker)



2. Employment

(Average number of employees)



Sources: Orbis; National Resource Governance Institute; and IMF staff estimates.

Note: The sample includes 98 NOCs and 1,520 private firms.

Many oil-exporting countries have created national oil companies (NOCs) to exercise control over oil and gas exploration and garner potentially large profits for the state. However, NOCs are significantly less profitable and efficient than their private peers, partly owing to pressures from the government to engage in excessive hiring (Figure 3.11). Another issue is governments often have NOCs sell fuel at subsidized retail prices and undertake social spending. In some cases, NOCs take on most of the exploration of oil

⁹ Studies do not show significant performance differences between private and public provision of water; see, for example Perard (2009) and Suárez-Varela and others (2016).

¹⁰ For example, protests in Chile after a metro fare increase are in part rooted in the failed 2007 reform of the informal bus transportation system in the capital. The reform was intended to reduce congestion, pollution, and accidents through additional dedicated bus lines, modernization of the bus fleet, and fare integration with the metro (Gomez Lobo 2012). The massive influx of passengers after the reform called for large investments that could not be covered by tariffs. The financial viability of the SOE operating the metro deteriorated rapidly, resulting in large direct subsidies from the government.

and gas, leaving governments with the costs and risks of exploration, instead of simply taxing profits. Moreover, the large profits create strong incentives for corruption (April 2019 *Fiscal Monitor*).

C. Are Public Banks an Appropriate Tool for Macro-Fiscal Management?

Government intervention in the financial system, including through public banks, is significant in many countries.¹¹ Although the presence of public banks—commercial banks that provide corporate and retail banking services to the general population and development banks that provide credit for development-related projects—has declined sharply since the 1990s as economic liberalization and financial

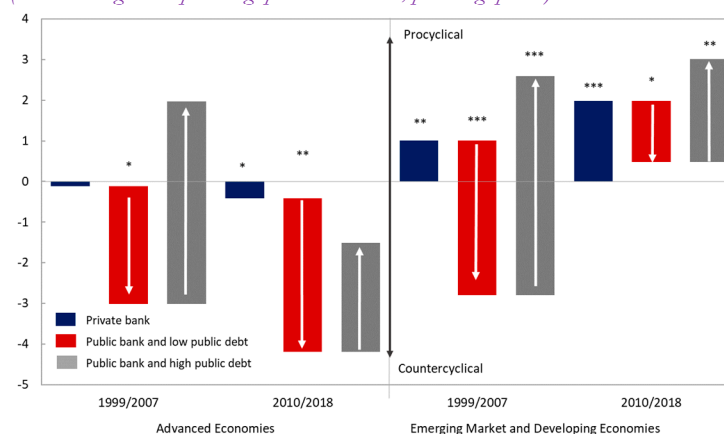
globalization gained traction, they still have significant market share in several large economies.¹² State ownership of banks has been justified by the need to address market failures and promote economic development, although many banks also pursue profit maximization (see Box 3.2).¹³ There is some recent renewed government interest in public banks, especially development banks, owing to their potential role in funding infrastructure investment.¹⁴

Governments also call on public banks to fight recessions. Public banks were used widely for this purpose during the global financial crisis, often financed by direct support from the governments' budgets (for example, loans or capital injections by Brazil, Canada, and India). Countries also raised credit ceilings of their public banks (for example, Finland and Korea) or issued special guarantees (for example, Mexico) for public banks to support key markets and firms (World Bank 2013).

There are, however, limits to the effectiveness of public banks in stabilizing the economy. Public bank lending has been less procyclical than private bank lending, on average, in the past 20 years but not in developing countries with high public debt levels (Figure 3.12). This different behavior likely reflects higher financing costs of and lower government subsidies to public banks in economies with tighter

Figure 3.12. Change in Loan Growth over the Cycle

(when GDP grows 1 percentage point above trend; percentage points)



Sources: Fitch Connect; and IMF staff estimates.

Note: Regressions control for several factors, including other bank characteristics (see Online Annex 3.3). Public banks are defined as banks with over 25 percent of equity owned by the government. Countries with high public debt are those above the 75th percentile of the distribution across the whole sample, roughly corresponding to 100 percent of GDP for AEs and 60 percent of GDP for EMDEs. AEs: advanced economies, EMDEs: emerging market and developing economies. ***, **, and * indicate statistical significance of the bars at the 1, 5, and 10 percent level, respectively. Bars indicate distance from zero for blue bar or preceding bars for the others.

¹¹ This section focuses on public banks, but governments have also used SOEs in other financial areas, including insurance and mortgage markets (for example, Canada and the United States, among many others).

¹² The global financial crisis led to a wave of large-scale recapitalizations and nationalizations of failing banks, notably in advanced economies, that has not been completely unwound (Igan and others 2019).

¹³ On the role of public banks, see also Cull, Martinez-Peria, and Verrier (2017); Ferrari, Mare, and Skamnelos (2017); World Bank (2012); and Yeyati and others (2005).

¹⁴ See, for instance, “National development banks are back in vogue” (*The Economist* 2019). Several new public development banks have been established since the global financial crisis, including PT Sarana Multi Infrastruktur in Indonesia (2008), Bpifrance (2012) and Société de financement local (2013) in France, the Development Bank of Nigeria (2013), and FinDev Canada (2017).

budget constraints. For example, in the case of the Brazilian development bank, BNDES, credit surged during the global financial crisis and for a few years during the strong postcrisis recovery but declined sharply during the recession of 2014–16, because soaring public deficits and debt closed the door on government lending to public banks (case study for Brazil, Online Annex 3.2). The quality of this rapid credit growth may not have been adequately assessed in the haste to extend credit, potentially leading to nonperforming loans in the future.

Public banks may also be used to fund the government and simultaneously receive support from the government. This sovereign-bank nexus potentially exacerbates the financial vulnerabilities of both (April 2019 *Global Financial Stability Report*; Dell’Ariccia and others 2018).

Public banks tend to hold larger amounts of sovereign debt than

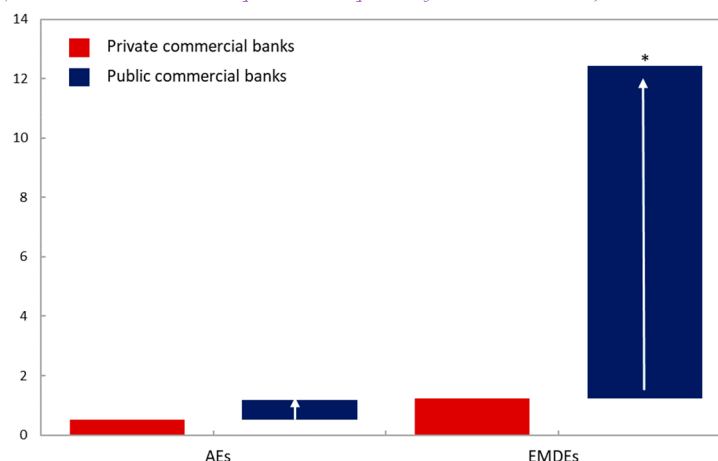
do private banks, especially in developing economies with higher public debt vulnerabilities (Figure 3.13). Moreover, during the sovereign debt crisis in Europe, domestic banks, particularly state-owned ones, were more likely to increase their holdings of domestic government bonds in fiscally distressed economies, suggesting a “moral suasion” mechanism (Ongena, Popov, and Van Horen 2019). In India, government guarantees allowed public banks—even vulnerable ones—to expand credit during the global financial crisis with deposits moving from vulnerable private to “safer” public banks. However, the loan quality of these public banks soon deteriorated, increasing financial sector fragility and contingent liability risks for the government (Acharya and Kulkarni 2019).

IV. Are SOEs Performing Efficiently?

Many governments demand that SOEs achieve their public mandates, perform efficiently, and compete with private firms. This section compares SOEs’ financial performance with that of private firms and analyzes its determinants using data for about 1 million individual firms across 109 countries.¹⁵ It also reviews evidence on governments’ exposure to fiscal risks from SOEs.

Figure 3.13. Bank Holdings of Government Bonds in Countries with High Public Debt

(Relative to countries with low public debt in percent of assets, 1999–2018)



Source: Fitch Connect; and IMF Staff estimates.

Note: The regressions control for several factors including bank characteristics (see Online Annex 3.3). Public banks are defined as those with over 25 percent of equity owned by the government. AEs = advanced economies; EMDEs = emerging market and developing economies.

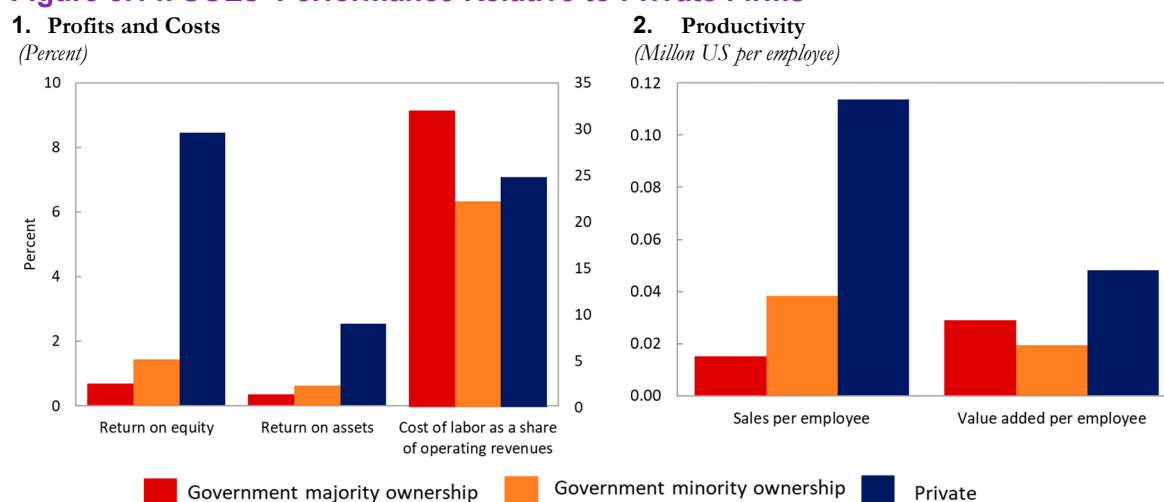
* = statistical difference from zero at 10 percent significance level.

¹⁵ Of the 969,000 firms in the sample, 949,000 are fully private, 15,000 are majority state owned, and 4,000 are minority state owned. The database includes mainly firms from advanced and emerging market economies with a smaller sample from low-income countries. The results are robust when constraining the analysis to countries where the coverage of firms is high. See Online Annex 3.4 for details.

A. SOE Financial Performance

A simple comparison reveals that profits and labor productivity are lower in SOEs than in private firms (Figure 3.14).¹⁶ This finding is consistent with country or regional studies for China, Russia, and other countries in the Central, Eastern, and Southeastern European (CESEE) region (Abramov and others 2017; Lardy 2019; Richmond and others 2019). In part, this difference could reflect the cost of public mandates—for example, providing services at below-cost prices to underserved communities or promoting employment beyond what is efficient for the firm—but other factors may be at play. It is important to note that if the differences are because SOE's are less efficient, the resulting misallocation of resources can reduce economywide productivity (Song, Storesleten, and Zilibotti 2011).

Figure 3.14. SOEs' Performance Relative to Private Firms



Sources: Authorities' Annual Reports on SOEs; Natural Resource Governance Institute; Orbis; and IMF staff estimates.

Note: The charts are based on median values. Weighted-averages show similar pattern. ROA = return on assets; ROE = return on equity.

B. The Role of Economic Sectors and State Ownership in SOE Performance

SOEs' performance gaps may reflect differences in the sectors in which they operate or in ownership. Cross-country evidence shows that SOEs are less productive than private firms in the same sectors¹⁷ and that the productivity gap tends to be larger in sectors where there is usually more competition (for example, agriculture and manufacturing). In some of the regulated sectors (such as utilities), the gap is lower (Figure 3.15).

Mixed ownership also makes a difference in firm performance. Private owners put greater emphasis on profits and efficiency. Listed mixed-ownership enterprises are subject to greater monitoring by private investors and analysts (Biglaiser and Brown 2003; D'Souza, Megginson, and Nash 2005; Pargendler,

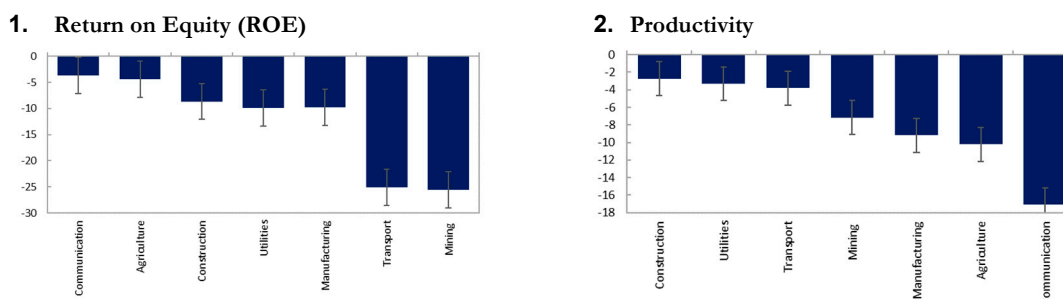
¹⁶ The analysis is based on SOE financial data, given that it is available for a large set of firms. For example, labor productivity is proxied by sales per employee, which does not necessarily only reflect differences in technical efficiency. If SOEs are restricted to charging lower prices relative to private firms, this would have a negative effect on sales per employee.

¹⁷ The results in this section are similar for other performance measures. See Online Annex 3.4.

Musacchio, and Lazzarini 2013). The evidence confirms that partial involvement of the private sector is beneficial (Megginson 2001; Vining and Boardman 1992). The analysis in this chapter indicates that firm productivity is lowest when the government has a majority position—private firms are three times more

Figure 3.15. Relative Performance of SOEs, by Sector

(Percentage point difference in SOEs performance relative to private firms)

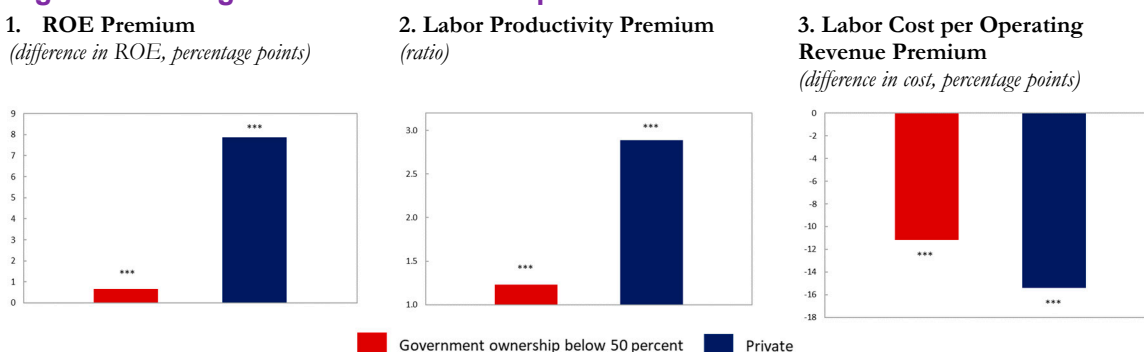


Sources: Authorities' Annual Reports on SOEs; Natural Resource Governance Institute; Orbis; and IMF staff estimates.

Note: For productivity (sales per employee), sales data are based on 2017 prices. SOEs are firms with 50–100 percent public sector ownership. Data are from 1999 to 2017.

productive—but the gap is narrower when the government has a minority position (Figure 3.16). There are also significant differences for return on equity, labor costs, and other measures of performance. Empirical studies on privatization complement these results (see Box 3.1).

Figure 3.16. Degree of State Ownership and Firms' Performance



Sources: Authorities' Annual Reports on SOEs; Natural Resource Governance Insittue; Orbis; and IMF staff estimates.

Note: The panels show the performance of firms depending on the degree of state ownership and controlling for other factors. Minority ownership = the government owns less than 50 percent of the company. Majority ownership = the government owns 50 percent or more. For productivity (sales per employee), sales data are based on 2017 prices. Data are from 1999 to 2017. The coefficients are relative to firms with government majority ownership. ROE = return on equity.*** indicate statistical difference from zero at 1 percent significance level.

Good Governance Is Critical

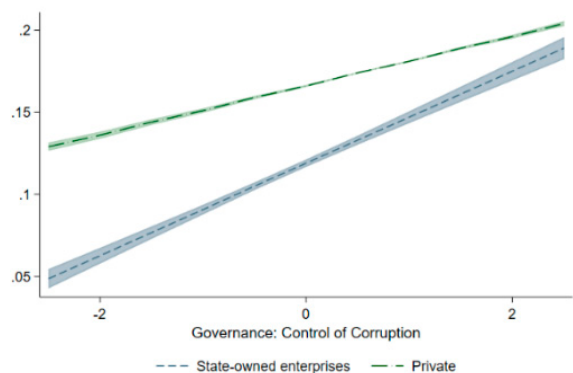
Weak governance in government harms all firms but has an especially deleterious effect on SOEs (Baum and others 2019). This subsection reports on the relationship between financial performance and a measure of countrywide perceived governance (control of corruption), controlling for the level of development and other factors. The results show that as countrywide perceived governance improves, SOEs' performance and productivity gaps relative to private firms shrinks (Figure 3.17). SOEs that operate in countries with high levels of perceived corruption are one-third as productive as private firms, on average; in countries with strong governance, the productivity gap is 7 percent. Regarding profitability, the gap with private firms declines but remains significant—a difference of 4 percentage points in return

on equity between SOEs and private firms in countries with good governance scores—which may reflect, at least in part, unfunded public mandates.

Figure 3.17. Governance and Firms' Performance

1. Labor Productivity

(million US dollars per worker)



2. ROE

(percent)



Sources: Authorities' Annual Reports on SOEs; Natural Resource Governance Institute; Orbis, World Bank, Worldwide Governance Indicators; and IMF staff estimates.

Note: The panels illustrate the effect of control of corruption on firms' performance depending on the type of ownership. SOEs are firms for which the government owns 50 percent or more. The analysis controls for firm-specific characteristics, country-specific variables, and sector where the firm operates. The Control of Corruption Index provides a relative measure of perceived corruption. Data are from 1999 to 2017. ROE = return on equity.

One possible driver of performance across different degrees of governance is the sector in which the SOE operates. Countries with better governance scores seem to be more selective, having SOEs in specific sectors, especially utilities and transportation, in which there is a stronger reason for intervention and the performance of SOEs is closer to that of private firms. These countries have fewer SOEs in areas in which private firms have significantly superior performance (for example, manufacturing).

C. Fiscal Costs and Risks to the Government

SOE performance and the realization of fiscal risks from SOEs can significantly affect public finances. Over the years, governments have provided significant support to financial SOEs (mainly capital injections) and nonfinancial SOEs (predominantly recapitalizations and debt assumptions), with the maximum annual support to financial and nonfinancial SOEs reaching 18 and 16 percent of GDP, respectively (updated version of database by Bova and others 2016).¹⁸ SOEs that operate in the airline, banking, mining, railway and utility sectors are among those that required costly support. For example, Italy's national airline is under bankruptcy protection and has received large loans or transfers from the government in the past few years. Similarly, South Africa's government-owned power company, Eskom, is receiving a rolling government bailout of 2⅓ percent of GDP over three years, although the cost may turn out larger (IMF 2019b). In Belarus, over the past years, the government on average provided 1½ percent of GDP in subsidies and about 2 percent of GDP in additional off-budget support (Richmond and others 2019).

More broadly, SOE debt levels can pose a risk to public sector finances, even in the absence of explicit government guarantees. In some countries, debt of the SOEs exceeds 20 percent of GDP and in several cases comprises half or more of the public sector debt stock (Figure 3.18). In other countries, SOE

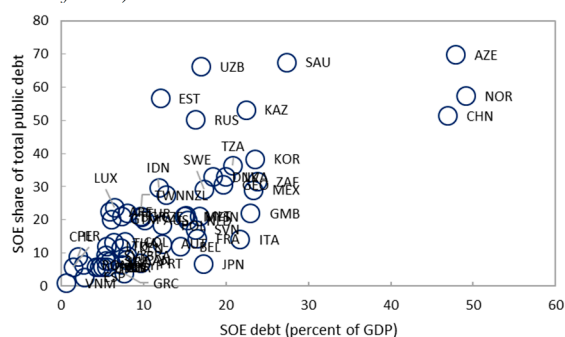
¹⁸ Governments have also provided significant support to private financial institutions and nonfinancial companies, most noticeably during the global financial crisis.

external debt exceeds 25 percent of the countries' exports of goods and services (see also IMF 2020). Even if the debt was incurred to develop a natural resource, as in oil-exporting countries, the debt may increase the vulnerability of the government to shocks (for example, fall in oil prices). In addition to debt, SOEs may have significant obligations to private parties through joint ventures, public-private partnerships, and power purchase agreements.

Figure 3.18. SOE Debt Vulnerability

1. Nonfinancial SOE Liabilities

(Percent of GDP)

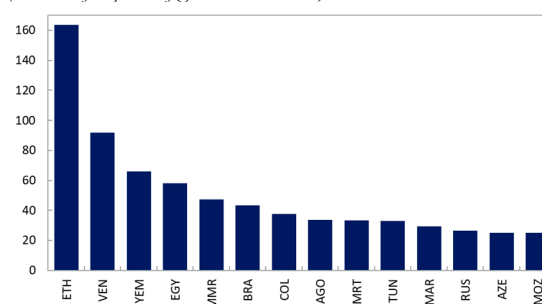


Sources: IMF's Public Sector Balance Sheet (PSBS) database, Eurostat, S&P Capital IQ, and IMF staff calculations.

Note: Debt drawn from S&P Capital IQ is only for the largest SOEs in the country. S&P Capital IQ and Eurostat data are for 2017 or 2018. Debt data drawn from the PSBS database covers a range of years from 2012–2016 and, for some countries, represent total liabilities less equity. Data labels in the figure use International Organization for Standardization (ISO) country codes.

2. External SOE Debt

(Percent of exports of goods and services)



Sources: World Bank (2020); WEO (2019); and IMF staff calculations.

Note: The figure includes both financial and non-financial SOEs. Data labels in the figure use International Organization for Standardization (ISO) country codes.

The realization of SOE risks may also have multiplier effects on the whole economy. When these risks materialize in public banks, credit growth may be curtailed, undermining economic activity. As for nonfinancial SOEs, the larger they are the more significant the impact of their financial imbalances can be for employment and investment. If financially impaired SOEs dominate a key economic sector such as power, they can also affect the financial system and competitiveness (for example, Ghana, see Online Annex 3.5). The public sector balance sheet approach can be used to show how a macroeconomic shock can have cascading effects through interrelationships between financially vulnerable SOEs (for example, in The Gambia) to the national budget (October 2018 *Fiscal Monitor*).

D. Reforms Can Help

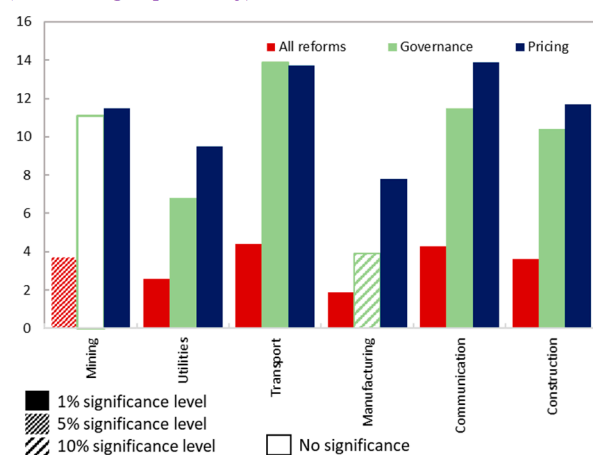
The discussion so far suggests that there is scope for SOE reforms targeting governance and financial incentives to improve SOE performance. Some empirical cross-country evidence, although limited, indicates that SOE reforms can improve their efficiency (Megginson and Netter 2001). Taking advantage of a novel database for a sample consisting primarily of developing and emerging economies, as well as a few advanced economies (members that had IMF-supported programs in 2002–17), we study the effect of SOE reforms in a cross-country setting.¹⁹ The reforms target (i) SOE governance (for example, SOE management, oversight, and transparency)—not governance in general; (ii) public enterprise pricing (such as tariffs and automatic fuel price mechanisms); (iii) arrears clearance; and (iv) the achievement of specific financial targets.

¹⁹ The information comes from data on structural conditionality in the context of IMF-supported programs. See Online Annex 3.6 for details.

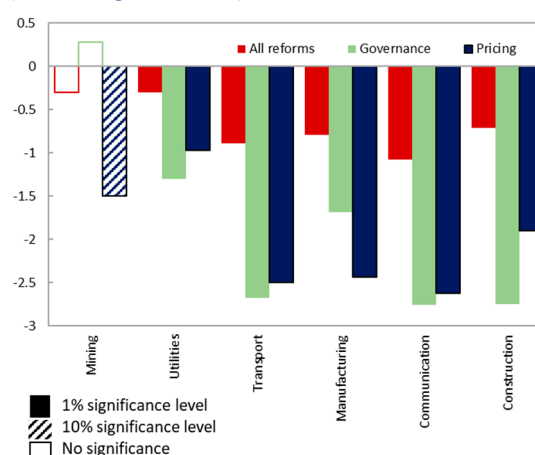
The results show that some reforms positively affect financial performance.²⁰ Reforms of SOE governance and pricing improve financial variables for all sectors except for mining SOEs (Figure 3.19). For example, an implemented governance reform is associated with an increase in productivity of \$10,000 per worker and a reduction of costs of 5 percent in the electricity sector. Reforms such as arrears clearance and financial targets have weaker or no impact, perhaps reflecting that if other structural reforms are not part of the package the underlying factors driving performance may not change.

Figure 3.19. Impact of SOE Reforms 2002–17

(Percent change in productivity)



(Percent change in labor costs)



Source: IMF staff estimates.

Note: "All reforms" includes the impact of financial target setting and arrears clearance in addition to governance and pricing reforms.

"Pricing" includes, among others, implementation of automatic fuel prices and electricity tariffs adjustments. The coefficients measure the impact of SOE reforms on average productivity and average cost changes. The coefficients can be interpreted as the average improvement of productivity or costs following reforms.

These reforms require building and sustaining broad popular support over several years. It is also important that improvements in the financial health of SOEs be achieved while protecting the more vulnerable segments of the population from possible adverse effects. Jordan's and Ukraine's experiences provide two examples.

- Subsidies to Jordan's electricity company, NEPCO, were close to 6 percent of GDP in 2014 (for context, the share of total health spending was 7.5 percent of GDP in the same year). NEPCO undertook a series of reforms, including gradual tariff adjustments since 2012 and the installation of a liquefied natural gas plant to ensure cheaper inputs. At the same time, vulnerable households were supported by increased cash transfers. As a result, public transfers to NEPCO were eliminated as of 2015, and NEPCO has posted small positive or negative net operational balances since 2016.
- Ukraine's national oil and gas company, Naftogaz, turned from a loss-making firm receiving significant budget aid to a profitable company within a few years. Significant gas and heating price increase along with restructuring and governance reforms as of 2014 were accompanied by the extension of utility subsidy programs for vulnerable households.

In both countries, ongoing efforts will be needed to sustain the reforms, including targeted support to the most vulnerable and continued efficiency gains.

²⁰ SOE reforms are implemented SOE reforms during IMF-supported programs. Governance reforms span a wide array of reforms related to monitoring, auditing, management, structural reforms to a sector as a whole (if they are governance related), and others. Public enterprise pricing reforms primarily concern tariff structures and typically target SOEs in electricity, gas, oil, heating, and water sectors.

V. How to Get the Most Out of SOEs

As the previous sections illustrate, SOEs can be difficult to manage and costly to the budget and the economy. This is particularly true when they are subject to excessive political interference and are used as vehicles to disguise off-budget spending and borrowing, patronage, or corruption. This section explores what countries can do to overcome these and other challenges and get the most out of SOEs. Although SOEs exist for many reasons, including historical and political circumstances, it is important to regularly review whether the rationale for each SOE remains valid and whether it delivers value for taxpayers' money. Given the potentially large costs, countries should use SOEs selectively and only where government intervention through SOEs can be most effective. The case is weaker for SOEs that operate in competitive sectors because private firms provide goods and services more efficiently. In contrast, experience suggests a stronger case for public intervention in sectors in which the government strives to achieve universal delivery of goods and services at affordable prices (for example, public utilities and ground transportation)—this is an area where SOEs are heavily present around the world.

For their SOEs to be successful, many countries will need to strengthen the link between SOEs and public sector goals, improve firm-level incentives, and enhance governance institutions. Some countries, for example, the Nordics (Online Annex 3.7), have built strong SOE frameworks that encompass these elements with the aim of ensuring they deliver value for taxpayers' money.

