

# QUANTIFYING THE ROLE OF STATE ENTERPRISES IN INDUSTRIAL SUBSIDIES

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## Quantifying the Role of State Enterprises in Industrial Subsidies

The growing participation of state enterprises in industrial supply chains raises concerns over the implications for global markets of the subsidies that some of these companies receive. New firm-level evidence from the OECD MAGIC database shows that state enterprises are relatively larger recipients of industrial subsidies than their private competitors. They can also benefit from indirect government support, such as favourable treatment under competition rules and government procurement. Despite these advantages, evidence indicates that state enterprises in manufacturing tend to underperform financially. The report provides unprecedented evidence about the role certain state enterprises play as providers of subsidies, such as when providing financing and inputs to other firms at below-market prices. The analysis concludes by describing the implications of these findings for trade rules and the governance of state-owned enterprises.

**Key words:** State-owned enterprises; bank loans; level playing field; market distortions; competition

**JEL codes:** F13, F23, H25, H81, O25

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## Acronyms

AML	Anti-Monopoly Law
BCBS	Basel Committee on Banking Supervision
BMB	below-market borrowings
CBIRC	China Banking and Insurance Regulatory Commission
EBIT	Earnings before interest and taxes
FTZ	Free Trade Zone
GCC	Gulf Cooperation Council
GFSEC	Global Forum on Steel Excess Capacity
GGF	Government guidance fund
IEA	International Energy Agency
ITT	International technology transfers
JV	Joint venture
MAGIC	Manufacturing Groups and Industrial Corporations (database)
MIIT	Ministry of Industry and Information Technology
NDRC	National Development and Reform Commission
NPL	Non-performing loan
PBOC	People's Bank of China
PTA	Preferential Trade Agreement
PV	Photovoltaic
SAMR	State Administration for Market Regulation
SASAC	State-owned Assets Supervision and Administration Commission
SE	State enterprise
SOE	State-owned enterprise

## Executive Summary

Many state enterprises (SEs) have become key actors in global manufacturing, with most industrial sectors featuring one or more SEs in their top 10 companies by revenue. While government ownership is not problematic in and of itself, a growing concern shared by many countries is where government ownership allows SEs to operate with certain advantages, distorting the level playing field with private competitors.

Subsidies, direct and indirect, are one major reason why governments are concerned about the participation of SEs in industrial supply chains. Drawing on the OECD MAGIC database, available evidence for 14 key industrial sectors shows that the subsidies firms receive relative to their revenue tend to increase with the extent of their ownership by the state or state entities. This is particularly the case for government grants and below-market borrowings; corporate-tax concessions seem to benefit all firms more evenly.

Other, more indirect, forms of government intervention in the market may also favour SEs. This includes, among others, the non-neutral application and enforcement of competition rules, with evidence to suggest that SEs may be treated more favourably than private competitors in certain jurisdictions. Other examples of indirect forms of support for which some evidence exists include discriminatory public procurement rules and practices favouring domestic SEs in certain sectors and forced technology transfers benefitting or enabled by SEs.

Despite benefitting from these advantages, data indicate that SEs tend to underperform financially, as assessed by their returns on assets and equity, which often decline with the proportion of company shares held by state entities. This finding is further underscored by the fact that the profitability of a company is itself affected by subsidies, with most forms of support feeding into higher returns through larger profits before tax. Removing subsidies would undoubtedly widen the gap in performance between SEs and private firms.

Crucially, SEs are not just large recipients of subsidies, but can also be providers of support themselves, such as where they provide inputs to other firms at below-market prices. A prominent case is that of below-market borrowings, which usually involves state banks on the provider side, as well as other SEs on the recipient side. Below-market borrowings are particularly prevalent for China-based firms covered in the OECD MAGIC database. Detailed information collected for all top banks in China over the period 2010-22 indicates that corporate loans to the manufacturing sector issued by major state banks have been these banks' largest target sector, while also having one of the largest volumes and ratios of non-performing loans compared with other target sectors. Together with the finding that average lending rates for major state banks in China have been slightly above or below the country's one-year loan benchmark, this supports the view that below-market borrowings are a widespread subsidy instrument in China and highlights the key role of SEs as providers of support.

Alongside the provision of debt on below-market terms, SEs can also be involved in the provision of equity to industrial companies on favourable terms. This form of support is especially hard to quantify but has seen growing use in recent years, notably in the semiconductor industry. A further subsidy instrument involving SEs as providers is the provision of energy inputs on below-market terms, which typically involves state utilities offering electricity or natural gas to manufacturers at below-market prices. Quantification is again difficult in this case, but available evidence for selected industrial sectors shows nonetheless that state energy providers can act as intermediaries between the government and industrial companies, shifting the burden of input costs onto other parts of the supply chain.

These findings have important implications for trade policy and the global trading system more generally. The WTO has to date played a limited role in disciplining the support provided to and by SEs, prompting some governments to incorporate specific disciplines on SEs in their preferential trade agreements. To support the emergence of a consensus at the multilateral level, there is a need for sharing more widely further empirical evidence, as well as the knowledge and experience acquired at the bilateral and plurilateral levels. The involvement of SEs as providers of support calls, in particular, for a rethink of multilateral subsidy rules. Viewing government support as an ecosystem in which support flows in multiple directions and fundamentally reshapes markets poses challenges for approaches based on specific transfers, but may open the way for more comprehensive solutions to the multiple market distortions engendered by support to and through SEs.

## 1. The evolving landscape of state enterprises in industrial supply chains

Enterprises in which the state is a significant investor are playing a considerable role in global supply chains and capital markets. While many of these companies operate in services industries that were previously shielded from competition (e.g. banking, energy & utilities, transport, and telecommunications), several others play leading roles as manufacturers in industrial supply chains and compete internationally through cross-border trade and investment. Of the top 10 companies by revenue in different key industrial sectors covered in the OECD MAGIC database, many have sizable government ownership (Table A B.1).<sup>1</sup> With the exception of glass & ceramics, semiconductors, and solar photovoltaic (PV) panels, all other sectors covered feature one or more companies in the top 10 with at least 25% government investment. State enterprises (Box 1) are thus important actors in manufacturing activities, with their influence extending well beyond historically state-owned natural monopolies.

### Box 1. State enterprises versus state-owned enterprises

Governments can differ in their views of what constitutes a state-owned enterprise (SOE). National definitions abound but reflect at times conflicting assessments as to whether companies ought to be considered state-owned, state-invested, state-controlled, or state-influenced. While recognising these differences, the *OECD Guidelines on Corporate Governance of State-Owned Enterprises*, which were revised in 2024, define SOEs as “any undertaking recognised by national law as an enterprise, and in which the state exercises ownership or control.”<sup>1</sup>

More specifically, the *Guidelines*’ definition of an SOE encompasses:

“[enterprises] that are owned and/or controlled by the state. Ownership comprises direct majority ownership and, provided that control exists, includes other types of direct and indirect ownership. Control can be exercised if an ownership entity (or several ownership entities acting in concert):

- is the ultimate beneficiary owner of the majority of voting rights; or
- otherwise exercises an equivalent degree of control.

[...] Conversely, state influence over corporate decisions exercised via *bona fide* regulation would normally not be considered as control. Undertakings not covered by the above criteria, and in which the government assigns voting rights, held indirectly via asset managers or institutional investors such as pension funds, would also not be considered as SOEs. For the purpose of these Guidelines, undertakings which are owned or controlled by a government for a limited and well-defined duration arising out of bankruptcy, liquidation, conservatorship or receivership, would normally not be considered as SOEs.”

This report follows the definition of the Guidelines but generally refrains from employing the phrase ‘state-owned enterprise’ in light of the different meanings that this phrase can carry in different legal contexts. Instead, the report uses the broader phrase ‘state enterprise’ in accordance with earlier OECD work undertaken for the Trade Committee (Kowalski and Rabaioli, 2017<sup>[1]</sup>), unless the discussion addresses legal definitions of SOEs specifically. As noted in this earlier work (ibid), “[o]wnership, implies certain interests, rights and obligations characteristic to an owner and thus exertion of influence may be more likely. It is also directly observable. Yet, it is also clear that ownership is neither necessary for governments to influence enterprises’ operations, nor does it inevitably entail such influence.” In what

<sup>1</sup> The OECD’s Manufacturing Groups and Industrial Corporations (MAGIC) database is a confidential firm-level database of government support in key industrial sectors covering 14 sectors and more than 450 companies over the period 2005-22 (wherever possible and applicable). See Annex A for a short description of the database. Government ownership is here understood as cumulative ownership by government-related entities, including through indirect horizontal and vertical linkages. Analysis in this report uses 10%, 25%, and 50% as ownership thresholds for categorising companies. These thresholds are for analytical purposes only and do not seek to pass a judgment on the extent of state control over companies.

follows, 'state enterprises' therefore refers to companies that are owned, invested, controlled, or otherwise influenced by the state, although the ensuing empirical analysis is only able to measure companies' ownership by government-related entities.

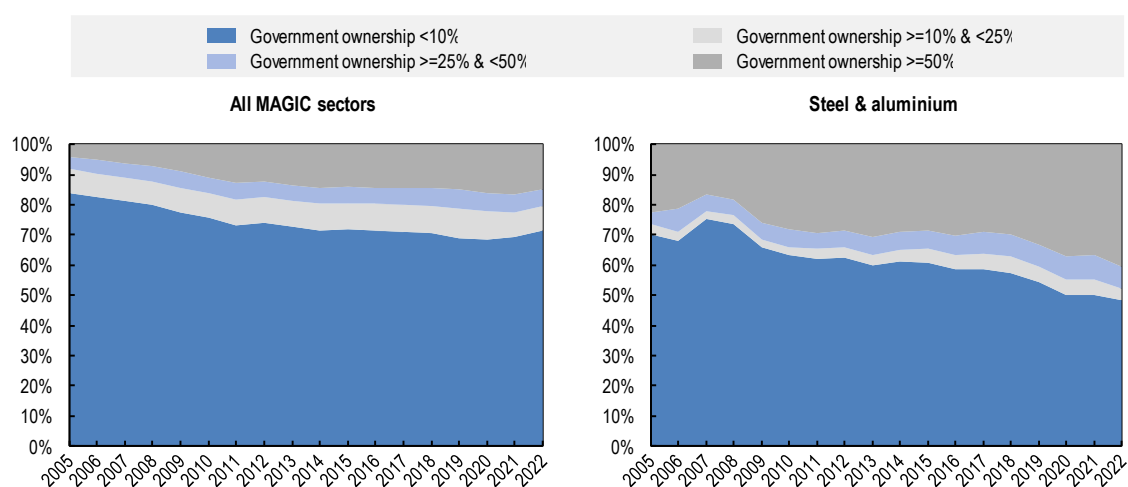
While the percentage of ownership is not the sole factor in considering the extent of government control over companies, large ownership stakes can reveal important linkages between firms and the state. Analysis in this report uses 10% government ownership as its first government ownership threshold because many firms globally have small stakes (e.g. 2%) held by government-related pension funds for portfolio reasons.

1. See <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0414>.

State enterprises (SEs) are important actors in manufacturing and have come to account for a growing share of revenue in the different industrial sectors covered (Figure 1). This mostly reflects a tendency for SEs in the sample to grow faster than their private peers (Figure A B.1), particularly since there have only been a few acquisitions by SEs of hitherto large private firms in the period considered.<sup>2</sup> The growing weight of SEs is especially visible in heavy industries such as steel and aluminium, where firms having 25% or more government ownership generated nearly half of all revenue among sampled firms in 2022. The pace of increase is, however, faster in sectors where SEs were more modest in size back in 2005. This concerns especially aerospace & defence, automobiles, cement, rolling stock & signalling, and semiconductors.

### Figure 1. State enterprises account for a growing share of revenue in industrial sectors

Total sector revenue by firms' government-ownership category



Note: See Annex A for more information on the firm sample.

Source: OECD MAGIC database.

<sup>2</sup> The semiconductor industry is notably one where state entities have increased their equity participation in some hitherto private companies (e.g. SMIC). Other cases involve large state enterprises acquiring foreign private companies, such as ChemChina acquiring the assets of Swiss company Syngenta in 2017. The faster growth of SEs may also reflect the fact that countries having sizable SEs have generally grown faster than others in the period considered.



Government ownership may not be problematic in and of itself. Concerns are increasingly arising, however, where government ownership enables SEs to operate with substantial advantages, thus distorting the level playing field with private competitors. These advantages can include direct and indirect support from government owners, government owners tolerating lower returns on their equity, or granting them more favourable treatment in terms of the wider regulatory environment. Earlier OECD efforts to identify and quantify government support in industrial sectors<sup>3</sup> have also found certain SEs to act as providers of support or policy intermediaries themselves. This can involve state banks offering loans to industrial companies at below-market rates (OECD, 2021<sup>[2]</sup>) or other in-kind or below-market inputs, such as state utilities selling electricity to manufacturing plants at below-cost tariffs (OECD, 2023<sup>[3]</sup>).

Several countries have expressed concerns about the possible trade and competition implications of the growing role of SEs in global supply chains. Most recently, G7 Leaders, in their *Statement on Economic Resilience and Economic Security* of 20 May 2023 in Hiroshima, noted their “renewed concerns about comprehensive strategies to use a range of non-market policies and practices such as pervasive, opaque, and harmful industrial subsidies, *market distortive practices of state owned enterprises*, and all forms of forced technology transfers” (own emphasis).<sup>4</sup> On 8 June 2023, Ministers and high-level representatives of participants to the Global Forum on Steel Excess Capacity stated “that much of the investment in new [steel] capacity, *including by state-owned enterprises*, has the potential to produce significant volumes of steel, thereby worsening the excess capacity problem and raising the risk of a global steel crisis” (own emphasis).<sup>5</sup> Finally, the EU-US Trade and Technology Council Inaugural Joint Statement of 29 September 2021 mentioned the aim of participants to “share information on non-market distortive policies and practices”, notably “market-distorting industrial subsidies, *including support given to and through SOEs*, and all other types of support offered by governments; [...] and *anti-competitive and non-market actions of SOEs*”<sup>6</sup> (own emphasis).

These and similar concerns are also related to the notion of ‘competitive neutrality’, which the OECD defines as a principle according to which all enterprises, public or private, domestic or foreign, face the same set of rules, and where government’s contact, ownership or involvement in the marketplace, in fact or in law, does not confer an undue competitive advantage on any actual or potential market participant. The *OECD Recommendation on Competitive Neutrality*<sup>7</sup>, adopted in May 2021, provides the main principles that governments should follow in order to ensure competitive neutrality is maintained between state-owned and privately-owned enterprises, between different privately-owned enterprises, and between domestic and foreign enterprises. Additionally, the revised *OECD Guidelines on Corporate Governance of State-Owned Enterprises* aim to address, among other things, possible concerns arising from market distortions caused by SOEs and to support the goal of a level playing field in the market.

The present report seeks to help inform these various discussions by offering empirical evidence regarding the support that SEs receive from governments and which they provide to other industrial firms. The findings in this report could help inform efforts in the OECD and elsewhere to craft better rules and standards laying the foundation for a level playing field between SEs and their private peers, and to monitor progress toward that goal.

<sup>3</sup> This refers to firm-level work undertaken for the OECD Trade Committee and summarised in OECD (2023<sup>[5]</sup>). Other OECD projects are also addressing the issue of industrial policy at the country or sector level but do not look specifically into the role of state enterprises (Crisuolo, Lalanne and Díaz, 2022<sup>[59]</sup>) (Mercier and Giua, 2023<sup>[60]</sup>).

<sup>4</sup> See [www.mofa.go.jp/files/100506843.pdf](http://www.mofa.go.jp/files/100506843.pdf) (accessed on 27 June 2023).

<sup>5</sup> See [www.steelforum.org/events/gfsec-ministerial-statement-june-2023.pdf](http://www.steelforum.org/events/gfsec-ministerial-statement-june-2023.pdf) (accessed on 27 June 2023).

<sup>6</sup> See [https://ec.europa.eu/commission/presscorner/detail/en/STATEMENT\\_21\\_4951](https://ec.europa.eu/commission/presscorner/detail/en/STATEMENT_21_4951) (accessed on 22 February 2024).

<sup>7</sup> See <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0462> (accessed on 22 February 2024).

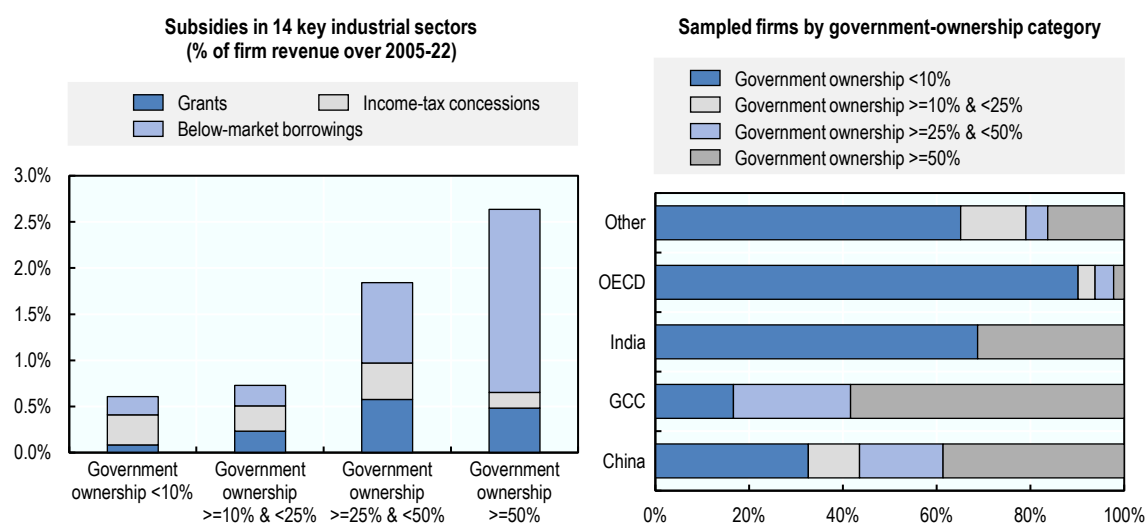
## 2. State enterprises as recipients of industrial subsidies

### 2.1. State enterprises tend to obtain more subsidies than their private peers

Subsidies, direct and indirect, are one major reason why governments are concerned about the participation of SEs in industrial supply chains. To the extent that SEs obtain more support than their private peers, this could constitute an important source of distortions to competitive neutrality, markets, and trade. Subsidies may, for instance, enable recipients to increase their market share by offering lower prices or by acquiring their competitors. They may also allow structurally loss-making companies to evade financial constraints and remain commercially active, which could in turn affect wider market outcomes (e.g. by depressing prices). In a world of global value chains and integrated economies, these possible impacts are unlikely to be confined to any one country and therefore matter for international trade, investment, and the rules that guide them (IMF et al., 2022<sup>[4]</sup>; OECD, 2023<sup>[5]</sup>).

Available evidence for 14 key industrial sectors shows that SEs receive relatively more support than their private competitors. Data drawn from the OECD MAGIC database (Annex A) indicate that the subsidies firms receive relative to their revenue tend to increase with the extent of their ownership by state entities (Figure 2; left) (Box 2). This generally holds true for government grants and for below-market borrowings. In the case of income-tax concessions, firms having between 25% and 50% government ownership appear to obtain the most support, followed by firms having less than 10% government ownership. The lower proportion of tax concessions for firms having 50% or more government ownership is partly due to these firms operating in sectors less targeted by R&D and investment incentives, such as heavy industries. Overall, however, firms having less than 25% government ownership receive relatively less support than other firms covered in this study.

**Figure 2. State enterprises receive relatively more support than their private competitors**



Note: See Annex A for more information on the firm sample.  
Source: OECD MAGIC database.

Government ownership of large industrial firms is not evenly split across jurisdictions, with the People's Republic of China (hereafter "China") and countries of the Gulf Cooperation Council (GCC)<sup>8</sup> possessing relatively more SEs among the sampled firms covered (Figure 2; right). Many governments retain ownership stakes in resource extraction firms or in large services providers in network industries, such as power generation and transmission (e.g. EDF, Hydro Québec, and the Tennessee Valley Authority), air and rail transport (e.g. Air New Zealand, Deutsche Bahn, and the Korea Railroad Corporation), postal services (e.g. Australia Post, Correos de Chile and Japan Post), or telecommunications (e.g. Telenor and

<sup>8</sup> Member countries of the GCC are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates.

Telia). In manufacturing industries, however, large government stakes are less common and concentrated in a few jurisdictions. This explains why the discussion in this report has a relatively large focus on China and GCC countries. It also explains why there is significant overlap between the finding that SEs obtain relatively more support and the finding that firms based in China are relatively large beneficiaries (OECD, 2023<sup>[5]</sup>).

### Box 2. Measuring government ownership of industrial firms

Government ownership of firms should not be approached in a binary fashion but rather as a continuum, ranging from firms with zero government ownership to firms in which governments hold all shares. The extent to which governments own industrial firms is in that sense an empirical question, which requires access to information on the ownership structure of companies. This is the approach taken in this report, where detailed information on large shareholders was collected for each firm covered (Annex A), allowing government ownership to be approached factually and quantitatively.