A. Aligning SOE Activities with Public Sector Goals

Consistency between SOE activities and general government policies is important to prevent the two parts of the public sector from working at cross purposes. For example, if SOEs accumulate significant debt when the rest of the public sector is aiming at fiscal adjustment, the government's efforts to reduce its borrowing costs may be undermined. Coverage of SOEs in the public accounts and provision of the right incentives for SOEs allow for better alignment of SOE actions and performance with overall government objectives.

Consistency with the Broader Public Sector Goals

SOE financial operations and assets and liabilities should be fully integrated into the financial statements of the public sector. Applying such a public sector balance sheet approach would enhance transparency of SOE financial performance and relations with other parts of the public sector (October 2018 *Fiscal Monitor*). Some countries or regions already implement a public sector balance sheet approach (Australia, New Zealand, United Kingdom) or partially reflect SOEs' main financial indicators in the public accounts (for example, Latin America). But many others do not, as is the case in sub-Saharan Africa (Figure 3.20) and most of Europe.²¹ Fully integrating SOEs into a public sector accounting framework will likely require an incremental approach in some countries. In the meantime, countries that currently report information only on central or general government fiscal results (revenue, expenditures, budget balance, and debt) should complement this reporting with memoranda that summarize government guarantees to SOEs (in addition to the recommended SOE financial disclosure practices outlined in the transparency section below).

²¹ Based on IMF's Fiscal Transparency Evaluations since 2014, around 90 percent of the countries evaluated did not publish comprehensive information on the public sector.

Given that SOEs use public resources and pursue policy goals, it is important to ensure that they collectively operate consistently with the country's broader macro-fiscal objectives. Those objectives are often embedded in fiscal targets, such as the overall budget balance or gross debt, that are set at levels to support macroeconomic goals—economic growth, inflation, and stability. Including nonfinancial SOEs in the fiscal targets would create greater incentives for fiscal discipline and transparency because (1) governments will likely exercise greater oversight over SOE overall borrowing and (2) governments' options to circumvent fiscal targets would be more limited. It would ensure that the broader fiscal policy goals are consistent across the public sector, for example, in keeping total public debt at safe levels.

The preference is to include nonfinancial SOEs in fiscal targets. Many governments in Latin America already include most nonfinancial SOEs in the fiscal targets and rules. At a minimum, governments should ensure comprehensive coverage in

fiscal targets of at least nonfinancial SOEs that pose significant fiscal risks and for which the government is a majority shareholder (IMF 2007).^{22, 23} If this is not feasible, an SOE's debt should be included in public sector debt when the SOE poses a fiscal risk.

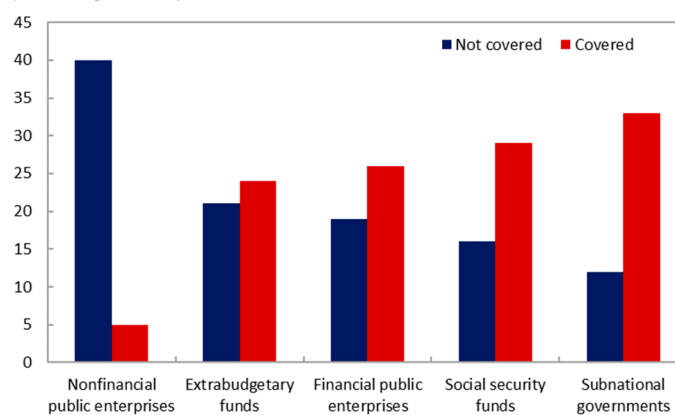
When considering the need for macroeconomic stabilization, it is appropriate to limit the use of SOEs and use more direct, transparent measures instead. Using SOEs to support employment during economic downturns is less efficient than monetary or fiscal policy tools. Likewise, forcing public banks to boost credit as the economy weakens could ultimately deteriorate the quality of their loan portfolio and increase risks. A case could be made for using public banks in situations of severe economic deterioration as part of a broader, and exceptional, policy action (as during a major global financial crisis). This approach requires fully transparent objectives and costs.

Getting Incentives Right at the Firm Level

Governments must give SOEs the right incentives to deliver value for taxpayers' money. This is more challenging, but also more necessary, when SOEs operate in sectors with limited competition or when

Figure 3.20. Fiscal Coverage beyond the Central Government in Sub-Saharan Africa

(Number of countries)



Source: IMF staff survey of 45 countries in sub-Saharan Africa.

²² SOEs have public mandates that imply that their finances and operations will likely deviate from commercial interests making the commercial orientation of an SOE ill-suited as a selection criterion. Past analysis by IMF staff finds that SOEs did not behave commercially because there was always some government-imposed mandate or constraint (for example, on setting prices or employment policies) (IMF 2005).

²³ Public banks are better kept outside fiscal targets given the nature of their financial operations. It is also important to keep close track of the performance of SOEs that routinely turn profits—as might be the case, for example, for a highly profitable national oil company—to ensure that such SOEs remain efficient and to recognize that such profits will ultimately accrue to the state. The case for inclusion of such SOEs in the fiscal targets needs to be counterbalanced against the possibility that they could obscure the underlying financial performance of the rest of the public sector.

there are significant externalities (for example, when provision of a good is important for economic growth) or social mandates. To promote efficiency and a sustainable business model:

- *Getting the pricing policy right is key.* Pricing rules should be transparent and depoliticized (for example, published rules specifying how domestic fuel prices will adjust automatically to changes in the cost of supplying fuel). Preferably, prices should be set to ensure cost recovery (including to cover investment expenditure). The pricing policy in sectors with negative externalities (for example, fossil fuels that lead to pollution and health problems) should also be adjusted, protecting more vulnerable households.²⁴ If this is not possible—for example, because a large share of the population is poor and there is no social safety net—governments should appropriately compensate the SOE in a timely and transparent manner. Conversely, it is important to prevent excessively high prices if the SOE has monopoly power because they may lead to inefficiencies.
- *Independent regulatory agencies* need to balance different interests, ensuring that government and firms operate according to transparent and well-defined rules, especially when private investors are involved. For example, regulators can ensure tariffs in public utilities are set to balance affordability with the need to cover costs. In low-income countries, pooling resources in a single regulator overseeing several sectors can help build capacity.
- *Professional managers and the independence of managerial decisions are required to ensure the firm operates efficiently.* Firms need to have corporate governance structures that promotes sound hiring, wage, and procurement policies. The next section discusses in greater detail some of the important features, including a professional board and a high degree of transparency.

Other strategies that have been adopted to improve the SOE incentives include corporatization and allowing for participation of private minority shareholders. In OECD countries, most SOEs are incorporated according to company law and are generally subject to the same laws and regulations as private companies.²⁵ About half of those companies by value are listed on a national stock exchange (OECD 2017). Mixed ownership has been adopted by many countries to some degree over the past decades (for example, Brazil and China as well as European countries).

B. Strengthen Institutions

The starting point is a clear and comprehensive ownership policy aiming to get value for taxpayers' money out of SOEs (Allen and Alves 2016). Ownership policies should clearly state (1) the mandates, objectives, and a dividend policy for SOEs; (2) the approach to achieving professional boards of directors; (3) the functions carried out by the government as owner of the SOE and its coordination with fiscal risk oversight functions; and (4) the way the government exercises its ownership rights. To assess SOEs' effectiveness in achieving value for money, it is also important to distinguish and disclose commercial and noncommercial activities (policy mandates). Moreover, governments must develop the capacity to properly oversee the operations of the company while avoiding excessive intervention of public officials; enforce transparency requirements; and establish a sound SOE corporate governance framework. Implementation of anticorruption strategies to prevent the use of SOEs for private gain is also critical.

²⁴ In some cases, a better approach would be to have a broader strategy, under which firms can charge prices that reflect costs with the government directly providing subsidies to the poorest households.

²⁵ At the same time, company laws do not specifically address the relationship between the state and SOEs. The legal framework for SOEs must therefore consist of an additional layer, that could be an SOE law, governing such relationship.

Effective Financial Oversight and Ownership

A strong oversight and control agency can yield better performance from SOEs (Musacchio and Pineda 2019). A centralized model provides the best potential for ensuring consistency between the ownership (for example, representation on company boards, strategic direction of firm) and financial oversight functions. A centralized model could take the form of an autonomous agency or holding company (as in Finland, France, Kenya, Malaysia, Peru, and Singapore). Holding companies exhibit advantages when managers have professional expertise and they protect SOEs from undue political interference.

It is critical to have one government unit responsible for the financial oversight of SOEs even when a holding company is in place. One unit makes oversight activities more coherent, while pooling experts from different areas. A central element of the oversight function is to identify, disclose, and mitigate fiscal risks. Fiscal risk assessments can be made for individual companies and the SOE portfolio. The latter allows for evaluation of the combined risks for the government.²⁶ Oversight units can be located within ministries of finance (France) or public companies (such as the UK Government Investments). The former model has the advantage of better integrating SOE risk oversight in the budget process and facilitating a broader assessment of fiscal risks. Moreover, SOE oversight units should be accountable to an institution representing the interests of the public (for example, parliament).

SOEs' investment plans, because of their direct fiscal costs and impact on growth, deserve special scrutiny. Government assessment of large investment (infrastructure) plans of SOEs should be informed by technical and economic appraisals based on standardized criteria. Furthermore, when projects involve direct budgetary costs—for instance through capital injections or on-lending to SOEs—they should be subject to a selection process to ensure the consistency of aggregate investment plans with medium-term fiscal objectives and the degree of fiscal risk. The effectiveness of the process requires close cooperation among the ministry of finance, SOEs, and line ministries, who are often tasked with the design of sectoral investment strategies. However, line ministries should not be given excessive control over ownership arrangements or strategic decisions because this might undermine SOE efficiency.

Several approaches exist to contain potential risks from the SOE sector. One possibility is to explicitly commit to a no-bailout clause. This approach has been used mostly in transition countries, such as Poland and Ukraine. A recommended approach is to subject SOEs to effective insolvency procedures such as those for private firms. For example, bankruptcy legislation in Korea, Netherlands, Sweden, and the United Kingdom has the same insolvency procedures for SOEs as for private companies. Providing SOE management with incentives to manage risks (such as performance contracts and benchmarking) can help too. However, the latter approach is often difficult to implement.

Countries should also regularly review their SOE portfolios to assess whether the policy case for an SOE remains valid. For example, technological changes may mean the reason for the government intervention no longer exists (for example, it is possible that competitive mobile phone networks have undermined the need for state ownership in telecommunications). Several European countries conduct these reviews, either periodically or on an ad hoc basis (such as when a need arises to analyze an SOE). For example, Germany conducts a biennial review of its SOE portfolio during which each SOE's continued existence must be justified (OECD 2018a). In general, if the SOE is no longer relevant, options for freeing government resources for better uses include (1) selling the assets and closing the firm—with appropriate

²⁶ IMF staff have supported the development of SOE risk analysis templates in several countries during the past decade, most recently in Armenia (2015), Namibia (2018), and Serbia (2019).

protection to workers and communities—if the business plan is not viable, and (2) privatizing the firm if the appropriate institutional preconditions are in place and the business plan is viable (Box 3.1).

Transparency

The financial and operational performance of the SOE along with its financial relations with the government must be disclosed. This can reduce the likelihood that SOEs will be used as vehicles for off-budget spending and borrowing, political patronage, or corruption. Unfortunately, financial information on SOEs in many countries is sparse. This is especially the case for national oil companies, which manage large assets, particularly in the Middle East and sub-Saharan Africa (NRGI 2019).

Disclosure of SOE financial statements is the prevailing practice in advanced economies, whereas in emerging market economies disclosure is often restricted to listed SOEs. SOE financial statements should be audited by the national audit office or private audit firms approved by the national audit office. Finland, France, Ireland, New Zealand, and Sweden also publish performance assessments of at least their largest SOEs.

An annual report with detailed information and analysis of the performance of the SOE sector at the aggregate, sectoral, and company levels can be an effective communication tool. Countries such as India, Paraguay, the Philippines, and Sweden publish reports on the aggregate performance of the SOE sector. Brazil, Ghana, India, Korea, and Sweden also provide information at the individual SOE level. As highlighted earlier, ultimately, SOE financial data should also be integrated into a public sector balance sheet to provide a comprehensive view of the public finances.

Transparency is also needed on the financial interactions between the general government and SOEs. Government mandates to SOEs should be clearly defined, transparently disclosed in the budget, and compensated if needed.²⁷ Fiscal risks associated with SOEs, both at the public sector level and at the firm level, when relevant, should be regularly reported (including contingent liabilities). The assessment of SOE risks and the mitigation measures should be disclosed. Fiscal risk statements are a good vehicle for doing this, as in Austria, Georgia, and the Philippines. In South Africa, the budget review discloses the financial position and prospects of the largest loss-making nonfinancial SOEs (in addition to other SOEs) and describes ongoing risk mitigation measures.

SOE Corporate Governance

Governments should establish and enforce SOE corporate governance standards in line with good international practice.²⁸ The composition of SOE boards plays a significant role in the quality of corporate governance. At a minimum, governments should promote professional boards that can help ensure proper accountability. In some countries, some or all of the members of the boards of directors are required to be independent of the government (for example, Canada, Germany, Netherlands, and Switzerland). Appropriate regulation of SOEs is another important element of corporate governance. In Chile, Netherlands, Norway, and Sweden, at least the largest SOEs are subject to the same regulatory framework as listed private companies. A third attribute of good corporate governance is regularly assessing SOE management performance. This can be difficult but is possible. For example, New

²⁷ The IMF's *Fiscal Transparency Handbook* recommends the disclosure of quasi-fiscal activities, including the rationale for undertaking them through SOEs rather than through the budget and the mechanisms used to compensate SOEs for any resulting deterioration in their financial positions.

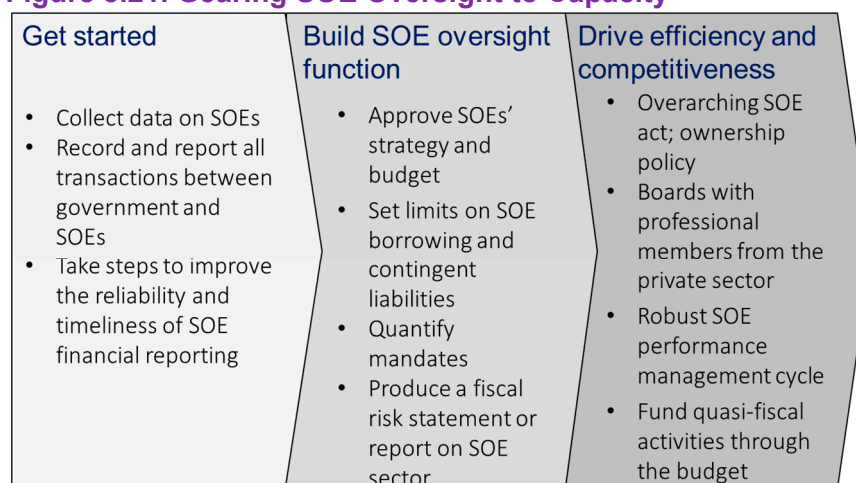
²⁸ The OECD Guidelines on Corporate Governance of SOEs (OECD 2015) are an example of good standards.

Zealand has a sound and effective performance contracting framework within which SOEs' goals are informed by risk oversight and fiscal objectives. Implementing high corporate governance standards remains challenging in many developing countries.

Transition to Better Oversight and Management of SOEs

Implementing a system for overseeing SOEs that meets all the requirements discussed previously takes time and resources. Some of these reforms may not be possible in the short term in low-capacity countries. In such cases, this argues for a risk-based and sequenced approach to building an oversight regime for SOEs with a focus on monitoring mainly SOEs that involve higher risks.

Figure 3.21. Gearing SOE Oversight to Capacity



Source: IMF staff.

Figure 3.21 illustrates the three main pillars of reform. First, governments need to know their SOEs, as many countries do not have a firm grasp of the number or size of the SOEs they own. This will also allow regular reviews to determine which SOEs are still relevant. The second pillar focuses on building oversight with a strong emphasis on controlling fiscal risks. Third, policies and procedures need to incentivize government officials and SOE boards and management to strive for SOE efficiency. In some cases, it may be possible to pursue elements of different pillars simultaneously. The feasibility and speed of reforms will depend on country circumstances, including political economy considerations.

C. Being a Good “Global Citizen”

As SOEs have grown in scope and size, their drawbacks have spilled over to other countries, leading to calls for protectionist measures. As discussed previously, concerns that government support can provide SOEs with competitive advantages are growing.²⁹ As such, SOEs' activities may distort international markets (for example, aluminum, semiconductors, airlines, and steel), including when they are shielded from foreign competitors in their domestic markets. Another concern is that SOE expansion abroad is not always based on commercial objectives but may reflect other home country goals, such as control of natural resources, acquisition of technology, or political or diplomatic objectives. Moreover, SOEs are a major conduit for foreign bribes, with available data suggesting SOE officials received 80 percent of total bribes in foreign bribery cases (OECD 2014). SOEs in the power sector (generation of electricity) account for a substantial quantity of greenhouse gases (OECD 2018c), more than their private peers, and national oil companies can have a significant impact on the environment in countries where they operate

²⁹ The legal framework for state aid in the European Union provides an example of how some of the concerns could be addressed. It also contains a working definition: government support is a concern if it confers an advantage to certain firms and the advantage is selective, distorts competition, and affects trade between member states.

(for example, by polluting water or abandoning oil fields without cleaning them). Addressing these drawbacks can deliver domestic and global benefits.

The main benefits are domestic. Well-governed, transparent, and efficient SOEs that compete on a level playing field support productivity growth, better use of public resources, and reduce local pollution. These benefits could also generate positive spillovers to other countries. Indeed, SOEs can play their part in the pursuit of global public goods, such as protecting the environment (for example, by moving toward cleaner sources of energy in the power sector, or by minimizing environmental damage when conducting oil and gas exploration). Likewise, SOEs can play a positive role in the global fight against corruption if governments improve general governance at home and impose effective anticorruption strategies, including when SOEs operate abroad.³⁰ Multilateral efforts would complement these domestic reforms.

Some advanced economies have taken steps toward fostering a level playing field (i.e., competitive neutrality).³¹ The EU and Australia have some of the most comprehensive approaches. For example, Australia requires SOEs to make compensatory payments to the national treasury for regulatory or debt financing advantages (OECD 2016b). Other advanced economies have made a commitment to competitive neutrality, and most have laws and regulations that address potential uneven treatment of SOEs and private firms (OECD 2018a). Several countries have sought to address some elements of competitive neutrality across borders.³² Multilateral institutions have also established disciplines (WTO) or guidelines (OECD 2015) that touch on the issue of competitive neutrality to varying degrees.

A more cooperative solution would be a multilateral agreement on general principles to ensure a level playing field between SOEs and private firms. These principles would guide SOE international behavior and recipient-country responses, which would build mutual trust. An approach akin to the Santiago Principles for sovereign wealth funds (International Working Group of Sovereign Wealth Funds 2008) may be worth considering, with appropriate adaptation to SOEs. The principles could cover areas such as transparency on mandates and the type and size of government support. They could also promote nondiscriminatory treatment. Adoption of the principles could be voluntary, at least initially.

Establishing effective principles would require significant technical work and political desire across countries. Detection and satisfactory resolution of SOE competitive advantages requires information that is frequently lacking on explicit and implicit government support for SOEs, the cost to the SOE of its noncommercial mandate (if any), SOE and comparator company finances, and the broader regulatory and legal environment in which the firms operate. Table 3.1 highlights some of the issues that would need to be addressed to foster competitive neutrality. For example, the costs of an

³⁰ Similarly, source countries need to enforce legislation against foreign bribery (as envisaged, for example, under the OECD anticorruption convention—see April 2019 *Fiscal Monitor*) to prevent their private firms from paying bribes to foreign SOE officials.

³¹ Competitive neutrality is usually defined as a situation in which no entity operating in an economic market is subject to undue competitive advantages or disadvantages (OECD 2012; UNCTAD 2019). Competitive neutrality concerns are not limited to SOEs; they may also apply to nonprofit entities that are active in the marketplace or to private entities receiving government support.

³² For example, the US-Australia Free Trade Agreement contains specific obligations on anticompetitive practices by SOEs. At the sectoral level, recent agreements between the United States and several Gulf countries and a revised EU directive on airline competition (EU 2019) have sought to address concerns about unfair SOE competition in the global airline industry. At the regional level, the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), the Agreement between the EU and Japan for an economic partnership (EU-Japan EPA), and the Agreement between the United States, Mexico, and Canada each contain a chapter on SOEs that establishes rules to promote fair competition and prevent market distortion by governments.

SOE's commercial and noncommercial mandates would need to be identified, separated, and disclosed, using a methodology to be agreed upon. Another important aspect would be to ensure that an SOE's cost of capital (interest on debt and return on equity) is similar to its private sector competitors, which would require benchmarking competitors' costs of capital and requiring the SOE to make compensatory payments to the budget if the SOE's cost of capital is lower than the benchmark. Challenges to establish common methodologies can be overcome, and an agreement on common principles would yield benefits domestically and globally by supporting trade and foreign direct investment.

VI. Conclusion

SOEs have major economic and fiscal effects in many countries. SOEs are among the largest companies in the world and are now global players. At the same time, many SOEs are struggling. SOEs generally have low productivity, distort competition, and can be plagued by corruption. SOEs have fallen short, particularly in developing countries, in providing basic services, such as access to safe water, sanitation, and reliable electricity, to the entire population. Many have been a significant drain on the government budget and in some cases have contributed to economic and fiscal crises. Concern about the activities of multinational SOEs is growing, which could fuel protectionist measures.

The model for using and managing SOEs should be strengthened in many countries. The stakes are high because SOEs provide core economic services and could potentially be an important vehicle to achieving the Sustainable Development Goals. International experience provides lessons on how to move forward. Governments should not waste public resources in areas where intervention is not needed. The case for SOEs is weak when markets are competitive and private firms provide goods and services efficiently. Where SOEs play a dominant role, such as public utilities, improving their performance and achieving a sustainable business model are priorities. Governments will also need to find ways to attract private investment to complement the activities of SOEs, which are unlikely to be able to satisfy all development goals.

Governments need to set appropriate incentives and build sound institutions to ensure SOEs operate efficiently and fiscal costs are contained. A strong framework would include a clear and comprehensive ownership policy supported by appropriate government oversight and good corporate governance. Transparency of SOE activities and their relations with the government is critical to bolster accountability.

In view of the growing presence of SOEs in global trade and investment, ensuring a level competitive playing field is important to foster economic efficiency at home and to address international spillovers. Several countries have adopted rules with this aim. Some of these issues are also flagged in international trade and investment treaties. However, there is room for a more coordinated international approach that could benefit from setting global principles for multinational SOEs.

Table 3.1. Competitive Neutrality: Some Basics

Concept	Some challenges and complexities
Cost allocation transparency	<ul style="list-style-type: none"> • What type of policy mandates should be compensated? • What methodologies should be used to appropriately allocate costs between commercial and noncommercial activities? • Assuring debt neutrality, what is the value of an implicit government guarantee? • What is an appropriate benchmark for assessing return adequacy? • What is the value of a legally created captive home market? • Valuing compensation: What about in-kind benefits such as free land?
Compensation of policy obligations	
Market = consistent rate of return	
Debt neutrality	
Similar tax, regulatory, and procurement rules	

Source: OECD 2018a; and IMF staff.

Box 3.1. Experience with Privatization

Privatization, done right, can mean improved firm performance, healthier public finances, and positive macroeconomic effects (Estrin and others 2009; Estrin and Pelletier 2018; Megginson and Netter 2001). The literature suggests that privatized firms outperform SOEs but underperform firms that have always been in private hands (Harrison and others 2019; Shirley and Walsh 2000). So, how can privatization be “done right” and what happens if necessary, conditions are not met?

Privatization has disappointed when complementary institutional and market reforms, as well as equity goals, are not pursued with equal vigor. The existence of a competitive market, the protection of property rights, and the privatization method are important to the outcome of the privatization (Hanousek and others 2008; Havrylyshyn and McGettigan 1999). In Russia and Ukraine, for example, rapid mass privatization within a framework of weak governance and regulation often led to bid rigging and limited, if any, efficiency improvements (Rose-Ackerman and Palifka 2016). Estache and Trujillo (2008) find significant productivity gains after pre-2000 privatization in Latin American countries but point to employment loss and unequal distribution of privatization rents, especially for noncompetitive activities. Privatization reversals are also common where regulation is not effective. Power sector privatizations were reversed in the Dominican Republic, the Indian state of Odisha, and some African countries when tariffs remained too low or the utility was not yet functioning at a basic level (Foster and Rana 2020).

Sector dynamics are also relevant for privatization success. Take, for example, water supply, a natural monopoly. There could be a tension between ensuring affordable provision of water and adequate profits by the private firm. In Guinea, private participation in the sector increased access to water by 10 percent from 1986 to 1997 but made the price of water 40 times more expensive (Nellis 2008). Privatization was reversed in 2003.¹ Similarly, in California in the 1990s electricity generation was privatized in a push for higher efficiency and lower prices. Lobbying for deregulation, subsequent fraudulent behavior, and the search for higher company stock values resulted in several problems and a hike in electricity prices (Rose-Ackerman and Palifka 2016; Tillman 2009). Similar arguments against privatization have been raised for other sectors, including electricity transmission and other infrastructure (such as roads and railways).

Popular concerns about the impact of privatization have not always been warranted. Employees and labor unions oppose privatization because of the threat of layoffs (Andrews and Dowling 1998; Boix 1997; Chong, Guillenand, and López-de-Silanes 2011), as in Nicaragua and Argentina in the 1990s. However, privatization can lead to employment gains even if employment and wages in the former state firm fall (Davis and others 2000; Earle and Shpak 2019; Estache and Trujillo 2008). After Zambia Airways was liquidated, two new private airlines emerged, leading to higher employment in the sector (Kikeri 1998). McKenzie and Mookherjee (2003) find that utility prices, on average, fell by 50 percent in some Latin American countries after privatization, and in countries where prices rose, access to previously unavailable goods and services did too.

Realizing the benefits of privatization requires certain preconditions to achieve success: a solid regulatory framework, including a well-functioning legal system, an effective and independent regulator and strong property rights; and relatively low levels of corruption to permit a transparent sale process and avoid embezzlement of SOE assets in the run-up to privatization.² Moreover, privatized firms will be more likely to be efficient and to serve the public if there is sufficient competition in the underlying market or an independent regulator at its onset. Frequent renegotiation of contracts in the public services sector after privatization in Latin America indicates the failure of efforts to achieve competition in markets with too few bidders for the auctioned firms (Estache and Trujillo 2008). Low barriers to new domestic firm entry and openness to foreign direct investment can remedy this problem.

¹ See also Kirkpatrick and others (2006) and Tan (2012) for mixed results of private participation in the water sector.

² See, for example, Balza and others (2013); Estrin and Pelletier (2018); Gasmi and others (2013); Jomo (2008); Kikeri and Kolo (2005); Kikeri and Nellis (2004); Rose-Ackerman and Palifka (2016); and Zhang and others (2008) for discussions on the different preconditions and consequences of their absence.

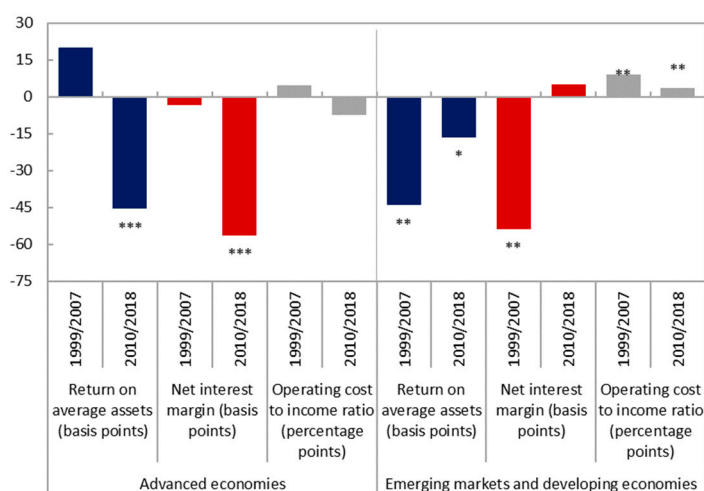
Box 3.2. State-Owned Banks

Public banks comprise two broad categories: commercial banks, which provide competitive banking services, and development banks, which provide credit for development-related projects, usually at subsidized rates, with funding coming from the budget or with government guarantees. In practice, the two types are hard to differentiate given that both have public mandates. One common stated objective is to finance socially valuable but financially unattractive or highly risky projects, such as lending to young, small, and innovative firms (for example, the Business Development Bank of Canada). Another is to finance capital-intensive infrastructure projects (for example, the Development Bank of Southern Africa).

Public banks have struggled to achieve their socioeconomic mandates. Studies have shown that greater state ownership of banks is associated with lower levels of financial development, weaker economic growth, and higher financial instability (Barth and others 2004; Beck and others 2008; La Porta, Lopez-De-Silanes, and Shleifer 2002). There is a concern that the state presence politicizes credit allocation (including lending to connected entities or other SOEs). For example, in Ukraine's state-owned banks, politically motivated lending led to massive losses in recent years and repeated recapitalizations by the state (Repko 2019). But public banks can also play a positive role. For example, Mexico's NAFIN is credited for fostering financial development, innovation, and inclusion (de La Torre and others 2017).

The empirical evidence on financial performance is mixed. Public commercial banks operating in developing economies tend to have lower profitability and interest margins, higher overhead costs, and higher nonperforming loans than private banks, whereas no significant performance differences are found in advanced economies (for instance, Berger, Hasan, and Zhou 2009; Iannotta, Nocera, and Sironi 2007; Micco, Panizza, and Yanez 2007). A sample of more than 4,000 banks in 125 countries over the past two decades shows that public commercial banks are less profitable and cost-efficient than their private counterparts (see Online Annex 3.3), not even accounting for the substantial guarantees, subsidies, and preferential treatment that public banks enjoy. Comparing the decades before and after the global financial crisis, however, the findings suggest that the performance differences have narrowed between public and private commercial banks in developing economies but widened in advanced economies (Figure 3.2.1). For developing economies, one hypothesis is that greater government support for public commercial banks after the crisis boosted their profitability. In advanced economies, the ultra-loose monetary policy after the global financial crisis tends to have a disproportionate effect on public commercial banks because they lend more locally than their private peers.

Figure 3.2.1. Financial Performance of Public Relative to Private Commercial Banks



Source: Fitch Connect; and IMF staff estimates.

Note: Regressions control for several factors, including other bank characteristics.***, **, and * indicate statistical difference from zero at 1, 5, and 10 percent significance level, respectively.

References

- Acharya, V., and N. Kulkarni. 2019. “Government Guarantees and Bank Vulnerability during a Crisis: Evidence from an Emerging Market.” NBER Working Paper 26564, National Bureau of Economic Research, Cambridge, MA.
- Agou, G., and J. Ralyea. 2019. “A Public Sector Balance Sheet for Ghana.” In “Ghana Selected Issues Paper.” IMF Country Report 19/368, International Monetary Fund, Washington, DC.
- Aldaba, R. M. 2011. “SMEs Access to Finance: Philippines.” In *Small and Medium Enterprises (SMEs) Access to Finance in Selected East Asian Economies*, edited by C. Harvie, S. Oum, and D. Narjoko, 291–350. ERIA Research Project Report 2010–14. Jakarta: ERIA.
- Allen, R., and M. Alves. 2016. “How to Improve the Financial Oversight of Public Corporations.” How-to Note, IMF Fiscal Affairs Department, International Monetary Fund, Washington, DC.
- Allen, R., and S. Vani. 2013. “Financial Management and Oversight of State-Owned Enterprises.” In *the International Handbook of Public Financial Management*, edited by R. Allen, R. Hemming, and B. H. Potter. Houndmills, UK: Palgrave Macmillan Limited.
- Alvarez, J., T. Chen, and B. G. Li. Forthcoming. “The State and China's Productivity: Firm-Level Evidence.” IMF Working Paper, International Monetary Fund, Washington, DC.
- Andrews, W. A., and M. J. Dowling. 1998. “Explaining Performance Changes in Newly Privatized Firms.” *Journal of Management Studies* 35 (5): 601–17.
- Bai, C. E., C. T. Hsieh, and Z. M. Song. 2016. “The Long Shadow of a Fiscal Expansion.” NBER Working Paper 22801, National Bureau of Economic Research, Cambridge, MA.
- Bai, C. E., J. Mao, and Q. Zhang. 2014. “Measuring Market Concentration in China: The Problem with Using Censored Data and Its Rectification.” *China Economic Review* 30 (September): 432–47.
- Balance, T., and S. Tremolet. 2005. *Private Sector Participation in Urban Water Supply in Sub-Saharan Africa*. German Development Corporation, KfW, Frankfurt.
- Balza, L., R. Jimenez, and J. Mercado. 2013. “Privatization, Institutional Reform, and Performance in the Latin American Electricity Sector.” Technical Note IDB-TN-599, Inter-American Development Bank, Washington, DC.
- Barth, J. R., G. Caprio, and R. Levine. 2004. “Bank Regulation and Supervision: What Works Best?” *Journal of Financial Intermediation* 13 (2): 205–48.
- Baum, A., C. Hackney, P. Medas, and M. Sy. 2019. “Governance and State-Owned Enterprises: How Costly Is Corruption?” IMF Working Paper 19–253, International Monetary Fund, Washington, DC.
- Berger, A. N., I. Hasan, and M. Zhou. 2009. “Bank Ownership and Efficiency in China: What Will Happen in the World's Largest Nation?” *Journal of Banking & Finance* 33 (1): 113–30.
- Bertay, A. C., A. Demirgüç-Kunt, and H. Huizinga. 2015. “Bank Ownership and Credit over the Business Cycle: Is Lending by State Banks Less Procyclical?” *Journal of Banking and Finance* 50 (January): 326–39.
- Biglaiser, G., and D. S. Brown. 2003. “The Determinants of Privatization in Latin America.” *Political Research Quarterly* 56 (1): 77–89.

- Boix, C. 1997. “Privatizing the Public Business Sector in the Eighties: Economic Performance, Partisan Responses and Divided Governments.” *British Journal of Political Science* 27 (4): 473–96.
- Bortolotti, B., and M. Faccio. 2009. “Government Control of Privatized Firms.” *Review of Financial Studies* 22 (8): 2907–39.
- Bova, E., M. Ruiz-Arranz, F. Toscani, and E. Ture. 2016. “The Fiscal Costs of Contingent Liabilities: A New Dataset.” IMF Working Paper 16/14, International Monetary Fund, Washington, DC.
- Brazilian National Treasury. 2019. Boletim das Participações Societárias da União 2018.
- Brei, M., and A. Schclarek. 2013. “Public Bank Lending in Times of Crisis.” *Journal of Financial Stability* 9 (4): 820–30.
- Brollo, F., T. Nannicini, R. Perotti, and G. Tabellini. 2013. “The Political Resource Curse.” *American*
- Capobianco, A., and H. Christiansen. 2011. “Competitive Neutrality and State-Owned Enterprises: Challenges and Policy Options.” OECD Corporate Governance Working Paper 1, OECD Publishing, Paris.
- Chivakul, M., and R. York. 2006. “Implications of Quasi-Fiscal Activities in Ghana.” IMF Working Paper 06/24, International Monetary Fund, Washington, DC.
- Chong, A., J. Guillenand, and F. López-de-Silanes. 2011. “Privatization and Labor Policies.” *Journal of Public Economics* 95 (9): 1119–30.
- Cornett, M., G. Lin, S. Khaksari, and H. Tehranian. 2009. “The Impact of State Ownership on Performance Differences in Privately-Owned versus State-Owned Banks: An International Comparison.” *Journal of Financial Intermediation* 19 (1): 74–94.
- Cremer, A. 2017. “German State Conservatives Take Tougher Line on VW Oversight.” *Reuters*. August 7.
- Cuervo-Cazurra, A., A. Inkpen, A. Musacchio, and K. Ramaswamy. 2014. “Governments as Owners: State-Owned Multinational Companies.” *Journal of International Business Studies* 45: 919–42.
- Cull, R., and M. S. Martinez-Peria. 2013. “Bank Ownership and Lending Patterns during the 2008–09 Financial Crisis: Evidence from Latin America and Eastern Europe.” *Journal of Banking and Finance* 37 (12): 4861–78.
- Cull, R., and J. Verrier. 2017. “Bank Ownership: Trends and Implications.” IMF Working Paper 17/60, International Monetary Fund, Washington, DC.
- D’Souza, J., W. L. Megginson, and W. L. R. Nash. 2005. “Effect of Institutional and Firm Specific Characteristics on Post-Privatization Performance.” *Journal of Corporate Finance* 11 (5): 747–66.
- Davis, J., R. Ossowski, T. Richardson, and S. Barnett. 2000. “Fiscal and Macroeconomic Impact of Privatization.” IMF Occasional Paper 194, International Monetary Fund, Washington, DC.
- de la Torre, A., J. C. Gozzi, and S. L. Schmukler. 2017. “An Online Platform for Reverse Factoring Transactions: NAFIN’s Experience in Mexico.” In *Innovative Experiences in Access to Finance: Market-Friendly Roles for the Visible Hand?* Washington, DC: World Bank.
- Dell’Ariccia, G., C. Ferreira, N. Jenkinson, L. Laeven, A. Martin, C. Minoiu, and A. Popov. 2018. Managing the Sovereign-Bank Nexus, IMF Departmental Paper No 18/16, International Monetary Fund, Washington, DC.

- Dewenter, K., and P. Malatesta. 2001. "State-Owned and Privately-Owned Firms: An Empirical Analysis of Profitability, Leverage, and Labor Intensity." *American Economic Review* 91 (1): 320–34.
- Dinc, I. S. 2005. "Politicians and Banks: Political Influences on Government-Owned Banks in Emerging Markets." *Journal of Financial Economics* 77 (2): 453–79.
- Earle, J. S., and S. Shpak. 2019. "Impact of Privatization on Employment and Earnings." IZA World of Labor.
- Estache, A., and L. Trujillo. 2008. "Privatization in Latin America: The Good, the Ugly, and the Unfair." In *Privatization: Successes and Failures*, edited by G. Roland, 136–69. New York: Columbia University Press.
- Estache, A., and L. Wren-Lewis. 2009. "Toward a Theory of Regulation for Developing Countries: Following Jean-Jacques Laffont's Lead." *Journal of Economic Literature* 47 (3): 729–70.
- Estrin, S., J. Hanousek, E. Kocenda, and J. Svejnar. 2009. "The Effects of Privatization and Ownership in Transition Economies." *Journal of Economic Literature* 47 (3): 699–728.
- Estrin, S., and A. Pelletier. 2018. "Privatization in Developing Countries: What Are the Lessons of Recent Experience?" *World Bank Research Observer* 33 (1): 65–102.
- European Commission. 2013. European System of Accounts 2010 (ESA10), Section 2.51, Luxembourg.
- Farazi, S., E. Feyen, and R. Rocha. 2013. "Bank Ownership and Performance in the Middle East and North Africa Region." *Review of Middle East Economics and Finance* 9 (2): 159–96.
- Ferrari, A., D. Mare, and I. Skamnelos. 2017. "State Ownership of Financial Institutions in Europe and Central Asia." World Bank Policy Research Working Paper 8288, World Bank, Washington, DC.
- Finansministeriet. 2018. "Statens Selskaber 2018." June.
- Foster, V., and A. Rana. 2020. "Rethinking Power Sector Reform in the Developing World." World Bank, Washington, DC.
- Frigerio, M., and D. Vandone. 2018. "Bank Ownership and Firm-Level Performance: An Empirical Assessment of State-Owned Development Banks." In *Contemporary Issues in Banking*, edited by M. García-Olalla and J. Clifton, 197–219. Palgrave Macmillan Studies in Banking and Financial Institutions. London: Palgrave Macmillan.
- Gasmi, F., A. A. Maingard, P. P. Noumba Um, and L. R. Virto. 2013. "The Privatization of the Fixed-Line Telecommunications Operator in OECD, Latin America, Asia, and Africa: One Size Does Not Fit All." *World Development* 45: 189–208.
- Gathon, H. J., and P. Pestiau. 1996. "La performance des entreprises publiques. Une question de propriété ou de concurrence?" *Revue économique* 47 (6): 1225–38.
- Gennaioli, N., A. Martin, and S. Rossi. 2018. "Banks, Government Bonds, and Default: What Do the Data Say?" *Journal of Monetary Economics* 98–113.
- Gomez-Lobo, A. 2012. "The Ups and Downs of a Public Transport Reform: The Case of Transantiago." Documentos de Trabajo Universidad de Chile, 354.
- Gopinath, G., S. Kalemli-Ozcan, L. Karabarbounis, and C. Villegas-Sanchez. 2017. "Capital Allocation and Productivity in South Europe." *Quarterly Journal of Economics* 132 (4): 1915–67.
- Government of Ghana. 2018. "2017 State Ownership Report." Accra, Ghana.

- Hanousek, J. E. Kocenda, and J. Svejnar. 2008. “Privatization in Central and Eastern Europe and the Commonwealth of Independent States.” In *Privatization: Successes and Failures*, edited by G. Roland, 76–108. New York: Columbia University Press.
- Harrison, A., M. Meyer, P. C. Wang, L. Zhao, and M. Y. Zhao. 2019. “Can a Tiger Change Its Stripes? Reform of Chinese State-Owned Enterprises in the Penumbra of the State.” NBER Working Paper 25475, National Bureau of Economic Research, Cambridge, MA.
- Havrylyshyn, O., and D. McGettigan. 1999. “Privatization in Transition Countries: A Sampling of the Literature.” IMF Working Paper WP/99/6, International Monetary Fund, Washington, DC.
- Hsiao, C. H. 2003. *Analysis of Panel Data*. Cambridge, UK: Cambridge University Press.
- Hsieh, C. T., and Z. Song. 2015. “Grasp the Large, Let Go of the Small: The Transformation of the State Sector in China.” NBER Working Paper 21006, National Bureau of Economic Research, Cambridge, MA.
- Hubbard, P. 2015. “Where Have China’s State Monopolies Gone?” EABER Working Paper 115, East Asian Bureau of Economic Research, Canberra, Australia.
- Iannotta, G., G. Nocera, and A. Sironi. 2007. “Ownership Structure, Risk and Performance in the European Banking Industry.” *Journal of Banking & Finance* 31 (7): 2127–49.
- Igan, D., H. Moussawi, A. Tieman, A. Zdzienicka, G. Dell’Ariccia, and P. Mauro. 2019. “The Long Shadow of the Global Financial Crisis: Public Interventions in the Financial Sector.” IMF Working Paper 19/164, International Monetary Fund, Washington, DC.
- International Monetary Fund (IMF). 2005. “Public Investment and Fiscal Policy—Summaries of the Pilot Country Studies.” IMF Policy Paper 05/119, Washington, DC.
- IMF. 2007. “Public Enterprises and Fiscal Risk—Lessons from the Pilot II Country Studies.” IMF Policy Paper, Washington, DC.
- IMF. 2014. *Government Finance Statistics Manual 2014*. Washington, DC: International Monetary Fund.
- IMF. 2015. *Is the Glass Half Empty or Half Full? Issues in Managing Water Challenges and Policy Instruments*. IMF Staff Discussion Note (SDN/15/11). Washington, DC.
- IMF. 2017. “People’s Republic of China Article IV Staff Report 2017.” IMF Country Report 17/247, Washington, DC.
- IMF. 2019a. “Ghana Staff Report for the 2019 Article IV Consultation.” IMF Country Report 19/367, Washington, DC.
- IMF. 2019b. “South Africa Staff Report for the 2019 Article IV Consultation.” IMF Country Report 20/33, Washington, DC.
- IMF. 2020. “The Evolution of Public Debt Vulnerabilities in Lower Income Economies.” IMF Policy Paper, Washington, DC.
- International Working Group of Sovereign Wealth Funds. 2008. “Sovereign Wealth Funds Generally Accepted Principles and Practices ‘Santiago Principles.’” International Working Group of Sovereign Wealth Funds.
- Jomo, K. S. 2008. “A Critical Review of the Evolving Privatization Debate.” In *Privatization: Successes and Failures*, edited by G. Roland, 199–212. New York: Columbia University Press.

- Kalemli-Ozcan, S., B. Sorensen, C. Villegas-Sanchez, V. Volosovych, and S. Yesiltas. 2015. “How to Construct Nationally Representative Firm-Level Data from the Orbis Global Database.” NBER Working Paper 21558, National Bureau of Economic Research, Cambridge, MA.
- Kaufmann, D., A. Kraay, and M. Mastruzzi. 2007. “Worldwide Governance Indicators Project: Answering the Critics.” World Bank Policy Research Working Paper 4149, World Bank, Washington, DC.
- Kaufmann, D., A. Kraay, and M. Mastruzzi. 2010. “The Worldwide Governance Indicators: Methodology and Analytical Issues.” World Bank Policy Research Working Paper 5430, World Bank, Washington, DC.
- Kikeri, S. 1998. “What Happens to Workers when Governments Divest?” World Bank Technical Paper No. 296. World Bank, Washington, DC.
- Kikeri, S., and A. F. Kolo. 2005. “Privatization: Trend and Recent Development.” Policy Research Working Paper 3765, World Bank, Washington, DC.
- Kikeri, S., A. F. Kolo, and J. Nellis. 2004. “An Assessment of Privatization.” *The World Bank Research Observer* 19 (1): 87–118.
- Kowalski, P., M. Buge, M. Sztajerowska, and M. Egeland. 2013. “State-Owned Enterprises: Trade Effects and Policy Implications.” OECD Trade Policy Paper 147, OECD Publishing, Paris.
- Kripfganz, S., and C. Schwarz. 2019. “Estimation of Linear Dynamic Panel Data Models with Time-Invariant Regressors.” *Journal of Applied Econometrics* 34 (4): 526–46.
- La Porta, R., F. López-de-Silanes, and A. Shleifer. 2002. “Government Ownership of Banks.” *Journal of Finance* 57 (1): 265–301.
- Lam, W. R., and M. Moreno-Badia. Forthcoming. “Chinese Abacus: General Government Balance Sheet.” IMF Working Paper, International Monetary Fund, Washington, DC.
- Lam, W. R., and A. Schipke. 2017. “State-Owned Enterprises Reforms.” In *Modernizing China: Investing in Soft Infrastructure*, edited by W. R. Lam, M. Rodlauer, and A. Schipke. Washington, DC: International Monetary Fund.
- Lardy, N. 2019. “The State Strikes Back: The End of Economic Reform in China?” Peterson Institute for International Economics, Washington, DC.
- Laeven, L., and F. Valencia. 2018. “Systemic Banking Crises Revisited.” IMF Working Paper 18/206, International Monetary Fund, Washington, DC.
- Maliszewski, W., S. Arslanalp, J. Caparusso, J. Garrido, S. Guo, J. S. Kang, W. R. Lam, D. Law, W. Liao, N. Rendak, P. Wingender, J. Y. Yu, and L. M. Zhang. 2016. “Resolving China’s Corporate Debt Problem.” IMF Working Paper 16/203, International Monetary Fund, Washington, DC.
- Mattera, G., and F. Silva. 2018. “State Enterprises in the Steel Sector.” OECD Science, Technology and Industry Policy Paper 53, OECD Publishing, Paris.
- McKenzie, D., and D. Mookherjee. 2003. “Distributive Impact of Privatization in Latin America: An Overview of Evidence from Four Countries.” *Economia* 3(2): 161–218.
- Meggison, M., and J. Netter. 2001. “From State to Market: A Survey of Empirical Studies on Privatization.” *Journal of Economic Literature* 39 (2): 321–89.

- Menard, C., and A. Peeroo. 2011. "Liberalization in the Water Sector: Three Leading Models." *International Handbook of Network Industries: The Liberalization of Infrastructure*.
- Micco, A., U. Panizza, and M. Yanez. 2007. "Bank Ownership and Performance: Does Politics Matter?" *Journal of Banking and Finance* 31 (1): 219–41.
- Musacchio, A., and S. Lazzarini. 2014. *Reinventing State Capitalism: Leviathan in Business, Brazil, and Beyond*. Cambridge, MA: Harvard University Press.
- Musacchio, A., and Emilio I. Pineda Ayerbe. 2019. *Fixing State-Owned Enterprises in Latin America: Old Problems, New Solutions*. Washington, DC: Inter-American Development Bank.
- Natural Resource Governance Institute (NRGI). 2019. *National Oil Company Database*. New York, NY: Natural Resource Governance Institute.
- Nellis, J. 2008. "Privatization in Africa. What Has Happened? What Is to Be Done?" In *Privatization: Successes and Failures*, edited by G. Roland, 109–135. New York: Columbia University Press.
- Ongena, S., A. Popov, and N. Van Horen. 2019. "The Invisible Hand of the Government: 'Moral Suasion' during the European Sovereign Debt Crisis." *American Economic Journal: Macroeconomics* 11 (4): 346–79.
- Organisation for Economic Co-operation and Development (OECD). 2014. "Foreign Bribery Report: An Analysis of the Crime of Bribery of Foreign Public Officials." OECD Publishing, Paris.
- OECD. 2015. *OECD Guidelines on Corporate Governance of State-Owned Enterprises, 2015 Edition*. Paris: OECD Publishing.
- OECD. 2016a. *Broadening the Ownership of State-Owned Enterprises: A Comparison of Governance Practices*. Paris: OECD Publishing.
- OECD. 2016b. *State-Owned Enterprises as Global Competitors: A Challenge or an Opportunity?* Paris: OECD Publishing.
- OECD. 2017. *The Size and Sectoral Distribution of State-Owned Enterprises*. Paris: OECD Publishing.
- OECD. 2018a. *Ownership and Governance of State-Owned Enterprises: A Compendium of National Practices*. Paris: OECD Publishing.
- OECD. 2018b. *State-Owned Enterprises and Corruption: What Are the Risks and What Can Be Done?* Paris: OECD Publishing. <https://doi.org/10.1787/9789264303058-en>.
- OECD. 2018c. "State-Owned Enterprises and the Low-Carbon Transitions." OECD Publishing, Paris.
- OECD. 2019a. "Measuring Distortions in International Markets: The Aluminium Value Chain." OECD Trade Policy Paper 218, OECD Publishing, Paris.
- OECD. 2019b. "Measuring Distortions in International Markets: The Semiconductor Value Chain." OECD Trade Policy Paper 234, OECD Publishing, Paris.
- Pargendler, M., A. Musacchio, and S. Lazzarini. 2013. "In Strange Company: The Puzzle of Private Investment in State-Controlled Firms." *Cornell International Law Journal* 46 (3): 569–610.
- Pesaran, H., and Q. Zhou. 2018. "Estimation of Time-Invariant Effects in Static Panel Data Models." *Econometric Reviews* 37 (10): 1137–71.
- Petri, M., and G. Tauber. 2003. "Fiscal Policy beyond the Budget: Quasi-Fiscal Activities in the Energy Sectors of the Former Soviet Union." *Emerging Markets Finance & Trade* 39 (1): 24–42.

- Public-Private Infrastructure Advisory Facility (PPIAF). 2016. “Improving Private Sector Participation in Vietnam.” *Impact Assessment*, October 2016.
- Repko, M. 2019. “Banking fragility rooted in justice failures Evidence from Ukraine.” CEPS Paper in *Liberty and Security in Europe*, No. 2019–08, May 2019.
- Richmond, C. J., D. Benedek, E. Cabezon, B. Cegar, P. Dohlman, M. Hassine, B. Jajko, P. Kopyrski, M. Markevych, J. A. Miniane, F. J. Parodi, G. Pula, J. Roaf, M. Kyu Song, M. Sviderskaya, R. Turk, and S. Weber. 2019. “Reassessing the Role of State-Owned Enterprises in Central, Eastern, and Southeastern Europe.” European Departmental Paper Series 19/11, International Monetary Fund, Washington, DC.
- Rose-Ackerman, S., and B. J. Palifka. 2016. *Corruption and Government – Causes, Consequences, and Reform*. Cambridge University Press, New York.
- Rosen, D., W. Leutert, and S. Guo. 2019. “Missing Link: Corporate Governance in China’s State Sector.” Asia Society Special Report with Rhodium Group, San Francisco, CA.
- Shirley, M., and P. Walsh. 2000. “Public versus Private Ownership: The Current State of the Debate.” Policy Research Working Paper 2420, World Bank, Washington, DC.
- Song, Z., K. Storesleten, and F. Zilibotti. 2011. “Growing Like China.” *American Economic Review* 101 (February): 202–41.
- Statistisches Bundesamt. 2019. “Public Funds, Institutions and Enterprises, Annual Balance Sheets of Public Funds, Institutions and Enterprises by Owner (Central, Regional and Local Authorities).”
- Telia. 2017. “Telia Company Reaches a Global Settlement with the Authorities Regarding Uzbekistan Investigation.” Press Release, September 21, 2017.
- Ter-Minassian, T. 2017. “Identifying and Mitigating Fiscal Risks from State-Owned Enterprises (SOEs).” IADB Discussion Paper 546, Inter-American Development Bank, Washington, DC.
- Tillman, R. 2009. “Making the Rules and Breaking the Rules: The Political Origins of Corporate Corruption in the New Economy.” *Crime, Law and Social Change* 51 (1): 73–86.
- Tribunal de Contas da União (TCU). Governança da União sobre estatais: o caso da Petrobras.
- United Nations Conference on Trade and Development (UNCTAD). 2019. *World Investment Report 2019: Special Economic Zones*. Geneva: United Nations.
- Warner M., and A. M. Aldag. 2019. “Re-Municipalization in the US: A Pragmatic Response to Contracting.” *Journal of Economic Policy Reform*.
- World Bank. 2004. *Reforming Infrastructure: Privatization, Regulation, and Competition*. Washington, DC: World Bank.
- World Bank. 2013. *Global Financial Development Report 2013: Rethinking the Role of the State in Finance*. Washington, DC: World Bank.
- World Bank. 2017. *Who Sponsors Infrastructure Projects? Disentangling Public and Private Contributions*. Washington, DC: World Bank.
- World Bank. 2019. *Rethinking Power Sector Reform in the Developing World*. Washington, DC: World Bank.
- Yeyati, L., A. M. Eduardo, and U. Panizza. 2005. “State-Owned Banks: Do They Promote or Depress Financial Development and Economic Growth?” Background Paper, Conference on Public

Banks in Latin America: Myths and Reality, Inter-American Development Bank, Washington, DC.

Zhang, Y.-F., D. Parker, and C. Kirkpatrick. 2008. “Electricity Sector Reform in Developing Countries: An Econometric Assessment of the Effects of Privatization, Competition and Regulation.” *Journal of Regulatory Economics* 33 (2): 159–78.

Online Annex 3.1. China: State-Owned Enterprises Remain Key Players

State-owned enterprises have been an integral component in China's economic model. Previous reforms to SOEs beginning in the late 1990s, along with other market-oriented reforms and the accession to the World Trade Organization, have brought economic transformation and two decades of high growth. The state reduced the role of SOEs and gave more space to market activity and private firms, contributing to more efficient resource allocation and substantial productivity gains during 2002–12 (Hsieh and Song 2015). As a result, the SOE share of total urban employment declined from 38 percent to less than 18 percent during 1999–2012, and another 4 percentage points from 2012–17. SOE assets as a ratio of GDP, however, have rapidly expanded since 2012, reversing the previous decline during the 2000s (Online Annex Figure 3.1.1). While China has continued to grow remarkably after 2012, some argue that the strong growth occurred despite, rather than because of, a resurgence of SOEs (Lardy 2019), or because of a substantial credit expansion in recent years (Bai and others 2016).

SOEs continue to play a significant role in the Chinese economy and have recently expanded globally:

- At US\$26 trillion in total assets in 2018 (equivalent to one third of global GDP or over 200 percent of China's GDP), China's nonfinancial SOEs were one of the largest globally, spreading across nearly 190,000 nonfinancial SOEs at central and local government levels. Similar to other countries, SOEs in China operate in energy, utilities, and transportation. A difference, however, is that more than half of China's nonfinancial SOEs (by assets) operate in the services sector, including real estate, telecommunications, and social services (Online Annex Figure 3.1.2). Nonfinancial SOEs accounted for an increasing share (more than two-thirds in 2018) of nonfinancial corporate credit over the last decade. Their market power, measured by the Herfindahl-Hirschman index on a consolidated basis, rose in many capital-intensive industries during the early 2010s (Hubbard 2015; Bai, Miao, and Zhang 2014; Online Annex Figure 3.1.3). SOEs also remain a key driver of domestic investment, supporting over three-quarters of infrastructure and half of coal and petroleum investment.
- Globally, there are about 20 Chinese SOEs in the top 100 largest global firms by revenues today compared to less than a handful in 2008.

Nonfinancial SOEs underperform relative to private firms on average, indicating resource misallocation and likely constraining growth. Studies find that nonfinancial SOEs have weaker profitability, lower productivity, and higher leverage than private firms (Hsieh and Song 2015 and Lam and Schipke 2017 Online Annex Figures 3.1.4). The difference in returns on assets between SOEs and private firms was large at 7½ percentage points during 2010–17, despite narrowing recently due to a deterioration in returns among private firms rather than a large improvement in SOEs. Although profitability improved for those partially privatized SOEs that introduced private shareholders, both partially privatized SOEs and fully state-owned SOEs still tend to underperform in terms of profitability relative to private firms (Harrison and others 2019). Firm-level data show that total factor productivity of industrial SOEs was about 15 percent lower than that of private firms during 1998–2013, after controlling for sectors and firm characteristics (Alvarez and others, forthcoming). The productivity differentials between SOEs and private firms are observed among all sectors. About one-quarter (by assets) or over a third (by number) of SOEs incur losses, many of which are nonviable and face persistent losses.