While it can be relatively easy to distinguish private firms from companies that are directly owned by governments through dedicated government agencies (e.g. the French Agence des participations de l'État or the Chinese State-owned Assets Supervision and Administration Commission [SASAC]), there can be difficult cases where government ownership occurs through indirect horizontal and vertical linkages involving other SEs as owners or chains of shell entities serving as intermediaries between government bodies and the companies they own. This is particularly the case where ownership of a company is split between different government-related entities (including at different levels of government), and where each of them owns enough shares to be deemed a major shareholder but not enough to exercise majority control on their own. It is important in this case to consider the cumulative ownership resulting from the addition of shares owned by different government-related entities.

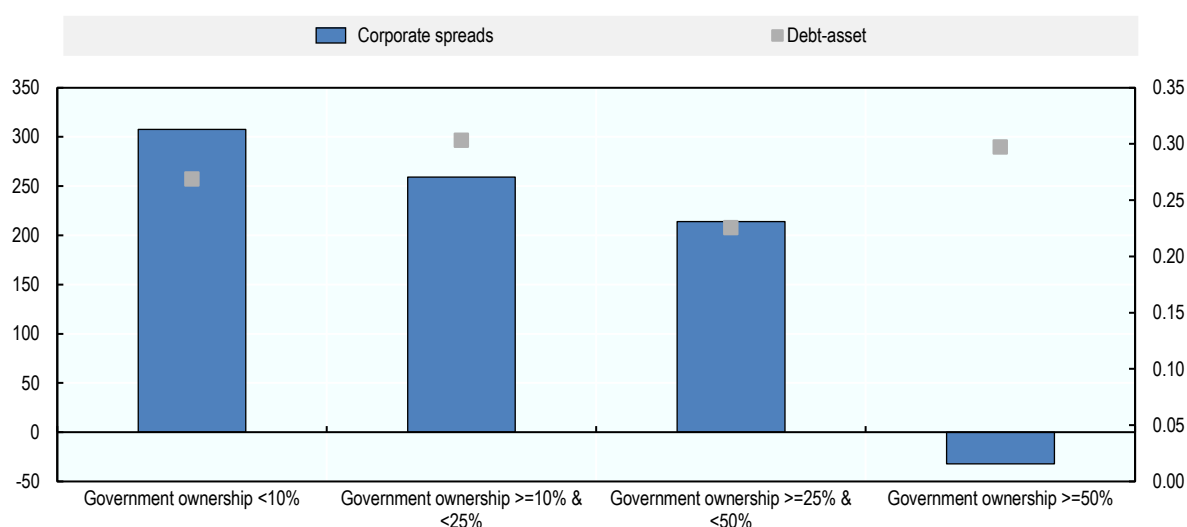
In such situations, lack of transparency about the identity of shareholders and their beneficial owners can hinder understanding of the role of governments in markets, complicate efforts to discipline the behaviour of SEs, and further worsen opacity around the scope and scale of government support. Moreover, while the above only concerns government ownership, it is not the only dimension along which government can exert influence over companies. Additional consideration may need to be given to the composition of boards, the existence of golden shares, or other relevant factors.

SEs tend to face lower risk spreads on their debt, consistent with the fact that they obtain more below-market borrowings (Figure 3). This can be seen by subtracting lending base rates<sup>9</sup> from the average effective rates of interest on borrowings that firms incur. The resulting numbers ought to provide a measure of how debt providers perceive the idiosyncratic risk involved in lending to these companies. There are many reasons for firms to face different spreads (indebtedness, profitability, etc.), as reflected in their credit ratings, but the gap is particularly stark between firms having less than 10% government ownership, for which average spreads reach about 300 basis points, and those having more than 50% government ownership, for which average spreads are negative. Moreover, the higher spreads observed for firms with less than 10% government ownership do not appear to stem from higher levels of outstanding debt on their balance sheets. To the contrary, debt-asset ratios are on average higher for majority state-owned companies. These findings are suggestive of the possible presence of subsidised lending and implicit loan guarantees built on the assumption of government backing for government-owned companies (Box 3).

<sup>9</sup> The lending base rates used in the analysis are weighted averages accounting for the different currencies in which firms borrow. This reflects the fact that base rates can vary a lot across countries and currencies. The base rate for a firm borrowing 60% in USD and 40% in EUR would, for example, be a 60-40 average of the LIBOR (pre-2023) and the EURIBOR, respectively.

**Figure 3. State enterprises face lower risk spreads on their debt**

Left axis: average corporate spreads in basis points; right axis: average debt-asset ratio



Note: The data behind this graph cover the entire period 2005-22. See Annex A for more information on the firm sample.  
Source: OECD MAGIC database.

### Box 3. Implicit loan guarantees benefitting state enterprises: Some examples from credit-rating assessments

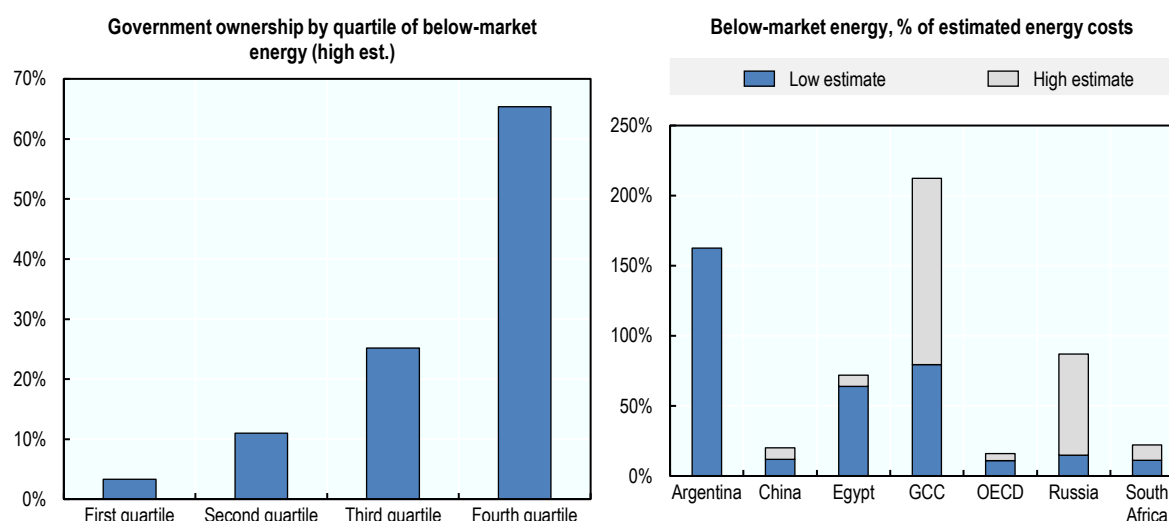
- Fitch Ratings on China Baowu (steel), 20 February 2023:** “We assess Baowu's status, ownership and control as 'Strong' due to the company's high strategic importance to the state. Baowu is fully owned by China's SASAC, which exerts control over the company's board and senior management, and has strong influence over the group's major strategies and investment decisions. [...] We assess Baowu's support record as 'Very Strong', as the state provided significant support during its creation in 2016 with the merger of Baosteel Group Corporation and Wuhan Iron and Steel Group. This helped Baowu quickly deleverage and become China's largest auto-sheet and silicon steel producer, with a market share of 60% and 80%, respectively. [...] Baowu's ratings are equalised with China's sovereign rating under Fitch's [Government-Related Entities] criteria. Its support score is comparable with that of other centrally owned flagship SOEs in other sectors, such as CRRC Corporation Limited (A+/Stable) and Aluminum Corporation of China (A-/Stable). [...] Fitch has raised Baowu's [Standalone Credit Profile] to 'bbb+' from 'bbb', to reflect our expectation that the company will sustain its net leverage below 1.7x from 2023 onwards.”
- Moody's on State Power Investment Corporation (SPIC; power generation & aluminium smelting), 21 July 2020:** “SPIC's A2 issuer rating combines its Baseline Credit Assessment (BCA) of ba2 and a six-notch uplift based on the very high likelihood of support from, and the very high dependence on the Government of China (A1 stable), under Moody's Joint Default Analysis approach for government-related issuers. The six-notch uplift is based on Moody's expectation of a very high likelihood of central government support, based on SPIC's high systemic importance as one of the nation's major electricity suppliers, and its full ownership and direct supervision by the central government, with a strong track record of government support.”
- Moody's on Airbus (aerospace & defence), 9 April 2020:** “Airbus' A2 rating continues to incorporate one notch of uplift from the company's a3 standalone Baseline Credit Assessment (BCA), given the strategic ownership stake of France (11%) and Germany (via a subsidiary of Kreditanstalt für Wiederaufbau - KfW, 11%), in accordance with our Government-Related Issuers (GRI) rating methodology.”

- **Moody's on Hydro (power generation & aluminium smelting), 28 March 2019:** “While Moody's classifies Hydro as a Government Related Issuer in view of its 34.3% ownership by the Norwegian government (Aaa stable), the Baa2 rating does not incorporate any uplift as a result of the government ownership, which reflects Moody's assumption of 'low' governmental support in a distress scenario.”

Source: Fitch Ratings and Moody's.

Earlier OECD work has found that SEs in heavy industries are relatively large recipients of support in the form of energy inputs obtained at below-market prices (OECD, 2023<sup>[3]</sup>). Quantifying the support conferred through below-market energy inputs is particularly hard, time-consuming, and data-demanding due to lack of transparency over the quantities and prices of energy carriers exchanged between state energy companies and their industrial customers. For this reason, the OECD has not been able to cover all companies represented in the OECD MAGIC database. Using an illustrative sample of 33 large industrial groups operating in aluminium smelting, steelmaking, cement, and chemicals, this earlier work found, nevertheless, SEs to be relatively large beneficiaries of below-market energy inputs (Figure 4; left). Between 2010-20, the 25% of sampled firms that obtained the highest amount of below-market energy (i.e. the fourth quartile) were, for instance, 65% owned by government entities on average. Many of these firms are based in GCC countries, a region where the IEA estimates fossil-fuel subsidies to be very large (Figure 4; right).<sup>10</sup>

**Figure 4. State enterprises are relatively large beneficiaries of below-market energy inputs**



Note: Quartiles of below-market energy are defined such that the first (fourth) quartile comprises the 25% of firms that receive the lowest (highest) relative amount of below-market energy in the sample. While the graph on the left-hand side is based on the upper bound of the OECD's estimates for below-market energy, using instead the lower bound does not change the findings of this graph.

Source: OECD (2023<sup>[3]</sup>).

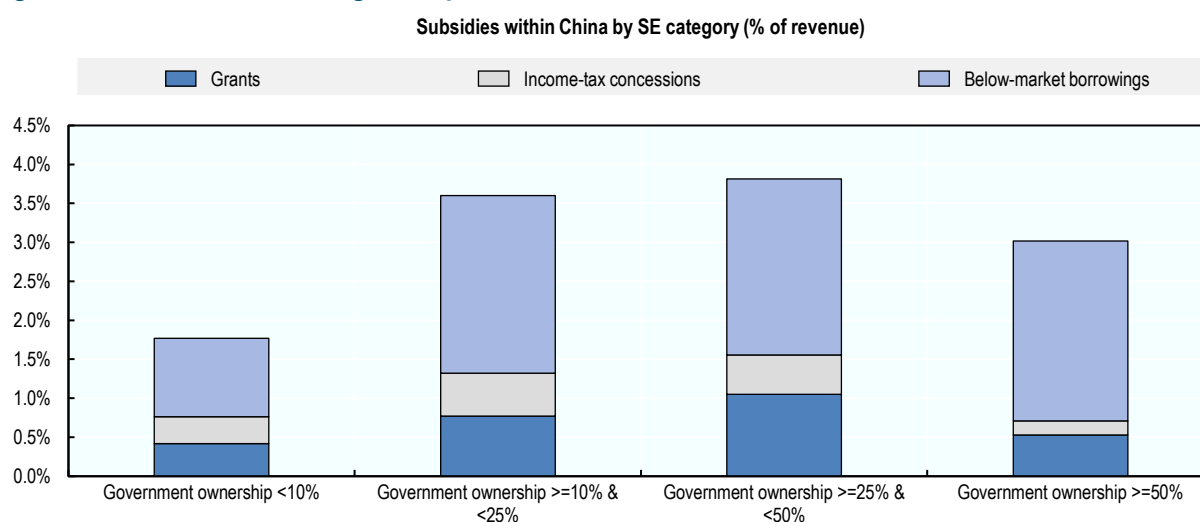
The OECD MAGIC database (Annex A) provides first-of-its-kind cross-country data on the ownership of industrial companies and the subsidies they receive. Outside of the work of the OECD, the empirical literature on industrial subsidies benefitting SEs is, to date, limited. Existing studies tend to focus on specific countries or sectors, with many looking at China. Using a large sample of medium and large enterprises in China between 1998 and 2007, Aghion et al. (2015<sup>[6]</sup>) found, for example, that “[p]ublic sector enterprises were more likely to receive subsidies and tariff protection, but less likely to receive tax holidays.” Using similar data but for a longer period covering up to 2013, Harrison et al. (2019<sup>[7]</sup>) identified SOEs as the foremost recipients of “low interest loans and government subsidies.” For the period 2012-15, Cheng et

<sup>10</sup> See [www.iea.org/topics/energy-subsidies](http://www.iea.org/topics/energy-subsidies) (accessed on 22 February 2024).

al. (2019<sup>[8]</sup>) noted, for their part, that “SOEs and politically connected firms [in China] appear more likely to receive innovation subsidies.” On the question of subsidised loans more specifically, Poncet et al. (2010<sup>[9]</sup>) found SOEs to be less financially constrained than private firms in China, while Ru (2018<sup>[10]</sup>) has shown that China Development Bank’s industrial loans to SOEs tended to “crowd out private firms in the same industry but crowd in private firms in downstream industries.” While the above does not aim to provide a comprehensive overview of the literature, it shows, nevertheless, that this report’s finding that SEs generally obtain more subsidies is not isolated nor unprecedented.

While the finding that SEs obtain relatively more subsidies stems partly from China’s larger use of government support in manufacturing and its widespread government ownership of companies, it is important to note that Chinese SEs are also large recipients of subsidies relative to other firms based in China (Figure 5). This is consistent with the findings of the studies cited above, some of which point to the favoured access that Chinese SEs have to loan financing from state banks.<sup>11</sup> In addition to being an issue for trading partners, the question of competitive neutrality is therefore also one for these companies’ operations in their domestic markets.

**Figure 5. Chinese SEs are larger recipients of subsidies than other China-based firms**



Note: The data behind this graph cover the entire period 2005-22. See Annex A for more information on the firm sample.

Source: OECD MAGIC database.

## 2.2. State enterprises can also obtain other, non-pecuniary advantages

While manufacturing SEs are relatively large recipients of subsidies, there are other, more indirect forms of government intervention in the market that can also favour SEs. These non-pecuniary forms of support generally involve transfers induced by the regulatory regime and its enforcement in areas such as competition law, public procurement, or bankruptcy law that provide more favourable treatment or protection to domestic firms. Given the large presence of SEs in industrial sectors (Figure 1 and Table A B.1), guaranteeing a competitively neutral regulatory environment amongst companies engaged in manufacturing is crucial to maintain a level playing field and avoid trade distortions.

### 2.2.1. State enterprises and the non-neutral application and enforcement of competition rules

As much as private enterprises, SEs may have an incentive to engage in anti-competitive behaviour, with a view to gaining or holding market power, or protecting a monopoly position. For instance, in raising barriers to entry and foreclosing rivals, or in concentrating their activities to become a dominant player in a given market, SEs may restrict competition and, ultimately, reduce market efficiency and consumer

<sup>11</sup> This issue is discussed in more detail in the next section of the report.

welfare. The advantages and privileges SEs may enjoy, such as government support, softer budget constraints, or the perception of government protection, may amplify their incentive and ability to engage in, and sustain such anti-competitive conduct [DAF/COMP/GF(2018)10].

Guaranteeing competitive neutrality by ensuring that all firms can compete on their own merit, regardless of their ownership, nationality, or legal form is key to maintaining a level playing field and preventing distortions of competition.<sup>12</sup> According to the *OECD Recommendation on Competitive Neutrality* (henceforth “the OECD Recommendation”), this implies that “countries should adopt or maintain, as appropriate, a competitively neutral competition law that address anti-competitive conduct and includes merger control”, as well as apply the same procedural rules and sanctions to all market players.<sup>13</sup> This report next analyses competition rules and decisions adopted across different jurisdictions, as well as empirical evidence, to examine whether the scope of application of certain national competition laws and their enforcement prejudice the principle of competitive neutrality by privileging SEs, to the detriment of foreign, private enterprises. This analysis focuses by necessity on jurisdictions where state ownership of industrial assets is more common, and thus more at risk of significantly affecting trade and competition in manufacturing.

*Competition rules apply to both state and private enterprises in the majority of jurisdictions worldwide, although a few exceptions remain*

Most jurisdictions have enacted competition rules applying to both state and private enterprises. National competition laws may at times explicitly provide that they apply to all legal entities, public or private, while others may specify that they apply to all undertakings defined as “any entity engaged in an economic activity, regardless of its legal status and the way in which it is financed.”<sup>14</sup> National competition authorities and tribunals have ruled on many occasions against the anticompetitive conduct of SEs, upholding the principle that their national competition legislation applies to both private enterprises and SEs. This well-developed jurisprudence from both OECD and non-OECD countries has thus far overwhelmingly concerned SEs in services sectors as many governments retained ownership stakes in large services providers in network industries following privatisation. In some instances (e.g. China and the European Union), competition authorities have also found that both cartel and merger rules apply to SEs, even where both companies involved have state ownership.<sup>15</sup>

In contrast to the apparently neutral scope of application of many national competition legal frameworks, some jurisdictions, notably countries of the GCC, long maintained or continue to maintain some forms of exemptions, excluding companies owned or controlled by the state from the reach of their competition laws (Annex C). Although these exemptions may predominantly concern national utilities, which remain largely under the ownership or control of the state, they may also benefit important manufacturing SEs that also form part of the industrial landscape of these countries, notably in chemicals, fertilisers, and cement.

<sup>12</sup> See <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0414>.

<sup>13</sup> See <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0462>.

<sup>14</sup> *C-41/90 Höfner and Elser v Macroton*, EU:C:1991:161. The concept of ‘economic activity’ refers to “any activity consisting in offering goods or services on a given market,” irrespective as to whether it is profit-making oriented.

<sup>15</sup> In certain jurisdictions, rules on merger control may apply to two companies that are majority-owned or controlled by the same SE or by the same private enterprise if, prior to the concentration, they acted independently on the market, pursuing a separate commercial conduct and commercial policy. On the contrary, should the two companies owned by the same SE or the same private enterprise not have an independent power of decision prior to the concentration, the operation will be regarded as an internal restructuring. See, for instance, the EU rules on merger control, Section 1.7 of the Commission Consolidated Jurisdictional Notice under Council Regulation 139/2004/EC on the control of concentrations between undertakings, 16 April 2008, OJ C 95/1 and Recital 22 of Council Regulation 139/2004/EC of 20 January 2004 on the control of concentrations between undertakings, OJ L 24/1.

### *Competition rules may not always be enforced equally against state and private enterprises – A case study of merger-control assessment in China*

While competition rules may appear *de jure* competitively neutral, their enforcement may *de facto* discriminate against private enterprises by affording more favourable treatment for SEs, including in merger control or antitrust enforcement. Unfair enforcement of competition law can result in cartel-like behaviour by SEs, abuse of dominant position by SEs, or anti-competitive behaviour of a SE following a merger, and can thus significantly distort the level playing field. For this reason, the OECD Recommendation says that competitive neutrality should extend to the enforcement of competition law by competition authorities.

*Ex ante* review by the Chinese competition authority of state-led mergers and acquisitions between and by SEs in China provides an example of where a national competition authority may have treated domestic SEs more leniently than private firms. China's push to consolidate its SEs over the past decade has resulted in the emergence of very large domestic SEs, which now compete internationally in sectors such as chemicals, shipbuilding, steel, and rolling stock (Box 4 and Annex D). While these mergers and acquisitions (M&As) were – as would be the case for private companies – notified to the State Administration for Market Regulation (SAMR), China's competition authority, only one transaction involving a central SE<sup>16</sup> was not cleared unconditionally, despite the consolidations leading to a single SE in many cases. All prohibited mergers (3) and mergers approved subject to remedies (59) in China concerned private enterprises only, with two exceptions.<sup>17</sup> Most of these conditional decisions also involved at least one foreign firm.<sup>18</sup> Indeed, it is not uncommon for the SAMR to impose remedies to mergers involving private foreign enterprises whereas other jurisdictions unconditionally clear the same transactions. As an illustration, 9 of the 13 concentrations with conditions in China since 2021 – which mainly involved private companies active in manufacturing, notably in semiconductors – fulfilled the merger thresholds in other jurisdictions and thus were also reviewed by these other jurisdictions. Of these nine transactions, only three were also approved conditionally by these other jurisdictions while the rest were approved unconditionally (Annex E).

In conclusion, the evidence reviewed above may be suggestive of an imbalance between the treatment under Chinese merger control of private, notably foreign, companies, on the one hand, and SEs on the other. Although merger control in China *de jure* applies to both state and private enterprises, this apparent imbalance may have allowed the emergence of very large domestic SEs, with possible implications for global markets.