The government relies on SOEs as a policy lever to stabilize the economy during downturns in order to smooth the impact on employment and investment. Moreover, SOEs contribute to national development goals and provide public goods (infrastructure) and social services (e.g., local healthcare and pensions). Without clear, adequate compensation for carrying out those social services, SOEs are often compensated through derogations from obligations such as local fees and permits. Many SOEs face

persistent losses (accounting for about 10 percent of total corporate debt in 2017) but have not exited their markets owing to implicit guarantees, favorable regulatory treatment, connections with government officials, and possibly cross-subsidization by profit-making SOEs under a complex institutional structure.

If government support goes beyond compensating SOEs for carrying out non-economic mandates, it could also have implications for domestic and cross-border competition. Direct subsidies have been gradually reduced (to 0.1 percent of GDP in 2017 for listed companies). At the same time, SOEs benefit from preferential access to finance, land use at below-market cost, and sector-specific incentives (Bai and others 2014; IMF 2017). One evidence on the implicit guarantees that SOEs may benefit from is the lower borrowing costs that they face relative to private enterprises that are not justified by differences in other firm characteristics (Online Annex Figure 3.1.5; Maliszewski and others 2016). SOEs also tend to receive higher credit ratings and their borrowings are less sensitive to financing conditions than comparable private firms after controlling for firms' leverage, profitability and size. Moreover, outright defaults of SOE bonds remain rare (0.1 percent of total bond outstanding in 2018, compared with 1.4 percent for private firms).

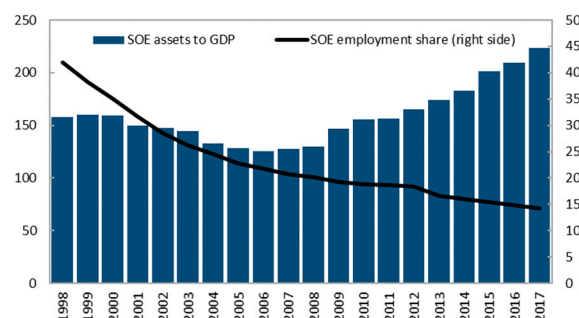
SOEs have other linkages to public finances that could pose fiscal risks.

- SOEs' financial performance is related to inter-governmental fiscal imbalances: provinces with less profitable SOEs tend to have higher revenue-spending imbalances (Online Annex Figure 3.1.6). SOEs are major contributors to fiscal revenues through taxes (accounting for one-third of total tax revenue of the general government) and dividends. When year-on-year growth of tax revenues falls in times of slowing economic growth, growth in nontax revenues (partly in the form of fees and dividends from SOEs) tends to rise, thereby mitigating a deterioration of local public finances. If SOE profits deteriorate, SOE transfers of dividends and fees may not be forthcoming.
- The eventual exit of nonviable SOEs or the debt restructuring of underperforming SOEs will likely entail fiscal costs to cover losses and to mitigate the adverse impact on local employment and output.
- Tackling the low efficiency in SOEs and managing fiscal risks arising from close linkages between SOEs and government is crucial. The announced SOE reforms since 2013 aim to better delineate the commercial and social functions of SOEs, achieve competitive neutrality, and contain the risks from rising corporate leverage (including through debt-equity swaps and restructuring of highly indebted SOEs). Although the aggregate SOE leverage ratio has stabilized recently, measures to date, such as pilots on mixed-ownership reforms and consolidation of SOEs through mergers and acquisitions, have not significantly improved SOE efficiency and corporate governance (Rosen and others 2019; IMF 2017). Achieving tangible progress toward competitive neutrality and sound corporate governance can boost SOE efficiency and improve resource allocation. This will benefit China as well as the global economy.

Online Annex Figure 3.1.1. SOE Assets and Share of Total Urban Employment

(Percent of GDP (LHS); Percent of Total Urban Employment)

The SOE presence in China remains large.

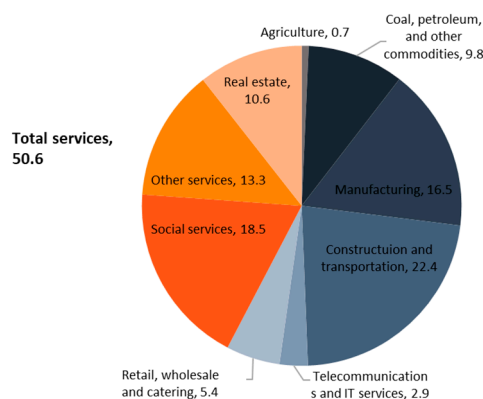


Sources: China Statistical Yearbook and Public Finance Yearbook 2017.

Online Annex Figure 3.1.2. Sectoral Decomposition of Nonfinancial SOEs

(Percent, by SOE assets in 2017)

... and broad.

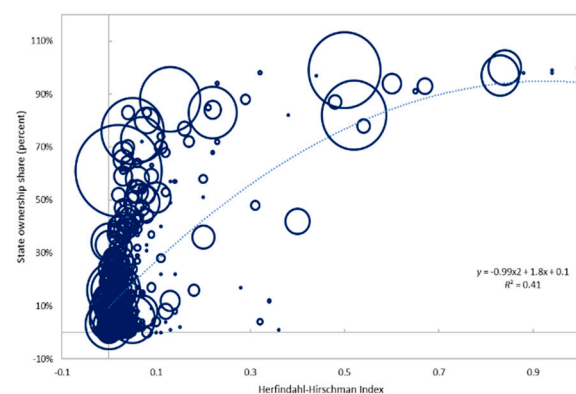


Source: China Public Finance Yearbook 2018.

Online Annex Figure 3.1.3 Market Concentration across Industries

(Percent)

Industries with higher state share tend to have greater market power.



Sources: Hubbard 2015 and IMF staff calculations.

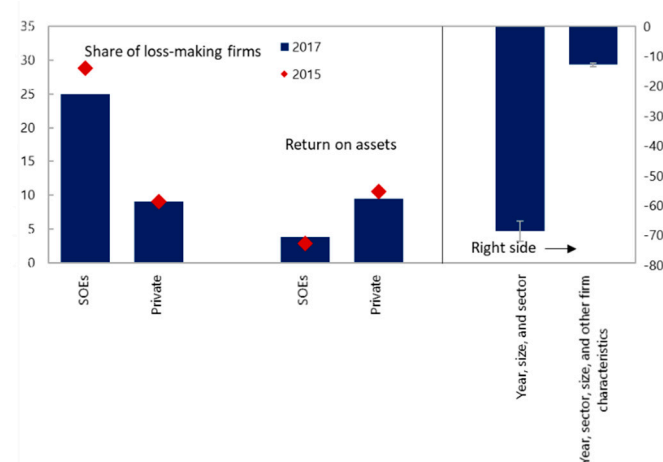
Note: Bubbles indicate SOE sale revenues in the industry.

The Herfindahl-Hirschman Index (HHI) is a measure of market concentration. The index is calculated by summing the square of the market share of each firm competing in a market. A lower index number indicates the market is more competitive, while a higher index indicates a more concentrated market (that is, firms are more monopolistic).

Online Annex Figure 3.1.4. Comparison of State-Owned and Private Enterprises

(Percent (LHS); Percent in deviation)

SOEs are less efficient than private firms in profitability and productivity, controlling for industries and firm characteristics.



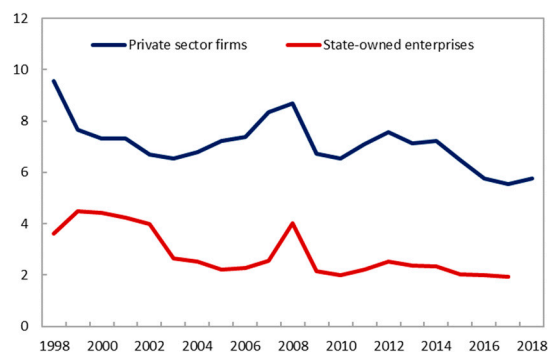
Source: Alvarez, Chen, and Li (forthcoming).

Note: Dots indicate data for 2015 and bars indicate data for 2017. The bars on the right indicate estimated coefficients of productivity differentials and the intervals show one standard deviation of the panel regression results.

Online Annex Figure 3.1.5. Interest Rates: State-Owned Enterprises and Private Firms

(Percent)

SOEs tend to face lower borrowing costs, partly reflecting the implicit government guarantees



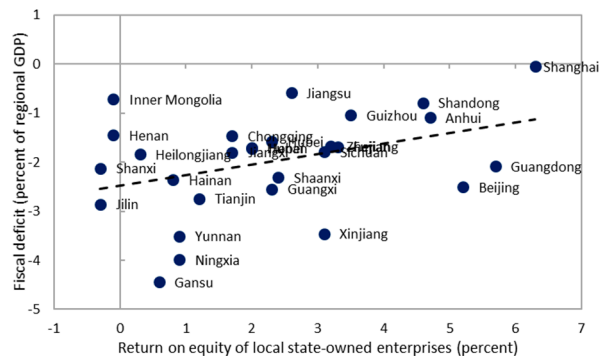
Sources: CEIC, China Public Finance Yearbook, and IMF staff estimates.

Note: For the interest cost chart, the private sector rate is the average borrowing rates estimated based on official monthly data on the benchmark lending rate and the share of corporates that borrows above it. The SOE interest bill cost is an effective interest rate calculated based on annual data on interest coverage ratio, operating profits, and the short-term and long-term debt level. The aggregate levels in the chart are consistent with the averages obtained from empirical studies using firm-level data.

Online Annex Figure 3.1.6. Fiscal deficit and SOE Profitability at Local Levels

(Percent)

Regions with less profitable SOEs tend to have higher fiscal imbalances.



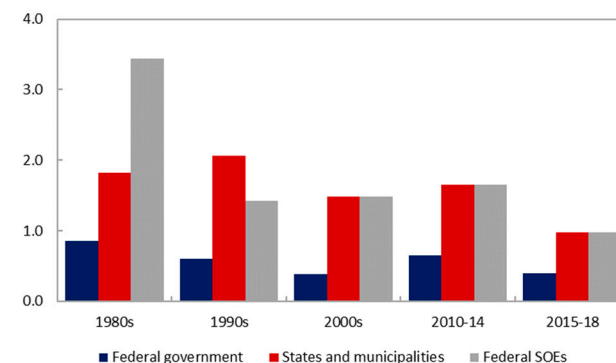
Sources: CEIC and Lam and Moreno-Badia (forthcoming).

Online Annex 3.2. Brazil: A Complex and, at Times, Turbulent Relationship Between SOEs and the Government

The economic weight of state-owned enterprises has varied significantly in Brazil's history reflecting changing views of the role of the state and fiscal pressures. The number and importance of SOEs expanded between 1930s and 1970s reflecting the heavy intervention of the state in the economy. The economic and fiscal crises of the 1980s led to a reversion of the importance of SOEs and opening of sectors that were state monopolies to private initiative (e.g. oil, telecommunications). A privatization process ensued in the 1990s was linked to both broader market-oriented reforms and a weak fiscal position. In some cases, the government opted for bringing in minority shareholders. Even so, state-owned enterprises remain an important tool for the government; for example, they represent around 40 percent of public investment (Online Annex Figure 3.2.1). Beginning in 2019, the federal government has initiated a renewed process of sales of assets and privatizations.

State ownership runs the gamut from wholly state-owned firms to entities in which the government holds indirectly (through SOEs) a share in a private-owned firm. The federal government is a shareholder in 637 companies, including the largest non-financial companies and banks in the country and some that operate internationally. At the federal level, there are 203 SOEs and the majority are subsidiaries of the two largest SOEs.¹ The government has direct control over 46 companies several of them conglomerates. For example, the Eletrobras group (power) has 71 subsidiaries and the Petrobras group (oil and gas) has 52.² The federal government has influence in several other companies, which are not classified as SOEs, through its public banks. For example, the government development bank (BNDES) has shares in 102 companies. Some are SOEs, such as Petrobras and Eletrobras, but others are private companies, including previously privatized companies such as Vale

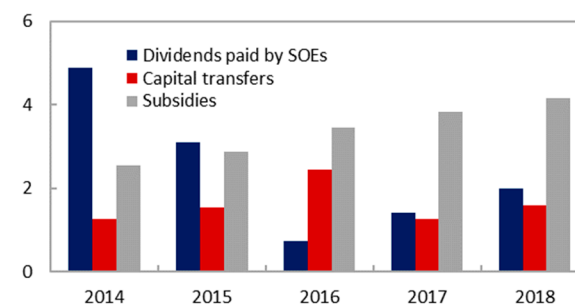
Online Annex Figure 3.2.1. Federal SOEs' Share of Public Investment
(Yearly average; share of GDP)



Source: Fundação Getúlio Vargas

Note: The data does not include information on investment done by SOEs at state and municipal levels.

Online Annex Figure 3.2.2. Relations Between Federal SOEs and Government
(Billion \$ US)



Source: Brazilian National Treasury

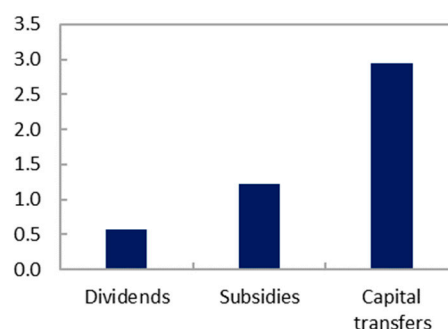
¹ These statements are based on the report by the Ministry of Economy (Boletim de Empresas Estatais federais) issued in the third quarter of 2019.

² Among the federal SOEs, 18 are classified as dependents—they rely on the government to cover most of their operational costs (more than 90 percent on average) and as such are included in the federal government budget.

(mining) and Embraer (aviation). At the subnational (state) level, there are 258 SOEs.³ Most are in the sectors of research and development, sanitation, and banking.

The contribution of SOEs to the federal budget has become increasingly negative in recent years, reflecting materialization of fiscal risks. The federal government has provided significant support to dependent companies (subsidies to cover recurrent expenses) and large capital transfers to other SOEs (Online Annex Figure 3.2.2)—partly as response to a deterioration in the finances of some large companies (e.g. Eletrobras). In addition, the government had to manage large volatility in dividends, which were significantly higher in the past, but have declined sharply in recent years. At the states level, almost a third of SOEs had losses (and some did not report). In 2018, state governments transferred US\$2.9 billion in capital transfers and an additional US\$1.2 billion in subsidies (Online Annex Figure 3.2.3).⁴

Online Annex Figure 3.2.3.
Relations Between State-Level Governments and Their SOEs
(Billion \$ US, 2018)



Source: Brazilian National Treasury.

Another potential source of macroeconomic and fiscal risks is the complex network of links between non-financial SOEs, public banks, and subnational governments. Some of the largest SOEs accumulated significant debt in past years, partly by borrowing from public banks. Any distress in these companies could put pressure on the public banks, which in turn could affect their ability to provide credit to the rest of the economy and require financial support from the federal government. In addition, some subnational governments received significant loans from public banks and also depend on oil royalties from Petrobras.

Some of the problems with SOEs reflected lack of clarity on policy mandates and weaknesses in governance. In some respects, Brazil has a high degree of transparency regarding its SOEs. It publishes reports on their financial performance and main relationships between SOEs and government. However, the experience of past years has highlighted significant weaknesses:

- **Lack of mandate clarity.** In most cases, SOEs policy mandates are vague and the cost unknown. For example, the audit agency (TCU 2018) found that the government had set no objectives or targets for Petrobras. This is also the case among public banks, where the information on the mandates and total cost remains limited (although some programs are explicitly on the subsidized rates). This prevents an evaluation of the performance of SOEs, relative to their policy mandates, with adverse effects for accountability.
- **Governance shortfalls.** Governance weaknesses led to widespread corruption involving the two largest non-financial SOEs (Petrobras and Eletrobras). This has contributed to the recent decline in the contribution of non-financial SOEs to public investment (Online Annex Figure 3.2.1).

Government interference in public banks has also raised concerns given the lack of transparency. For example, the use of the development bank (BNDES) during the global financial crises and subsequent years raised several issues. During the crisis, BNDES increased substantially credit in response to help stabilize the economy. However, the operation raised concerns because the bulk of the subsidized credit benefitted mainly large firms and not the ones that faced greater credit constraints (World Bank 2013).

³ This estimate is based on the Brazilian National Treasury (2019). Some estimates put the number of SOEs at the state level at around 300 and at the local level at about 60.

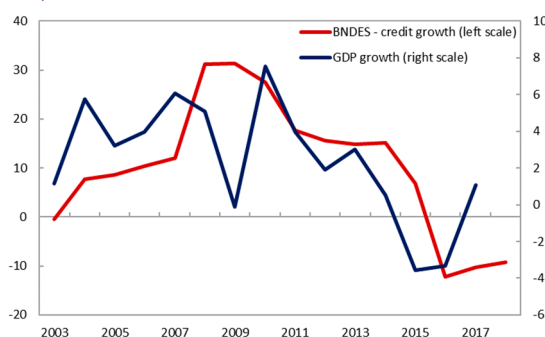
⁴ This is based on the companies that provided data on these variables (slightly more than half)

BNDES continued to expand credit at a large pace during the strong post-crisis recovery. However, during the recession of 2014–16, public deficits and debt led the government to reduce its support to public banks. As a result, BNDES in turn had to curtail its own lending—sharply and procyclically (Online Annex Figure 3.2.4). There are also concerns that public banks may have extended loans under political pressures and not necessarily to achieve their policy mandates (Lazzarini and others 2011). In addition, nontransparent transactions between the government and public banks contributed to hide a deterioration of the fiscal accounts in the past.

Online Annex Figure 3.2.4. BNDES Credit and Brazil's Public Finances

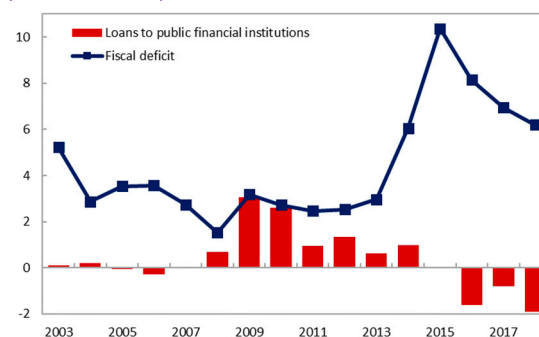
- 1. BNDES credit growth declined sharply during the recent recession in 2014–16** **2. As excessive fiscal deficits crowded out policy lending to public banks.**

(*percent*)



Source: BNDES, Brazilian Central Bank, and IMF staff estimates.

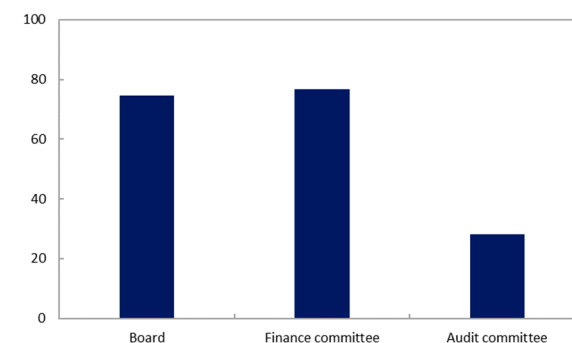
(*Percent of GDP*)



Brazil has undertaken several reforms over the last few years, partly as a response to the “Car wash” corruption scandal, that represent a step forward to promote greater governance. A new law for SOEs was passed in 2016 with a special focus to strengthen corporate governance—including requiring qualified board members and management, heighten internal controls, and enhanced protection of minority shareholders—and procurement processes. The federal government has also improved the reporting on the state of SOEs, including on the relationship with public banks. Still, further reforms would be beneficial. The lack of clarity on public mandates and a clear accountability framework (e.g. clear benchmarks) remains a significant weakness. In addition, more needs to be done to improve corporate governance, especially at the subnational level (Online Annex Figure 3.2.5).

Online Annex Figure 3.2.5. Governance Structure of State-Level SOEs

(*Share of firms with indicated unit*)



Source: Brazil National Treasury.

Online Annex 3.3. Public Banks: Revisiting Their Role and Financial Performance¹

This annex provides information on the data sources and empirical methodologies used in Chapter 2 to assess the stabilization role, sovereign bond holdings, and financial performance of public banks in the decades before and after the global financial crisis. It also includes a summary of the results and robustness checks of the analyses.

Data Sources and Definitions

The analyses mainly rely on cross-country bank-level data from Fitch Connect, which provides comprehensive information on bank balance sheets and income statements for the past 30+ years. The empirical analyses focus on 1999–2018, when data coverage is better, or, in some cases, after the global financial crisis (2010–18). Fitch Connect also provides data on (1) the sector specialization of banks, which makes it possible to differentiate between commercial and development banks, and (2) the shareholders of banks, including whether a bank is public or private.²

Public banks are identified as those reported as “government sponsored entities” or “public entities” in the dataset, or those with state ownership share of over 25 percent.³ “Local and regional governments” providing banking services are excluded from the analysis as they are part of the general government, not state-owned banks or enterprises. National development banks, the majority of which do not have ownership data, are identified as public banks, as governments often have substantial influence on their operations and funding (for example, in the Philippines, see Aldaba 2011).

The sample is restricted to banks with total assets over USD 5 billion to avoid skewing the results by the large number of small banks in the dataset. Only the latest data from the original financial statements covering a 12-month period and reported at the end of the year are used. Nonconsolidated data are used when available, and consolidated data otherwise. Banks without at least two years of consecutive data are dropped from the analysis. After cleaning the data and eliminating the outliers, the sample contains more than 4,000 (3,000) banks from 45 advanced and 80 (75) developing economies for 1999–2018 (2010–18), of which around 7 (8.5) percent are public.⁴

Online Annex Table 3.3.1 reports descriptive statistics for the banks in our sample. For example, public banks tend to have more assets than private banks, especially in advanced economies, and tend to hold more government securities as a share of assets in developing economies.⁵ They also have higher

¹ This annex is based on the forthcoming IMF working paper by Elif Türe.

² A caveat is that Fitch Connect provides shareholder data only for the latest year, precluding identification of the changes in bank ownership over time, for instance, from nationalizations or privatizations. IMF 2019 shows state ownership remained largely stable in the Central, Eastern, and Southeastern European economies during 2006–16 with only a few exceptions.

³ A public bank is often defined in the literature as (1) more than 20–25 percent government owned (La Porta and others 2002; Dinc 2005; Cornett and others 2009; Frigerio and Vandone 2018), which is seen as sufficient to control a company, or (2) more than 50 percent (majority) government owned (Brei and Schclarek 2013; Cull and others 2013; Bertay and others 2015). The former assumption allows for sufficient data to separately analyze the behavior of public commercial versus development banks in advanced versus emerging market economies.

⁴ Data cleaning includes eliminating banks with total equity or total employees less than zero, limiting relevant financial ratios (for example, deposits over total liabilities) to range between 0% and 100%, limiting financial returns (for example, return on average assets) to range between -100% and 100%, and limiting remaining financial indicators (for example, growth of net loans) to within the 1st and 99th percentiles of their distribution.

⁵ Another caveat is that Fitch Connect does not report the nationality of the issuer of government securities held by banks, which prevents identification of domestic versus foreign government bond holdings. The presumption in the literature is that the

nonperforming loan ratios on average, particularly in developing economies, and lower profitability (measured by the returns on average assets).

Online Annex Table 3.3.1. Descriptive Statistics of the Banks in the Sample (Averages over time for the median bank)

Financial Indicators	1999–2018								2010–2018							
	Advanced Economies				Developing Economies				Advanced Economies				Developing Economies			
	Private		Public		Private		Public		Private		Public		Private		Public	
	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median
<i>Asset Size (billions of US\$)</i>																
Total Assets	2,930	11.3	146	31.8	823	10.1	139	13.3	2,122	12.8	133	37.0	730	11.3	134	16.2
<i>Loan Size and Quality (%)</i>																
Net Loans / Total Assets	2,847	63.0	146	65.0	816	52.0	137	57.9	2,045	63.1	132	65.6	724	53.3	133	60.4
Net Loan Growth	2,751	8.7	144	7.2	763	15.3	134	15.0	1,967	3.8	129	3.8	673	11.5	130	12.2
Nonperforming / Gross Loans	2,276	1.8	106	2.0	737	3.1	126	6.2	1,732	2.2	91	1.8	672	2.7	122	5.0
<i>Liquidity (%)</i>																
Liquid / Total Assets	2,922	11.0	146	14.1	823	18.7	139	14.2	2,117	10.7	133	14.2	730	17.2	134	14.0
<i>Capitalization (%)</i>																
Equity / Total Assets	2,930	7.1	146	5.6	823	9.2	139	8.8	2,122	7.7	133	6.3	730	9.4	134	8.5
<i>Funding (%)</i>																
Deposits / Total Liabilities	2,771	84.3	122	61.5	813	84.9	126	83.3	1,995	89.7	112	61.1	722	85.1	122	84.0
<i>Profitability (%)</i>																
Return on Average Assets	2,901	0.5	145	0.3	817	1.1	139	1.0	2,102	0.5	132	0.3	725	1.1	134	0.9
<i>Sovereign Exposure (%)</i>																
Govt Securities / Total Assets	2,151	4.9	109	4.6	720	9.5	119	15.5	1,748	6.0	95	5.9	672	9.8	116	15.1

Sources: Fitch Connect; and IMF Staff estimates.

The country-level macro-fiscal data (GDP growth, public debt and so on) are from the IMF's World Economic Outlook database, and the data on financial development are from the IMF's Financial Development database.⁶ The data on sovereign bond spreads come from Bloomberg and the data on financial crises (including systemic banking, currency, and debt) come from Laeven and Valencia (2018).

Methodology and Results

A panel fixed effects model is used to estimate (1) bank lending behavior over the cycle and (2) bank holdings of government debt.⁷ This wipes out bank level fixed effects in the data, along with country level fixed effects (such as the level of development and the quality of institutions) as the host country of a bank is also fixed over time. Each model is estimated with robust standard errors.

Economies with general government debt levels higher than the 75th percentile of the distribution are identified as “high public debt” in exercises testing whether the cyclical behavior of bank lending or the holdings of government debt differ in countries with high public debt levels. The 75th percentile of the distribution roughly corresponds to a general government debt level of 100 percent of GDP for advanced and 60 percent of GDP for developing economies in our sample.

Equation (3.3.1) presents the baseline empirical model used to estimate the impact of bank ownership on bank lending over the cycle, in economies with high versus low public debt levels:

bulk of the sovereign debt banks hold is domestic due to strong home bias. Fitch Connect data have been shown to closely follow the country-level data from the IMF on banks' net claim on the government, the bank-level stress-test data from EBA on a subset of European countries, and from the Central Bank of Argentina on a subset of Argentine banks (see, for instance, Gennaioli and others 2018), validating the use of the Fitch Connect data as a proxy for domestic government bond holdings.

⁶The financial development index developed by IMF Staff summarizes how developed financial institutions and markets are in terms of their size, liquidity, access, and cost efficiency.

⁷The Hausman test specifies that a fixed effects model is appropriate in both cases.

$$\begin{aligned} \Delta \text{Net Loans}_{i,t,j} = & \text{Cycle}_{i,t} + \text{Public Bank}_{i,j} * \text{Cycle}_{i,t} + \text{High Public Debt}_{i,t} + \\ & \text{Public Bank}_{i,j} * \text{Cycle}_{i,t} * \text{High Public Debt}_{i,t} + \text{Financial Development}_{i,t-1} + \\ & \Delta \text{Net Loans}_{i,t-1,j} + \text{Bank Controls}_{i,t-1,j} + \text{Bank Fixed Effects}_j + \text{Year Fixed Effects}_t + \\ & u_{i,t,j} \end{aligned} \quad (3.3.1)$$

Accordingly, the growth rate of net loans in current US dollars in country i , year t , and bank j is set as the dependent variable, and the growth rate of GDP per capita relative to its average growth rate in the past 20 years is set as the baseline cyclical indicator. The model controls for the lagged values of the dependent variable (for persistency), the level of financial development, and various bank characteristics such as bank size (log of total assets), capitalization (equity over assets), liquidity (liquid over total assets), profitability (return on average assets), funding (deposits over liabilities), loan size (net loans over assets), and loan quality (non-performing loans over gross loans). Year fixed effects are also included.

Similarly, equation (2) below presents the baseline empirical model used to estimate the impact of bank ownership on holdings of government debt in economies with high versus low public debt levels:

$$\begin{aligned} \text{Govt Bonds}_{i,t,j} = & \text{High Public Debt}_{i,t} + \text{Public Commercial Bank}_{i,j} * \text{High Public Debt}_{i,t} + \\ & \text{Fiscal Balance}_{i,t} + \text{Bond Spreads}_{i,t} + \text{Cycle}_{i,t} + \text{Crisis}_{i,t} + \text{Financial Development}_{i,t-1} + \\ & \text{Govt Bonds}_{i,t-1,j} + \text{Bank Controls}_{i,t-1,j} + \text{Bank Fixed Effects}_j + \text{Year Fixed Effects}_t + \\ & v_{i,t,j} \end{aligned} \quad (3.3.2)$$

Accordingly, holdings of government securities as a share of assets in country i , year t , and bank j are set as the dependent variable, and a public commercial bank dummy is included to identify public bank holdings of government bonds in economies with high public debt (development banks are excluded from the analysis for comparability). The model controls for the supply of government securities (government net lending or borrowing—that is, fiscal balance—as a share of GDP), sovereign risk (spread over 10-year US bond yield), cyclical conditions (growth rate of GDP per capita), crises (systemic banking, currency, and debt), the lagged values of the dependent variable, central bank exposure (central bank deposits over assets), and the rest of the bank controls included in model (3.5.1), as well as the level of financial development. Year fixed effects are also included.

A panel random effects model, presented in equation (3.3.3), is instead used to estimate the financial performance of commercial banks, which enables us to identify the impact of being a public versus private bank (a fixed variable) on performance:

$$\begin{aligned} \text{Performance}_{i,t,j} = & \text{Public Commercial Bank}_{i,j} + \text{Public Development Bank}_{i,j} + \text{Cycle}_{i,t-1} + \\ & \text{Financial Development}_{i,t-1} + \text{Performance}_{i,t-1,j} + \text{Govt Bonds}_{i,t-1,j} + \\ & \text{Bank Controls}_{i,t-1,j} + \text{Country Fixed Effects}_i + \text{Year Fixed Effects}_t + z_{i,t,j} \end{aligned} \quad (3.3.3)$$

Bank profitability (return on average assets or net interest margin) and cost efficiency (operating cost to income ratio) in country i , year t , and bank j are set as dependent variables (performance indicators), and public commercial and development bank dummies are used to identify the performance differences among public versus private commercial banks. The model controls for the lagged dependent variables, lagged values of cyclical conditions (growth rate of GDP per capita), financial development index, sovereign debt holdings (government securities over assets), and the rest of the bank controls included in models (3.3.1) and (3.3.2), as well as country and year fixed effects.

Cyclicalities of Lending by Public Banks

The empirical evidence suggests lending by public banks tend to be less procyclical than their private counterparts in developing economies, and even countercyclical in advanced economies.⁸ Our analysis confirms that lending by public banks has been less procyclical than private bank lending, but not in developing economies with high public debt levels. Online Annex Table 3.3.2 presents the estimation results from model (3.3.1). When growth rises relative to its trend, private banks increase lending procyclically in developing economies (coefficients for the “cycle” are positive and significant for developing economies), while keeping an acyclical lending behavior in advanced economies (coefficients for the “cycle” are small, negative, and insignificant for advanced economies). In contrast, public banks increase lending significantly less than private banks do, particularly in developing economies (coefficients for the interaction term “public bank * cycle” are negative in columns (1) to (2)). But averages mask heterogeneity. While lending by public banks is less procyclical than private bank lending in economies with low public debt (coefficients for the interaction term “public bank * cycle” are negative in columns (3) to (8)), this is not the case for lending by public banks in economies with high public debt, particularly in developing economies and outside of the GFC period (coefficients for the interaction term “public bank * cycle * high public debt” are positive in columns (5) to (8)).

In the decade after the global financial crisis (in columns (7) and (8)), for instance, the growth rate of private bank net lending increases by 2 (-0.4) percentage points in developing (advanced) economies in response to a 1 percentage point increase in the growth rate of GDP per capita relative to its trend. Public banks’ net lending, on the other hand, grows 1.5 (3.8) percentage points less in developing (advanced) economies with low public debt levels in this period, resulting in less procyclical (or countercyclical) lending by public banks in developing (advanced) economies with low public debt levels. When public debt is high, however, public bank net lending grows 2.5 (2.7) percentage points more in developing (advanced) economies compared to when public debt is low, pointing to a more procyclical public bank lending behavior in economies with high public debt, although the difference is statistically significant only for developing economies. Figure 3.12 in the main text summarizes the above findings.

The control variables in model (3.3.1) also affect bank lending behavior in expected directions, supporting the validity of the model specification. Net lending tends to grow faster in developing economies with higher levels of financial development and in banks with (1) lower lending size in the previous period, reflecting a base effect; (2) lower size (proxied by total assets), likely reflecting smaller banks taking on higher risk and expanding loans more aggressively; (3) higher capitalization rate, particularly in advanced economies, lower nonperforming loan ratios, and higher profitability, particularly in developing economies, reflecting financial health; (4) higher deposit funding ratios in developing economies, with banks in advanced economies likely having greater access to other funding sources; and (5) lower liquidity ratios in developing economies, with these banks expanding credit rather than holding more liquid assets.

As a robustness check, Online Annex Table 3.3.3 presents the estimation results using the growth rate of net loans in constant local currency terms as the dependent variable (instead of current US dollar terms). The main results for public bank lending behavior remain qualitatively unchanged. While lending by public banks in economies with low public debt are less procyclical than private bank lending (coefficients for the interaction term “public bank * cycle” are negative in columns (3) to (8)), this is not

⁸ See, for instance, Micco and Panizza 2006; Brei and Schclarek 2013; Cull and Martinez-Peria 2013; Bertay and others 2015; Allen and others 2017.

the case for lending by public banks in economies with high public debt, particularly in developing economies and before the global financial crisis (coefficients for the interaction term “public bank * cycle * high public debt” are positive in columns (5) to (8)). In the decade after the global financial crisis, however, the coefficients for developing economies (in column (8)) remain no longer statistically significant.

Various other robustness checks do not change the main results materially, thus are not reported here. These include: (1) dropping banks without eight years of consecutive (asset) data between 2005 and 2012 to make sure each bank was operational and had at least three years of data both before and after the global financial crisis, (2) relaxing the assumption that development banks are public banks, (3) identifying public banks as majority government owned (over 50 percent rather than over 25 percent), and (4) using the GDP per capita growth rate as the cyclical indicator (instead of the gap).

Public Commercial Bank Holdings of Government Debt

Public commercial banks are often “persuaded to” increase holdings of government securities. Ongena and others (2019), for instance, found that during the sovereign debt crisis in Europe, domestic—particularly state-owned—banks were more likely to increase government bond holdings in fiscally stressed economies; and this suggests a “moral suasion” mechanism, ruling out risk-return and regulatory considerations. Using a larger country sample, our analysis finds that public commercial banks tend to hold larger amounts of sovereign debt, particularly in developing economies with higher debt vulnerabilities.

Online Annex Table 3.3.4 presents the estimation results from model (3.3.2). Accordingly, public commercial banks in developing (advanced) economies with high public debt levels tend to hold 11.2 (1.2) percentage points more government bonds as a share of assets than the average bank in a low-debt economy, controlling for other factors that could affect government bond holdings, such as the supply of bonds (proxied by government net lending or borrowing) and their relative price (proxied by sovereign spreads). However, the estimate is significant only for developing economies. Figure 3.13 in the main text summarizes these findings.

To put the finding for developing economies into perspective, in Brazil and India, for instance, which are identified as economies with “high public debt” in the sample (general government debt over 60 percent of GDP), banking system assets amounted to around 100 and 70 percent of GDP in 2016, respectively.⁹ In turn, public banks held around 50 and 70 percent, respectively, of banking sector assets in these economies, amounting to about 50 percent of GDP in 2016 (World Bank, Bank Regulation and Supervision Survey 2019). Thus, our finding that public commercial banks in developing economies with high public debt levels hold 11.2 percentage points more government bonds as a share of assets would mean, for example, that public commercial banks hold 5.6 percent of GDP more government debt in Brazil and India compared to the average government bond holdings in developing economies with low public debt levels.

Financial Performance of Public Commercial Banks

The empirical evidence suggests that public commercial banks operating in developing economies tend to have lower profitability than that of private commercial banks, as well as lower interest margins, higher

⁹ The data on total assets held by deposit money banks as a share of GDP are retrieved from the Federal Reserve Economic Database.

overhead costs, and higher non-performing loans,¹⁰ although the latter would be expected given public banks' mandate of financing credit constrained (riskier) borrowers. No significant performance differences are found for public and private banks operating in advanced economies.¹¹ Our analysis confirms these findings for the decade before the global financial crisis, but finds these performance differences to have narrowed for developing economies and widened for advanced economies in the decade after the global financial crisis.

Online Annex Table 3.3.5 shows that public commercial banks in developing economies had significantly lower returns on assets, lower net interest margins, and higher cost-to-income ratios between 1999 and 2007 than their private counterparts; but these differences were less (or no longer) significant between 2010 and 2018. However, public banks would have performed much weaker without the substantial state guarantees and subsidies they enjoy, which are not accounted for in the analysis. Indeed, the narrowing performance differences between public and private commercial banks in developing economies are mainly driven by a decline in private commercial bank profitability and cost efficiency, which likely reflects greater government support for public commercial banks in these economies. Conversely, public commercial banks in advanced economies were equally profitable and cost efficient as their private counterparts between 1999 and 2007; but their asset returns, and interest margins fell behind their private counterparts between 2010 and 2018. This is mainly driven by a decline in public commercial bank profitability in advanced economies, which likely reflects the ultra-loose monetary policy having a disproportionate effect on public commercial banks, as they tend to lend more locally than their private peers. Figure 3.2.1. in the main text summarizes these findings.

As a robustness check, Online Annex Table 3.3.6 presents the estimation results restricting the sample to those banks with at least eight years of consecutive (asset) data between 2005 and 2012 to make sure each bank was operational and had at least three years of data both before and after the global financial crisis. This addresses the survival bias that the results are driven by the weakest banks disappearing after the global financial crisis. The main results remain qualitatively unchanged. While differences in profitability (asset returns, interest margins, and operating costs) between public and private commercial banks have narrowed after the global financial crisis in developing economies, they have widened in advanced economies (in a favorable direction only for cost efficiency).

¹⁰ See for instance Iannotta and others 2007; Micco and others 2007; Berger and others 2009; Farazi and others 2013.

¹¹ See for instance Altunbas and others 2001; Micco and others 2007.

Online Annex Table 3.3.2. Cyclical Behavior of Bank Lending before and after the Global Financial Crisis (in current US dollar terms)

Sample Period	1999-2018		1999-2018		1999-2007		2010-2018	
Country Group	AEs	EMDEs	AEs	EMDEs	AEs	EMDEs	AEs	EMDEs
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Loan Growth								
GDP pc Growth Gap (Cycle)	-0.166 (0.202)	1.114*** (0.198)	-0.300 (0.196)	1.111*** (0.197)	-0.113 (0.434)	1.011** (0.465)	-0.416* (0.213)	1.978*** (0.384)
Public Bank * Cycle	-0.506 (0.529)	-1.088*** (0.312)	-0.686 (0.540)	-1.014*** (0.361)	-2.907* (1.486)	-3.813*** (1.188)	-3.780** (1.807)	-1.497* (0.806)
High Public Debt (HD)			0.0753*** (0.00952)	-0.0532* (0.0316)	-0.181*** (0.0382)	-0.125 (0.0989)	0.122*** (0.0127)	-0.0613* (0.0344)
Public Bank * Cycle * HD			0.704 (1.526)	-0.175 (0.572)	4.985 (4.074)	5.389*** (1.434)	2.678 (2.052)	2.530** (0.999)
Financial Development = L _t	-0.0303 (0.0861)	0.434*** (0.117)	0.0304 (0.0864)	0.439*** (0.119)	-0.868*** (0.155)	1.314*** (0.358)	0.315** (0.155)	0.927*** (0.200)
Loan Growth = L _t	0.0213 (0.0134)	0.0241 (0.0189)	0.0213 (0.0134)	0.0249 (0.0190)	0.0381* (0.0209)	0.0478 (0.0421)	-0.0353* (0.0188)	-0.00207 (0.0308)
Log of Total Assets = L _t	-0.200*** (0.0115)	-0.189*** (0.0206)	-0.209*** (0.0116)	-0.191*** (0.0208)	-0.359*** (0.0272)	-0.242*** (0.0666)	-0.262*** (0.0208)	-0.250*** (0.0421)
Equity/ Total Assets = L _t	0.381** (0.165)	-0.221 (0.223)	0.323* (0.167)	-0.211 (0.224)	0.375 (0.299)	0.0997 (0.610)	0.522* (0.288)	0.549 (0.375)
Liquid Assets/ Total Assets = L _t	0.0663 (0.0563)	-0.227*** (0.0716)	0.0560 (0.0548)	-0.234*** (0.0719)	0.379*** (0.118)	-0.389* (0.197)	-0.00197 (0.0972)	-0.330*** (0.104)
Return on Average Assets = L _t	0.474 (0.372)	1.431*** (0.484)	0.393 (0.368)	1.406*** (0.485)	0.765 (0.869)	0.439 (0.662)	-0.279 (0.367)	1.740** (0.755)
Deposits/ Total Liabilities = L _t	-0.0193 (0.0325)	0.107** (0.0512)	-0.0612* (0.0339)	0.110** (0.0517)	-0.335*** (0.0999)	0.211 (0.164)	-0.0348 (0.0608)	0.0284 (0.0697)
Net Loans/ Total Assets = L _t	-0.428*** (0.0521)	-0.722*** (0.0831)	-0.445*** (0.0508)	-0.736*** (0.0840)	-0.338*** (0.0974)	-0.953*** (0.266)	-0.665*** (0.0979)	-0.999*** (0.128)
Nonperforming/ Gross Loans = L _t	-0.660*** (0.0874)	-0.524*** (0.122)	-0.667*** (0.0887)	-0.512*** (0.124)	-1.177*** (0.239)	-0.336 (0.266)	-0.379*** (0.134)	-0.282 (0.220)
Constant	0.888*** (0.0931)	0.739*** (0.0932)	0.895*** (0.0930)	0.762*** (0.0939)	2.207*** (0.195)	0.713*** (0.250)	0.957*** (0.177)	0.895*** (0.171)
Bank and Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Observations	13,908	3,401	13,908	3,401	5,228	813	7,066	2,152
R-squared	0.176	0.284	0.182	0.285	0.185	0.213	0.199	0.295
Number of Banks	1,930	623	1,930	623	1,102	234	1,484	562

Sources: Fitch Connect; and IMF staff estimates.

Note: Robust standard errors are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1. Regressions use the growth rate of net loans in current US dollars as the dependent variable, and control for bank and year fixed effects as well as the lagged values of the dependent variable (growth rate of net loans), bank size (total assets), capitalization (equity over assets), liquidity (liquid over total assets), profitability (return on average assets), funding (deposits over liabilities), loan size (net loans over assets), loan quality (non-performing loans over gross loans), and level of financial development. Public banks are defined as those with more than 25 percent of equity owned by the government. Countries with high public debt are those above the 75th percentile of the distribution across the whole sample, roughly corresponding to 100 percent of GDP for AEs and 60 percent of GDP for EMDEs. AEs = advanced economies, EMDEs = emerging market and developing economies.

Online Annex Table 3.3.3. Cyclical Behavior of Bank Lending before and after the Global Financial Crisis (in constant local currency terms)

Sample Period	1999-2018		1999-2018		1999-2007		2010-2018	
Country Group	AEs	EMDEs	AEs	EMDEs	AEs	EMDEs	AEs	EMDEs
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Loan Growth								
GDP pc Growth Gap (Cycle)	0.226 (0.207)	-0.181 (0.212)	0.189 (0.204)	-0.185 (0.212)	1.611*** (0.428)	0.233 (0.435)	-0.131 (0.215)	0.589 (0.399)
Public Bank * Cycle	-0.842 (0.578)	-1.398*** (0.366)	-1.101* (0.602)	-1.204** (0.482)	-2.816*** (0.969)	-3.345*** (1.075)	-4.253** (1.823)	-1.288 (1.200)
High Public Debt (HD)			0.0192** (0.00923)	-0.0413 (0.0289)	-0.106*** (0.0337)	-0.0740 (0.0780)	0.0387*** (0.0124)	-0.0845*** (0.0325)
Public Bank * Cycle * HD			1.319 (1.588)	-0.478 (0.658)	8.411 (5.541)	4.765*** (1.316)	3.208 (2.238)	2.017 (1.314)
Financial Development = L _t	0.0472 (0.0796)	0.154 (0.121)	0.0601 (0.0806)	0.162 (0.123)	-0.608*** (0.142)	0.777** (0.336)	0.217 (0.163)	0.683*** (0.236)
Loan Growth = L _t	-0.0279** (0.0138)	-0.0248 (0.0203)	-0.0272** (0.0138)	-0.0244 (0.0203)	0.000760 (0.0201)	0.00517 (0.0416)	-0.0853*** (0.0179)	0.000538 (0.0294)
Log of Total Assets = L _t	-0.172*** (0.0107)	-0.160*** (0.0191)	-0.175*** (0.0108)	-0.161*** (0.0192)	-0.324*** (0.0245)	-0.192*** (0.0562)	-0.209*** (0.0200)	-0.205*** (0.0392)
Equity/ Total Assets = L _t	0.476*** (0.166)	-0.208 (0.222)	0.461*** (0.166)	-0.201 (0.224)	0.601* (0.309)	0.567 (0.555)	0.680** (0.270)	0.506 (0.386)
Liquid Assets/ Total Assets = L _t	0.0360 (0.0564)	-0.178** (0.0711)	0.0335 (0.0559)	-0.185*** (0.0715)	0.326*** (0.116)	-0.237 (0.177)	0.0135 (0.104)	-0.291*** (0.108)
Return on Average Assets = L _t	0.654* (0.375)	1.595*** (0.481)	0.634* (0.374)	1.588*** (0.483)	1.570* (0.943)	0.186 (0.607)	-0.0822 (0.363)	2.484*** (0.781)
Deposits/ Total Liabilities = L _t	-0.0331 (0.0322)	0.0385 (0.0502)	-0.0444 (0.0338)	0.0416 (0.0507)	-0.209** (0.0908)	0.181 (0.144)	-0.0141 (0.0656)	-0.0122 (0.0761)
Net Loans/ Total Assets = L _t	-0.454*** (0.0525)	-0.606*** (0.0754)	-0.458*** (0.0518)	-0.619*** (0.0763)	-0.424*** (0.0933)	-0.979*** (0.215)	-0.679*** (0.104)	-0.909*** (0.135)
Nonperforming/ Gross Loans = L _t	-0.517*** (0.0839)	-0.580*** (0.119)	-0.519*** (0.0842)	-0.568*** (0.121)	-0.744*** (0.195)	-0.541** (0.233)	-0.518*** (0.143)	-0.371 (0.237)
Constant	0.751*** (0.0868)	0.765*** (0.0903)	0.755*** (0.0871)	0.782*** (0.0912)	1.784*** (0.175)	0.737*** (0.208)	0.876*** (0.181)	0.781*** (0.181)
Bank and Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Observations	13,913	3,411	13,913	3,411	5,225	817	7,074	2,156
R-squared	0.145	0.164	0.146	0.165	0.180	0.166	0.174	0.149
Number of Banks	1,931	625	1,931	625	1,101	235	1,485	562

Sources: Fitch Connect; and IMF staff estimates.

Note: Robust standard errors are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1. Regressions use the growth rate of net loans in constant local currency as the dependent variable, and control for bank and year fixed effects as well as the lagged values of the dependent variable (growth rate of net loans), bank size (total assets), capitalization (equity over assets), liquidity (liquid over total assets), profitability (return on average assets), funding (deposits over liabilities), loan size (net loans over assets), loan quality (non-performing loans over gross loans), and level of financial development. Public banks are defined as those with more than 25 percent of equity owned by the government. Countries with high public debt are those above the 75th percentile of the distribution across the whole sample, roughly corresponding to 100 percent of GDP for AEs and 60 percent of GDP for EMDEs. AEs = advanced economies; EMDEs = emerging market and developing economies.

Online Annex Table 3.3.4. Holding of Government Securities by Public and Private Commercial Banks in Economies with High Relative to Low Public Debt Levels

Sample period Country group	1999-2018	
	AEs (1)	EMDEs (2)
Government Securities/ Total Assets		
High Public Debt	0.00516 (0.00409)	0.0123 (0.0280)
Public Commercial Bank * High Public Debt	0.00656 (0.00835)	0.0996* (0.0527)
Fiscal Balance	-0.135** (0.0636)	0.0980 (0.172)
Spread over 10-year US Bond Yields	0.319*** (0.122)	0.0858 (0.223)
GDP per Capita Growth	0.121* (0.0659)	-0.0658 (0.113)
Crisis	0.00138 (0.00814)	-0.0256** (0.0126)
Financial Development = L,	0.0321 (0.0572)	0.0619 (0.0754)
Government Securities/ Total Assets = L,	0.490*** (0.0617)	0.398*** (0.0507)
Central Bank Exposure = L,	0.0215 (0.0394)	-0.158** (0.0620)
Log of Total Assets = L,	0.0105** (0.00501)	-0.0223*** (0.00811)
Equity/ Total Assets = L,	-0.0212 (0.0421)	0.0657 (0.131)
Liquid Assets/ Total Assets = L,	-0.0251 (0.0366)	-0.00274 (0.0448)
Return on Average Assets = L,	0.00884 (0.0682)	0.555* (0.290)
Deposits/ Total Liabilities = L,	0.0215 (0.0172)	-0.0228 (0.0328)
Net Loans/ Total Assets = L,	-0.0414 (0.0266)	-0.128*** (0.0400)
Nonperforming Loans/ Gross Loans = L,	0.0486* (0.0294)	0.228*** (0.0643)
Constant	0.0162 (0.0542)	0.110** (0.0560)
Bank and Year Fixed Effects	YES	YES
Observations	2,688	1,595
R-squared	0.328	0.427
Number of Banks	697	380

Sources: Fitch Connect; and IMF staff estimates.

Note: Robust standard errors are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1. Regressions use holding of sovereign debt (government securities over assets) as the dependent variable, and control for supply of government securities (government net lending and borrowing), sovereign risk (spread over 10-year US bond yield), cyclical conditions (growth rate of GDP per capita), episodes of crisis (systemic banking, currency, and debt), bank and year level fixed effects, and the lagged values of the dependent variable, bank size (total assets), capitalization (equity over assets), liquidity (liquid over total assets), profitability (return on average assets), funding (deposits over liabilities), loan size (net loans over assets), loan quality (nonperforming loans over gross loans), central bank exposure (central bank deposits over assets), and level of financial development. Public banks are defined as those with more than 25 percent of equity owned by the government. Countries with high public debt are those above the 75th percentile of the distribution across the whole sample, roughly corresponding to 100 percent of GDP for AEs and 60 percent of GDP for EMDEs. AEs = advanced economies; EMDEs = emerging market and developing economies.

Online Annex Table 3.3.5. Financial Performance of Public versus Private Commercial Banks before and after the Global Financial Crisis (whole sample)

Sample Period	1999–2018		1999–2007		2010–2018		1999–2018		1999–2007		2010–2018		1999–2018		1999–2007		2010–2018	
	(1) AEs ROAA	(2) EMDEs ROAA	(3) AEs ROAA	(4) EMDEs ROAA	(5) AEs ROAA	(6) EMDEs ROAA	(7) AEs NIM	(8) EMDEs NIM	(9) AEs NIM	(10) EMDEs NIM	(11) AEs NIM	(12) EMDEs NIM	(13) AEs CIR	(14) EMDEs CIR	(15) AEs CIR	(16) EMDEs CIR	(17) AEs CIR	(18) EMDEs CIR
Public Commercial Bank	-0.00202* (0.00108)	-0.00153* (0.000858)	0.00200 (0.00154)	-0.00442** (0.00184)	-0.00456*** (0.00125)	-0.00166* (0.000876)	-0.00437*** (0.00101)	-0.000105 (0.00107)	-0.000326 (0.000894)	-0.00539** (0.00253)	-0.00564*** (0.00127)	0.000487 (0.00109)	-0.0931*** (0.0356)	0.0384** (0.0156)	0.0462 (0.0312)	0.0887** (0.0358)	-0.0732 (0.0462)	0.0359** (0.0163)
Public Development Bank	-0.000415 (0.000965)	-0.000510 (0.000865)	-0.00271** (0.00132)	-0.000528 (0.00244)	0.000220 (0.000928)	-0.000439 (0.000949)	-0.00254*** (0.000608)	-0.000631 (0.00148)	-0.00373** (0.00147)	-0.00814 (0.00502)	-0.00224*** (0.000637)	-0.000747 (0.00144)	-0.0271 (0.0309)	-0.0333 (0.0220)	-0.0864*** (0.0228)	-0.0430 (0.0427)	-0.0224 (0.0399)	-0.0265 (0.0228)
Govt Securities / Total Assets = L	0.00321** (0.00125)	0.00901*** (0.00345)	-0.000255 (0.00239)	0.0178 (0.0109)	0.00457*** (0.00161)	0.00711** (0.00352)	-0.000729 (0.00105)	-0.00111 (0.00360)	0.00259 (0.00258)	0.000842 (0.00826)	9.25e-05 (0.00127)	-0.00521 (0.00493)	-0.0825** (0.0381)	-0.163*** (0.0476)	-0.184* (0.0994)	-0.238** (0.0941)	-0.125*** (0.0404)	-0.109** (0.0525)
GDP per Capita Growth = L	0.0469*** (0.0106)	0.000514 (0.00726)	0.0275** (0.0118)	0.0125 (0.0163)	0.0316** (0.0137)	-9.33e-05 (0.00884)	-0.00497 (0.00411)	-0.0202* (0.0116)	0.00484 (0.00938)	-0.0113 (0.0178)	-0.0189*** (0.00471)	-0.0183 (0.0142)	-1.567*** (0.273)	-0.234* (0.138)	-1.554*** (0.499)	-0.687* (0.358)	-0.753*** (0.279)	-0.316* (0.171)
Financial Development = L	0.00894*** (0.00344)	-0.0125** (0.00505)	0.0106*** (0.00375)	0.0373*** (0.0120)	-0.00993 (0.00648)	-0.0184*** (0.00704)	-0.00213 (0.00182)	-0.00103 (0.00605)	-0.00670* (0.00362)	0.0178 (0.0122)	-0.00631** (0.00256)	-0.0112* (0.00634)	-0.565*** (0.0937)	0.00584 (0.0988)	-0.730*** (0.165)	-0.642*** (0.215)	0.0811 (0.164)	0.374** (0.175)
Dependent Variable = L	0.153** (0.0772)	0.421*** (0.0507)	0.177*** (0.0415)	0.286*** (0.0504)	0.153 (0.112)	0.418*** (0.0762)	0.693*** (0.0401)	0.741*** (0.0934)	0.676*** (0.0755)	0.559*** (0.0693)	0.680*** (0.0466)	0.790*** (0.0918)	0.413*** (0.0197)	0.490*** (0.0373)	0.394*** (0.0360)	0.329*** (0.0618)	0.377*** (0.0254)	0.535*** (0.0468)
Log of Total Assets = L	-0.000550*** (0.000188)	5.85e-06 (0.000207)	9.68e-05 (0.000108)	-0.000992 (0.00129)	-0.000319 (0.000236)	0.000260 (0.000217)	-0.000277** (0.000114)	-0.000851** (0.000360)	-0.000664*** (0.000162)	0.00132 (0.00104)	-4.37e-05 (0.000145)	-0.000675 (0.000442)	0.00150 (0.00248)	-0.00296 (0.00368)	-0.00269 (0.00527)	-0.0345*** (0.0133)	-0.00461* (0.00266)	-0.00350 (0.00367)
Equity/ Total Assets = L	0.0160 (0.0193)	0.00935 (0.00666)	0.0322*** (0.00626)	0.0383** (0.0162)	0.0121 (0.0225)	0.0159** (0.00741)	0.0146*** (0.00542)	-0.00626 (0.0143)	0.0225** (0.00966)	0.0236 (0.0247)	0.0130** (0.00588)	-0.00120 (0.0142)	-0.375*** (0.0994)	-0.280*** (0.0837)	-0.326 (0.243)	-0.596* (0.352)	-0.406*** (0.120)	-0.281*** (0.0816)
Deposits/ Total Liabilities = L	-0.000209 (0.00138)	-0.000967 (0.00162)	1.24e-05 (0.00116)	-0.00959 (0.00602)	-0.000799 (0.00157)	0.00273* (0.00161)	-1.09e-05 (0.00127)	0.00647*** (0.00199)	0.000602 (0.00153)	0.00771 (0.00629)	-1.26e-06 (0.00182)	0.00455 (0.00287)	0.0457** (0.0205)	0.105*** (0.0301)	0.111** (0.0481)	0.0754 (0.0661)	0.0386 (0.0251)	0.0879** (0.0356)
Net Loans/ Total Assets = L	-0.00217** (0.00109)	-0.000195 (0.00194)	-0.00133 (0.000981)	-0.00412 (0.00588)	-0.000516 (0.00145)	-0.000348 (0.00253)	0.00206** (0.00100)	0.00162 (0.00383)	0.00374** (0.00167)	-0.00658 (0.00686)	0.00357*** (0.00128)	0.00204 (0.00560)	0.0282 (0.0205)	0.0767** (0.0389)	0.00947 (0.0508)	0.0652 (0.0923)	0.0174 (0.0245)	0.0379 (0.0448)
Nonperforming/ Gross Loans = L	-0.0194** (0.00910)	-0.0160 (0.0105)	-0.00754*** (0.00350)	-0.00342 (0.0156)	-0.0130 (0.0133)	-0.00880 (0.0115)	0.00289* (0.00162)	-0.00489 (0.00468)	0.00370 (0.00284)	0.00893 (0.0126)	0.00777*** (0.00245)	0.00187 (0.00777)	0.227** (0.0997)	0.300* (0.160)	0.0900 (0.162)	0.273 (0.169)	0.242** (0.123)	0.274 (0.218)
Country and Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	9,360	3,148	2,181	635	6,310	2,138	9,360	3,148	2,182	635	6,309	2,138	9,658	3,373	2,342	695	6,434	2,281
Number of Banks	1,518	610	508	191	1,337	579	1,517	610	509	191	1,336	579	1,533	623	530	209	1,348	589

Sources: Fitch Connect; and IMF staff estimates.