#### **Box 4. The state-led consolidation of state enterprises in China**

Since China's State Council created the SASAC as the authority overseeing central SEs in 2003, the consolidation of SEs within specific sectors through M&As has increased significantly. The phenomenon accelerated after 2006, following the announcement by the SASAC that the central government would endeavour to maintain full control of seven strategic industries via central SEs and exert influence via central SEs in other less strategic, albeit important, industries (Owen, Sun and Zheng, 2008<sup>[11]</sup>; Zheng, 2023<sup>[12]</sup>).<sup>1</sup> Merger-driven SE consolidation gained further momentum following the 'Made in China 2025' initiative, published in May 2015, with the goal of nurturing companies able to compete with global manufacturing leaders (Song, 2018<sup>[13]</sup>; O'Connor, 2019<sup>[14]</sup>; Lardy, 2019<sup>[15]</sup>). It was

<sup>16</sup> Central SEs refer in China to enterprises owned and administered by the SASAC at the national level.

<sup>17</sup> The SAMR issued two decisions in, 2022 and 2023 respectively, approving conditionally concentrations involving SEs: the planned joint venture between a local SE, Shanghai Airport Authority and Eastern Air Logistics, whose beneficial owner is China Eastern Airlines, a central SE that is majority-owned by the SASAC, and the envisaged concentration between two local SEs, namely Wanhua Chemical and Yantai Yongli.

<sup>18</sup> The numbers above are based on the authors' own research drawing on the publication by the SAMR of concentrations conditionally approved, [www.samr.gov.cn/fldes/tzgg/ftj/index.html](http://www.samr.gov.cn/fldes/tzgg/ftj/index.html) (accessed on 24 February 2024) and <https://globalcompetitionreview.com/guide/the-guide-merger-remedies/fifth-edition/article/china-recent-remedy-cases-showcase-impact-of-amended-anti-monopoly-law> (accessed on 16 February 2024).



then further advanced by the government's policies in the context of the 14<sup>th</sup> Five-Year Plan (2021-25), aimed at supporting the merger, acquisition, and reorganisation of state-owned capital in strategically important industries.<sup>2</sup>

As a result of this consolidation wave, the number of central SEs was reduced from 189 in 2003 to 97 in November 2023 (Zheng, 2023<sup>[12]</sup>).<sup>3</sup> Major central SEs have emerged in the last years in various industrial sectors, be it through mergers of central SEs or through acquisitions by central SEs of local or smaller central SEs. Between 2012 and August 2022, there were 22 M&As either involving a central SE or leading to the creation of a central SE in pivotal industrial sectors, such as steel, aluminium, rolling stock, shipbuilding, or rare earths (Annex D). Nine of these transactions took place in the steel sector. In two of these mergers, i.e. the merger between China CNR Corp. and China CSR Corp. (rolling stock) and the merger between China Shipbuilding Industry Co. and China State Shipbuilding Corp (shipbuilding), the SASAC re-merged companies it had previously broken up (Zheng, 2023<sup>[12]</sup>; OECD, 2023<sup>[16]</sup>).

Today, large central SEs resulting from this consolidation wave, such as China Railway Rolling Stock Corporation (CRRC), Chalco, China Baowu Group, China National Building Material (CNBM), China Shipbuilding (CSSC), and China Rare Earths are all the largest companies globally by sales in their respective sectors.

1. SASAC, Guidance on the Restructuring of State Capital and SOEs (18 December 2006). The seven so-called strategic industries included national defence, electrical power generation and grids, petroleum and petrochemicals, telecommunications, coal, civil aviation, and waterway transportation while the other important industries concerned automobiles, steel, and technology.

2. See [www.sasac.gov.cn/n2588025/n2588139/c15887785/content.html?jump=false](http://www.sasac.gov.cn/n2588025/n2588139/c15887785/content.html?jump=false) (accessed on 19 March 2024).

3. See [www.sasac.gov.cn/n2588045/n27271785/n27271792/index.html](http://www.sasac.gov.cn/n2588045/n27271785/n27271792/index.html) (accessed on 23 February 2024).

### 2.2.2. State enterprises and discriminatory public procurement rules and practices

Ensuring that government procurement does not involve discriminatory practices favouring SEs is another important dimension of competitive neutrality. Government procurement plays an important role in some of the sectors covered by the OECD MAGIC database (Annex A), particularly rolling-stock, aerospace, telecommunications network equipment, and renewable energy equipment, where government entities or SEs are often important buyers.<sup>19</sup> Instances where public procurement legislation or its implementation favours specific types of players, such as SEs or national incumbents, can hinder market access, distort competition, and, in turn, limit consumer choices, increase prices, as well as impede tendering processes aimed at helping achieve better value for money. In this context, many OECD countries view it as important that government procurement processes follow open, fair, non-discriminatory, and transparent conditions, so that procuring entities, including SEs, allow all potential suppliers to participate in public tenders, and all bidders are treated equally, regardless of their ownership, legal form, nationality, or origin of goods.<sup>20</sup>

While there has been significant progress across countries in opening up public markets to foreign competition, notably promoted by national legislation regulating public procurement, as well as by multilateral and plurilateral trade agreements, discriminatory procurement measures and practices still permeate public procurement processes. However, documenting such measures and practices is a difficult exercise, not least because discrimination can occur even in the absence of explicit rules favouring *de jure* or *de facto* specific suppliers, and instead result from implicit policies and customs. Although the OECD has recently assessed the extent of discrimination taking place through government procurement in the rolling-stock sector (OECD, 2023<sup>[16]</sup>), this exercise cannot be easily replicated as it depends on whether

<sup>19</sup> Public transport authorities at the state, regional, or municipal levels are often the principal buyers of rolling stock. Several national airlines or telecommunication operators have also remained state-owned, -controlled, or -invested. Likewise, government ownership of electric utilities, often in charge of developing renewable energy parks, remains significant worldwide.

<sup>20</sup> The subsidies that certain bidders (including SEs) receive from governments may, however, distort competition in government procurement, requiring further action to maintain a level playing field. This forms the rationale behind some provisions of the EU's Foreign Subsidy Regulation, which entered into force in July 2023. See [https://competition-policy.ec.europa.eu/foreign-subsidies-regulation\\_en](https://competition-policy.ec.europa.eu/foreign-subsidies-regulation_en) (accessed on 24 May 2024).

the supplier or the procuring entity disclose procurement contracts they have been awarded or have awarded.

Discriminatory government procurement rules may at times provide explicit, *de jure* preferential treatment to domestic SEs, notably in sectors where, in a given jurisdiction, one or several SEs are the exclusive provider of goods or services (OECD, 2021<sup>[17]</sup>). Often, however, governments adopt discriminatory rules through, for instance, market access restrictions to protect domestic firms from foreign competition, irrespective of their ownership. Market access restrictions discriminating between foreign and domestic firms could, nevertheless, effectively favour SEs in cases where SEs are dominant in a sector domestically. In other words, absent a *de jure*, textual discriminatory provision against private enterprises, circumstantial factors, such as the presence of SEs within the domestic sector, their domestic market share, their past or present role and status, and more broadly, the government's industrial policy strategy may prove relevant in evaluating the advantage that government procurement may provide to SEs. Identifying such cases is understandably difficult, particularly where discrimination results from informal government policies and practices, as well as tacit conduct not codified in written rules (Gourdon and Messent, 2017<sup>[18]</sup>). In this context, finding evidence of *de facto* preference for SEs in government procurement mainly relies on wider contextual factors.

### *The case of rolling stock*

The challenge of finding evidence of *de facto* preference for SEs in government procurement can be illustrated using the rolling-stock sector. Earlier OECD work has shed light on the existence of *de jure* discrimination between domestic and foreign firms and on the difficulties involved in detecting *de facto* discrimination (OECD, 2023<sup>[16]</sup>). Several countries, including India, Türkiye, and the United States, have explicit local content requirements affecting purchases of rolling stock by their public railway companies (ibid). This can lead foreign manufacturers (e.g. Alstom or Hitachi) to establish a local production base to serve the local market.

Fewer countries have systematic market access restrictions in procurement, which effectively foreclose foreign rolling-stock manufacturers from entering the market altogether. This is the case for China, where stringent restrictions on procurement have long favoured the country's two state-owned manufacturers of rolling-stock and signalling equipment, CRRC and CRSC. In practice, only Chinese majority-owned companies holding the full ownership of intellectual property rights required for the project's execution may reportedly bid for rolling stock tenders.<sup>21</sup> Where foreign firms wish to participate in a tender, they need to be in a joint venture with local companies, but they cannot have the controlling share. Additionally, it appears that companies must have a state-issued license to participate in rolling-stock tenders. In the absence of pre-defined criteria, however, such licenses are seemingly only granted to Chinese-controlled companies.<sup>22</sup> In this situation, the combination of stringent market-access restrictions with two SEs holding a quasi-monopoly on the production and supply of rolling stock and signalling results in privileging SEs over private, foreign enterprises.

A key actor in the allocation of these procurement contracts is the China Railway Corporation, another SE. Over 2014-22, CRRC earned on average 45% of its revenue from the China Railway Corporation.<sup>23</sup> Likewise, CRSC has reported on several occasions<sup>24</sup> that the majority of the Group's customers are China Railway Corporation and its affiliated entities, specifying that "any temporary change in the tendering and bidding plans of China State Railway Group" may adversely affect its business development. This illustrates that state procuring entities, to the extent they favour domestic companies in the selection of their suppliers, may also confer support to companies upstream.<sup>25</sup> In that sense, state procuring enterprises downstream can be the implementing agents of discriminatory policies, hence acting as intermediaries between the government and domestic suppliers. In such instances, however, absent

<sup>21</sup> Case M.8677, *Siemens/Alstom*, para 129.

<sup>22</sup> *ibid*, paras 108 and 129.

<sup>23</sup> Authors' calculation based on the annual reports of CRRC between 2014 and 2022.

<sup>24</sup> See CRSC's 2019 annual report.

<sup>25</sup> See the next section of this report, which concerns the issue of SEs as providers of support.

explicit public-procurement rules discriminating between domestic and foreign companies or market-access restrictions having such an effect, it remains very difficult to document preferential treatment by state procuring entities of domestic (state) enterprises.

### *The case of telecommunications network equipment*

Telecommunications network equipment is another sector where public procurement crucially influences the structure of the sector. As in rolling stock, the role and conduct of telecommunication operators as procuring entities can shape the domestic market for telecommunications equipment. And as in rolling stock, the little evidence there is generally points to the role played by China's state telecom operators, namely China Telecom, China Mobile, and China Unicom.<sup>26</sup>

China's state telecommunication operators, notably China Telecom and China Unicom, appear to be encouraged through a two-tiered fee system to prefer domestic telecommunication equipment manufacturers as their suppliers. Procurement of the three telecommunication operators in the country mostly takes place through the companies' centralised procurement, which they publish on an annual or biennial basis.<sup>27</sup> In the case of China Telecom and China Unicom, centralised procurement services are performed by the state-owned parents, i.e. China Telecommunications Corporation and Unicom Group.<sup>28</sup> Both China Telecom and China Unicom have consistently reported in their annual reports that they must pay a concession fee to their parents in exchange for these procurement services. The amount of the concession fee to be paid nonetheless differs according to the origin of the telecommunication equipment. While the concession fee for the procurement of imported equipment cannot exceed 1% of the contract value, the two subsidiaries must pay a maximum concession fee of 3% of the contract value for the procurement of domestic equipment.<sup>29</sup> As a result, when the parent groups (China Telecommunications Corporation and Unicom Group) award a purchase contract to a domestic manufacturer of telecommunication equipment, China Telecom and China Unicom must transfer a fee to their parents that is three times higher than that which would apply for the purchase of imported equipment. As the parent entities responsible for organising the procurement of their subsidiaries, China Telecommunications Corporation and Unicom Group are incentivised to choose domestic, instead of imported, equipment.

This mechanism may have the effect of discriminating between domestic and foreign telecommunication equipment, hence possibly offering Chinese manufacturers, namely Huawei and state-invested ZTE, a protected home market. The fact that preference may be given to domestic over imported telecommunication equipment in China may be corroborated by the predominance of local suppliers in the centralised procurement, which China Telecom and China Unicom have disclosed in their corporate sustainability reports.<sup>30</sup> Moreover, the extent of telecommunication equipment installed within China that

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<sup>26</sup> There have been allegations, for example, that informal guidance of the central government in the mid-2000s induced China's state telecom operators to allocate no less than 70% of their 4G orders to the two domestic companies producing telecommunication equipment, Huawei and ZTE (Kratz and Oertel, 2021<sup>[65]</sup>).

<sup>27</sup> As an example, China Unicom has reported in recent corporate social responsibility reports the percentage of its centralised procurement. For the period 2019-21, procurement of China Unicom taking place through its centralised procurement exceeded 90%, even amounting to 96.7% in 2021.

<sup>28</sup> In this respect, China Unicom acknowledged that by providing equipment-procurement services to its subsidiary, the Unicom Group may force China Unicom to make decisions that differ from or even conflict with the interests of China Unicom's other shareholders.

<sup>29</sup> See, for instance, China Telecom's 2022 annual report.

<sup>30</sup> In its recent corporate sustainability reports, China Telecom disclosed that its centralised procurement suppliers mainly come from mainland China. For 2021 and 2022, for instance, the total number of centralised procurement suppliers amounted, respectively, to 19,041 and 24,237, with 18,515 and 23,706 originating in mainland China. Hence, for these two years the procurement of goods (and services) to China Telecom by local suppliers exceeded 97%. Similarly, China Unicom reported that for the period 2019-21 more than 99% of its suppliers for its centralised procurement (which represents, as mentioned above more than 90% of its procurement) were local suppliers. Although China Mobile is not seemingly subject to the same concession fee, it also reported in its corporate sustainability reports that from 2020 to 2022, 100% of its centralised procurement suppliers came from mainland China. Note that values for this company are, however, not reported for previous years.

is manufactured by Huawei or ZTE may partly constitute a reflection of the two-tiered system. As of 2023, 58% and 31% of all 5G base stations in China had been manufactured by, respectively, Huawei and ZTE.<sup>31</sup>

### 2.2.3. State enterprises can be key actors in, and beneficiaries of, forced technology transfers

While international technology transfers (ITT) by companies can contribute to enhancing knowledge diffusion and gains from trade, domestic policies and measures restricting foreign investment and market access to force technology transfers may raise important trade and competition concerns. Forced technology transfers commonly occur in situations where the owner of a technology (e.g. an investor or licensor) is required or pressured to transfer technology to be able to access a foreign market or obtain the necessary permits to operate under the same conditions as local firms (Andrenelli, Gourdon and Moisé, 2019<sup>[19]</sup>).

It is in general extremely difficult to document instances of forced technology transfers, including to quantify the effects on foreign firms of such forced transfer (Sykes, 2021<sup>[20]</sup>).<sup>32</sup> Transfer of knowledge a company voluntarily engages in as part of a foreign investment, including in areas subject to investment restrictions, cannot be assumed to be forced, especially where the transfer of technology is not required or pressured as a *quid pro quo* for market access. At the same time, evidence is especially hard to gather in the case of implicit government policies or practices requiring or pressuring domestic companies to organise such transfers. Government-induced technology transfers may be the result of oral communications or ‘behind-closed-door’ agreements that cannot be traced. This is exacerbated by the fact that companies may be reluctant to report their experience on such policies and practices, particularly if they fear, as a result, losing access to valuable markets (Andrenelli, Gourdon and Moisé, 2019<sup>[19]</sup>). Discerning what may appear consensual but is in fact forced is also difficult: investors may feel they realistically have no choice but to accept demands to transfer technology if their refusal could result in disadvantage to themselves while technology would be transferred by their competitors anyway.

Public allegations of forced technology transfers exist mainly again in relation to China.<sup>33</sup> There are notably concerns about “corporate structure requirements” (Sykes, 2021<sup>[20]</sup>), which restrict foreign investment and are deemed to be used as a tool by Chinese authorities and firms to force the transfer of foreign technology. Chinese authorities have, for instance, conditioned the right to invest in China on the formation of joint ventures (JVs) (e.g. an equity joint venture or a contractual joint venture) with Chinese partners. They have also imposed a percentage cap on foreign equity ownership, thus at times requiring that the Chinese party within the JV be the controlling shareholder or the holder of the majority of the shares. Moreover, the Chinese Government has set out administrative licensing and approval processes as a condition to establish and operate a business in China. In other words, China has strictly disciplined and restrained inbound foreign investment through a broad range of regulatory measures at the central and subcentral levels, notably through the so-called Catalogue for the Guidance of Foreign Investment, as well as the Special Administrative Measures for Foreign Investment Access<sup>34</sup> – also known as the Foreign Negative List – and the Special Administrative Measures for Foreign Investment Access in Pilot Free Trade Zones

<sup>31</sup> See [www.statista.com/statistics/1194757/china-market-share-of-5g-base-stations-by-manufacturer](http://www.statista.com/statistics/1194757/china-market-share-of-5g-base-stations-by-manufacturer) (accessed on 26 February 2024). This market share seemingly coincides with the market share the two telecommunication equipment manufacturers equipment have maintained through successive bidding rounds since 2020. See [www.spglobal.com/marketintelligence/en/news-insights/podcasts/mediatalk-s2-ep-01](http://www.spglobal.com/marketintelligence/en/news-insights/podcasts/mediatalk-s2-ep-01) (accessed on 26 February 2024).

<sup>32</sup> See also <https://eastasiaforum.org/2017/10/03/section-301-us-investigates-allegations-of-forced-technology-transfers-to-china/> (accessed on 28 February 2024).

<sup>33</sup> In this respect, the United States Trade Representative (USTR) launched an investigation in August 2017 under Section 301 of the 1974 Trade Act to inquire into China’s practices, including forced technology transfers. In March 2018, USTR released a report on the findings of its Section 301 investigation, concluding that China engages *inter alia* in forced technology transfer. Similarly, in June 2018, the EU brought a request for consultations with China before the WTO dispute settlement system concerning certain measures imposed by China pertaining to the transfer of foreign technology into China.

<sup>34</sup> See [www.ndrc.gov.cn/xxgk/zcfb/fzggwl/202112/P020211227540591870254.pdf](http://www.ndrc.gov.cn/xxgk/zcfb/fzggwl/202112/P020211227540591870254.pdf) in Chinese language only (accessed on 22 May 2024).

(FTZ)<sup>35</sup> – also known as the FTZ Negative List, which both regulate foreign investments in China since 2015. Under these two negative lists, foreign investments in specific industry areas may be prohibited or restricted by requiring *inter alia* specific corporate forms or specific percentage of shareholdings by foreign investors. Both negative lists were last updated in December 2021 and entered into force on 1 January 2022.

While restrictions regulating market access, such as mandatory joint-venture requirements or administrative licensing and approval processes, can be encountered in different jurisdictions, they can have the potential to result in the forced transfer of technology depending on the nature of the measures themselves and the wider policy environment. For the purpose of informing policy discussions on this issue, the OECD has organised measures related to ITT along a continuum that differentiates between three groups of measures (Andrenelli, Gourdon and Moïse, 2019<sup>[19]</sup>): green measures are aimed at creating an appropriate supporting environment for ITT; yellow measures may have the effect of imposing ITT to varying degrees; and, orange and especially red measures may clearly result in the forced transfer of technology. This ITT continuum further classifies policies according to two main factors, namely (i) the degree of compulsion the policies impose on foreign firms when they interact with local counterparts; and (ii) the effect they have on the extent of foreign firms' control over their proprietary technology. Corporate structure requirements often belong to the second category of measures: they may not traditionally set up a *quid pro quo* for market access, yet conditions governing these measures, as well as policies or factors shaping the broader environment, may be indicative of an involuntary ITT. Mandatory JV requirements may, for instance, involve a *de jure* or *de facto* condition to transfer technology. Other factors related to the measures themselves and to the broader policy environment (e.g. discrimination between domestic and foreign firms, lack of transparency, and the presence or involvement of state authorities within both the economy and domestic companies competing or partnering with foreign firms) may contribute to increasing foreign companies' vulnerability to involuntary ITT.

Chinese SEs have, in various industrial sectors, concluded multiple JVs with both direct foreign competitors and upstream suppliers of key equipment as a result of mandatory JV requirements. All the major foreign carmakers had, for instance, as of the mid-1990s entered into JVs with different Chinese automotive SEs.<sup>36</sup> Likewise, foreign rolling-stock manufacturers seeking to access China's vast and growing rail-supply market in the early 2000s were required by central authorities to enter into JVs with domestic SEs. Between 2004 and 2006, key rolling-stock manufacturers, such as Alstom, Siemens, Bombardier and Kawasaki Heavy Industries, as well as major producers of rolling-stock equipment (e.g. Nabtesco, Toya Denki, Toshiba, Mitsubishi, Hitachi, ABB, and Wabtec) entered the Chinese market by winning contracts with the then two state-owned rolling-stock manufacturers, CSR Corp. and CNR Corp., under the condition that they form local JVs, assemble the trains in China, as well as share their technological expertise (Lin, Qin and Xie, 2021<sup>[21]</sup>; Ker, 2017<sup>[22]</sup>). The same phenomenon took place in the shipbuilding sector as important foreign marine equipment players entered into JVs with Chinese shipbuilding SEs, including CSSC and CSIC, in the mid-2000s and later, in the mid-2010s.<sup>37</sup>

Proving that these mandatory JV requirements, as well as other corporate structure requirements in China, have amounted to forced technology transfers remains a delicate exercise. Broader policy factors such as the wide range of measures enacted by the central government to accelerate indigenous innovation and ensure Chinese companies become technology leaders in certain sectors, as well as the pivotal role played by SEs in these efforts, might nonetheless indicate that these corporate structure requirements have

<sup>35</sup> The Special Administrative Measures for Foreign Investment Access in Pilot Free Trade Zones apply to the 20 Chinese Free Trade Zones and one free trade port. See [www.ndrc.gov.cn/xxgk/zcfb/fzggwl/202112/P020211227540530036342.pdf](http://www.ndrc.gov.cn/xxgk/zcfb/fzggwl/202112/P020211227540530036342.pdf) in Chinese language only (accessed on 22 May 2024).

<sup>36</sup> Chinese authorities used to limit foreign ownership in JVs to 50%, thus giving Chinese partners significant control and bargaining power. The government also required all JVs to localise at least 40% of their parts and components and to transfer knowledge and establish joint technical centres to train Chinese workers (Sims Gallagher, 2006<sup>[67]</sup>). In addition, the Chinese Government imposed import quotas and high import tariffs (amounting to 80%-100%) on automobiles and parts. These investment restrictions were, however, lifted in 2022 around the time Tesla established its Shanghai factory. Import tariffs have also since been lowered.

<sup>37</sup> In September 2016, CSSC, Carnival Corporation, and Fincantieri jointly signed a Memorandum of Understanding for the construction of large luxury 133 500 GT cruise ships. The project partners subsequently concluded a binding agreement in February 2017 for the construction of two cruise ships with an option for four additional ships.

constituted an integral part of China's broader industrial policy goal and were designed to help Chinese firms achieve technological leaps.

In this respect, the multitude of JVs entered into by foreign companies with key manufacturing SEs might have contributed to improving their performance and, even in some cases, helping them achieve indigenous innovation. The obligation for foreign carmakers to enter into a JV with Chinese SEs, together with high import barriers on imported cars and parts, may have, for instance, contributed to improving the offering and profitability of Chinese state-owned carmakers (OECD, 2021<sup>[2]</sup>). In the rolling-stock industry, Chinese rolling-stock manufacturers were able to introduce high-speed trains in 2007, permitting CSR Corp. to win a major contract two years later over its foreign competitors (OECD, 2023<sup>[16]</sup>). The sector of rolling stock is perhaps the most telling example where technology transfer contracts signed with CSR Corp. and CNR Corp. allowed Chinese engineers through a process of 'digestion and re-innovation' conducted at record pace to assimilate high-speed trains' core technologies, including engines, dynamos, and electricity transmissions to railway signal control systems, which had formed part of the technology-transfer contracts (Lin, Qin and Xie, 2021<sup>[21]</sup>). Nabtesco reported, in this respect, in its 2005 annual report that:

*"When China's railway ministry held a tender for the manufacture of passenger trains with operating speeds of 200 km/h as part of its project to increase train speeds on existing tracks, Nabtesco participated in the bid in conjunction with a consortium of Japanese companies and Chinese train manufacturer Nanche Sifang Locomotive Co. The resulting contract was for 60 trains, or a total of 480 railcars. At the strong request of China's railway ministry, we also agreed to a transfer of our railway brake system technology to Nanjing Puzhen Rolling Stock Works. Koshiro Yoshida, the head of our Railroad Products Company, met with that company in Beijing on October 20, 2004 to sign the technology transfer agreement."*

While the discussion above has focussed on how restrictions to inward investment may have compelled transfers of foreign technology to Chinese SEs, SEs may also facilitate the transfer of technology through outward investment. This happens where, for example, SEs acquire foreign companies with backing from the state in an effort to obtain foreign technologies. The creation in 2014 of China's National Integrated Circuit Fund was, for example, quickly followed by a wave of acquisitions abroad by Chinese semiconductor firms, several of which had received equity from the National Fund (OECD, 2019<sup>[23]</sup>) (this is discussed further in the next section of the report).

### 2.3. Despite receiving more government support, state enterprises tend to underperform

Despite SEs receiving the subsidies and regulatory advantages described above, their financial performance remains on average below that of their private peers.<sup>38</sup> This is particularly visible using profitability metrics such as firms' returns on assets and equity, which often decline with the proportion of companies' shares held by state entities (Figure 6).<sup>39</sup> While the finding holds in the aggregate when pooling data across all companies in the database, there can be nuances for individual sectors (Table A B.2). This is notably the case for cement and automobiles, where companies with larger government ownership appear to be more profitable than competitors. As noted in earlier work (OECD, 2021<sup>[2]</sup>), this may be due to the presence of large energy subsidies in some regions of the world and to the (now revoked) obligation for foreign carmakers in China to form JVs with local state-owned partners. In the former case, earlier evidence (OECD, 2023<sup>[3]</sup>) strongly suggests below-market electricity and natural gas to have played a role in increasing the profits of certain state-owned firms in heavy industries.<sup>40</sup> In the case of automobiles, the

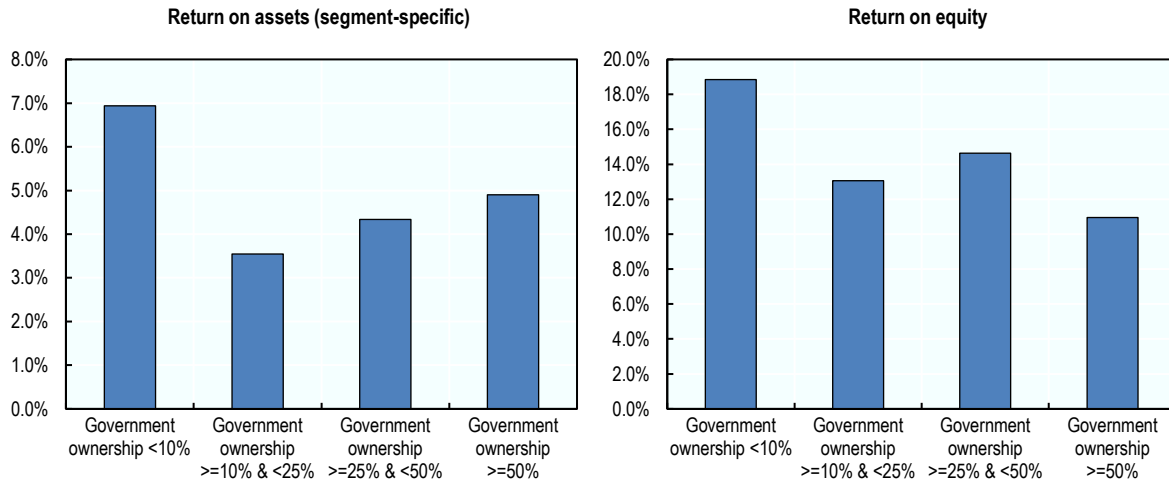
<sup>38</sup> Note that SEs' below-average returns on equity could themselves amount to government support in the form of below-market equity. See OECD (2021<sup>[2]</sup>).

<sup>39</sup> Using profit margins yields similar results.

<sup>40</sup> Removing firms from GCC countries from Figure 6 lowers the average return on assets for companies having 50% or more government ownership from 4.9% to 4.4%. Cement offers a particularly strong example. In a 2011 note on the Saudi cement sector, financial services provider Aljazira Capital noted, for instance, that: "Saudi cement companies receive natural gas at a subsidized rate of USD 0.75/mmbtu from state-owned Saudi Aramco. [...] Cement industry in

former obligation imposed on foreign carmakers in China to form JVs with local state-owned companies resulted for many years in above-average profits on the vehicles sold through these JVs. By contrast, sales under the state-owned companies' own brands do not seem to have generated much profit, and even losses at times.<sup>41</sup> Whether or not these JVs ought to be considered SEs thus has a strong bearing on the finding that SEs in automobiles had higher returns on average than private peers.

**Figure 6. Profitability tends to decrease with the proportion of government ownership**



Note: Both indicators are calculated using profit before tax and are averaged using firms' revenue as weights. Segment-specific returns on assets consider only the relevant business segments of industrial conglomerates spanning multiple sectors (e.g. semiconductors only for Samsung Electronics). The data behind this graph cover the entire period 2005-22. See Annex A for more information on the firm sample. Source: OECD MAGIC database.

Besides having worse financial results, SEs also tend to have higher levels of debt relative to their assets. The comparison between firms is not straightforward, however. The capital structure of companies will typically vary much more between sectors than between firms within a given sector. Heavy industries, which are relatively intensive in physical capital, often rely more on debt whereas high-tech industries, which are relatively intensive in intangible assets and R&D, tend to rely more on equity (Myers, 2001<sup>[24]</sup>; Myers, 2003<sup>[25]</sup>). It is therefore necessary to compare SEs with their private peers within each individual sector, or, alternatively, to standardise debt-asset ratios by sector. Doing the latter shows companies with at least 50% government ownership to have considerably higher debt-asset ratios than companies with less than 10% government ownership (Figure 7; left). Companies having between 25% and 49% government ownership display, however, much lower debt-asset ratios on average. This seems largely explained by the use of revenue-weighted averages, which give greater importance to large, debt-light companies in aerospace & defence and semiconductors (e.g. Airbus, Leonardo, STMicroelectronics, and Thales) (Figure 7; right). The data yield even clearer results for companies' debt-equity ratios, showing SEs to be more leveraged than their private peers (Figure A B.2).<sup>42</sup>

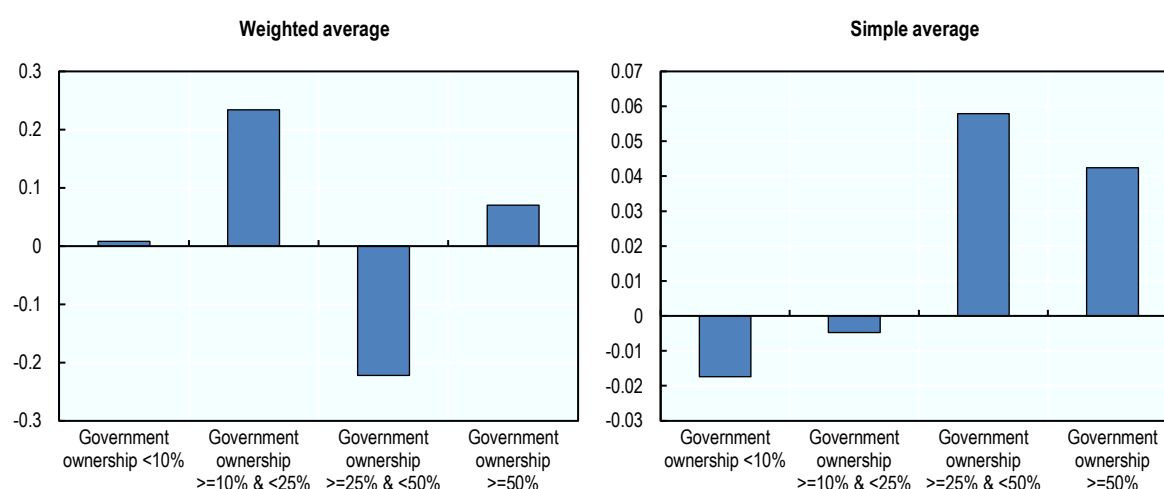
Saudi Arabia operates at the highest gross margin and net profit margin in the world." See OECD (2023<sup>[3]</sup>) for a discussion and more evidence.

<sup>41</sup> See Box 1 in OECD (2021<sup>[2]</sup>).

<sup>42</sup> This may partly reflect a lesser propensity for SEs to issue new shares as a means of financing their assets. Government owners may, for example, be reluctant to dilute their ownership of companies they view as strategic. That said, there have been numerous instances of government equity infusions in sectors such as semiconductors (OECD, 2019<sup>[23]</sup>) as well as government-led debt-equity swaps in certain heavy industries (e.g. aluminium, steel, and shipbuilding).

**Figure 7. State enterprises tend to have higher levels of debt relative to their assets**

Standardised debt-asset ratios



Note: Debt-asset ratios are here standardised for each sector so they have a mean of zero and a standard deviation of one. The data behind this graph cover the entire period 2005-22. See Annex A for more information on the firm sample.

Source: OECD MAGIC database.

The relationship between SEs' financial performance, their indebtedness, and the support they receive from governments is complex. Whether government ownership makes it easier for companies to take on debt, or whether government ownership leads to companies finding themselves in a position of needing more debt remains to be determined. This also raises the question of the extent to which subsidies and other regulatory advantages affect companies' performance and thus their ability to raise funds with debt and equity investors.

From an accounting perspective, different types of subsidies affect different elements of companies' income statements, with important implications for their profitability and perceived performance (**Error! Reference source not found.**). As an example, energy inputs obtained at below-market prices lower firms' cost of sales (2), which inflates their gross profit (3). Absent adequate information on energy subsidies, outside observers might wrongly consider these companies to be very efficient in converting their sales into profit when in fact this owes much to government intervention. The same is true of government grants, the impacts of which occur throughout income statements, and of below-market borrowings, which lower firms' financial expenses (10) and thus increase their profit before tax (11). Because these various accounting metrics serve as the basis for calculating conventional financial indicators (e.g. return on assets, return on equity, and interest coverage), subsidies may generate a misleading view of firm performance, particularly where information on subsidies is inadequate. Although they are not easily quantifiable, adding in the impacts of non-pecuniary measures discussed above such as discriminatory public procurement rules and practices would likely aggravate the problem since they can also have the effect of increasing companies' sales and profits.



**Table 1 Different types of subsidies affect different elements of companies' income statements**

Mock income statement and possible impacts of subsidies

		Accounting metric	Possible incidence of subsidy instruments	Types of instruments
1)	+	Sales revenue	Market price support increases the price per unit sold	Market price support
2)	-	Cost of sales	Asset-related grants lower depreciation costs; below-market prices for energy inputs and other intermediates reduce firms' production costs	Grants & below-market inputs
3)	=	Gross profit		
4)	-	Operating expenses		
4a)		<i>including R&amp;D expenses</i>	<i>R&amp;D grants lower firms' R&amp;D costs</i>	<i>Grants</i>
5)	=	Operating profit		
6)	+	Non-operating income	Income-related grants are counted as non-operating income (or other income)	Grants
7)	-	Non-operating expenses		
8)	=	Earnings before interest and taxes (EBIT)		
9)	+	Financial income		
10)	-	Financial expenses	Below-market borrowings reduce firms' interest expenses	Below-market borrowings
11)	=	Profit before tax		
12)	-	Income tax expense	Income-tax concessions lower the amount of taxes paid by firms	Income-tax concessions
13)	=	Net profit after tax	Excessively low profit may indicate the presence of below-market equity returns in the case of state enterprises	Below-market equity returns

Note: This mock income statement assumes that companies are making a profit. Losses would show differences, particularly with regards to income tax expenses.

Source: Authors' elaboration.

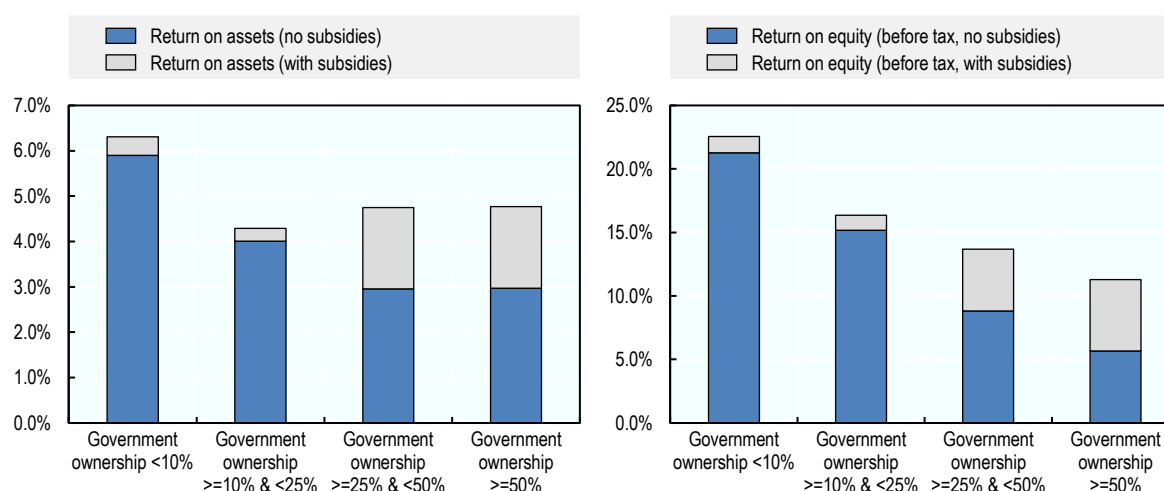
The profitability of companies certainly seems to be affected by subsidies, with most forms of support feeding into higher returns through larger profits before tax. Under a purely hypothetical scenario that subtracts grants and below-market borrowings from company profits before tax (11), the return on assets of SEs becomes markedly lower than it already is, thereby further widening the gap between private firms and companies with larger government ownership (Figure 8, left).<sup>43</sup> The same holds for the return on equity of firms with larger government ownership, which becomes negative once grants and below-market borrowings are subtracted from companies' profit before tax (Figure 8, right). Likewise, interest coverage, which measures firms' capacity to meet interest payments on their outstanding debt,<sup>44</sup> appears considerably worse once grants are removed from earnings before interest and taxes (EBIT) and below-market borrowings added back to interest expenses (Figure A B.3). While this is true across all categories of firms, the difference is more visible for companies having at least 25% government ownership.

<sup>43</sup> Return on assets in year  $t$  is calculated as profit before tax in year  $t$  (number 11 in **Error! Reference source not found.**) divided by the average of assets in year  $t$  and  $t-1$ . Return on equity is calculated in the same way, but replacing assets with equity and excluding cases where companies have negative equity. This is because firms with negative equity tend to make large losses, which, together with negative equity, results in very large, positive rates of return on equity.

<sup>44</sup> Interest coverage is defined as EBIT (8) divided by interest expenses (10) in **Error! Reference source not found.**

**Figure 8. Subsidies may generate a misleading view of firm performance**

Left: return on assets; right: return on equity



Note: Both indicators are averaged using firms' revenue as weights and are calculated using profit before tax, which negates the need to consider tax concessions. The graphs only consider government grants and below-market borrowings, thus omitting below-market inputs for which only few data points exist. Readers are advised that the counterfactual of no subsidies shown here is purely hypothetical and does not represent what would actually happen were subsidies to be removed. The data behind this graph cover the entire period 2005-22. See Annex A for more information on the firm sample.

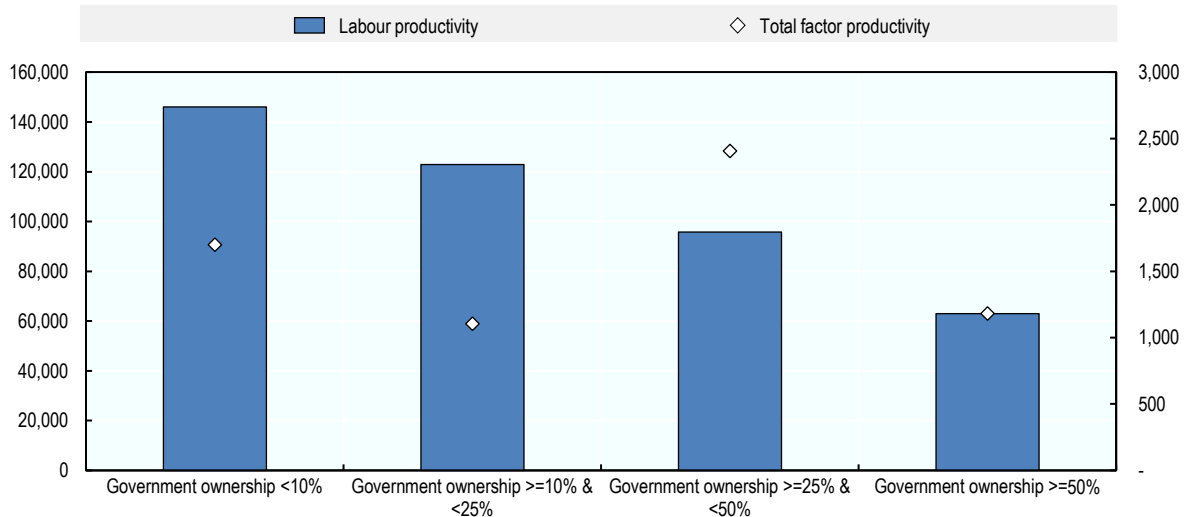
Source: OECD MAGIC database.

While the hypothetical scenario described above can shed light on the impacts of support, there are at least two important caveats to bear in mind. First is the fact that the data shown above do not reflect what the performance of firms would actually be absent subsidies. Estimating this counterfactual would require detailed modelling to understand the behavioural response of companies following the withdrawal of government support. A second concern is that the numbers above do not account for important forms of support which have been left out of the analysis due to lack of transparency and data. As already mentioned, this concerns first and foremost below-market energy inputs, which can have large effects on gross profit (3) through lower cost of sales (2) (OECD, 2023<sup>[3]</sup>). Other below-market inputs may also include, for example, land acquired or rented from governments for free or at preferential prices or cheaper intermediates. Finally, this could also concern non-pecuniary forms of government support such as the regulatory advantages mentioned above.