Note: Robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Regressions use return on average assets (ROAA), net interest margin (NIM), and operating cost to income ratio (CIR) as dependent variables and control for country and year fixed effects, as well as the lagged values of the dependent variable, bank size (total assets), capitalization (equity over assets), funding (deposits over liabilities), loan size (net loans over assets), loan quality (non-performing loans over gross loans), sovereign exposure (government securities over total assets), economic cycle (GDP per capita growth), and financial development. Public banks are defined as those with more than 25 percent of equity owned by the government. AEs = advanced economies; EMDEs = emerging market and developing economies.

Online Annex Table 3.3.6. Financial Performance of Public versus Private Commercial Banks Before and after the Global Financial Crisis (restricted sample)

Sample Period	1999–2018		1999–2007		2010–2018		1999–2018		1999–2007		2010–2018		1999–2018		1999–2007		2010–2018	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Country Group	AEs	EMDEs	AEs	EMDEs	AEs	EMDEs	AEs	EMDEs	AEs	EMDEs	AEs	EMDEs	AEs	EMDEs	AEs	EMDEs	AEs	EMDEs
VARIABLES	ROAA	ROAA	ROAA	ROAA	ROAA	ROAA	NIM	NIM	NIM	NIM	NIM	NIM	CIR	CIR	CIR	CIR	CIR	CIR
Public Commercial Bank	-0.00226** (0.000886)	-0.00218*** (0.000825)	0.00206 (0.00203)	-0.00169 (0.00200)	-0.00347*** (0.000855)	-0.00120 (0.000946)	-0.00313*** (0.000793)	-0.00104 (0.00266)	6.76e-05 (0.000662)	-0.00622* (0.00372)	-0.00330*** (0.000814)	-0.000814 (0.00276)	-0.105*** (0.0375)	0.0326* (0.0175)	0.0822 (0.0586)	0.0710* (0.0421)	-0.0980** (0.0433)	0.0350 (0.0218)
Public Development Bank	-0.000518 (0.000822)	-0.00226** (0.000963)	-0.000539 (0.000708)	0.00174 (0.00416)	-0.000393 (0.000966)	-0.00229* (0.00123)	-0.00114*** (0.000432)	-0.00435* (0.00232)	-0.00385*** (0.00106)	-0.0130* (0.00782)	-0.00108** (0.000446)	-0.00446* (0.00263)	-0.00697 (0.0358)	-0.0192 (0.0320)	-0.0851*** (0.0208)	-0.0843* (0.0496)	0.00100 (0.0408)	-0.000695 (0.0289)
Govt Securities / Total Assets = L	0.00419*** (0.00134)	0.00548 (0.00497)	0.00142 (0.00353)	0.00826 (0.0128)	0.00539*** (0.00150)	0.00249 (0.00311)	-0.00182 (0.00120)	-0.00463 (0.00636)	-0.000637 (0.00138)	-0.00260 (0.0120)	-0.00160 (0.00139)	-0.0108 (0.00868)	-0.0884* (0.0460)	-0.0744 (0.0652)	-0.0157 (0.131)	-0.225* (0.123)	-0.133*** (0.0477)	-0.0689 (0.0673)
GDP per Capita Growth = L	0.0215*** (0.00771)	-0.00308 (0.00800)	0.0134 (0.0145)	0.0143 (0.0205)	0.00275 (0.00875)	0.000478 (0.00737)	-0.00303 (0.00579)	-0.0216** (0.0105)	0.00342 (0.0107)	-0.0352 (0.0293)	-0.00891 (0.00603)	-0.0106 (0.0109)	-1.201*** (0.296)	-0.261 (0.198)	-1.463** (0.726)	-0.297 (0.352)	-0.606* (0.328)	-0.473* (0.271)
Financial Development = L	0.00993*** (0.00381)	-0.0149** (0.00736)	0.0108** (0.00514)	0.0336* (0.0175)	-0.00851 (0.00566)	-0.0102 (0.00857)	-0.00552*** (0.00208)	0.00158 (0.00753)	-0.0112*** (0.00407)	0.0357** (0.0159)	-0.00802*** (0.00270)	-0.00342 (0.00872)	-0.520*** (0.139)	-0.0280 (0.142)	-0.875*** (0.235)	-0.215 (0.251)	0.0296 (0.194)	0.381 (0.302)
Dependent Variable = L	0.405*** (0.0716)	0.502*** (0.0566)	0.218*** (0.0651)	0.165* (0.0874)	0.436*** (0.0689)	0.552*** (0.0526)	0.843*** (0.0374)	0.670*** (0.104)	0.766*** (0.0749)	0.465*** (0.0825)	0.864*** (0.0357)	0.681*** (0.114)	0.442*** (0.0243)	0.507*** (0.0515)	0.389*** (0.0482)	0.358*** (0.101)	0.411*** (0.0299)	0.603*** (0.0673)
Log of Total Assets = L	-5.13e-05 (0.000108)	0.000107 (0.000295)	0.000220 (0.000157)	-0.00132 (0.00169)	5.30e-05 (0.000118)	0.000288 (0.000399)	-0.000154* (8.46e-05)	-0.00227*** (0.000630)	-0.000390*** (0.000132)	0.000611 (0.00166)	-6.88e-05 (9.69e-05)	-0.00188* (0.00102)	-0.00212 (0.00279)	0.00209 (0.00614)	-0.0194*** (0.00577)	-0.0187 (0.0122)	-0.00469* (0.00284)	-0.00250 (0.00672)
Equity/ Total Assets = L	0.0550*** (0.0164)	0.00976 (0.00915)	0.0244*** (0.00891)	0.0435 (0.0363)	0.0546*** (0.0157)	0.0174 (0.0131)	0.00350 (0.00625)	-0.0224 (0.0235)	0.0205** (0.0102)	0.0640 (0.0462)	0.000934 (0.00585)	-0.0147 (0.0287)	-0.353*** (0.133)	-0.251 (0.172)	-0.438 (0.274)	-0.825* (0.429)	-0.369*** (0.140)	-0.284 (0.208)
Deposits/ Total Liabilities = L	-0.00234* (0.00140)	-0.00297* (0.00156)	-0.000428 (0.00184)	-0.00908 (0.00560)	-0.00271* (0.00141)	-0.00101 (0.00183)	-0.000673 (0.00117)	0.00252 (0.00306)	0.00106 (0.00115)	0.0120 (0.00775)	-0.00102 (0.00123)	-0.00122 (0.00453)	0.0437* (0.0257)	0.155*** (0.0406)	0.123* (0.0666)	0.0589 (0.0908)	0.0427 (0.0297)	0.143*** (0.0524)
Net Loans/ Total Assets = L	-0.00130 (0.00110)	-0.00212 (0.00240)	0.000417 (0.00129)	-0.000981 (0.0102)	-0.000272 (0.00117)	-0.00262 (0.00267)	0.000558 (0.000913)	-0.00152 (0.00692)	0.00341** (0.00142)	-0.00428 (0.0118)	0.000772 (0.000979)	-0.00499 (0.0109)	0.00301 (0.0267)	0.161*** (0.0588)	0.00704 (0.0673)	0.0763 (0.104)	-0.0113 (0.0305)	0.0897 (0.0655)
Nonperforming/ Gross Loans = L	-0.00961* (0.00503)	0.000134 (0.00998)	-0.00254 (0.00470)	-0.0194 (0.0155)	-0.00547 (0.00633)	0.0105 (0.0124)	0.00211 (0.00235)	-0.00268 (0.00630)	0.00577* (0.00345)	-0.0180 (0.0171)	0.00637* (0.00367)	0.0139 (0.0119)	0.423*** (0.136)	0.199 (0.163)	0.0859 (0.250)	0.474** (0.217)	0.572*** (0.179)	0.0820 (0.201)
Country and Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	6,330	1,642	1,133	331	4,682	1,104	6,330	1,642	1,133	331	4,682	1,104	6,467	1,749	1,221	363	4,728	1,166
Number of Banks	906	246	239	95	874	241	906	246	239	95	874	241	908	249	246	105	875	242

Sources: Fitch Connect; and IMF staff estimates.

Note: Robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Regressions use return on average assets (ROAA), net interest margin (NIM), and operating cost to income ratio (CIR) as dependent variables and control for country and year fixed effects, as well as the lagged values of the dependent variable, bank size (total assets), capitalization (equity over assets), funding (deposits over liabilities), loan size (net loans over assets), loan quality (non-performing loans over gross loans), sovereign exposure (government securities over total assets), economic cycle (GDP per capita growth), and financial development. Public banks are defined as those with more than 25 percent of equity owned by the government. AEs = advanced economies; EMDEs = emerging market and developing economies.

Online Annex 3.4. Assessing the Determinants of SOEs' Performance

This annex provides details on data sources and empirical methodologies used in this chapter regarding the determinants of SOEs' performance. It also includes a summary of the results of the analysis.

Data Sources and Definitions

Data Sources

The data used in the chapter examining SOE performance is sourced primarily from ORBIS and the Natural Resource Governance Institute (NRGI) database on national oil companies (Online Annex Table 3.4.1.). The data sample covers SOEs from 102 countries¹ of which 28 are advanced, 53 emerging, and 18 developing (Online Annex Table 3.4.2.).

ORBIS Database

The Orbis database compiled by the Bureau van Dijk is the primary source for balance sheet data. The database: contains information on over 220 million firms—both state-owned (SOE) and private-owned (POE)—worldwide in more than 100 countries up to 15–20 years; provides both financial and real information (employment) about the firms; and includes historical information on firms' ownership. However, the coverage is uneven across countries. SOEs in ORBIS are identified through ownership as "organizations ultimately owned or de facto controlled by public sector entities".²

The raw Orbis data, while very rich, requires treatment to correct for some data issues or to adjust it for the objective of our study. In particular,

The analysis is based on unconsolidated financial data of domestically owned SOEs in sectors, excluding the financial sector, with a relatively higher incidence of SOEs and where SOEs compete with private firms: agriculture, electricity and gas, water and sewerage, mining (including oil) and quarrying, manufacturing, communication, and construction.³

The data cleaning process closely follows Kalemli-Ozcan and others (2015) and Baum and others (2019). Observations that have negative assets, negative tangible assets, negative employees, or negative sales were dropped first. We then drop any observation that is missing data for any of the following variables: total assets, sales, numbers of employees, and total operating revenues. Finally, we drop companies that have two or less years of data available, and companies that do not have two consecutive years of data available. We also drop observations that: are duplicates; do not have an industry classification (either nace2 or nace4); or are missing cost of employees and productivity.

Additional adjustments are made to address outliers. While the majority of return on average equity (ROE) observations lie within plus and minus 20 percent, we find a significant number of observations with very large values (positive and negative), which might either be indicative of misreporting, or of SOE equity close to zero. Therefore, we only include a company observation in the sample if the ROE is between -50 and 50 percent. We also exclude firms that have zero sales and sales above US\$1.5 million per employee, and/or zero labor costs per operating revenue.

¹ When the SOE database is appended with the POE database, we have a total of 109 countries in the total sample as reported in the main text. This is because there are 7 countries that are in the POE but not in the SOE database.

² This implies organizations not only directly but also indirectly controlled by a public entity.

³ Adding wholesale and retail trade doesn't change the main results,

We follow Gopinath and others (2017) and drop observations that are below the 0.1 percentile or above the 99.9 percentile of the distribution of each variable (except for ROE).

National Oil Companies Database

The Natural Resource Governance Institute (NRGI, 2019) has assembled a comprehensive open database on National Oil Companies (NOC). The NOC database gathers detailed information derived from public sources and compiled according to a consistent methodology to facilitate benchmarking of companies and cross-cutting analysis. The database covers 71 NOCs headquartered in 61 countries worldwide. It provides data on 11 indicator groups, including NOC production, revenue generation, fiscal transfers to government and operational and financial performance, covering a seven-year time series (2011 to 2017).

Other Data

For a few countries, we complement the data from national authorities and data collected by IMF staff.

Online Annex Table 3.4.1. Data and Sources

Indicator	Source
GDP growth	IMF - World Economic Database
GDP per capita (PPP)	IMF - World Economic Database
Share of oil exports	IMF - World Economic Database
Transition economies (dummy)	IMF - World Economic Database
IMF program (dummy)	IMF staff compilation
Ease of starting a business	World Bank - Doing Business
Control of Corruption	World Bank - Worldwide Governance Indicators
Government effectiveness	World Bank - Worldwide Governance Indicators
Liquidity: current ratio	Orbis Database, NRGI, Authorities Annual Reports
Solvency: shareholders' funds/total assets	Orbis Database, Authorities Annual Reports
Total employment	Orbis Database, NRGI, Authorities Annual Reports
Sales	Orbis Database, NRGI, Authorities Annual Reports
Degree of public sector ownership	Orbis Database and IMF staff compilation
Return on equity	Orbis Database, NRGI, Authorities Annual Reports
Return on assets	Orbis Database, NRGI, Authorities Annual Reports
Total assets	Orbis Database, NRGI, Authorities Annual Reports
Operating profit to sales revenue	Orbis Database, Authorities Annual Reports
Costs of employees per operating revenue	Orbis Database, Authorities Annual Reports
Productivity: Sales per employee	IMF staff calculations based on Orbis Database, NRGI and Authorities Annual Reports
Value added per employee	IMF staff calculations based on Orbis Database and Authorities Annual Reports

Source: IMF staff compilation.

Online Annex Table 3.4.2 contains the list of 102 countries in the SOEs sample between 1999 and 2017 after the cleaning of the data.

Online Annex Table 3.4.2. Distribution of countries in the SOE sample by income level

Advanced Economies	Emerging Markets		Low-Income Countries
Austria	Algeria	Macedonia, FYR	Bangladesh
Belgium	Angola	Mexico	Cameroon
Cyprus	Argentina	Montenegro	Chad
Czech Republic	Azerbaijan	Namibia	Democratic Republic of Congo
Denmark	Bahrain	Oman	Republic of Congo
Estonia	Bolivia	Pakistan	Cote d'Ivoire
Finland	Bosnia & Herzegovina	Panama	Ethiopia
France	Brazil	Peru	Ghana
Germany	Brunei Darussalam	Philippines	Kenya
Greece	Bulgaria	Poland	Liberia
Iceland	Cabo Verde	Qatar	Moldova
Italy	Chile	Romania	Mozambique
Japan	China	Russia	Myanmar
Korea	Colombia	Saudi Arabia	Nepal
Latvia	Croatia	Serbia	Nigeria
Lithuania	Ecuador	South Africa	South Sudan
Luxembourg	Egypt	Suriname	Sudan
Malta	Equatorial Guinea	Thailand	Tanzania
Netherlands	Gabon	Trinidad and Tobago	Timor-Leste
Norway	Hungary	Tunisia	Yemen
Portugal	India	Turkmenistan	
Singapore	Indonesia	Ukraine	
Slovak Republic	Iran, I. Rep. Of	United Arab Emirates	
Slovenia	Iraq	Vietnam	
Spain	Jamaica	Venezuela	
Sweden	Kazakhstan		
Switzerland	Kosovo		
Taiwan: Province of China	Libya		
28 countries	53 countries		21 countries

Source: IMF staff compilation

Measurement of Governance

To assess the impact of governance on SOEs' performance, we use the control of corruption (CoC) indicator from the Worldwide Governance Index (WGI). The CoC is mainly based on surveys of perception of corruption (see Kaufmann and others 2007 and 2010), and available since 1996. In addition to corruption, we also test whether government effectiveness—also from the WGI—has an impact on SOEs' performance.

Methodology and Results

How does the degree of state ownership⁴ affect the performance of SOEs? To what extent does government governance affect the performance differential of SOEs compared to private firms?

⁴ To shorten the terminology, the degree of state ownership will be often called "ownership".

Formally, the relationship between the financial performance of SOEs and governance or ownership can be described as:

$$Performance_{i,t} = g(Variables\ of\ interest_{i,t}, X_{i,t}, \varepsilon_i), \quad (3.4.1)$$

where $Performance_{i,t}$ represents a specific performance indicator of a SOE i at time t . $X_{i,t}$ is a vector of observable covariates and ε_i is a vector of unobservables. $X_{i,t}$ includes liquidity, solvency and other firm-level characteristics suggested in the literature.

Several variables are used to gauge the performance of SOEs. Some assess their profitability (return on equity, return on assets, and operating margin) and others assess their productivity or efficiency (cost of employees per operating revenue, sales per employee, and value added per employee).

The explanatory variables of interest are ownership and governance. Ownership is a constant over time and varies across firms from 0 percent (private ownership) to 100 percent (full government ownership). We focus on a measure of governance at the country level, which allows examination of the broader governance environment's effects on SOEs' performance.⁵ As governance measures—including the CoC of the WGI—tend to be highly persistent (almost time invariant); therefore, estimating equation (3.4.1) using cross-country standard regression techniques such as the fixed-effect (FE) estimation is challenging. To tackle this issue, two alternative methodologies are employed. First, we use the classical pooled-cross section regression model while considering the heteroscedasticity in the sample and differences in performance between firms due to the fact that they are operating in different sectors. We also follow a two-step estimation to identify the effect of any constant (e.g. ownership and initial level of development) or almost time-invariant variables (e.g. CoC and business environment).⁶

In the first step, equation (3.4.1) is estimated by using the within estimator (fixed effects) and including only time-varying regressors. In the second step, the estimated unit effects of the first step are regressed on constant variables and on slowly-moving variables, with a between regression estimator. The second step also control for sector dummies to consider sectoral differences between firms. This approach has been first proposed by Hsiao (2003)⁷. More formally, the linear form of equation (3.4.1) can be written as:

$$PER_{i,t} = \alpha_0 + \alpha_1 G_{k,t} + \alpha_2 X_{i,t} + \alpha_3 Y_{k,t} + \mu_i + \mu_t + \varepsilon_{i,t} \quad (3.4.2)$$

$G_{k,t}$ is a measure of the quality of governance in country k . $X_{i,t}$ represents a set of time-varying firm-level characteristics. $Y_{k,t}$ represents some non-firm level controls such as real GDP growth, GDP per capita (PPP), natural resource endowment and quality of the business environment. We control for natural resource endowment (share of oil exports to total exports) as it can affect both the performance of firms and corruption. Indeed, the literature (see e.g. Brollo and others, 2013) suggests that windfalls associated with natural resources may exacerbate corruption, while at the same time raising the profitability in the extractive sectors. We also include a dummy for transition economies given the importance of SOEs in these countries. Finally, we control for the quality of the business environment, proxied by the World Bank's ease of starting a business. μ_i and μ_t are firms and time fixed effects, respectively. In equation (3.4.2) the standard errors are clustered at the country level, given heterogeneity and potential autocorrelation issues.

⁵ There is also no database with a systematic measure of governance at the firm level.

⁶ As a measure of the business environment we use "starting a business" from the World Bank as it is the only indicator that has experienced little methodological change since it was introduced. In addition, the methodology for obtaining this data is designed to isolate the impact of corruption and the payment of bribes to public officials (see <https://www.doingbusiness.org/en/methodology/starting-a-business>).

⁷ See also Pesaran and Zhou (2018) and Kripfganz and Schwarz (2019) for other ways to handle time-invariant regressors.

In the second step, the estimated unit effects (μ_i) of the first step are regressed on a constant and slowly moving variables (equation 3.4.3), with a between regression estimator. Weighted least squares are used to correct for heteroskedasticity. In addition, given that the estimated unit effects might depend on sectors in which firms operate, we also control for sector dummies in the second step.

$$\mu_i = \beta_0 + \beta_1 \text{GDP per capita} + \beta_2 \text{Governance variable} + \beta_3 \text{Business environment} + \xi_i \quad (3.4.3)$$

To analyze the different impact of governance on SOEs and private firms, we expand equation (3.4.1) by building on a similar approach as Dewenter and Malatesta (2001), who focus on the effect of ownership on firm performance:

$$PER_{i,t} = \alpha_0 + \alpha_1 \text{Ownership}_i + \alpha_2 \text{Ownership}_i G_k + \alpha_3 G_{k,t} + \alpha_4 X_{i,t} + \alpha_5 Y_{k,t} + \mu_i + \mu_t + \varepsilon_{i,t} \quad (3.4.4)$$

Ownership_i is a dummy variable that identifies private firms and SOEs. In some specifications, we use the exact value of ownership instead of the dummy.

The Effect of Ownership of SOEs' Performance

What is the effect of the degree of state ownership on SOE performance? Table 3.4.3.a shows the results for the two-step estimation and Table 3.4.3.b show the results for pooled-OLS. The sample contains only SOEs. The estimated coefficient for the degree of state ownership has the expected sign and is statistically significant. That is, the higher the degree of state ownership, the lower are the profits (return on equity, return on assets or profit margins), the lower is labor productivity (sales per employee) and value added per employee and the higher is labor cost per operating revenue.

We now turn to a comparison between SOEs with government ownership below 50 percent, between 50 and 100 percent, and private firms (0 percent government ownership). To this end, we created dummies for each category of firm and use SOEs with government ownership between 50 percent and 100 percent as the reference group (the baseline). Online Annex Table 3.4.3.a shows that, for example, private firms and SOEs with government ownership below 50 percent have returns on equity that are higher than those of SOEs with government ownership above 50 percent, 7.9 percentage points and 0.7 percentage points, respectively. On average, private firms and SOEs with government ownership below 50 percent are much more productive than SOEs with ownership above 50 percent, 1.2 times and 2.9 times, respectively.

The Effect of Governance on SOEs' Performance

Weak governance affects the performance of SOEs through a variety of channels (see Baum and others, 2019). SOE's vulnerabilities to corruption operate on two-levels: through a direct link to the government and via corporate governance of the individual firm. The level of a country's governance is likely to have a larger impact on SOEs given the close relationship with government. We test this by using the above framework (equation (3.4.1)) and the WGI's control of corruption index.

Online Annex Tables 3.4.4.a and 3.4.4.b show the results for SOEs with majority government ownership. The estimated coefficients for governance always have the expected sign and are strongly significant, at the 1 percent level. Weak governance in a country is associated with lower profits (return of equity, return on assets and profit margins), lower productivity and value added per employee, and higher cost of employee per operating revenue in the majority government-owned SOEs.

How does the impact of corruption depend on the type of ownership? We use the framework above and create a dummy variable taking the value of 1 if the firm is privately owned and 0 if the public sector is the majority shareholder (the baseline). We also add an interaction between the type of ownership and our measure of governance (see equation (3.4.4)). Online Annex Tables 3.4.5.a and 3.4.5.b present the baseline results. The results confirm the previous results that private firms have better performance on average (see dummy on ownership). This result is in line with the literature (e.g. Dewenter and Malatesta, 2001). The control of corruption has the expected effects across all specifications as in Online Annex Tables 3.4.6.a and 3.4.6.b. Most importantly, the interaction terms are negative for profits, productivity and value added per employee, and positive for cost of employee per operating revenue. Taken together, these results imply that the differences in performance between private firms and SOEs can be large in countries with weak governance. However, the difference in performance decreases as governance improves. These results are graphically illustrated in Figure 3.23 in the main text of the chapter (section IV).

Robustness Checks

A number of robustness checks confirm the results—they are similar to those of the baseline regressions both qualitatively and quantitatively.⁸ So far, we have focused on the control of corruption indicator as a proxy for a country's governance. As an alternative, we use the government effectiveness indicator as a measure of quality of governance.⁹ In a second robustness check, we kept only countries with a coverage of at least 60 percent of the universe of firms in ORBIS, based on coverage ratios estimated by Kalemli-Ozcan and others (2015). We also tested the specification using a sample restricted to only include private firms within a sector that has at least one SOE. Finally, in a last robustness check we restricted the countries in the sample of POEs to be the same as those in the sample of SOEs.

⁸ The results are not shown due to limited space.

⁹ Which measures the quality of public services, civil service, policy formulation, policy implementation and credibility of the government's commitment to raise these qualities or keeping them high

Online Annex Table 3.4.3.a. The Effect of Ownership of SOEs' Performance

	Return on Equity		Return on Asset		Operating Profit per Sales		Labor Costs per Op. Revenue		Productivity: Sales per Employee		Value Added per Empl.	
	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
GDP growth	-0.0177 (0.0408)		-0.0035 (0.0154)		0.0845 (0.0550)		-0.1957*** (0.0596)		0.1288 (0.3806)		-1.3127*** (0.2408)	
Share of oil exports as a share of total exports	0.0523 (0.0788)		0.0249 (0.0316)		0.4063* (0.2052)		-0.1206 (0.1984)		-3.7170** (1.5246)		-1.0389 (0.9696)	
Liquidity: current ratio	0.0006*** (0.0001)		0.0003*** (0.0000)		0.0012*** (0.0003)		-0.0003 (0.0003)		-0.0001 (0.0016)		0.0031* (0.0017)	
Solvency (Shareholders funds/Total assets)	0.0579** (0.0222)		0.0384*** (0.0032)		0.0125 (0.0140)		0.0223*** (0.0057)		-0.2142*** (0.0467)		0.1022* (0.0542)	
Total employment	0.0002 (0.0010)		-0.0012* (0.0007)		0.0405*** (0.0047)							
Sales	0.0306*** (0.0023)		0.0166*** (0.0009)		0.0452*** (0.0071)						0.2261*** (0.0289)	
Total assets									0.1850*** (0.0288)		0.2999*** (0.0204)	
Firm fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Initial GDP per capita		0.0049*** (0.0013)		0.0027*** (0.0006)		0.0349*** (0.0044)		-0.0318*** (0.0033)		0.9682*** (0.0144)	1.2659*** (0.0165)	1.2365*** (0.0157)
Transition economies (dummy)		-0.0479*** (0.0019)		-0.0249*** (0.0009)		-0.0475*** (0.0064)		0.0568*** (0.0050)		-0.8347*** (0.0212)	-0.3327*** (0.0276)	-0.3846*** (0.0268)
Ease of starting a business		0.0618*** (0.0051)		0.0229*** (0.0025)		0.1291*** (0.0173)		-0.0437*** (0.0128)		0.4453*** (0.0563)	0.1723*** (0.0686)	0.3329*** (0.0615)
Exact ownership		-0.0047*** (0.0018)		-0.0033*** (0.0009)		-0.0076 (0.0061)		0.1054*** (0.0043)		-0.3132*** (0.0199)	-0.1651*** (0.0195)	-0.1494*** (0.0201)
Industry fixed effect		Yes		Yes		Yes		Yes		Yes	Yes	Yes
Constant	-0.0577*** (0.0147)	-0.2595*** (0.0204)	-0.0335*** (0.0046)	-0.0956*** (0.0098)	-0.2608*** (0.0369)	-0.8112*** (0.0684)	0.3312*** (0.0111)	0.3755*** (0.0517)	-3.5306*** (0.3265)	-10.0740*** (0.2245)	-4.4336*** (0.2181)	-12.8831*** (0.2381)
Observations	145,281	110,692	142,663	108,678	142,118	108,434	119,166	87,571	144,607	110,160	59,178	44,120
R ²	0.0275	0.1697	0.0395	0.1929	0.0134	0.0848	0.0360	0.3062	0.1998	0.7309	0.2452	0.8127
Number of firms	18,797	16,224	18,708	16,142	18,549	15,963	16,445	13,710	18,722	16,123	9,700	7,841

Note: Standard-errors in parentheses. The regression in the first step includes firms and year dummies. The estimations of these effects are not reported. Residuals in the first step are clustered at the country level. Weighted least squares are used in the second step to correct for heteroskedasticity. *** p<0.01, **p<0.05, *p<0.1. The time dimension ranges from 1999 to 2017. Productivity and value added per capita are in logarithms.