State enterprises do not only underperform in accounting terms, but also in terms of productivity in an economic sense (Figure 9). Whether using a simple version of labour productivity or a more complex measure of total factor productivity, both sets of indicators show that companies with less than 10% government ownership are more productive than companies having 50% or more government ownership. Conclusions are more ambiguous for companies falling in between, with labour productivity showing such companies to be less productive than firms with less than 10% government ownership while total factor productivity shows the contrary for firms having between 25% and 49% government ownership.

### Figure 9. State enterprises in industrial sectors tend to be less productive

Average productivity by government-ownership category in USD;  
left axis: labour productivity; right axis: total factor productivity



Note: Averages are weighted by firm revenue. Labour productivity is calculated as firms' economic value added divided by their number of employees. Total factor productivity is calculated using econometric estimates of firms' production functions. These estimates rely on the control-function approach, whereby a flexible input (intermediates) is used to control for unobserved productivity shocks and obtain more accurate output elasticities for the different production inputs (Levinsohn and Petrin, 2003<sup>[26]</sup>; Andrews, Criscuolo and Gal, 2016<sup>[27]</sup>). The resulting productivity estimates are then purged of the impact of firms' market power by removing estimated markups following the procedure proposed by De Loecker and Warzynski (2012<sup>[28]</sup>). See Annex A for more information on the firm sample.

Source: OECD estimates based on the OECD MAGIC database.

Crucially, the productivity estimates above do not account for the subsidies firms receive, which could have ambiguous effects on observed productivity. On the one hand, one would expect grants and input subsidies to increase firms' earnings before interest, taxes, depreciation, and amortisation (EBITDA) (see **Error! Reference source not found.**), which would then increase economic value added and therefore productivity, keeping everything else constant. On the other hand, everything else is very unlikely to be constant, with subsidies plausibly affecting decision-making within companies and thus productivity. Ongoing OECD work suggests some of the subsidies measured in the OECD MAGIC database to affect firm-level productivity negatively, which would have the effect of lowering the productivity of SEs the most since they receive relatively more subsidies (Figure 2).<sup>45</sup>

In sum, this section has shown that SEs in industrial sectors tend to get more subsidies than their private competitors. The section has also shown that notwithstanding these larger subsidies, the industrial SEs covered here also tend to be less profitable, more indebted, and less productive.

<sup>45</sup> Interestingly, preliminary estimates indicate that subsidies account for most of the finding that government ownership correlates negatively with productivity (and positively with capacity investment), leaving state ownership to explain very little or zero of the remaining variance by itself. If verified, this would suggest that government ownership can be neutral for productivity and investment if SEs do not receive disproportionate amounts of subsidies.

### 3. State enterprises as providers of industrial subsidies

The previous section showed that SEs tend to receive relatively more support from governments. In addition, a very significant share of all industrial subsidies tends to be intermediated by or provided through SEs acting as suppliers of energy, financing, or parts and components to producers downstream (OECD, 2019<sup>[29]</sup>; OECD, 2021<sup>[2]</sup>; OECD, 2023<sup>[3]</sup>). These two findings together imply that companies in which governments are significant shareholders can play a dual role as both recipients and providers of industrial subsidies.

In this section, the analysis turns to the topic of SEs as providers by looking more specifically into the role of: i) state banks as providers of below-market borrowings; ii) government funds as providers of below-market equity; and iii) state electric utilities as provider of below-market energy. A recurring concern throughout is that, while profit-seeking private companies would normally seek to remunerate shareholders adequately, those SEs that are under government influence may pursue industrial policy by offering other companies goods and services at price levels that do not ensure their own profitability or financial sustainability. This has in turn important policy implications, discussed in the final section of the report, for the definition of subsidies and the ability of trade rules to discipline trade-distorting subsidies.

#### 3.1. State banks as providers of below market borrowings

In earlier work, the OECD has identified below-market borrowings (BMB) as a significant channel of government support (OECD, 2021<sup>[2]</sup>). BMB have been found to benefit companies from many countries, but they are especially large in China. While they can in a few instances involve non-banking institutions<sup>46</sup>, BMB usually involve state banks and other government financial institutions. This explains why the following analysis concentrates by necessity on jurisdictions, of which China is the foremost example, where BMB is prevalent and a substantial share of banking assets are held by government entities. China's largest state banks are also generally identified as lenders to the industrial companies covered in the OECD MAGIC database, which further motivates the focus of this sub-section.

##### 3.1.1. State ownership, control, and influence in the banking system

State ownership of banking assets is especially significant in China, where the proportion of government shares in the top 10 financial institutions by market capitalisation exceeded 39% in 2021 (Figure 10). This contrasts with the extent of government ownership in the top 10 financial institutions of other major economies. Except for Korea (16.6%) and Japan (5.4%), the top 10 financial institutions of other major economies were on average less than 5% government-owned, and for some, entirely private. Among these top 10 financial institutions in China, the first four were also the world's largest banks by assets as of end 2022.<sup>47</sup> Looking at a broader sample combining China's largest banks (Figure 11), which together account for three quarters of China's banking assets, shows that 64% of these assets are held by state-owned entities. State ownership and influence across China's banking system is thus pervasive due to the sheer volume of assets of the country's state-owned commercial banks, as well as the indirect presence of central and sub-central authorities within other categories of banking institutions (Box 5).

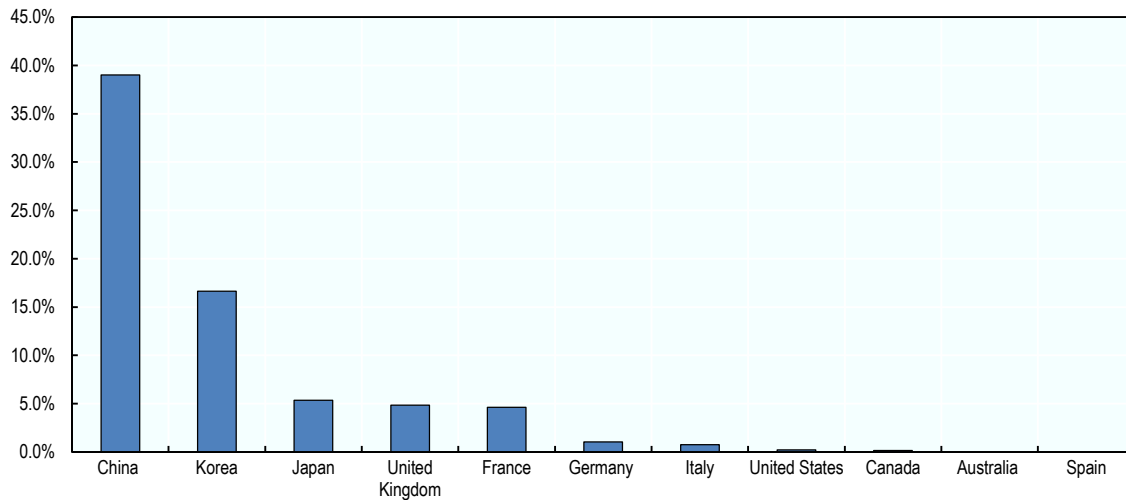
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<sup>46</sup> For example, BMB may notably occur through the issuance of so-called 'industrial revenue bonds', which are tax-exempt bonds issued by Industrial Development Corporations on behalf of private companies for specific projects. They usually carry a lower nominal interest rate than regular bonds of comparable quality. See, for example, <https://gov.texas.gov/business/page/industrial-revenue-bonds> (accessed on 22 August 2024).

<sup>47</sup> See [www.spglobal.com/marketintelligence/en/news-insights/research/the-world-s-100-largest-banks-2023](http://www.spglobal.com/marketintelligence/en/news-insights/research/the-world-s-100-largest-banks-2023) (accessed on 23 August 2023).

### Figure 10. State ownership of banking assets is especially significant in China

State ownership of the top 10 financial institutions by market capitalisation, 2021



Source: China Pathfinder, Rhodium Group.

#### Box 5. State ownership and influence across China's banking system are pervasive

Although the banking sector in China appears rather fragmented with more than 4 000 commercial banks (Bisio, 2020<sup>[30]</sup>), the six largest state-owned commercial banks – the so-called 'Big six' – held, as of end-2023, 41.7% of all commercial bank assets in China.<sup>1</sup> While they are all publicly traded, the Chinese Government, through the Ministry of Finance, Central Huijin Investment (a state-owned investment company), and other SEs, remains the majority shareholder in these six institutions.

The 12 national joint-stock commercial banks, which constitute the second largest category of Chinese banks by assets (17%), are not majority-owned by the government. Authorities often retain, however, a controlling interest in them through state-owned investment or holding companies (ibid).

The Chinese banking system also comprises a broad range of city commercial and rural banks, each of which hold 13-14% of the banking sector's total assets. They have varying ownership structures and may be majority-owned by private entities or individuals. Municipal or provincial governments often play nevertheless an important role in these institutions by maintaining key ownership stakes or an indirect influence (Lam, Rodlauer and Schipke, 2017<sup>[31]</sup>).

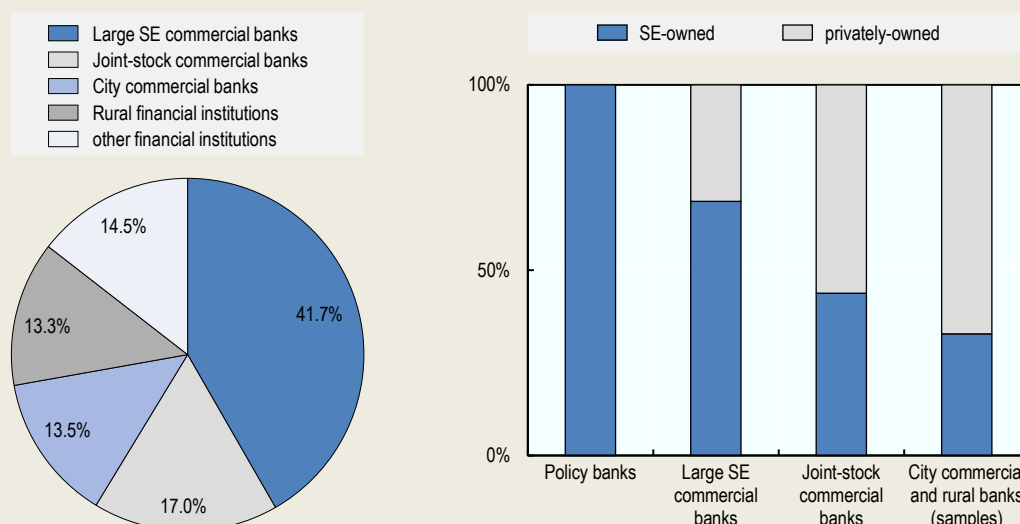
As of September 2023, the six state-owned commercial banks, nine of joint-stock commercial banks and five city commercial banks were designated as China's systemically important banks (SIB) by the People's Bank of China and the National Financial Regulatory Administration of China.<sup>2</sup> The SIB list is common in many countries and also colloquially known as a 'too-big-to-fail' list.

In addition to these commercial banks, the Chinese Government has also established three national state policy banks, namely the China Development Bank (CDB), the Export-Import Bank of China (Exim Bank), and the Agricultural Development Bank. There is ample evidence obtainable from annual reports and corporate disclosures that these banks also provide lending to domestic industrial firms in manufacturing sectors. CDB, for instance, may be well known for its growing international presence in supporting infrastructure projects abroad; however, the loans directed outside mainland China accounted only for 2.3% of its total outstanding loans according to its 2017 and 2018 annual reports.

**Figure 11. The composition of China's banking assets**

China's banking assets by bank category [left]

share of banking assets held by government entities, by bank category [right]



Source: National Financial Regulatory Administration, China (left); OECD research based on banks' annual reports (right), covering all three policy banks, all big six state-owned commercial banks, all 12 joint-stock commercial banks and a sample of 25 city commercial and rural banks.

1. See [www.cbirc.gov.cn/cn/view/pages/tongjishuju/tongjishuju.html](http://www.cbirc.gov.cn/cn/view/pages/tongjishuju/tongjishuju.html) (accessed on 21 February 2024).

2. See [www.cbirc.gov.cn/cn/view/pages/ItemDetail.html?docId=1128949&itemId=915&generalType=0](http://www.cbirc.gov.cn/cn/view/pages/ItemDetail.html?docId=1128949&itemId=915&generalType=0) (accessed on 21 February 2024).

The Chinese banking system is characterised not only by its high degree of state ownership, but also by the intricate ties Chinese banks, irrespective of their ownership, maintain with various levels of government. Central authorities, as well as provincial and local governments, have been found to frequently intervene in the lending decisions of commercial banks (Bisio, 2020<sup>[30]</sup>; Hsieh, Bai and Song, 2019<sup>[32]</sup>), often using bank lending as a policy tool to achieve pre-set industrial targets. In this respect, in February 2016, China's Ministry of Commerce issued an announcement titled "Several Opinions on the Financial Support of Industry for Stabilizing Growth, Adjusting Structure and Increasing Efficiency", which calls on banks to provide financial support for manufacturing sectors and for implementing the 'Made in China 2025' national strategic plan.<sup>48</sup> Likewise, 'window guidance' policies – i.e. informal policy instruments used by the People's Bank of China (PBOC) and the China Banking and Insurance Regulatory Commission (CBIRC) to guide financial institutions through lending quotas – as well as lending directives (e.g. regarding the pace and volume of lending) have formed an essential part of the Chinese policy toolkit (Kauko, 2020<sup>[33]</sup>). The annual reports of the banks studied in this report (Annex F) note, for example, that these banks respond to, and participate in, the implementation of national policies, including 'Made in China 2025', the Belt and Road Initiative, strategic emerging industries, 'Going Global', etc. Some banks have also signed strategic co-operation agreements with the Ministry of Industry and Information Technology (MIIT) or the National Development and Reform Commission (NDRC) (Zenglein and Holzmann, 2019<sup>[34]</sup>).<sup>49</sup> Banking institutions in China therefore appear as key implementing agents of the government's industrial strategy. Lending behaviour generally reflects these broad policies, with many of China's bank loans benefitting

<sup>48</sup> See [www.mofcom.gov.cn/article/b/g/201603/20160301287601.shtml](http://www.mofcom.gov.cn/article/b/g/201603/20160301287601.shtml) (accessed on 21 August 2023).

<sup>49</sup> As an illustration, in 2016, the China Development Bank and the MIIT signed a strategic co-operation agreement providing that during the '13<sup>th</sup> Five-Year Plan' period, the Bank will contribute to implementing 'Made in China 2025' through no less than CNY 300 billion of financing. See [www.gov.cn/xinwen/2016-11/10/content\\_5130742.htm](http://www.gov.cn/xinwen/2016-11/10/content_5130742.htm) (accessed on 18 August 2023).

SEs<sup>50</sup> and government infrastructure projects, at times even to the detriment of their profitability (Turner, Tan and Sadeghian, 2012<sup>[35]</sup>; Cull, Martinez Peria and Verrier, 2018<sup>[36]</sup>).

### **3.1.2. Who's afraid of the big, bad loan? The size, quality, and cost of loans supporting China's manufacturing sector**

Considering the size of BMB received by industrial firms, the banking sector's high state ownership, and the degree of overlap between political objectives and lending activities, this section delves deeper into China's banking activities to shed more light on the ways in which SEs intervene in the financing of industrial assets. To that end, the analysis has collected financial information covering the period 2010-22 for China's largest banks, which include two policy banks, the 'big six' large state-owned commercial banks, 11 joint-stock commercial banks and a sample of five city commercial and rural banks (Annex F). In the following, these sampled banks are often collectively referred to as "major Chinese banks."

Over the period 2010-22, the corporate loans of major Chinese banks have more than tripled, with the manufacturing sector being the top recipient by a large margin (Figure 12).<sup>51</sup> Consistent with the size of their assets, loans from the 'big six' large SE commercial banks account for the largest share of these corporate loans but joint-stock commercial banks appear to have grown in importance. While the current stress in China's property market is drawing considerable attention to real-estate loans, the volume of loans that major Chinese banks are directing to the manufacturing sector has consistently exceeded that which they provide to the real-estate sector.<sup>52</sup> These manufacturing loans have recently increased very rapidly, beginning in 2020 during the Covid-19 pandemic and accelerating further in 2022.

With rapid increases in loans comes the question of the financial risk of these transactions and their quality. The quality of lending activities constitutes a crucial element in measuring the financial health and overall soundness of banking institutions. The non-performing loan (NPL) ratio, i.e. the ratio of loans that are 'non-performing' on a bank's balance sheet to total loans in its portfolio, is the most widely used metric for assessing the quality of a banking institution's loan portfolio. Loans that are not performing, also called bad loans, form an inevitable part of banks' business. Any attempts by banks to fully eliminate NPLs from their loan portfolio may well prove impossible and ill-advised: it might contribute to dampening down credit significantly and hence slowing the pace of economic activity, notably in most Asian and European economies, where banks remain the main providers of corporate finance (ADB, 2021<sup>[37]</sup>).

While both the volume of NPLs and the NPL ratio are indicative of the credit quality of banks within a country, the absence of a harmonised definition of NPLs limits the relevance of cross-country comparisons. Caution should thus be exercised when comparing these values between jurisdictions (see Annex G). Bearing this caveat in mind, data from the World Bank on the average NPL ratio of banks by country for the period 2010-22 does not suggest China to have an outsized NPL ratio. The country's ratio is generally comparable to that of most OECD countries, with the notable exception of jurisdictions having experienced banking crises over the past 10-15 years (e.g. Greece, Croatia, Cyprus,<sup>53</sup> Italy, Ireland, and Portugal). China's NPL ratio has also significantly decreased since the late 1990s, at a time when Chinese state

<sup>50</sup> Note that many SEs have, at the group level, a finance company, i.e. a non-bank financial institution providing a broad range of financial services to members of the group (e.g. provision to member companies of loans, loan syndication services, financing consulting services, as well as acceptance of member companies' deposits, and underwriting of group members' securities) (Lin, 2017<sup>[61]</sup>). This suggests that, along with the traditional banking sector, SEs may obtain financing from other non-banking institutions.

<sup>51</sup> For the purpose of this report, the analysis concentrates on corporate loans, which are those that matter from the perspective of industrial subsidies.

<sup>52</sup> For the two policy banks covered in this study, infrastructure projects are the main target for China Development Bank. The Export-Import Bank of China disclosed the breakdown by its loan programme, rather than sectors.

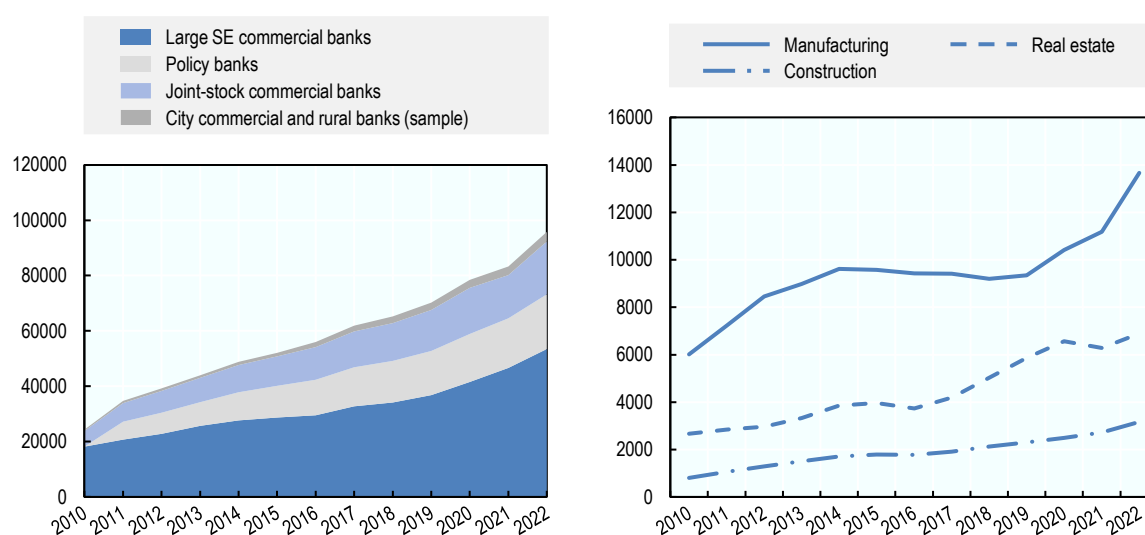
<sup>53</sup> Note by the Republic of Türkiye: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Türkiye recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Türkiye shall preserve its position concerning the "Cyprus issue". Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Türkiye. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

banks had large NPLs on their balance sheets, forcing central authorities to adopt measures to clean up these bad loans through the establishment of asset management companies serving as 'bad banks' (e.g. Cinda, Orient, and Huarong).

### Figure 12. Corporate loans to the manufacturing sector are the largest and have recently increased faster

Left: volume of corporate loans by bank category, in CNY billions

Right: volume of corporate loans by recipient sector, in CNY billions



Note: The graphs cover the two policy banks providing loans to industrial sectors, the 'big six' large state-owned commercial banks, 11 joint-stock commercial banks out of 12, and a sample of five city commercial and rural banks. See Annex F for the list of banks covered. Of these banks, the Export-Import Bank of China discloses loan breakdowns by loan programme rather than by sector and is therefore not included in the right hand-side graph.

Source: OECD research, based on banks' annual reports.

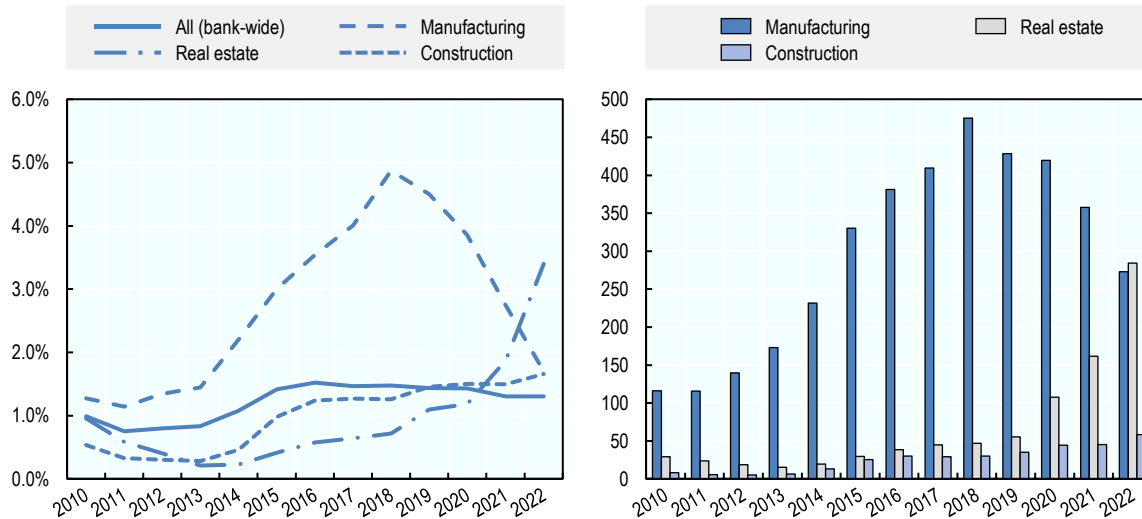
The volume and ratio of NPLs for manufacturing loans are nevertheless much higher than the bank-wide ratio and had been higher than real-estate loans up until China's recent property decline (Figure 13). It therefore took a severe decline in property prices for real-estate NPLs to finally surpass the NPL level of manufacturing loans. This suggests the quality of manufacturing loans to have been relatively weak over the period considered, which raises questions about the ability of certain manufacturers to meet their debt obligations.

There are, however, at least two reasons why one needs to view the above NPL numbers as conservative. One is that "[b]ad loans [at Chinese banks] are being written off and transferred to asset management companies on a massive scale, thus leaving them less visible on banks' balance sheets" (OECD, 2022<sup>[38]</sup>). The exact portion of loans being written off or transferred that concerns the manufacturing sector is not identifiable from annual reports, however. Second is the fact that a sizable portion of performing loans are susceptible to becoming non-performing. For this, it may be relevant to examine both the volume and ratio of the category of 'special mention' loans, i.e. loans that borrowers are able to service at present but for which repayment may be affected by specific factors (Box 6 and Table A G.1).



**Figure 13. The volume and ratio of NPLs for manufacturing loans are higher than the bank-wide ratio and had been higher than real-estate loans until China's property crisis**

Left: average NPL ratio; right: aggregate volume of NPLs by sector, in CNY billions



Note: The graphs cover all the 'big six' large state-owned commercial banks, 11 joint-stock commercial banks out of 12, and a sample of five city commercial and rural banks. See Annex F for the list of banks covered. Policy banks did not disclose the breakdown of their NPLs by industrial sector and are therefore not included in these graphs.

Source: OECD research, based on banks' annual reports.

### Box 6. China's 'special-mention loans' and the NPL ratio

A large number of financial analysts and economists consider China's NPL ratio to be understated, implying that the true level of NPLs in China is considerably higher (IMF, 2016<sup>[39]</sup>; Kauko, 2020<sup>[33]</sup>). Because a higher NPL ratio would force banks to abide by the required loan-loss provisioning (Table A G.1), which would curtail their lending capacity, some establishments may have had an incentive to shift bad loans onto other entities or reclassify them. Many Chinese banks have, for instance, classified some of their loans, which were more than 90 days overdue, as 'overdue but not impaired', with a view to reducing the loan-loss the provisions they need to set aside to cover losses from bad loans and thus to protect their capacity to lend, as well as their earnings.<sup>1</sup>

Along with this practice, banks have deployed various strategies to move their bad loans off their balance sheet, including by selling them to asset-management companies (e.g. 'bad banks' such as Cinda, Orient, and Huarong), investing in trust and other entities subject to looser lending regulations in the 'shadow-banking' sector, or undertaking debt-equity swaps (Lam, Rodlauer and Schipke, 2017<sup>[31]</sup>). The various methods and strategies employed by Chinese banks may therefore make their credit quality appear better than it actually is. Efforts to estimate the magnitude of bad loans in China's banking sector have, for instance, found the 'loans potentially at risk' made to the corporate sector to be much higher than the official NPL ratio alone would suggest (IMF, 2016<sup>[39]</sup>).

Combining NPLs and 'special-mention' loans together could offer one way to better approximate the true credit quality of loans in China's traditional banking sector, particularly since "some loans may be classified as 'special mention' even though they carry considerable credit risk."<sup>2</sup> The 'special-mention' loan category should in normal times shed some light on the potential magnitude of future NPLs, although 'special-mention' loans would not necessarily all become non-performing (IMF, 2016<sup>[39]</sup>; OECD, 2022<sup>[38]</sup>).

Two examples suggest that the category of ‘special mention’ loans used by the Chinese banking system may well contain loans, which would be considered NPLs in other jurisdictions. For example, Chinese banks may take account of the existence of collaterals attached to a loan to classify a loan as ‘non-performing’ or ‘special mention’. Despite signs of borrowers’ financial difficulties, a bank may still conclude that the loan will be fully repaid if the loans are collateralised (e.g. secured by land and properties). The 2017 guidelines of the Basel Committee on Banking Supervision (BCBS) and major banking systems today consider, however, that the collateralisation of loans is irrelevant to determining their classification (The World Bank, 2020<sup>[40]</sup>). Moreover, contrary to other banking systems, Chinese banks tend to classify their restructured loans as ‘normal’ or ‘special-mention’ loans. This practice may nonetheless change after the PBOC published new rules on asset classification in February 2023, requiring that banks classify at least their restructured loans as ‘special mentions’ and, in some instances, as non-performing.<sup>3</sup>

1. See, for example, [www.caixinglobal.com/2018-06-12/regulators-pressure-banks-to-speed-up-bad-debt-recognition-101269502.html](http://www.caixinglobal.com/2018-06-12/regulators-pressure-banks-to-speed-up-bad-debt-recognition-101269502.html) (accessed on 16 August 2023). The IMF and the World Bank recommended in 2017 that such a practice be eliminated in China (IMF and The World Bank, 2017<sup>[41]</sup>). Note also that, while Chinese banks have had to comply with the standard international five-category loan classification system since 2004, it does not stipulate the number of days required for loans that became overdue to be classified as non-performing (see Annex G), hence leaving the decision as to when a loan turns bad to the discretion of banks.

2. See [www.frbsf.org/banking/asia-program/pacific-exchange-blog/china-tightens-bad-loan-recognition-rules/](http://www.frbsf.org/banking/asia-program/pacific-exchange-blog/china-tightens-bad-loan-recognition-rules/) (accessed on 23 August 2023).

3. See, for example, [www.kwm.com/hk/en/insights/latest-thinking/Chinese-regulators-finalise-financial-asset-risk-classification-rules-for-banks.html](http://www.kwm.com/hk/en/insights/latest-thinking/Chinese-regulators-finalise-financial-asset-risk-classification-rules-for-banks.html) (accessed on 23 August 2023).

Due to ‘special-mention’ loans, the value of total NPLs in China may be considerably higher than the NPL ratio alone would suggest (Figure 14). While not all ‘special-mention’ loans should be deemed ‘non-performing’, combining them with NPLs is indicative of the fact that the potential value of total NPLs in China could be much higher. In this respect, Figure 14 shows that the NPL ratio of major Chinese banks would have increased on average by three times in the hypothetical case where all ‘special-mention’ loans would have fallen into the category of NPLs during the past decade. While the volume of ‘special-mention’ loans remained fairly stable between 2015 and 2022 (following a surge between 2010 and 2014), the ratio of ‘special-mention’ to total loans consistently decreased during the period. This may reflect, among other factors, a renewed push by authorities to accelerate banks’ recognition of their NPLs so that they can subsequently be written off and hence moved off their balance sheets.<sup>54</sup> Special mention loans are, however, not disclosed by target sector. It is thus difficult to judge how much of these special-mention loans are related to manufacturing.

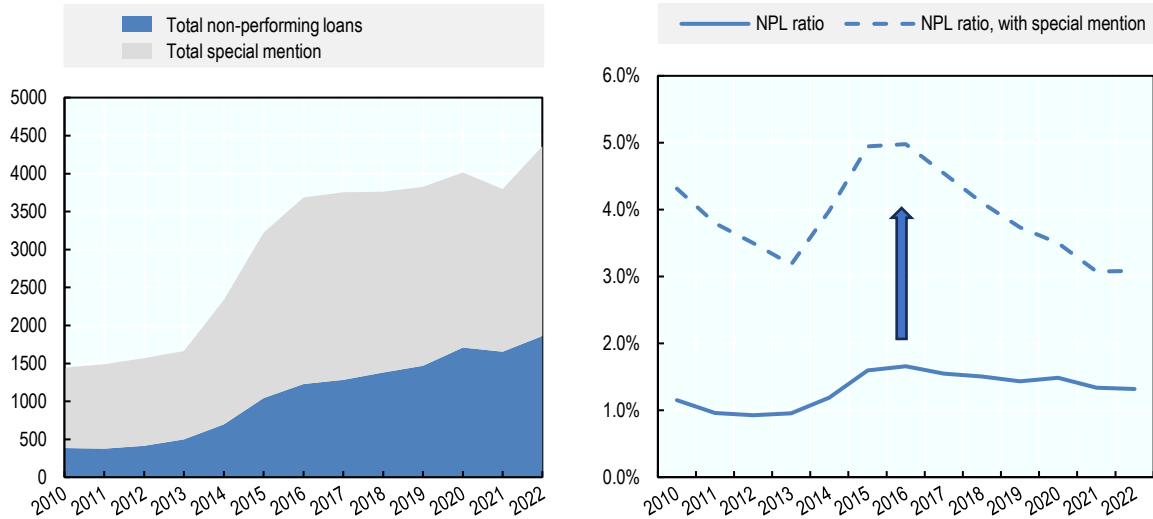
From the perspective of BMB, the key questions concern: (i) whether the entities providing the loans are state-owned or state-related; and (ii) whether the terms and conditions of these loans are in line with market principles, including in relation to accounting for the risk profile of borrowers. The earlier part of this section has answered the first question in the affirmative. It then noted that the manufacturing loans provided by China’s major banks are large and their level of risk larger than those directed at other sectors. The remaining question therefore concerns the rates at which these loans are offered to corporate customers.

<sup>54</sup> See [www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/chinese-banks-set-to-clean-up-balance-sheet-more-quickly-in-q4-61427131](http://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/chinese-banks-set-to-clean-up-balance-sheet-more-quickly-in-q4-61427131) (accessed on 22 August 2023).

### Figure 14. The value of total NPLs in China may be considerably higher than the NPL ratio alone would suggest

Left: total volume of NPLs and special-mention loans, in CNY billions

Right: NPL ratio, with and without special-mention loans



Note: While not all 'special-mention' loans should be deemed 'non-performing', the "NPL ratio with special mention" shows a hypothetical case where all 'special-mention' loans are added to NPLs. Graphs cover all the 'big six' large state-owned commercial banks, 11 joint-stock commercial banks out of 12, and a sample of five city commercial and rural banks. See Annex F for the list of banks covered. Policy banks did not report 'special mention' loans and are therefore not included in these graphs.

Source: OECD research, based on banks' annual reports.

For the major Chinese banks covered in this report (Annex F), average lending rates on corporate loans<sup>55</sup> appear only slightly above or even below the PBOC's one-year benchmark lending rates between 2010-22 (Figure 15). In the case of large SE commercial banks, lending rates remained the closest to the one-year benchmark (a spread of only 20bp on average between 2010-22), which is even lower than the other categories of banks in China. Four of these large SE commercial banks are also significant in that they were ranked as the largest banks globally in 2022.<sup>56</sup> These spreads to applicable base rates are in stark contrast with those found for other top 10 global banks not based in China (Figure 15). This finding is consistent with what was found at the level of individual subsidy recipients using the OECD MAGIC database; namely, that BMB are widespread in China. It is also consistent with reports that between a third and a half of all bank lending in China was provided with interest rates that were equal to or below the country's lending benchmark between 2010 and 2019 (OECD, 2019<sub>(42)</sub>).<sup>57</sup>

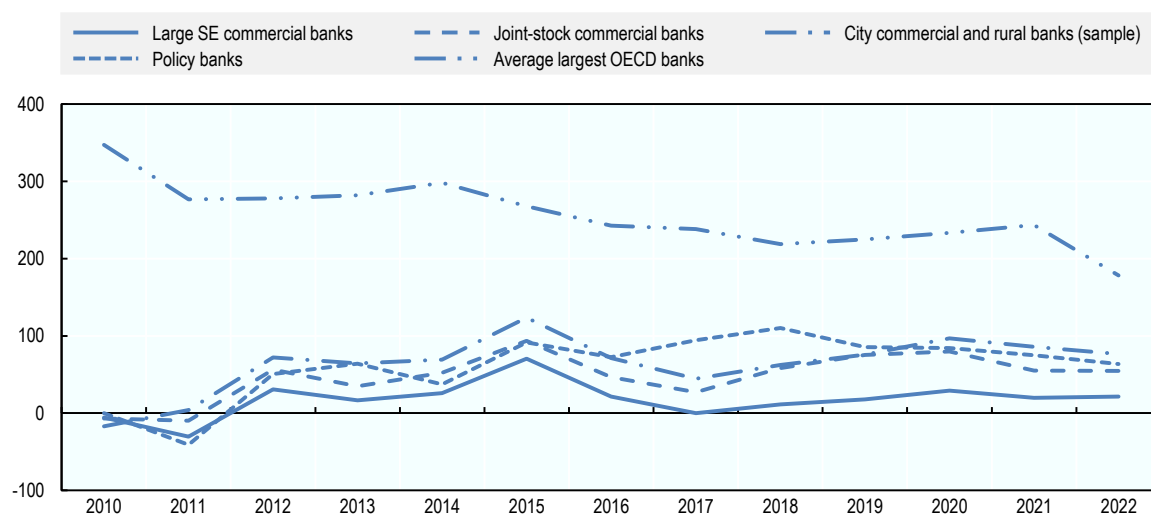
<sup>55</sup> Calculated as interest income related to corporate loans divided by the corresponding loan amount.

<sup>56</sup> See [www.spglobal.com/marketintelligence/en/news-insights/research/the-world-s-100-largest-banks-2023](http://www.spglobal.com/marketintelligence/en/news-insights/research/the-world-s-100-largest-banks-2023) (accessed on 23 August 2023).

<sup>57</sup> According to the OECD's Product Market Regulation indicators, China also counts among the few countries where SEs have easier access to borrowings on preferential terms. See [www.oecd.org/economy/reform/indicators-of-product-market-regulation/](http://www.oecd.org/economy/reform/indicators-of-product-market-regulation/) (accessed on 5 September 2023).

**Figure 15. Average lending rates of major banks in China have been slightly above or below the PBOC's one-year benchmark**

Spread to applicable base rates related to average interest rates on corporate loans, in basis points



Note: Average lending rates are calculated as interest income related to corporate loans divided by the corresponding loan amount. These average lending rates are compared against applicable base rates based on the currency of the loans. Of the sampled banks, only the Export-Import Bank of China did not disclose the breakdown of its currency and the analysis therefore assumes the currency mix to be 75% CNY and 25% USD, based on the bank's loan programme. Base rates used for OECD banks are currency-specific interbank rates. The benchmark lending rates for China refer to the Loan Prime Rate after its introduction in 2019 and to the previously used benchmark lending rates also published by the PBOC before then. The graphs cover the two policy banks providing loans to industrial sectors, the 'big six' large state-owned commercial banks, 11 joint-stock commercial banks out of 12, and a sample of five city commercial and rural banks. See Annex F for the list of banks covered.

Source: OECD research, based on firms' financial data retrieved through annual reports and Factset, and benchmark rates from the PBOC.

### 3.2. Government investment funds as providers of below-market equity and below-market equity returns

While it is much harder to identify and quantify, the provision of equity on non-market terms by SEs forms an important alternative to BMB for the purpose of channelling below-market finance to industrial companies. This happens when governments themselves, government-investment funds, or other SEs serve as providers of equity either in the form of an equity infusion on non-market terms or through their acceptance of below-market equity returns for sustained periods of time.<sup>58</sup> State entities may use equity infusions in various instances, with each responding to different objectives (e.g. achieving long-term financial returns, assisting a distressed company in times of crisis, protecting a domestic troubled company too important to fail for the economy, supporting national champions, etc.), which can have varying impacts on trade and competition.

Capital injections involving state resources can raise trade and competition concerns, especially when they are inconsistent with commercial practice or the expectations of private investors. Such concerns may become more of a systemic issue where equity infusions provided by governments and government-investment funds are systematically used to support – both directly and indirectly through a layer of vertical and horizontal state-related investments – domestic firms, with a view to achieving industrial-policy goals outside of an emergency or crisis situation. The development and multiplication of government-guidance funds (GGFs) in China used by central and subcentral authorities to channel important state resources into its industries seems to reflect, in this respect, a systemic issue posed by this new state-related investment vehicle.

<sup>58</sup> In the remainder of this section, below-market equity and below-market equity returns correspond to, respectively, governments providing equity infusions on non-market terms, hence giving a one-off benefit, and government shareholders accepting lower returns than private investors, thus providing ongoing support.

### 3.2.1. The provision of emergency equity to help distressed companies in times of crisis

In times of crisis, governments have at times provided emergency equity to companies experiencing serious difficulties. For example, during the 2008-09 global financial crisis, the U.S. Treasury took temporary equity stakes of, respectively, 61% and 10% in General Motors and Chrysler, along with the provision of large emergency loans (Goolsbee and Krueger, 2015<sup>[43]</sup>). More recently, the COVID-19 pandemic and Russia's invasion of Ukraine have prompted some governments to use equity injections to avoid the unnecessary collapse of systematically important companies (Christiansen and Sultan, 2020<sup>[44]</sup>). Although government support programmes have mostly consisted of a mixture of grants to troubled firms, government guarantees, as well as loans at low interest rates, a small number of governments have stepped into companies that were not able to sustain more debt and for which the liquidity support it had already provided was no longer sufficient to guarantee their long-term viability. Governments have, for instance, injected fresh equity into distressed companies with weak balance sheets or engaged in debt-equity swaps (Christiansen and Sultan, 2020<sup>[44]</sup>; OECD, 2021<sup>[45]</sup>). This is notably the case for certain services providers, such as airlines, which were significantly affected by travel restrictions and sanitary measures adopted during the pandemic<sup>59</sup>, as well as for those energy providers affected by supply shocks and soaring energy prices.<sup>60</sup>

Emergency government equity infusions are part of a rescue effort to avoid a costly failure in the short-term and hence may not necessarily follow a long-term, profit-oriented logic from the government. While such support can constitute an important and useful tool to deal with an emergency situation, this "accidental" state ownership should be carefully designed and managed to minimise the potential distortions to competition both at the time of, and following, the capital injection and thus to maintain a level playing field (OECD, 2021<sup>[45]</sup>). This form of emergency support should notably be: (i) transparent; (ii) proportional, i.e. limited to the minimum needed to ensure the viability of the recipient and designed only to restore the capital structure of the recipient to that predating the crisis; and (iii) time-limited, thus accompanied with an exit strategy of the government (Christiansen and Sultan, 2020<sup>[44]</sup>).<sup>61</sup>

### 3.2.2. The provision of equity infusions to assist a troubled company active in a sector deemed key to the economy

Governments may also use equity infusions in ordinary times to assist and protect a company experiencing difficulties in a sector deemed key to the economy. In 2013, for instance, the Japanese state-backed fund INCJ acquired a 69% stake in domestic chipmaker Renesas at a time the company was incurring important losses.<sup>62</sup> Between 2015 and 2017, the Korean Development Bank and the Export-Import Bank of Korea offered debt-equity swaps to Korean shipbuilder Daewoo Shipbuilding & Marine Engineering in a bid to improve the company's balance sheet.<sup>63</sup> More recently, in 2020, the Hefei municipality and the Anhui province in China rescued loss-making Chinese electric carmaker Nio using simultaneous equity infusions from four GGFs, namely the Jianheng New Energy Fund, the Advanced Manufacturing Industry Investment

<sup>59</sup> As an illustration, following the adoption by the European Commission in May 2020 of the second amendment to the EU Temporary Crisis Framework, allowing Member States to provide recapitalisations aid in favour of non-financial companies in need, the Commission approved no less than nine national state-aid measures in the form of equity injections into national airlines or rail passenger service operator. See [https://commission.europa.eu/strategy-and-policy/coronavirus-response/supporting-jobs-and-economy-during-coronavirus-pandemic/state-aid-cases\\_en#member-states](https://commission.europa.eu/strategy-and-policy/coronavirus-response/supporting-jobs-and-economy-during-coronavirus-pandemic/state-aid-cases_en#member-states) (accessed on 14 February 2024).