Online Annex Table 3.4.3.b. The Effect of Ownership of SOEs' Performance-Pooled

	Return on Equity		Return on Asset		Operating Profit per Sales		Labor Costs per Op. Revenue		Productivity: Sales per Employee		Value Added per Empl.	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
GDP growth	0.1567*** (0.0379)		0.0549*** (0.0179)		0.1773 (0.1279)		-0.7807*** (0.0864)		1.8472*** (0.4069)		-2.0883*** (0.4125)	
Share of oil exports as a share of total exports	-0.0511*** (0.0125)		-0.0210*** (0.0059)		-0.1109*** (0.0420)		0.3938*** (0.0300)		-2.1337*** (0.1332)		-0.7403*** (0.1434)	
Liquidity: current ratio	0.0013*** (0.0001)		0.0007*** (0.0001)		0.0025*** (0.0005)		-0.0006* (0.0003)		0.0099*** (0.0014)		0.0096*** (0.0017)	
Solvency (Shareholders funds/Total assets)	-0.0112*** (0.0030)		0.0198*** (0.0014)		-0.0273*** (0.0101)		0.0823*** (0.0068)		-0.6434*** (0.0313)		-0.0572* (0.0319)	
Total employment	0.0040*** (0.0004)		0.0027*** (0.0002)		0.0175*** (0.0013)							
Sales	0.0323*** (0.0007)		0.0168*** (0.0004)		0.0641*** (0.0025)						-0.0001 (0.0101)	
Total assets									0.2008*** (0.0031)		0.1918*** (0.0041)	
Firm fixed effect												
Initial GDP per capita	0.0062*** (0.0015)		0.0050*** (0.0007)		0.0204*** (0.0050)		-0.0355*** (0.0036)		0.8985*** (0.0160)		1.2659*** (0.0165)	
Transition economies (dummy)	-0.0297*** (0.0024)		-0.0155*** (0.0012)		-0.0748*** (0.0082)		0.0408*** (0.0055)		-0.7155*** (0.0263)		-0.3327*** (0.0276)	
Ease of starting a business	0.0906*** (0.0067)		0.0394*** (0.0032)		0.1465*** (0.0225)		-0.1034*** (0.0158)		0.7979*** (0.0716)		0.1723*** (0.0686)	
Exact ownership	-0.0076*** (0.0019)		-0.0053*** (0.0009)		-0.0152** (0.0065)		0.1108*** (0.0045)		-0.3103*** (0.0204)		-0.1651*** (0.0195)	
Industry fixed effect		Yes		Yes		Yes		Yes		Yes		Yes
Constant	-0.4272*** (0.0322)		-0.2218*** (0.0152)		-0.9107*** (0.1081)		0.9722*** (0.0705)		-14.5098*** (0.3387)		-16.4764*** (0.3098)	
Observations	110,692		108,678		108,434		87,571		110,160		44,120	
R ²	0.2126		0.2380		0.1097		0.3250		0.8117		0.8636	
Number of firms	16,224		16,142		15,963		13,710		16,123		7,841	

Note: Standard-errors in parentheses. Weighted least squares are used to correct for heteroskedasticity. *** p<0.01, **p<0.05, *p<0.1. The time dimension ranges from 1999 to 2017. Productivity and value added per capita are in logarithms.

Online Annex Table 3.4.4.a. The Relative Performance of SOEs with Government Majority Ownership

	Return on Equity		Return on Asset		Operating Profit per Sales		Labor Costs per Op. Revenue		Productivity: Sales per Employee		Value Added per Empl.	
	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
GDP growth	0.2462 (0.1708)		0.0934 (0.0679)		0.1549** (0.0755)		-0.1812** (0.0785)		0.4058 (0.3851)		0.0223 (0.0364)	
Share of oil exports as a share of total exports	-0.0987 (0.2150)		-0.0686 (0.0926)		-0.0661 (0.0972)		0.1338 (0.1407)		-2.3483 (1.5315)		-0.0187 (0.0552)	
Liquidity: current ratio	-0.0003 (0.0002)		-0.0005*** (0.0001)		-0.0005 (0.0004)		0.0004* (0.0002)		-0.0051*** (0.0017)		-0.0003*** (0.0001)	
Solvency (Shareholders funds/Total assets)	-0.0030 (0.0216)		0.0863*** (0.0140)		0.0478*** (0.0105)		0.0296*** (0.0101)		-0.0036 (0.0572)		0.0249*** (0.0021)	
Total employment	0.0082*** (0.0026)		0.0042*** (0.0012)		0.0123*** (0.0023)							
Sales	0.0409*** (0.0036)		0.0175*** (0.0013)		0.0034** (0.0016)						0.0054*** (0.0003)	
Total assets									0.3105*** (0.0270)		0.0186*** (0.0011)	
Firm fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Initial GDP per capita		-0.0134*** (0.0002)		-0.0061*** (0.0001)		-0.0025*** (0.0002)		0.0670*** (0.0004)		0.8314*** (0.0014)		0.0399*** (0.0002)
Ease of starting a business		0.1983*** (0.0009)		0.0929*** (0.0004)		0.1128*** (0.0008)		-0.1078*** (0.0015)		0.5504*** (0.0065)		0.0350*** (0.0007)
SOEs with ownership below 50%		0.0067*** (0.0017)		0.0088*** (0.0007)		0.0167*** (0.0015)		-0.1115*** (0.0029)		0.2069*** (0.0125)		0.0131*** (0.0013)
POEs		0.0788*** (0.0009)		0.0483*** (0.0004)		0.1247*** (0.0008)		-0.1541*** (0.0015)		1.0599*** (0.0066)		0.0231*** (0.0008)
Industry fixed effect		Yes		Yes		Yes		Yes		Yes		Yes
Constant	0.0638*** (0.0160)	-0.7855*** (0.0034)	-0.0192** (0.0088)	-0.3819*** (0.0014)	0.0073 (0.0045)	-0.5509*** (0.0029)	0.2388*** (0.0109)	-0.0813*** (0.0063)	-2.3136*** (0.0676)	-1.17415*** (0.0249)	0.0375*** (0.0048)	-0.5669*** (0.0031)
Observations	5,082,735	4,127,834	4,993,185	4,051,078	4,974,646	4,035,089	4,477,495	3,571,875	5,036,426	4,087,402	3,173,598	2,477,466
R ²	0.0699	0.0799	0.0883	0.1079	0.0152	0.0927	0.0348	0.0735	0.1293	0.4853	0.0457	0.1233
Number of firms	947,118	862,393	940,194	856,094	934,570	850,391	803,594	720,218	944,593	858,854	568,507	500,585

Note: Standard-errors in parentheses. The regression in the first step includes firms and year dummies. The estimations of these effects are not reported. Residuals in the first step are clustered at the country level. Weighted least squares are used in the second step to correct for heteroskedasticity. *** p<0.01, **p<0.05, *p<0.1. The time dimension ranges from 1999 to 2017. Productivity and value added per capita are in logarithms.

Online Annex Table 3.4.4.b. The Relative Performance of SOEs with Government Majority Ownership-Pooled

	Return on Equity		Return on Asset		Operating Profit per Sales		Labor Costs per Op. Revenue		Productivity: Sales per Employee		Value Added per Empl.	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
GDP growth	0.6092*** (0.0061)		0.2862*** (0.0025)		0.3730*** (0.0052)		-0.4885*** (0.0139)		5.9720*** (0.0426)		0.1013*** (0.0068)	
Share of oil exports as a share of total exports	-0.0381*** (0.0027)		-0.0122*** (0.0011)		0.0093*** (0.0023)		0.2716*** (0.0048)		-1.6999*** (0.0195)		0.0185*** (0.0024)	
Liquidity: current ratio	0.0007*** (0.0000)		0.0000*** (0.0000)		0.0013*** (0.0000)		-0.0020*** (0.0000)		-0.0084*** (0.0002)		0.0006*** (0.0000)	
Solvency (Shareholders funds/Total assets)	-0.0302*** (0.0005)		0.0796*** (0.0002)		0.0264*** (0.0005)		0.1060*** (0.0009)		-0.1851*** (0.0039)		0.0234*** (0.0004)	
Total employment	0.0021*** (0.0001)		0.0006*** (0.0000)		0.0024*** (0.0001)							
Sales	0.0262*** (0.0001)		0.0117*** (0.0001)		-0.0087*** (0.0001)						-0.0027*** (0.0001)	
Total assets									0.2618*** (0.0005)		0.0123*** (0.0001)	
Firm fixed effect												
Initial GDP per capita	-0.0108*** (0.0002)		-0.0041*** (0.0001)		-0.0036*** (0.0002)		0.0667*** (0.0004)		0.9574*** (0.0017)		0.0474*** (0.0002)	
Ease of starting a business	0.1778*** (0.0010)		0.0861*** (0.0004)		0.0983*** (0.0008)		-0.0948*** (0.0016)		0.6012*** (0.0070)		0.0316*** (0.0007)	
SOEs with ownership below 50%	0.0068*** (0.0017)		0.0093*** (0.0007)		0.0160*** (0.0015)		-0.1125*** (0.0029)		0.2223*** (-0.0124)		0.0122*** (0.0001)	
POEs	0.0600*** (0.0009)		0.0384*** (0.0004)		0.1072*** (0.0008)		-0.1482*** (0.0015)		0.8454*** (0.0066)		0.0081*** (0.0008)	
Industry fixed effect		Yes		Yes		Yes		Yes		Yes		Yes
Constant	-0.6674*** (0.0044)		-0.3876*** (0.0018)		-0.4471*** (0.0038)		0.0969*** (0.0069)		-15.2013*** (-0.0308)		-0.5680*** (0.0037)	
Observations	4,127,834		4,051,078		4,035,089		3,571,875		4,087,402		2,477,466	
R ²	0.1217		0.2567		0.0778		0.0846		0.5156		0.2240	
Number of firms	862,393		856,094		850,391		720,218		858,854		500,583	

Note: Standard-errors in parentheses. Weighted least squares are used to correct for heteroskedasticity. *** p<0.01, **p<0.05, *p<0.1. The time dimension ranges from 1999 to 2017. Productivity and value added per capita are in logarithms.

Online Annex Table 3.4.5.a. The Effect of Governance on SOEs Performance

	Return on Equity		Return on Asset		Operating Profit per Sales		Labor Costs per Op. Revenue		Productivity: Sales per Employee		Value Added per Empl.	
	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
GDP growth	-0.0192 (0.0346)		-0.0021 (0.0138)		0.1131** (0.0553)		-0.2257*** (0.0600)		0.1668 (0.3953)		-1.3081*** (0.2630)	
Share of oil exports as a share of total exports	0.0790 (0.0799)		0.0411 (0.0321)		0.4494* (0.2566)		-0.0993 (0.2189)		-3.7670** (1.6095)		-1.1887 (1.1123)	
Liquidity: current ratio	0.0005*** (0.0001)		0.0003*** (0.0000)		0.0013*** (0.0003)		-0.0005 (0.0004)		-0.0002 (0.0017)		0.0030* (0.0018)	
Solvency (Shareholders funds/Total assets)	0.0573** (0.0255)		0.0384*** (0.0045)		0.0194 (0.0196)		0.0150** (0.0071)		-0.1869*** (0.0478)		0.1009** (0.0475)	
Total employment	-0.0006 (0.0008)		-0.0019*** (0.0005)		0.0372*** (0.0042)							
Sales	0.0262*** (0.0016)		0.0145*** (0.0008)		0.0380*** (0.0084)						0.2261*** (0.0320)	
Total assets									0.1731*** (0.0288)		0.2959*** (0.0227)	
Firm fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Initial GDP per capita	-0.0060*** (0.0021)		-0.0048*** (0.0010)		0.0194*** (0.0073)		-0.0116** (0.0056)		0.6103*** (0.0238)		1.0816*** (0.0246)	
Transition economies (dummy)	-0.0426*** (0.0022)		-0.0226*** (0.0011)		-0.0451*** (0.0077)		0.0512*** (0.0060)		-0.7508*** (0.0250)		-0.3447*** (0.0323)	
Ease of starting a business	0.0741*** (0.0057)		0.0296*** (0.0027)		0.1438*** (0.0193)		-0.0677*** (0.0144)		0.5434*** (0.0622)		0.4378*** (0.0684)	
Control of Corruption, Estimate	0.0131*** (0.0017)		0.0082*** (0.0008)		0.0178*** (0.0057)		-0.0314*** (0.0038)		0.3857*** (0.0187)		0.1877*** (0.0152)	
Industry fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Constant	-0.0503*** (0.0169)	-0.2145*** (0.0267)	-0.0298*** (0.0035)	-0.0571*** (0.0127)	-0.2462*** (0.0404)	-0.7398*** (0.0912)	0.3512*** (0.0110)	0.3776*** (0.0687)	-3.5905*** (0.3322)	-7.4790*** (0.2968)	-4.3529*** (0.2426)	-12.1576*** (0.2994)
Observations	113,923	87,860	111,919	86,316	111,457	86,078	93,596	69,215	113,309	87,360	43,839	32,696
R ²	0.0240	0.1896	0.0357	0.2216	0.0119	0.0911	0.0452	0.3234	0.2072	0.7520	0.2541	0.8340
Number of firms	14,747	12,729	14,681	12,670	14,558	12,525	13,082	10,888	14,683	12,638	7,282	5,858

Note: Standard-errors in parentheses. The regression in the first step includes firms and year dummies. The estimations of these effects are not reported. Residuals in the first step are clustered at the country level. Weighted least squares are used in the second step to correct for heteroskedasticity. ***p<0.01, **p<0.05, *p<0.1. The time dimension ranges from 1999 to 2017. Productivity and value added per capita are in logarithms.

Online Annex Table 3.4.5.b. The Effect of Governance on SOEs Performance-Pooled

	Return on Equity	Return on Asset	Operating Profit per Sales	Labor Costs per Op. Revenue	Productivity: Sales per Employee	Value Added per Empl.
	[1]	[2]	[3]	[4]	[5]	[6]
GDP growth	0.0370 (0.0425)	-0.0132 (0.0198)	0.3362** (0.1457)	-0.7255*** (0.0959)	-0.0948 (0.4612)	-3.3954*** (0.4560)
Share of oil exports as a share of total exports	-0.0590*** (0.0140)	-0.0227*** (0.0066)	-0.1463*** (0.0481)	0.4182*** (0.0353)	-1.8946*** (0.1518)	-1.1053*** (0.1732)
Liquidity: current ratio	0.0010*** (0.0002)	0.0006*** (0.0001)	0.0021*** (0.0005)	-0.0004 (0.0004)	0.0091*** (0.0016)	0.0062*** (0.0020)
Solvency (Shareholders funds/Total assets)	-0.0127*** (0.0032)	0.0187*** (0.0015)	-0.0200* (0.0110)	0.0724*** (0.0076)	-0.6654*** (0.0342)	-0.1401*** (0.0349)
Total employment	0.0032*** (0.0004)	0.0024*** (0.0002)	0.0155*** (0.0014)			
Sales	0.0314*** (0.0008)	0.0165*** (0.0004)	0.0609*** (0.0027)			-0.0095 (0.0111)
Total assets					0.1797*** (0.0034)	0.1668*** (0.0046)
Firm fixed effect						
Initial GDP per capita	-0.0055** (0.0025)	-0.0020* (0.0012)	0.0036 (0.0085)	-0.0133** (0.0061)	0.5433*** (0.0268)	0.9859*** (0.0261)
Transition economies (dummy)	-0.0251*** (0.0027)	-0.0134*** (0.0013)	-0.0680*** (0.0094)	0.0348*** (0.0065)	-0.7177*** (0.0300)	-0.3241*** (0.0323)
Ease of starting a business	0.0879*** (0.0073)	0.0376*** (0.0034)	0.1783*** (0.0252)	-0.1069*** (0.0177)	0.6320*** (0.0802)	0.2696*** (0.0749)
Control of Corruption, Estimate	0.0147*** (0.0018)	0.0086*** (0.0009)	0.0201*** (0.0063)	-0.0341*** (0.0041)	0.3677*** (0.0201)	0.2848*** (0.0157)
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.3073*** (0.0419)	-0.1520*** (0.0196)	-0.9056*** (0.1430)	0.8987*** (0.0925)	-10.7956*** (0.4509)	-14.3814*** (0.3935)
Observations	87,860	86,316	86,078	69,215	87,360	32,696
R ²	0.2370	0.2675	0.1153	0.3376	0.8229	0.8820
Number of firms	12,729	12,670	12,525	10,888	12,638	5,858

Note: Standard-errors in parentheses. Weighted least squares are used to correct for heteroskedasticity. ***p<0.01, **p<0.05, *p<0.1. The time dimension ranges from 1999 to 2017. Productivity and value added per capita are in logarithms.

Online Annex Table 3.4.6.a. The Nexus between Governance and Ownership on Firms' Performance

	Return on Equity		Return on Asset		Operating Profit per Sales		Labor Costs per Op. Revenue		Productivity: Sales per Employee		Value Added per Empl.	
	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
GDP growth	0.2528 (0.1709)		0.0968 (0.0678)		0.1585** (0.0753)		-0.1842** (0.0785)		0.4332 (0.3898)		-0.2779 (0.5679)	
Share of oil exports as a share of total exports	-0.0884 (0.2113)		-0.0631 (0.0904)		-0.0621 (0.0941)		0.1325 (0.1411)		-2.2574 (1.4834)		-1.5667 (1.1196)	
Liquidity: current ratio	-0.0003 (0.0002)		-0.0005*** (0.0001)		-0.0005 (0.0004)		0.0004* (0.0002)		-0.0051*** (0.0017)		-0.0051*** (0.0012)	
Solvency (Shareholders funds/Total assets)	-0.0027 (0.0218)		0.0871*** (0.0142)		0.0486*** (0.0106)		0.0293*** (0.0102)		0.0045 (0.0535)		0.3498*** (0.0327)	
Total employment	0.0085*** (0.0025)		0.0044*** (0.0011)		0.0120*** (0.0024)				0.3127*** (0.0272)		0.2864*** (0.0245)	
Sales	0.0408*** (0.0036)		0.0174*** (0.0013)		0.0031** (0.0015)							
Total assets												
Firm fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Initial GDP per capita	-0.0054*** (0.0003)		-0.0059*** (0.0001)		0.0046*** (0.0002)		0.0372*** (0.0006)		0.6421*** (0.0020)		1.1076*** (0.0025)	
Ease of starting a business	0.2023*** (0.0009)		0.0944*** (0.0004)		0.1170*** (0.0007)		-0.1232*** (0.0015)		0.5383*** (0.0065)		0.2859*** (0.0061)	
Control of Corruption, Estimate	0.0156*** (0.0008)		0.0183*** (0.0003)		0.0431*** (0.0007)		-0.0842*** (0.0013)		0.5011*** (0.0058)		0.2634*** (0.0064)	
Ownership = 1 (POEs)	0.0780*** (0.0009)		0.0471*** (0.0004)		0.1200*** (0.0007)		-0.1583*** (0.0015)		1.0018*** (0.0066)		0.6497*** (0.0079)	
Ownership = 1 (POEs) x Governance	-0.0260*** (0.0008)		-0.0193*** (0.0003)		-0.0543*** (0.0007)		0.1230*** (0.0013)		-0.2964*** (0.0057)		-0.0964*** (0.0063)	
Industry fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Constant	0.0637*** (0.0159)	-0.8737*** (0.0040)	-0.0195** (0.0088)	-0.3888*** (0.0017)	0.0092** (0.0044)	-0.6260*** (0.0033)	0.2389*** (0.0108)	0.2492*** (0.0075)	-2.3077*** (0.0673)	-9.9413*** (0.0287)	-3.3122*** (0.0594)	-13.0525*** (0.0315)
Observations	5,051,377	4,105,002	4,962,441	4,028,716	4,943,985	4,012,733	4,451,925	3,553,519	5,005,128	4,064,628	3,149,008	2,456,261
R ²	0.0703	0.0818	0.0889	0.1099	0.0160	0.0991	0.0352	0.0971	0.1296	0.4911	0.1784	0.5219
Number of firms	943,068	858,898	936,167	852,622	930,579	846,953	800,231	717,396	940,554	855,377	566,136	498,605

Note: Standard-errors in parentheses. The regression in the first step includes firms and year dummies. The estimations of these effects are not reported. Residuals in the first step are clustered at the country level. Weighted least squares are used in the second step to correct for heteroskedasticity. *** p<0.01, **p<0.05, *p<0.1. The time dimension ranges from 1999 to 2017. Productivity and value added per capita are in logarithms.

Online Annex Table 3.4.6.b. The Nexus between Governance and Ownership on Firms' Performance-Pooled

	Return on Equity	Return on Asset	Operating Profit per Sales	Labor Costs per Op. Revenue	Productivity: Sales per Employee	Value Added per Empl.
	[1]	[2]	[3]	[4]	[5]	[6]
GDP growth	0.6067*** (0.0067)	0.2528*** (0.0028)	0.3773*** (0.0056)	-0.7871*** (0.0145)	3.7098*** (0.0472)	-1.2921*** (0.0603)
Share of oil exports as a share of total exports	-0.0365*** (0.0027)	-0.0163*** (0.0012)	0.0153*** (0.0023)	0.1888*** (0.0049)	-2.0579*** (0.0197)	-1.1746*** (0.0209)
Liquidity: current ratio	0.0006*** (0.000)	0.0000 (0.0000)	0.0012*** (0.0000)	-0.0016*** (0.0000)	-0.0081*** (0.0002)	-0.0006*** (0.0002)
Solvency (Shareholders funds/Total assets)	-0.0292*** (0.0005)	0.0800*** (0.0002)	0.0303*** (0.0005)	0.0913*** (0.0009)	-0.2275*** (0.0040)	0.2824*** (0.0034)
Total employment	0.0019*** (0.0000)	0.0005*** (0.0000)	0.0019*** (0.0001)		0.2609*** (0.0005)	0.1852*** (0.0005)
Sales	0.0263*** (0.0001)	0.0116*** (0.0001)	-0.0084*** (0.0001)			
Total assets						
Firm fixed effect						
Initial GDP per capita	-0.0099*** (0.000)	-0.0067*** (0.0002)	-0.0005 (0.0003)	0.0343*** (0.0007)	0.7370*** (0.0027)	1.1061*** (0.0029)
Ease of starting a business	0.1785*** (0.0009)	0.0847*** (0.0004)	0.1003*** (0.0008)	-0.1121*** (0.0016)	0.4591*** (0.0071)	0.0331*** (0.0060)
Control of Corruption, Estimate	0.0169*** (0.000)	0.0180*** (0.0003)	0.0470*** (0.0007)	-0.0834*** (0.0014)	0.4509*** (0.0060)	0.3016*** (0.0062)
Ownership = 1 (POEs)	0.0584*** (0.0009)	0.0372*** (0.0004)	0.1019*** (0.0008)	-0.1520*** (0.0015)	0.8261*** (0.0066)	0.3741*** (0.0076)
Ownership = 1 (POEs) x Governance	-0.0188*** (0.000)	-0.0167*** (0.0003)	-0.0531*** (0.0007)	0.1194*** (0.0013)	-0.2630*** (0.0057)	-0.0973*** (0.0060)
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.6755*** (0.005)	-0.3551*** (0.0024)	-0.4770*** (0.0047)	0.4763*** (0.0089)	-12.4869*** (0.0400)	-14.8943*** (0.0372)
Observations	4,105,002	4,028,716	4,012,733	3,553,519	4,064,628	2,456,261
R ²	0.1205	0.2592	0.0869	0.1039	0.6060	0.6178
Number of firms	858,898.0	852,622	846,953	717,396	855,377	498,605

Note: Standard-errors in parentheses. Weighted least squares are used to correct for heteroskedasticity. *** p<0.01, **p<0.05, *p<0.1. The time dimension ranges from 1999 to 2017. Productivity and value added per capita are in logarithms.

Online Annex 3.5. Ghana: Risks in SOEs Can Spillover to Other Sectors and the Budget

This case study provides an example of how financial vulnerabilities in state-owned enterprises can negatively impact the banks' balance sheets, the government budget, and competitiveness. Following an external shock in 2013–14, realization of these vulnerabilities has added 4 percent of GDP to government debt.

Ghana's state-owned energy companies are critical to Ghana's economy. The central government owns wholly or partially 86 enterprises (Online Annex Table 3.5.1) whose liabilities were equivalent to at least 20 percent of GDP in 2017. Energy sector SOEs are dominant. The energy firms account for 60–70 percent of the reported assets and liabilities of wholly-owned state enterprises in the 2017 State Ownership Report (Government of Ghana 2017). In the power sector, two SOEs distribute 99 percent of electricity and one SOE (Gridco) is responsible for all power transmission.

In 2019, the state-owned Volta River Authority (VRA) accounted for 43 percent of dependable power generation capacity and independent power producers the rest.

Ghana's energy sector SOEs are highly vulnerable to external shocks. Efficiency and cash flow problems have plagued the power sector SOEs since at least the early 2000s (IMF 2005; Chivakul and York 2006). The core power SOEs (the electricity distribution company (ECG), Gridco and VRA) have generated a negative average return on equity since 2014 and have accumulated arrears as a result. In 2018, SOE arrears in the energy sector reached US\$2.7 billion (4 percent of GDP), most of which were cross-arrears among public sector entities. Arrears also include US\$800 million owed to private fuel suppliers and independent power plants (IPPs). Absent reforms, the total financing shortfall from 2019–23 for energy SOEs, could reach US\$12.5 billion (about 20 percent of 2019 GDP) (IMF 2019a).

Energy SOE vulnerabilities stem from structural and governance issues. As the government noted in its 2017 State Ownership Report (Government of Ghana 2018), the problems reflect multiple and often conflicting objectives, lack of a clear framework for oversight of the SOE sector, ineffective SOE boards and management, inappropriate political interference in day-to-day decision making, and low levels of transparency and disclosure. (See Box 3 in IMF (2019) for a summary of the factors behind the energy SOE financial difficulties.)

SOE vulnerabilities and inefficiencies have impacted bank balance sheets and competitiveness. Starting in 2013–14, a steep loss in value of the Ghana cedi, higher crude oil prices, and a drought-induced shift away

Online Annex Table 3.5.1. Ghana: Central Government-Owned Enterprises
(Number)

Type		Sector	
Total	86	Total	86
Wholly state owned	45	Infrastructure	14
Commercial	36	Communication	8
Limited liability companies	26	Manufacturing	8
Statutory corporations	10	Financial	16
Subvented agencies	9	Agriculture	16
Partially state-owned	41	Energy	8
o/w mining companies	10	Water	1
o/w publicly traded	8	Unspecified	15

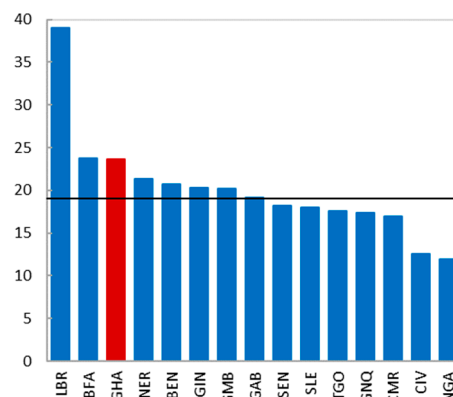
Source: 2017 State Ownership Report; IMF staff calculations.

from low-cost hydro to higher-cost thermal electricity generation aggravated existing cash flow difficulties for energy SOEs. To cover cash shortfalls, the SOEs borrowed working capital from banks and delayed payments to fuel suppliers, both state-owned and private ones. Eventually, a quarter of energy sector bank loans became non-performing. In addition, arrears to state-owned fuel suppliers led them to accumulate arrears to the government. Moreover, gas fuel supply problems led to temporary power outages and the contracting of emergency power purchase agreements (PPAs) with high charges (Online Annex Figure 3.5.2). The high cost of emergency PPAs, plus the uncoordinated contracting of further PPAs and the general inefficiency of some energy SOEs, contributes to Ghana's relatively high electricity costs compared to regional competitors which undermines competitiveness and job creation (Online Annex Figure 3.5.1).

The government has sought to contain the financial hemorrhaging of energy SOEs. In 2016, the government introduced a levy on end-consumer fuel purchases. Initially, the levy proceeds were paid directly to energy SOE creditors to reduce outstanding SOE debt. However, in 2017 the government assigned the levies to a government-sponsored entity (ESLA) to facilitate the restructuring of the energy SOE bank and supplier debt into long-term bonds.¹ In 2019, the central government budget also covered \$1 billion of the energy SOE cash shortfall.