<sup>60</sup> See Box 8 in the next sub-section. Note that government equity infusions resulting from the COVID-19 pandemic and Russia's war of aggression against Ukraine have concerned for the most part companies in services sectors and not in the manufacturing sector, except for Italian steelmaker ILVA, which received in 2021 an equity infusion from state-owned Invitalia.

<sup>61</sup> See also second amendment of the Temporary Framework for State aid measures to support the economy in the current Covid-19 outbreak issued on 8 May 2020, available at [https://competition-policy.ec.europa.eu/document/download/7c429c3e-c72c-48a6-ac2a-fc3a1652e3e3\\_en?filename=TF\\_consolidated\\_version\\_as\\_amended\\_3\\_april\\_and\\_8\\_may\\_2020\\_en.pdf](https://competition-policy.ec.europa.eu/document/download/7c429c3e-c72c-48a6-ac2a-fc3a1652e3e3_en?filename=TF_consolidated_version_as_amended_3_april_and_8_may_2020_en.pdf) (accessed on 25 February 2024).

<sup>62</sup> After 10 years, in October 2023, INCJ announced it had successfully exited from its investment in Renesas. See [www.incj.co.jp/english/newsroom/upload/docs/E\\_PressRelease\\_INCJ\\_Renesas\\_20231025.pdf](http://www.incj.co.jp/english/newsroom/upload/docs/E_PressRelease_INCJ_Renesas_20231025.pdf) (accessed on 25 February 2024).

<sup>63</sup> See [www.businesskorea.co.kr/news/articleView.html?idxno=16355](http://www.businesskorea.co.kr/news/articleView.html?idxno=16355) (accessed on 13 February 2024). The company was eventually sold to the Hanwha group in 2022 and renamed Hanwha Ocean.

Fund, the New Energy Automobile Fund, and the Anhui High Tech Co.<sup>64</sup> In such instances, governments do not generally pursue a long-term participation or long-term strategy designed to earn market-based rates of return, as evidenced by their subsequent exit from the companies mentioned above. Careful design and management of the government intervention are therefore key to minimise market distortions, as well as to avoid systematic use of this instrument by governments.

### **3.2.3. Government-guidance funds in China: the systematic use of state-led equity infusions to favour national champions**

Contrary to occasional government equity infusions, capital injections into domestic firms through GGFs have, in recent years, become a tool systematically used by Chinese central and subcentral governments to create and support national champions, either state-owned or private. As part of their efforts to accelerate indigenous innovation, Chinese authorities have used GGFs, namely state-led equity investments, to channel public and private capital into strategic industries in China, thereby contributing to guiding and advancing the government's industrial policy goals. According to Naughton (2021<sup>[46]</sup>), the creation of GGFs in 2005 proceeded from a desire to depart from an approach relying exclusively on direct government support and creating instead a hybrid financial instrument that would be both market-driven and government-oriented (Box 7). GGFs remain, however, predominantly sponsored by government agencies and SEs acting as key implementing agents of China's industrial policy. In that sense, equity infusions through GGFs do not differ significantly from direct equity infusions made by government institutions and SEs to create or grow national champions. For example, in 2008, the Chinese Government established through five different state investors (i.e. the SASAC, Shanghai Guosheng Group, Chalco, China Baowu, and Sinochem) the Commercial Aircraft Corporation of China (COMAC) as an independent aircraft manufacturer by separating two Shanghai subsidiaries from the Aviation Industry Corporation of China (AVIC) and transferring the intellectual property for China's regional jet, the ARJ-21. In 2018, new state shareholders then injected further capital into the company to bolster COMAC's financial resources.<sup>65</sup>

State-investment vehicles are not a Chinese prerogative and exist in other jurisdictions. Examples would include: the Norwegian Government Pension Fund Global, managed by Norges Bank; the Mubadala Investment Company (Abu Dhabi); Saudi Arabia's Public Investment Fund (PIF); Singapore's Temasek; or the Japan Investment Corporation (JIC). However, many of these government investment funds do not explicitly seek to support national champions in specific sectors. It is useful in this regard to view these funds and GGFs along a spectrum, starting, at one end, with sovereign wealth funds aiming to maximise returns on their portfolio investments (representing generally less than 10% of the shares of the target company). Moving along the spectrum, government funds exert more and more control over target companies and objectives are broadened beyond solely the maximisation of investment returns. At the other end of the spectrum would be investment funds seeking explicitly to create or grow national champions notwithstanding poor financial returns. In practice, many funds fall in between these two extremes, such as Saudi Arabia's PIF, which combines strategic investments in domestic companies with a foreign investment strategy centred on tech sectors and entertainment and high financial returns in the long term.<sup>66</sup> Some funds may also move along the spectrum over time, in one direction or another.

In this respect, five key aspects distinguish GGFs in China from various other government-investment funds: (i) Chinese authorities have used GGFs systematically in recent years to channel support into strategic, often mature, industries; (ii) use of these financial instruments responds to China's industrial policy goals to create national technology leaders; (iii) GGFs involve a complex structure of both government institutions and SEs that may not be guided solely by profit considerations; (iv) control of Chinese authorities over the investment decisions of the GGFs remains prevalent despite the appearance of private sector participation; (v) transparency is crucially lacking not only with respect to the structure of

<sup>64</sup> See [www.sec.gov/Archives/edgar/data/1736541/000110465920071391/tm2022004d4\\_ex99-1.htm](http://www.sec.gov/Archives/edgar/data/1736541/000110465920071391/tm2022004d4_ex99-1.htm) (accessed on 25 February 2024). These investors have since reduced their holdings of NIO shares.

<sup>65</sup> Similarly, in 2016, investments from the State Council, the Beijing municipal government, AVIC, and COMAC led to the creation of another Chinese aircraft manufacturer, the Aero Engine Corporation of China (AECC).

<sup>66</sup> See, for example, [www.tresor.economie.gouv.fr/Articles/aa549f58-31ad-473b-ae7c-9c8a6f7dc354/files/8ec101aa-4823-461e-b391-1ea700d97a10](http://www.tresor.economie.gouv.fr/Articles/aa549f58-31ad-473b-ae7c-9c8a6f7dc354/files/8ec101aa-4823-461e-b391-1ea700d97a10) (accessed on 27 February 2024).

the GGFs and the ownership of the investing entities, but also with respect to the investment criteria, the investment records and the performance of GGFs.

### Box 7. The ‘in-principle’ institutional design of government guidance funds

GGFs are public-private entities, which can only be formed by a central, provincial, or municipal government entity or several government entities. The initiating government agency guides and sponsors the creation of the fund by defining the purpose of the fund (e.g. the sectoral focus) and its investment strategy (e.g. start-ups only, early-stage firms, or pre-IPO companies), injecting its own capital to fulfil part of the fundraising target it determined, and designating a managing agency responsible for handling the day-to-day operations of the fund (Pan, Zhang and Wu, 2021<sup>[47]</sup>; Naughton, 2021<sup>[46]</sup>). From this perspective, the government plays a key steering role in the creation, definition, and financing of the fund.

The Chinese Government initially modelled GGFs after public-private equity funds to bring private, profit-oriented investors into the funds and hence guarantee market-consistent investment decisions (Pan, Zhang and Wu, 2021<sup>[47]</sup>), although few private actors have to date actually invested in GGFs. The initiating government agency designates a separate managing agency (often state-owned) responsible for the day-to-day operations of the fund, including individual investment decisions (Naughton, 2021<sup>[46]</sup>). In principle, while the government sponsor sets the initial direction of the fund, it should not subsequently interfere with the managing agency’s decisions to support or not specific projects. GGFs may also operate as a fund of funds: they invest in other equity investment funds, thus becoming a limited partner of these funds, which in turn invest in specific projects and companies. This may widen the gap between the initiating government agency and the ultimate investment: not only would the presence of an intermediary limit, in principle, governmental interference with the investment decisions taken by the sub-fund but it would also reduce the amount of state capital ultimately injected into a company.<sup>1</sup>

The institutional structure of GGFs therefore suggests that these funds could in principle be government-steered but governed by market forces under the right circumstances, with the government sponsor defining directly (or indirectly in the case of a ‘fund of funds’ structure) where market forces ought to focus. In practice, however, and as discussed further below, the market-oriented elements of GGFs are limited to date and funding remains dominated by both government entities and SEs primarily guided by industrial-policy considerations (Figure 16).

1. To ensure that sub-funds remain sufficiently independent from the fund, and hence from the initial government sponsor, governments at various levels have defined caps on the share a government can invest in a sub-fund (i.e. generally between 20% and 30%), as well as the capital it can channel into the sub-fund. For instance, the local Optics Valley Fund cannot invest more than 25% in any of its sub-funds nor can it inject more than CNY 100 million into any of these sub-funds. See [www.caixinglobal.com/2020-02-25/four-things-to-know-about-chinas-670-billion-government-guidance-funds-101520348.html](http://www.caixinglobal.com/2020-02-25/four-things-to-know-about-chinas-670-billion-government-guidance-funds-101520348.html) (accessed on 14 February 2024) and [www.economist.com/business/2022/06/27/the-rise-of-chinas-vc-industrial-complex](http://www.economist.com/business/2022/06/27/the-rise-of-chinas-vc-industrial-complex) (accessed on 13 February 2024).

### *Government guidance funds in China have developed as a key tool to provide systematic support to Chinese industrial policy*

In 2005, the NDRC formally introduced GGFs by encouraging central and local governments to set up venture-capital structures to guide investments, with a view to establishing and developing enterprises “through equity participation and the provision of financing guarantees.”<sup>67</sup> Although GGFs focused in the first years on venture-capital investments in startups, they gradually became a government tool to channel capital into strategic and emerging sectors, with a view to increasing firms’ production capacity, their R&D spending, as well as supporting their development through M&As.<sup>68</sup> This coincides with the fact that

<sup>67</sup> NDRC, *Interim Measures for the Administration of Venture Capital Enterprises*, 2005.

<sup>68</sup> In 2015, for instance, a State Council chaired by Premier Li Keqiang took the decision to set up national-level GGFs to support the development of emerging industries in China. More recently, several central ministries stated in a 2021 joint policy document that full freedom should be given to GGFs. Social capital should also be encouraged, according to the document, in order to accelerate the cultivation and development of high-tech enterprises, including so-called

investments of GGFs must comply with national industrial policy.<sup>69</sup> In this respect, the development of this new financial instrument coincided with efforts by the central government to support industrial upgrading, accelerate indigenous innovation, and reduce China's reliance on foreign technologies (Chen and Naughton, 2016<sup>[48]</sup>; Wei, Ang and Jia, 2023<sup>[49]</sup>; OECD, 2019<sup>[23]</sup>).

The creation in 2014 of the USD 23 billion China Integrated Circuit Industry Investment Fund Co. Ltd (also known as the 'National IC Fund' or the 'Big Fund') and the subsequent establishment of sister funds at the provincial and municipal levels (e.g. in Beijing and Shanghai) to support the development of the semiconductor industry in China marked a decisive turn in the use of GGFs.<sup>70</sup> In the years following the creation of the Big Fund in 2014 and the formulation of 'Made-in China 2025' a year later by the Chinese central government, many other funds emerged at various levels of governments, including – among the national GGFs – the National Advanced Manufacturing Investment Fund (2016), the National Emerging Industry Investment Fund (2016), the Central SOE Structural Adjustment Fund (2017), the National Manufacturing Transformation Upgrade Fund (2019), and the soon-to-be Strategic Emerging Industry Fund (announced in 2023).<sup>71</sup> Noticeably, some of these funds had between two and three rounds of funding.<sup>72</sup>

Since their introduction in 2005, the number of GGFs in China has grown very fast (Pan, Zhang and Wu, 2021<sup>[47]</sup>; Wei, Ang and Jia, 2023<sup>[49]</sup>). While their numbers remained low in the first years of their existence, they started growing steadily after 2008 and experienced a boom in 2015 and 2016, following the creation of the Big Fund. In the last years, they have grown at a slower rate due to regulatory tightening by the central government and economic difficulties in China.<sup>73</sup> Despite this slowdown, the number of GGFs created every year between 2017 and 2021 has remained significantly higher than in the period before 2015 (Wei, Ang and Jia, 2023<sup>[49]</sup>).<sup>74</sup> With more than 1 800 GGFs having been established in China as of 2021 (ibid), GGFs have become a systematic state-led instrument through which the Chinese Government supports the technological advances of its domestic firms.

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'little-giant' enterprises, individual champion enterprises in the manufacturing industry, and leading enterprises in the industrial chain with specialisation. See the Guiding opinions of six departments on accelerating the cultivation and development of high-quality enterprises in the manufacturing sector, [www.gov.cn/zhengce/zhengceku/2021-07/03/content\\_5622135.htm](http://www.gov.cn/zhengce/zhengceku/2021-07/03/content_5622135.htm) (accessed on 20 February 2024).

<sup>69</sup> See Notice No 1638 [2019] by the NDRC, the People's Bank of China, the Ministry of Finance and other departments of further clarifying the matters concerning regulating asset management products for financial institutions to invest in venture capital funds and government-invested industry investment funds, available at [www.gov.cn/xinwen/2019-10/26/content\\_5445159.htm](http://www.gov.cn/xinwen/2019-10/26/content_5445159.htm) (accessed on 22 May 2024).

<sup>70</sup> The *Guideline for the Promotion of the Development of the National Integrated Circuit Industry* announced by the authorities in June 2014 called for the promotion of "industry upgrades", including through "mergers and regroupings", in the context of broader efforts to "encourage domestic integrated circuit companies to strengthen international cooperation, integrate international resources, and open up international markets."

<sup>71</sup> See [www.reuters.com/markets/asia/china-state-asset-manager-plans-14-blb-emerging-industry-fund-report-2023-09-24/](http://www.reuters.com/markets/asia/china-state-asset-manager-plans-14-blb-emerging-industry-fund-report-2023-09-24/) (accessed on 20 February 2024).

<sup>72</sup> In 2019, the central government launched a second round of funding for the National Advanced Manufacturing Investment Fund of approximately EUR 6.4 billion to leverage artificial intelligence and 5G and guide the upgrading and modernisation of manufacturing. Similarly, a second round of funding for the National IC Fund was completed in 2019, adding USD 29 billion for investments into upstream domestic semiconductor companies. In September 2023, China launched a third round of funding under the National IC Fund, with a target of USD 40 billion, which will focus on semiconductor manufacturing equipment. See [www.reuters.com/technology/china-launch-new-40-blb-state-fund-boost-chip-industry-sources-say-2023-09-05/](http://www.reuters.com/technology/china-launch-new-40-blb-state-fund-boost-chip-industry-sources-say-2023-09-05/) (accessed on 13 January 2024).

<sup>73</sup> This includes the detention of the head of Hua Capital, the Big Fund's manager, following a probe by China's anti-corruption agency. See [www.ft.com/content/ffb81a37-5239-4d5b-80b6-2b318084b460](http://www.ft.com/content/ffb81a37-5239-4d5b-80b6-2b318084b460) (accessed on 27 February 2024).

<sup>74</sup> Drawing on the Zero2IPO database, Wei, Ang, and Jia (2023<sup>[49]</sup>) noted that while in 2016, newly-created GGFs exceeded 400, there were less than 250 GGFs founded in 2017. Since 2018, such level has not been attained, suggesting that GGFs peaked in 2016. Yet, more than 100 GGFs were created annually, with this number exceeding 150 in 2018 and 2021.

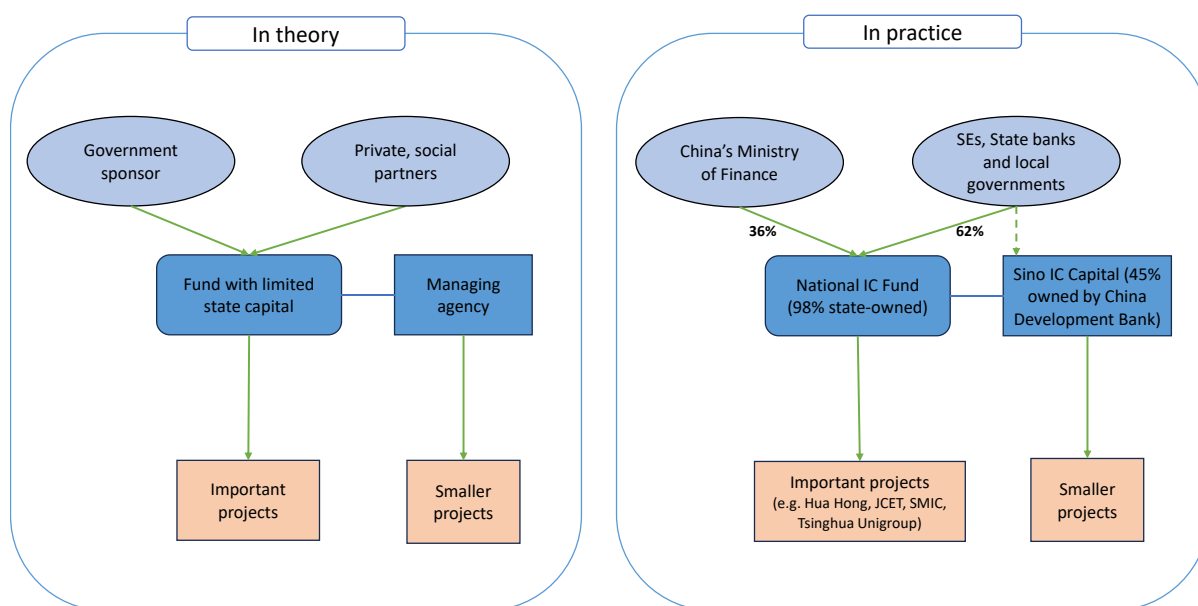


*Government guidance funds have struggled to attract private investors and are today largely composed of government institutions and state enterprises*

Despite the initial intention of the Chinese Government to attract both public and private capital into GGFs, these investment vehicles predominantly involve the state resources of both central and local government institutions, as well as those of SEs through complex ownership structures, which may be hard to track.<sup>75</sup> The Big Fund is perhaps the most telling example, although many GGFs follow the same pattern. Seven SEs joined the fund three months after it was set up by China's Ministry of Finance (36%): the China Development Bank (22%); China Tobacco, a SE under the State Council (11%); Shanghai Guosheng, an investment holding of the Shanghai municipality (9%); Wuhan Financial Holdings, the financial arm of the Wuhan municipality (5%); China Mobile (5%); and Beijing E-Town International Investment and Development (10%), an investment corporation of the Beijing municipality. In sum, state-related entities provided altogether nearly 98% of the Fund's first-round funding [TAD/TC(2022)9/FINAL], with SEs overwhelmingly present both in the group of limited partners and in the management agency, Sino IC Capital Co. Ltd, which is 45% owned by the China Development Bank (Figure 16).

Likewise, central enterprises owned by the SASAC are the exclusive limited partners of the SOE Structural Adjustment Fund, which was created in 2016 by the Chengtong Corporation, a central SE converted into a state-investment corporation (Naughton, 2021<sup>[46]</sup>). Although this fund was specifically designed to reorganise central enterprises, thus justifying their equity participation in the fund, they also attracted capital from state-financial institutions, notably China Construction Bank, which is one of the six largest state-owned commercial banks, and China Merchants Group, a bank holding company (ibid).<sup>76</sup>

**Figure 16. The institutional structure of GGFs in principle and in practice**



Source: Authors' elaboration.

<sup>75</sup> It may be even more difficult to trace back the ownership structures of local GGFs and funds of funds, notably due to the absence of any obligation to publish accounting reports for these funds (Luong, Arnold and Murphy, 2021<sup>[62]</sup>) (Chimits, 2023<sup>[63]</sup>).

<sup>76</sup> Another large state-owned commercial bank, the China Postal Savings Bank, played a large role in initial organisation of the fund although it did not become a limited partner.

*The overwhelming presence of the state in government guidance funds may affect their choices regarding investment returns and exit*

Although Chinese authorities tend to present GGFs as a market-oriented tool<sup>77</sup>, the limited existing evidence for semiconductors suggests their returns to have been below-market (OECD, 2019<sup>[23]</sup>; OECD, 2021<sup>[2]</sup>). Sustained below-market equity returns at large chipmakers in which the Big Fund and sister funds invested would suggest that semiconductor GGFs may have failed to act in accordance with market considerations, at least over the period 2014-19 (ibid).<sup>78</sup> What makes these findings particularly significant is that the semiconductor industry is equity-intensive relative to other industrial sectors, where debt is often the preferred source of finance and BMB is an important channel of support. Aerospace and defence form another equity-intensive industry, where, to a lesser extent, the existence of below-market equity returns involving government investors has been documented (OECD, 2021<sup>[2]</sup>). This is exemplified by the case of COMAC (noted above), which has failed to generate any profit before tax since 2016.