The impact on Ghana's public sector balance sheet has been significant. Government debt has risen at least 4 percent of GDP since 2016 with the realization of fiscal risks from energy SOEs. In 2020, IMF staff anticipates the central government will cover another 1 percent of GDP of the SOEs' projected financial shortfall (IMF 2019a). More broadly, the liabilities of state-owned enterprises are significant at about 50 percent of GDP on a gross basis (Agou and Ralyea 2019), compared to a central government debt stock (excluding ESLA bonds) of

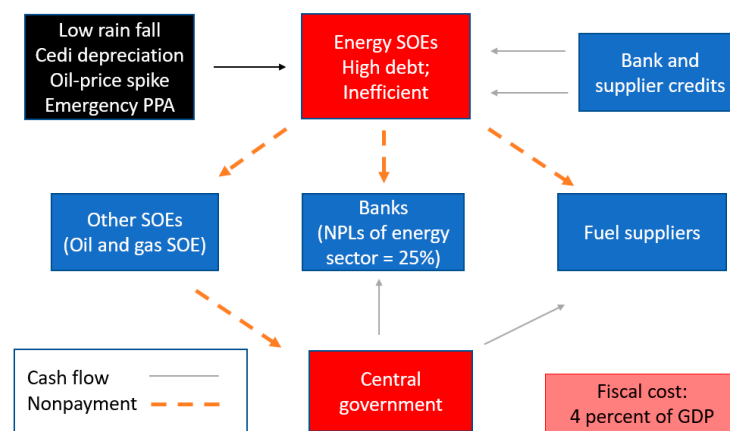
Online Annex Figure 3.5.1.
Electricity Prices in West Africa
(US cents per kWh, 2018)



Sources: World Bank doing business database and IMF staff calculations.

Note: A monthly electricity consumption is assumed, for which a bill is then computed for a warehouse based in the largest business city of the economy for the month of March.

Online Annex Figure 3.5.2. Spillover of SOE Vulnerabilities



Source: IMF staff

Note: The fiscal cost is composed of the following items: allocations from levies on fuel products (ESLA levies) to pay energy SOE debt of 0.5 percent of GDP in 2016 and 2017; issuance of ESLA bonds backed by ESLA levies (1.7 percent of GDP) in 2017–19; and further budget support of 1.5 percent of GDP in 2019. PPA = Power Purchase Agreement

¹ ESLA plc issues long-term bonds (7 and 10-year tenure), which are backed by revenue from ESLA levies. The proceeds from the bonds are used to pay down the debts of the power utilities and the state-owned oil refinery.

about 62 percent of GDP at end-2019.

The authorities are taking further steps to move the energy sector toward financial health. In addition to recent increases in electricity tariffs, the authorities have developed a multiyear Energy Sector Recovery Program (ESRP) with assistance from the World Bank. The ESRP contains a series of measures to be implemented over the next five years which would bring greater balance between Ghana's power and gas supply and demand. It also addresses structural issues in the sector that have undermined SOE financial performance.

The authorities are also making efforts to improve oversight and transparency of the SOE sector more generally. A June 2019 law, the State Interests and Governance Authority Act, creates an entity to oversee, administer, and improve corporate governance in public corporations (SOEs). The law complements the new Public Financial Management law and regulations that contain provisions for financial disclosure by SOEs, though compliance needs to improve (Government of Ghana 2018). An upgrade in transparency and disclosure of SOE financial performance, including all the major energy SOEs, began in 2016 with the initial publication of an aggregate SOE report.

Online Annex 3.6. The Impact of SOE Reforms

This annex provides details on data sources and empirical methodologies used in this chapter regarding the impact of SOE reforms. It also includes a summary of the results of the analysis.

Data Sources and Definitions

Only majority ownership SOEs (with public ownership above 50 percent) are used in this analysis. State-owned enterprise (SOE) reforms are proxied by measures implemented according to conditionality under IMF-supported programs. Implemented reforms are reforms that have been fully met, met with delay, or partially met. Reforms that were not met, or where the program ended before the reform was met have been excluded.¹ Included are reforms with the status of either quantitative performance criteria (QPCs) or structural benchmarks (SBs) as part of the programs. QPCs are used primarily for financial target setting, such as specific profit goals or reductions in employment costs and debt. Structural benchmarks include a broader set of reforms. The main categories are:

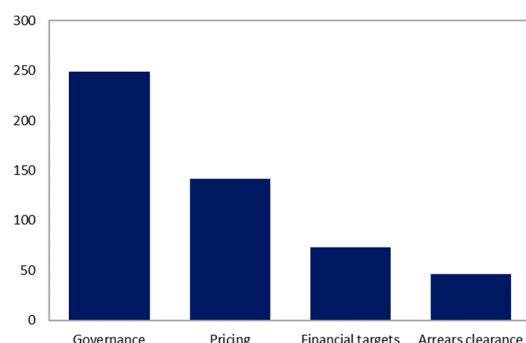
- **Governance:** these span a wide array of reforms related to monitoring, auditing, or management of SOEs, structural reforms that apply to the sector as a whole (if they are governance-related), and others. Examples include: “Set up an oversight institutional and reporting framework for SOEs”, “Collect data on the debt of state-owned enterprises and adopt a monitoring mechanism”, “Completion of independent audits” for specific firms, and “Preparation of strategic action plans for key SOEs”.
- **Pricing:** Public enterprise pricing primarily concerns SOEs in the electricity, gas, oil, heating and water sectors. Tariff changes and automatic fuel price mechanisms are common and are included as SOE reforms if the underlying motivation is the health of SOEs. Examples include: “Implement an electricity tariff increase”, and “Reinstatement of automatic bi-weekly price adjustments for petroleum products”.
- **Financial targets:** These include the QPC and SBs if the objective of the conditionality is to achieve a specific financial goal without specifying the precise reforms needed to achieve them. Examples include: “Take measures to reduce the quasi-fiscal losses of state-owned electricity company to x percent of GDP”, and “Eliminate central government transfers to firm x”. Given these SBs have been met, it is likely that the SOE has undertaken reforms. Compared to governance and pricing reforms, accompanying efforts to reach financial targets could be of shorter-term nature, especially if the targets are set as a one-off.
- **Arrears clearance:** Clearance of arrears to SOEs improves the SOEs liquidity situation. Arrears clearance by SOEs to the private or public sector usually benefits the economy, the public sector budget, or triggers reforms that will show results in the longer-term. However, a short- to medium-term impact might not be visible. Examples include: “Verify claims of government and firm x on each other and draw up a timetable for settlement of net claims” and “Establish a timetable for the reduction of outstanding arrears to the water and electricity company”.

We identify a total of 621 SOE reforms, which cover 172 out of 240 IMF programs (86 out of 97 program countries) between 2002 and 2017. Of those, 110 are reforms related to state-owned banks and the other 511 related to non-financial SOEs. About half of the non-financial reforms cover SOE governance, followed by pricing and financial target setting (Online Annex Figure 3.6.1). Most of the

¹ An extended analysis that includes reforms that were unsuccessful (“not met”) can be found in Baum and others (2019).

reforms are in the utilities sector, followed by mining and reforms that are not sector specific (Online Annex Figure 3.6.2). The latter include reforms that did not pertain to any specific sector, but often target SOE governance structures as a whole (such as transparency requirements, public management laws, or sectoral monitoring arrangements).

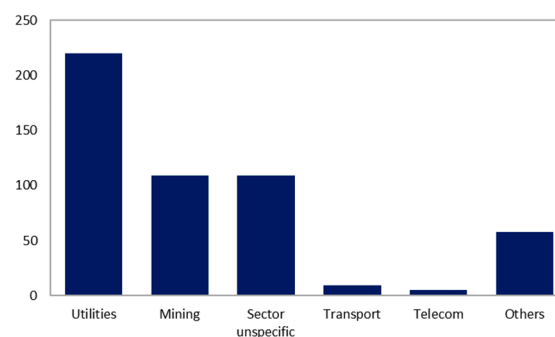
Online Annex Figure 3.6.1. Number of SOE Reforms, by Type (2002–17)



Source: IMF programs.

Notes: Reforms are collected based on IMF program conditionality.

Online Annex Figure 3.6.2. Number of SOE Reforms, by Sector (2002–17)



Source: IMF programs.

Notes: Reforms are collected based on IMF program conditionality. "Sector Unspecific" includes reforms that did not pertain to any specific sector. "Others" covers SOEs operating in agriculture, insurance, mail services, tourism, health, chemicals, construction, and others.

Non-financial SOE reforms and SOE financial data in ORBIS and National Oil Company (NOC) databases (and Authorities' Annual Reports on SOEs for a few countries) overlap for 35 countries, of which 14 are low-income, 17 emerging, and 4 advanced economies.² These allow to study the impact of the reforms on the performance of SOEs.

Methodology and Results

This annex follows a similar two-step regression approach as in Online Annex 3.4. One challenge is that the timing of the reforms cannot precisely be identified, as the conditionality is met at some point during the IMF program, or reforms are continuous (such as financial target setting and pricing reforms). In addition, firms and governments may begin to work towards reforms during the program negotiation and reform preparation stage. Finally, on average only 7 years are available for each firm. These constraints, together with other data limitations, make a specific year-on-year impact, for example by employing event studies or impulse response function analysis difficult. The alternative is to study the average impact of SOE-related reforms on performance over the sample period.

In the first step, the change in performance (first difference) is regressed on time-varying factors that drive changes in the performance of firms, including both SOE financial and macroeconomic variables. Given that the reforms (IMF program conditionality) are expected to lead to improvements, the above analysis is done in first differences rather than in levels. A firm-specific fixed effect is included. This allows capturing the average change in performance that reflects changes due to a reform or other slow

² LIDCs: Bangladesh, Cote d'Ivoire, Cameroon, Chad, Congo, Democratic Republic of Congo, Ethiopia, Ghana, Kenya, Liberia, Moldova, Mozambique, Nigeria, and Tanzania. EMs: Angola, Argentina, Bulgaria, Bosnia and Herzegovina, Croatia, Ecuador, Egypt, Gabon, Hungary, Iraq, Jamaica, Pakistan, Romania, Serbia, Suriname, Tunisia, and Ukraine. AEs: Cyprus, Greece, Latvia, and Portugal.

moving or constant variables. In order to isolate the impact of SOE reforms, a variety of additional economic variables are added, including GDP growth, the share of oil in exports, terms of trade, the exchange rate, public investment growth, inflation, and the unemployment rate.³

In the second step, the firm-specific fixed effects are regressed on the adoption of reforms and other controls using the between estimator. The hypothesis to test is if in the sample period countries or firms that have on average undertaken more SOE-related reforms have a higher firm-specific effect; i.e., higher changes/improvements on average. In particular, firm-specific fixed effects are likely smaller for cases without reforms than in countries with reforms, especially as the quality of institutions tends to be slow changing. The between estimator thus answers the question “did SOEs in countries with more reforms have a stronger improvement than SOEs in countries without reforms?” The estimation is done over the entire history of the SOE and can be interpreted as the effect of governance reforms on the improvement in SOE performance over time.

The following additional controls are added to the second stage estimation: The World Bank’s Doing Business Indicator, GDP per capita (both in first differences), sectoral dummies, an IMF program dummy that captures the impact of all other non-SOE related reforms on the SOE, and a dummy for former Soviet countries, as in these countries SOE reforms usually went hand in hand with other structural economic changes, including rapid privatization. In addition, we add the level first observation of each dependent variable per firm. For example, firms with low productivity could see overall higher productivity changes in the following years than already highly productive firms.

Online Annex Tables 3.6.1 and 3.6.2 present the first and second stage results for ROE, profits, productivity and costs. Online Annex Table 3.6.2 finds that SOE reforms on governance, pricing, and financial targets affect all main performance indicators positively on average. These reforms have a statistically significant impact on utilities, transportation, manufacturing and construction. Results on communication are somewhat mixed. Governance reforms and financial target setting have no significant impact on the mining sector. This could reflect higher volatility in financial performance due to oil price dependence, and corruption may be more difficult to fight due to high economic rents in the sector. The impact of arrears clearance is mixed, with some financials worsening in SOEs following its implementation.

³ Additional country-level controls have been tested for but did not change the results, including the public debt to GDP ratio, as well as its change to control for fiscal space and volatility.

Online Annex Table 3.6.1. First-Stage Estimation Results—SOE Reforms

		Δ ROE	Δ Profits	Δ Cost of employees	Δ Productivity
Country-level variables	GDP growth	-0.0502** (0.0196)	0.0551 (0.0505)	0.0910*** (0.0260)	-0.1508* (0.0786)
	Δ share of oil in exports	-0.1196* (0.0696)	0.2036 (0.1201)	-0.0001 (0.0814)	0.1074 (0.0917)
	Terms of trade (percentage change)	0.0005*** (0.0002)	0.0008*** (0.0003)	0.0002 (0.0002)	0.0003 (0.0003)
	Δ exchange rate (national currency per PPP dollar)	-0.0016 (0.0017)	-0.0051 (0.0032)	-0.0030 (0.0044)	0.0004 (0.0016)
	Public investment growth	0.0015 (0.0010)	0.0027 (0.0043)	-0.0032 (0.0023)	0.0033** (0.0014)
	Δ inflation, period average	0.0326*** (0.0046)	0.0810*** (0.0074)	0.0141 (0.0130)	0.0150** (0.0061)
	Change in the unemployment rate	-0.0001 (0.0007)	0.0019 (0.0011)	0.0006 (0.0007)	-0.0007 (0.0007)
Firm-specific variables	Total firm employment	-0.0088*** (0.0025)	-0.0038 (0.0029)		
	Sales	0.0155*** (0.0009)	0.0218*** (0.0025)		
	Liquidity: current ratio	-0.0002*** (0.0001)	-0.0006** (0.0002)	-0.0001 (0.0001)	-0.0001 (0.0001)
	(Shareholders' funds / Total assets) * 100	0.0001 (0.0001)	-0.0001 (0.0002)	0.0002** (0.0001)	-0.0001* (0.0000)
	Total assets				0.0012 (0.0011)
	Constant	0.0135** (0.0055)	-0.0040 (0.0062)	0.0099 (0.0103)	0.0145** (0.0064)
	Observations	80,464	78,896	63,888	80,039
	R ²	0.0060	0.0040	0.0054	0.0253
	Number of SOEs	10,136	9,939	8,556	10,072

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Time dummies are included.

Online Annex Table 3.6.2. Second Stage Estimation Results–SOE Reforms

	Governance Reforms				Pricing Reforms				Financial Targets				Arrears Clearance			
	Δ ROE	Δ Profits	Δ Cost of employees	Δ Productivity	Δ ROE	Δ Profits	Δ Cost of employees	Δ Productivity	Δ ROE	Δ Profits	Δ Cost of employees	Δ Productivity	Δ ROE	Δ Profits	Δ Cost of employees	Δ Productivity
ROE in T0	-0.1173*** (0.0028)				-0.1177*** (0.0028)				-0.1169*** (0.0028)				-0.1169*** (0.0028)			
Profits in T0		-0.0981*** (0.0021)				-0.0979*** (0.0021)				-0.0980*** (0.0021)				-0.0978*** (0.0021)		
Cost in T0			-0.0587*** (0.0020)				-0.0600*** (0.0020)				-0.0576*** (0.0020)				-0.0568*** (0.0020)	
Productivity in T0				-0.0394*** (0.0013)				-0.0393*** (0.0013)				-0.0396*** (0.0013)				-0.0398*** (0.0013)
GDP per capita growth	0.1355*** (0.0198)	-0.0717 (0.0473)	-0.0439** (0.0210)	0.0222* (0.0124)	0.2204*** (0.0236)	0.0418 (0.0563)	-0.1301*** (0.0274)	0.0637*** (0.0149)	-0.1370*** (0.0188)	-0.0079 (0.0449)	0.0021 (0.0201)	0.0021 (0.0117)	0.1104*** (0.0186)	-0.1554*** (0.0444)	0.0067 (0.0199)	-0.0011 (0.0116)
Change in doing business indicator	0.1064*** (0.0276)	0.2928*** (0.0657)	-0.1895*** (0.0305)	0.0073 (0.0166)	0.0403 (0.0290)	0.1932*** (0.0690)	-0.1420*** (0.0313)	-0.0377** (0.0175)	0.1192*** (0.0277)	0.3284*** (0.0661)	-0.2057*** (0.0307)	0.0159 (0.0168)	0.1157*** (0.0277)	0.2947*** (0.0661)	-0.1860*** (0.0308)	0.0058 (0.0168)
Former Soviet Union dummy	-0.0197*** (0.0012)	-0.0319*** (0.0028)	0.0118*** (0.0011)	-0.0033*** (0.0007)	-0.0290*** (0.0017)	-0.0455*** (0.0042)	0.0191*** (0.0017)	-0.0085*** (0.0010)	-0.0188*** (0.0011)	-0.0294*** (0.0027)	0.0107*** (0.0011)	-0.0024*** (0.0007)	-0.0167*** (0.0012)	-0.0265*** (0.0029)	0.0120*** (0.0012)	-0.0027*** (0.0007)
IMF program	-0.0012 (0.0017)	-0.0015 (0.0041)	0.0130*** (0.0019)	-0.0094*** (0.0011)	-0.0029* (0.0017)	-0.0025 (0.0041)	0.0135*** (0.0019)	-0.0095*** (0.0011)	-0.0011 (0.0018)	-0.0010 (0.0042)	0.0121*** (0.0019)	-0.0088*** (0.0011)	-0.0016 (0.0018)	0.0010 (0.0043)	0.0069*** (0.0019)	-0.0065*** (0.0011)
Mining * # of reforms by type	-0.0028 (0.0119)	0.0284 (0.0295)	0.0028 (0.0129)	0.0111 (0.0074)	0.0133** (0.0062)	0.0204 (0.0150)	-0.0150** (0.0070)	0.0115*** (0.0039)	-0.0215 (0.0469)	0.1206 (0.1159)	-0.1169** (0.0556)	0.0291 (0.0288)	-0.5536* (0.3208)	-0.3271 (0.7614)	0.4903* (0.2978)	-0.0100 (0.1931)
Utilities * # of reforms by type	0.0043** (0.0021)	0.0118** (0.0051)	-0.0130*** (0.0031)	0.0068*** (0.0013)	0.0149*** (0.0021)	0.0239*** (0.0050)	-0.0097*** (0.0026)	0.0095*** (0.0013)	0.0100 (0.0079)	0.0181 (0.0189)	-0.0356*** (0.0118)	0.0135*** (0.0047)	0.0910*** (0.0257)	0.1142* (0.0611)	0.0406* (0.0243)	-0.0409*** (0.0156)
Transportation * # of reforms by type	0.0252*** (0.0054)	0.0435*** (0.0129)	-0.0268*** (0.0059)	0.0139*** (0.0032)	0.0256*** (0.0031)	0.0301*** (0.0075)	-0.0250*** (0.0034)	0.0137*** (0.0019)	0.0676*** (0.0196)	0.1381*** (0.0470)	-0.0680*** (0.0199)	0.0330*** (0.0120)	0.0871 (0.0608)	0.1179 (0.1444)	-0.0335 (0.0565)	-0.0051 (0.0381)
Manufacturing * # of reforms by type	0.0135*** (0.0037)	0.0492*** (0.0090)	-0.0169*** (0.0040)	0.0039* (0.0022)	0.0200*** (0.0028)	0.0407*** (0.0067)	-0.0244*** (0.0029)	0.0078*** (0.0017)	0.0318** (0.0130)	0.1434*** (0.0309)	-0.0310** (0.0145)	0.0041 (0.0079)	0.0745 (0.0624)	0.0809 (0.1481)	0.1040* (0.0578)	-0.0307 (0.0375)
Communication * # of reforms by type	0.0005 (0.0047)	0.0081 (0.0111)	-0.0276*** (0.0093)	0.0115*** (0.0027)	0.0081** (0.0033)	0.0119 (0.0078)	-0.0262*** (0.0045)	0.0139*** (0.0019)	-0.0092 (0.0181)	-0.0341 (0.0434)	-0.0978*** (0.0375)	0.0278*** (0.0107)	0.1220 (0.0757)	-0.1229 (0.1872)	-0.1835** (0.0819)	0.0089 (0.0449)
Construction * # of reforms by type	0.0110** (0.0043)	0.0194* (0.0105)	-0.0275*** (0.0060)	0.0104*** (0.0026)	0.0170*** (0.0029)	0.0257*** (0.0070)	-0.0190*** (0.0035)	0.0117*** (0.0017)	0.0501*** (0.0154)	0.0698* (0.0366)	-0.0511*** (0.0186)	0.0222** (0.0093)	0.0083 (0.0464)	0.0999 (0.1135)	0.1710*** (0.0439)	-0.0245 (0.0279)
Constant	0.0030*** (0.0010)	0.0127*** (0.0024)	0.0131*** (0.0011)	0.0083*** (0.0008)	0.0008 (0.0011)	0.0095*** (0.0025)	0.0145*** (0.0012)	0.0075*** (0.0008)	0.0035*** (0.0010)	0.0143*** (0.0023)	0.0122*** (0.0011)	0.0089*** (0.0007)	0.0030*** (0.0010)	0.0141*** (0.0023)	0.0116*** (0.0011)	0.0092*** (0.0007)
Observations	63,633	62,571	48,471	63,284	63,633	62,571	48,471	63,284	63,633	62,571	48,471	63,284	63,633	62,571	48,471	63,284
R ²	0.2431	0.2145	0.1216	0.1090	0.2475	0.2148	0.1271	0.1124	0.2424	0.2140	0.1182	0.1055	0.2418	0.2115	0.1169	0.1038
Number of firms	8,911	8,742	7,331	8,845	8,911	8,742	7,331	8,845	8,911	8,742	7,331	8,845	8,911	8,742	7,331	8,845

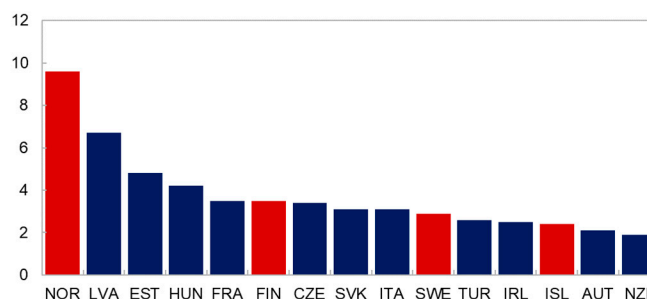
Notes: The dependent variables are firm-specific fixed effects from the first stage regression. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Sector dummies are included. "T0" is the first observation of each variable (in levels) for a firm. Blue highlighted cells indicate significantly positive reform outcomes. Red highlighted cells indicate significantly negative reform outcomes.

Online Annex 3.7. How to Get the Most Out of SOEs: The Nordic Example

Nordic national SOEs are important actors in their economies (Online Annex Figure 3.7.1).¹ SOEs are for example active in the utilities, transportation, and communication sectors. However, they also include opera houses and alcohol retailing monopolies. Nordic SOEs tend to be more profitable and efficient compared to their peers in similar industries in other advanced economies (Online Annex Figure 3.7.2). Several common factors contribute to their relatively good performance:

- *Clarity on ownership objectives* is critical to ensure accountability. All of the Nordic states specify their objectives and review their framework, including the rationale for ownership or changes in ownership policy, on a regular basis (Finansministeriet 2018 and OECD, 2018a). All have renewed their ownership policies in recent years (2014–17).²
- *Ownership in Sweden and Finland is generally³ centralized in one entity within the government* to ensure consistency and concentration of expertise. Keeping the ownership function separate from other policy functions, such as regulation, reduces the risk of conflict of interests. In Sweden, the centralized unit is in the Ministry of Enterprise and Innovation. In Finland, ownership is centralized in the Prime Minister's office.
- *Professional and empowered SOE boards.* Government representation on SOE boards is limited, reducing the likelihood of inappropriate political intervention. Denmark and Norway do not have state representatives on the SOE boards (OECD 2018a). In Sweden only the government employees responsible for the company are allowed on boards. In Finland, up to two state representatives can be on an SOE's board. Board authority to appoint and remove the CEO (as is the case in the Nordic states), further reduces the scope of government interference in operations.
- *Financial targets for effective governance of the commercial SOEs.* All Nordic countries generally set targets for the financing structure and return of the commercial SOEs. For Swedish SOEs the cost of capital is set as the return one could get from an alternative investment with the same risk and duration and is used as the floor for the profitability target. When assessing the companies' value creation, Norway specifies that the return targets provide a basis for the discussion and that this assessment must also take into account ongoing financial performance and the performance of other comparable companies.

Online Annex Figure 3.7.1. SOE Employees as a Percentage of Non-Agricultural Employees: OECD Top 15
(Percent, end-2015)



Source: OECD (2017).

Note: The statistics cover SOEs under the control of the central level of government and do not include minority-owned companies.

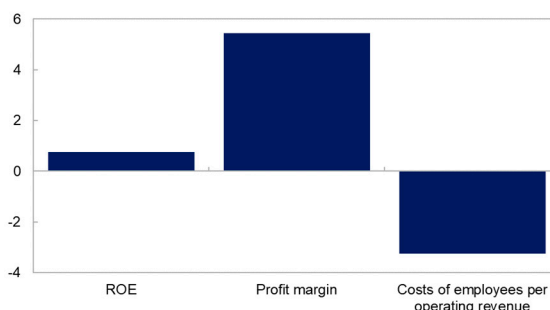
¹ In this box we focus on Denmark, Finland, Norway and Sweden.

² The recent ownership policies include: Statens ejerskabspolitik 2015 in Denmark, Government Resolution on State Ownership Policy (13 May 2016) in Finland, Diverse and value creating ownership, Meld. St. 27 (2013–14) Report to the Storting (white paper) in Norway and The state's ownership policy and guidelines for state-owned enterprises 2017 in Sweden.

³ In both countries ownership of companies with special policy objectives can also be found in other ministries.

- Consistency between financial and policy targets.* For the Swedish SOEs with public policy assignments, one of the purposes of setting targets is to clarify the associated cost. As policy targets and financial targets are mutually dependent these are normally prepared in unison, which allows one to weigh the ambition of the public policy targets against the cost in terms of financial return. When economic objectives are established for Finnish SOEs due consideration is also given to the costs associated with their special assignments. For the Norwegian SOEs with sectoral policy objectives return targets are not generally set; the goal is to fulfill the objectives and operate efficiently. For instance, for Norwegian Bane NOR (railway), one of the most important performance indicators is punctuality of trains. Operational efficiency is reviewed as part of the ownership dialogue.

Online Annex Figure 3.7.2. Performance of Nordic SOEs as Compared to Other SOEs in Advanced Economies
(Percentage point difference)



Sources: ORBIS, and IMF staff estimates.

Note: Return on equity, ROE, is estimated using net income. Profit margin corresponds to operating profit to sales revenue. The shown coefficients measure the impact of the SOE being Nordic as compared with being from another advanced economy. Regressions include controls for sector. Sample period is 1999–2017.

- Achieving balance in government and SOE management interactions.* One of the challenges of owning a SOE is striking the right balance between effective oversight and limiting political interference. In Sweden and Norway, the state uses the owner dialogue—regular meetings between the owner and the company—to track financial and public policy targets. The Norwegian ownership policy clarifies that opinions conveyed by the state during these meetings are suggestions and the board makes the decisions. The Danish ownership policy also qualifies that government communication with company management must not imply that the minister de facto leads the corporation. Rather, the dialogue should contribute to aligning expectations between the owner and the company.
- Transparency towards the owner and citizens.* Transparency can strengthen public confidence in state ownership. All Nordic states publish an annual aggregate report on SOEs. These include, for example, reporting on individual SOEs, to which extent policy targets were reached, financial performance, and significant events. In Norway the report also features a list summarizing all the public procurements/subsidies from the state to each SOE with sectoral policy objectives.
- Aligning executives' incentives with the state.* For Swedish SOEs, senior executives do not receive bonuses, whereas the board may offer bonuses in Finland, Denmark, and Norway. The latter three stress that beneficiaries must be able to influence goal attainment through their activities. For both Finland and Norway, the guidelines stipulate that the variable salary should not exceed a maximum percentage of the fixed salary. For the Danish SOEs, share-based remuneration should be linked to realized results over multiple years, to discourage short term behavior.
- Controlling corruption.* Norway's and Sweden's ownership policies set clear expectations regarding integrity and anti-corruption procedures. In Sweden, SOEs are required to behave in a manner that promotes public confidence and should work towards high standards of business ethics and actively prevent corruption. In Norway, companies are expected to establish procedures to prevent corruption. SOEs are also expected to avoid activities that could lead to the perception of corruption. These efforts do not fully eliminate corruption vulnerabilities. For example, in 2017 Swedish Telia reached a global settlement with authorities to pay \$965 million for making bribes involving operations in Uzbekistan (Telia 2017).