Absent broader empirical evidence beyond the semiconductor industry, anecdotal, as well as circumstantial evidence nonetheless raises questions about whether decisions of GGFs regarding their investment and exit have always been consistent with market considerations. Given how GGFs have gradually evolved towards investment vehicles dominated by government agencies, SEs, and state financial institutions, aiming to create and support domestic champions in strategic emerging sectors, it can be reasonably posited that they may not respond exclusively to the objective of producing financial returns. In focusing on high-tech, technology-oriented sectors, with a view to gaining a technological edge globally, various levels of government may use GGFs to channel capital into strategic firms, possibly locking it in for a longer period than a private investor would normally tolerate.<sup>79</sup> In addition, there are indications that GGFs may tolerate extremely low rates of return.<sup>80</sup> Naughton (2021<sup>[46]</sup>) notes, for instance, that although the Big Fund had officially announced targeting a 5% rate of return, some industry sources stated that it had set up a separate, 'strategic' sub-fund with a 0% target rate of return, along with the official, 'commercial' sub-fund, which maintained the 5% target rate of return. The overwhelming presence of SEs and state financial institutions within GGFs and governments' failure to attract sufficient private capital would also tend to suggest that the tolerance of low returns beyond those that would normally be acceptable to commercial players has been a feature of these investment vehicles.

### 3.3. State energy utilities as providers of below-market energy

The electricity sector constitutes another sector where state entities can play a significant role as providers of government support, in this case by supplying electricity (or natural gas) at below-market rates to industrial users. Government ownership of electric utilities worldwide is significant. According to the IEA, more than half of all investment in electricity networks in 2015 and 2019 came from state-owned enterprises (IEA, 2020<sup>[50]</sup>). This predominance of SEs in the sector, often taking the form of integrated state monopolies, may help explain why earlier OECD work has found several such companies playing a key role in supporting industrial firms through the provision of electricity at below-market rates (OECD, 2023<sup>[3]</sup>).

Unlike private companies seeking to recoup their costs and offer their shareholders competitive remuneration, one would expect SEs involved in the provision of electricity at below-market (or below-cost) rates to earn lower profit or make outright losses on their sales. Looking at a large range of electric utilities<sup>81</sup>

<sup>77</sup> During the WTO's 7<sup>th</sup> Trade Policy Review of China, the Chinese Government observed that the Big Fund is a private equity fund in which "investment decisions are accountable to shareholders" and whose objective is to "deliver profits for shareholders" (WTO, 2018<sup>[64]</sup>).

<sup>78</sup> The firms studied by the OECD (2021<sup>[2]</sup>) include, among others, JCET, Hua Hong, SMIC, and Tsinghua Unigroup.

<sup>79</sup> Along these lines, Naughton (2021<sup>[46]</sup>) observes that "the government provides money under conditions that make it clear that it is in no hurry to get it back [...] [it] waits patiently, its investment making an implicit zero return, thus essentially providing interest-free loans to the investment."

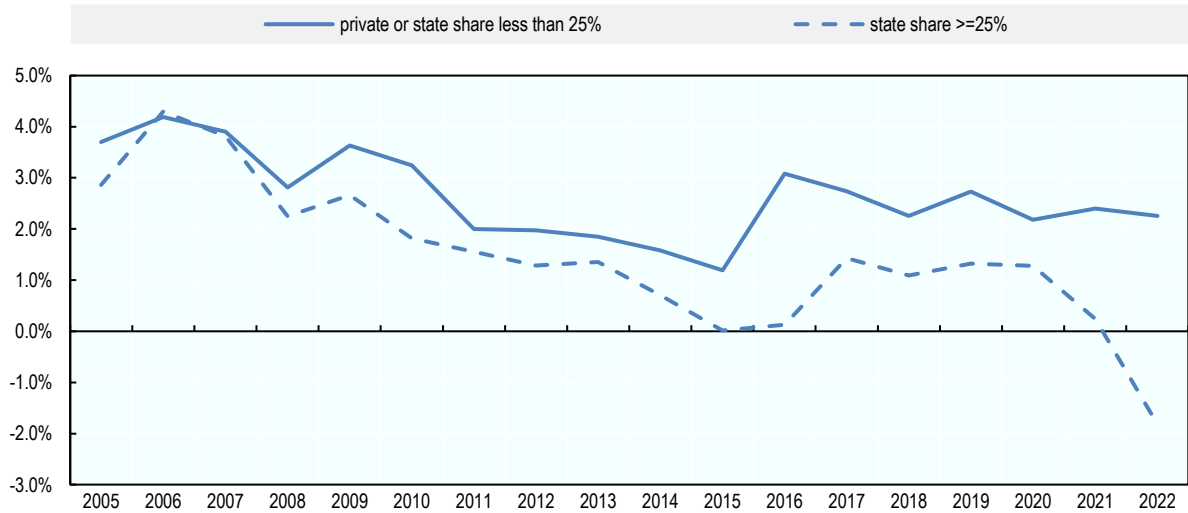
<sup>80</sup> This has implications for sub-funds, which must also ensure they meet policy goals and prevent the loss of state assets, to the detriment of investment returns. See [www.ft.com/content/5f6d7ffb-575e-4532-9a4b-1658317d84a2](https://www.ft.com/content/5f6d7ffb-575e-4532-9a4b-1658317d84a2) (accessed on 23 January 2024).

<sup>81</sup> This refers to all electricity companies covered by the Factset database.

over the period of 2005-22 shows companies with at least 25% government ownership to generally earn lower returns on assets than their private peers (Figure 17).

### Figure 17. State power providers generally have had lower returns on assets than private peers

Return on assets of electric utility companies, revenue-weighted average over 2005-22



Note: Factset defines electric utilities as companies engaged in the generation, transmission, and distribution of electric energy to residential and non-residential customers. The dataset only includes publicly listed electric utility companies covered by the Factset database.

Source: OECD based on Factset.

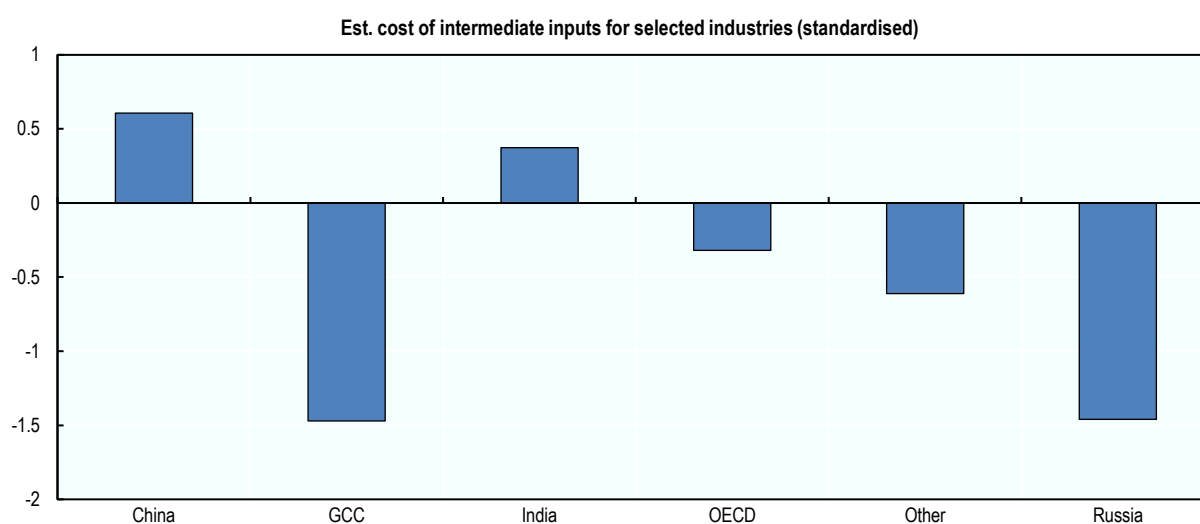
There are likely many reasons behind the poorer financial performance of state electric utilities, including principal-agent problems, political interference, lack of competition, softer budget constraints, the pursuit of non-commercial goals, or simply a less favourable energy mix (Matuszak and Kabaciński, 2021<sup>[51]</sup>). Public service obligations – such as the obligation imposed on many electric utilities to deliver electricity at affordable rates for the benefit of the general public – are a further important consideration. The revised *OECD Guidelines on Corporate Governance of State-Owned Enterprises* stipulate in this regard that SEs should be compensated for the cost incurred in pursuing public service obligations, while needing to ensure that this compensation is neither excessive nor insufficient, but instead adequately based on net costs related to fulfilling public service obligations and is done so transparently. Other than public service obligations, the *OECD Guidelines* also recommend that SEs engaging in economic activities should be expected to earn returns comparable to those of their private peers. The *Guidelines* further note the importance of separating accounts related to economic activities and those related to public service obligations in order to prevent cross-subsidisation. These aspects are key to maintaining both the commercial viability of SEs and a level playing field with private counterparts.

Whatever the reasons behind the weak performance of state power utilities, the provision of electricity at below cost is very likely to affect their returns. In this respect, state utilities may, similar to banks and GGFs (see above), act as key agents for the industrial policy of a government by accepting to incur losses to support the competitiveness of companies downstream. Disentangling how different factors may have impacted the returns of state utilities could, however, prove to be a difficult exercise. This report focuses instead on instances in which state utilities more directly act on behalf of the government as a provider of government support, potentially causing trade and competition concerns. In tracking subsidies along the value chain, this report also looks at what may enable such support in cases where the state utilities providing below-market electricity remain seemingly profitable.

### 3.3.1. Accounting for government support in the form of below-market energy matters to maintain a level playing field

The provision of below-market energy by SEs to industrial manufacturers can pose trade and competition concerns where energy costs constitute an important competitive factor, thus improving the profitability of recipients. Below-market energy may enable recipient firms to offer lower sales prices than their competitors or to produce and invest more than they would otherwise. By allowing recipient companies to compete with an advantage with their competitors both domestically and globally, below-market energy could harm trade partners, as well as exacerbate the effects that other support measures already have on markets such as excess capacity weighing down on global prices. In this context, Figure 18 shows that relative input costs for a sample of large energy-intensive companies have generally been lower in regions where significant levels of energy subsidies have been identified in earlier OECD work (OECD, 2023<sup>[3]</sup>) and by the IEA.<sup>82</sup> This finding is the expected consequence of lower energy costs in energy-intensive sectors translating into lower input costs overall.<sup>83</sup>

**Figure 18. Firms based in regions known to provide energy subsidies have lower input costs than competitors based elsewhere**



Note: The industries covered in this graph are aluminium, cement, fertilisers, and steel. Intermediate input costs are approximated by deducting depreciation, amortisation, and staff costs from firms' cost of sales and dividing the resulting number by revenue. The ratios thus obtained are then standardised for each sector so that they have a mean of zero and a standard deviation of one. Lastly, the data are averaged by region or country using firms' revenue as weights. The data behind this graph cover the entire period 2005-22. See Annex A for more information on the firm sample.

Source: OECD estimates based on the OECD MAGIC database.

<sup>82</sup> See [www.iea.org/topics/energy-subsidies](http://www.iea.org/topics/energy-subsidies) (accessed on 23 February 2024).

<sup>83</sup> This does not need to involve electricity only. Many industrial facilities have their own captive power plant on site, which they use to generate the electricity they need. In such cases, the provision of natural gas at below-market rates has similar implications as the provision of electricity at below cost.

### 3.3.2. Instances where state electric utilities act as providers of below-market electricity

The provision of electricity at below-market rates to industrial users generally proceeds either from structural concerns or from short-term emergencies. In the first instance, government support aims to improve the competitiveness of industries (particularly energy-intensive industries), whereas in the second instance, it is meant as a short-term response to a crisis (e.g. a supply shock). In both instances, state electricity utilities can act as key agents of their governments in that they contribute to implementing the government's policy. In so doing, utilities often bear financial costs that would have otherwise been passed on to, and borne by, industrial users. On some occasions, however, state electricity utilities are also themselves recipients of government support. This can result in a chain of subsidies where state utilities are able to preserve their profitability owing to the support they receive from authorities, even as they offer electricity to users downstream at below cost. This underscores again that it is often essential to look at both recipients and providers of government support along a value chain when identifying and measuring subsidies.

#### *Scenario #1: State electric utilities as providers of structural below-market electricity*

Structural below-market energy is here understood as involving cases where: (i) support is long-lasting and helps improve industrial competitiveness, and (ii) the government regulates or administers the electricity price. This prevents utilities from recovering their costs, including the costs of construction, financing, maintenance, and operation of their power plants. In this respect, the electricity suppliers concerned act as an intermediary between the government and the recipients of below-market energy. In charging the price set by the government to end-users, state electric utilities are providers of below-market electricity while bearing the financial burden of government support, thus potentially reducing their profitability.

#### *Scenario #2: State electric utilities as providers of emergency below-market electricity*

In a crisis or emergency context, governments may lean on state electric utilities to provide emergency below-market energy to cushion users from price spikes. These measures are normally transitory and often directed at households and small enterprises, with a view to alleviating energy poverty and improving affordability (Castle et al., 2023<sup>[52]</sup>; OECD, 2022<sup>[53]</sup>).<sup>84</sup> The energy crisis caused by Russia's war of aggression against Ukraine prompted many governments to intervene heavily in their energy markets to mitigate the impact of rocketing energy prices on their economy. In this context, many state-electric utilities have been used as a shield to protect end-users (Box 8), which has led to a significant drop in their returns since 2021 (Figure 17).

The examples in Box 8 illustrate that in times of crisis, governments may impose exceptional regulatory measures or delay necessary price reforms, with a view to protecting consumers from a sudden surge in energy prices. While such measures or decisions may constrain state electric utilities to provide electricity at below-market rates, they are not primarily aimed at improving the competitiveness of industries on an ongoing basis. Nor do they necessarily have such an effect where such support is short-lived and only serves to offset a price surge. Sunset clauses are in that sense a necessity to ensure that the thin line between emergency and structural support is not crossed (OECD, 2021<sup>[45]</sup>; OECD, 2021<sup>[54]</sup>).<sup>85</sup>

<sup>84</sup> Ensuring that these measures are properly targeted at the most vulnerable households and businesses can be a challenge, however (Castle et al., 2023<sup>[52]</sup>).

<sup>85</sup> The European Commission adopted, for example, the so-called Temporary Crisis Framework in March 2022, which loosens state-aid rules to enable EU Member States to help companies most affected by the energy crisis. Since its adoption, Member States have provided emergency aids approved by the Commission, mainly taking the form of grants, tax concessions, guarantees and counter-guarantees, loans, and equity to both small- and medium-sized enterprises and large industries. See [https://competition-policy.ec.europa.eu/document/download/1b687754-5eab-4447-bcbb-da0eb9ae61b9\\_en?filename=State\\_aid\\_TCTF\\_decisions.pdf](https://competition-policy.ec.europa.eu/document/download/1b687754-5eab-4447-bcbb-da0eb9ae61b9_en?filename=State_aid_TCTF_decisions.pdf) (accessed on 23 February 2024).

### Box 8. Many state-electric utilities have been used to shield end-users from soaring energy prices

France's Électricité de France (EDF) noted in its annual report for 2022 that it incurred a large loss in 2022 due largely to a drop in nuclear power output related to inspections and repairs for stress corrosion, forcing EDF to purchase electricity on the market at the time electricity prices soared in Europe. The financial hit to the company was amplified by the government having set a cap on electricity tariffs to mitigate the impact of energy price increases on consumers. This exceptional measure prevented EDF from passing on its additional costs to consumers, thereby constraining the utility to sell power at a discount. EDF and the French Government ultimately agreed in November 2023 on a reference price level for power prices close to EDF's nuclear production cost (i.e. EUR 70 per MWh) and on the introduction of a 90% tax imposed on EDF's extra-revenues if prices surpass EUR 110 per MWh.<sup>1</sup>

Similar to EDF, the Korea Electric Power Corporation (KEPCO) has experienced important difficulties with rising energy prices. KEPCO's operational costs have been significantly affected by increases in the price for fuel (mainly coal and natural gas) and for the electricity it purchases at market price. However, the company has not been able to pass on the increase to end users due to the government's regulated sales prices on electricity. In this regard, the energy crisis contributed to exacerbating KEPCO's pre-existing difficulties in relation to its high fuel costs.<sup>2</sup> In response to the COVID-19 pandemic, the Korean Government decided to keep electricity tariffs unchanged through a capped-tariff adjustment system, preventing KEPCO from fully covering its increased fuel costs.<sup>3</sup>

Where utilities fare particularly badly, governments may intervene to provide support in compensation for the financial hit they incur as a result of a crisis situation. While not initially state-owned, the 2022 energy crisis led to the full nationalisation of German utility Uniper by the Federal Government of Germany following a series of government loans and equity infusions.<sup>4</sup> French authorities likewise recapitalised EDF in 2022 and opted to acquire all shares not previously held by the state, leading the company to be fully owned by the government.

In France, Germany, and other countries, the exceptional support for utilities was notably accompanied by specific measures to shield energy-intensive businesses from the price spikes caused by the war in Ukraine. In most cases, these measures took the form of direct grants meant to cover the additional costs resulting from higher prices for electricity and natural gas.<sup>5</sup> Despite these measures, the production volume of energy-intensive sectors has declined by more than 10% between 2021 and 2023 in both France and Germany.<sup>6</sup> This suggests that this exceptional support did not result in improved competitiveness at the expense of foreign competitors but rather served to address an emergency situation by preventing an even bigger decline in industrial activity in the European Union.

1. See [www.reuters.com/business/energy/edf-france-agree-70-eurosmwh-electricity-price-deal-source-2023-11-13/](https://www.reuters.com/business/energy/edf-france-agree-70-eurosmwh-electricity-price-deal-source-2023-11-13/) (accessed on 23 February 2024).

2. During the period 2018-20, for instance, its ratio of fuel costs to sales was around 30% as explained in KEPCO's 2020 20-F report to the US Securities and Exchange Commission.

3. See <https://disclosure.spglobal.com/ratings/en/regulatory/article/-/view/sourceId/12391152> (accessed on 23 February 2024).

4. See [www.bundesregierung.de/breg-de/aktuelles/uniper-takeover-2128422](https://www.bundesregierung.de/breg-de/aktuelles/uniper-takeover-2128422) (accessed on 23 February 2024). Uniper has since announced it would start repaying the support it received, following improvements in its financial performance. See [www.reuters.com/business/energy/uniper-start-repaying-government-bail-out-after-68-bln-profit-2024-02-15/](https://www.reuters.com/business/energy/uniper-start-repaying-government-bail-out-after-68-bln-profit-2024-02-15/) (accessed on 16 February 2024).

5. See, for example, <https://competition-cases.ec.europa.eu/cases/SA.103280> and [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_22\\_4506](https://ec.europa.eu/commission/presscorner/detail/en/ip_22_4506) (accessed on 25 March 2024).

6. This can be seen using data from Insee and Destatis. See, for example, [www.destatis.de/EN/Methods/WISTAScientificJournal/Downloads/production-index-energy-intensive-industrial-022023.pdf?\\_\\_blob=publicationFile](https://www.destatis.de/EN/Methods/WISTAScientificJournal/Downloads/production-index-energy-intensive-industrial-022023.pdf?__blob=publicationFile) (accessed on 25 March 2024).

### *Scenario #3: State electric utilities as both providers of structural below-market electricity and recipients of structural support*

Not only can state energy utilities be providers of government support, but they can also be recipients of structural support themselves. This support might often result from, and thus be intrinsically linked with, the provision of structural below-market energy, such as where governments compensate utilities for the losses they incur as a result of lower energy prices.<sup>86</sup> When providing below-market energy, state utilities act most of the time on behalf of the government by selling energy at a price that is regulated or administered by the government. In this context, governments may be providing various forms of support in order to directly offset the financial consequences of below-market sales (e.g. grants, tax concessions, higher energy tariffs for government entities, interest-free loans, etc.). On other occasions, governments may not explicitly link the provision of below-market energy with the support provided to state utilities. In both cases, however, government support to state utilities lowers their costs; it also forms part of a broader subsidy chain where different entities at the upstream and downstream stages are recipients of support.

One common type of support in this situation is below-market finance. Implicit state guarantees may, for instance, convey an expectation that the government would support a state electric utility that is experiencing difficulties but deemed too important to fail. These guarantees can have important cost implications by reducing investors' perceptions of a company's default risk, thereby contributing to lowering the cost of financing for the state utility in question. Likewise, the direct provision of BMB to state utilities can help them finance costly capacity expansion by reducing the associated financing costs.<sup>87</sup> For example, while below-market energy for industrial users does not seem to be a widespread policy in China (Figure 18), earlier OECD studies indicate the presence of BMB for the country's large power operators (OECD, 2019<sup>[29]</sup>; OECD, 2023<sup>[3]</sup>).

Just as below-market (or below-cost) electricity supports industrial companies, below-market feedstock to state power companies can lower their operational cost. Perhaps the most telling example is to be found in Saudi Arabia, where the Saudi Electric Company (SEC), an electric power provider 81% owned by the Kingdom of Saudi Arabia, provides electricity at tariffs regulated by the government, which "may not reflect commercial or market terms, including any increases in the SEC Group's cost of production."<sup>88</sup> There is evidence that these low tariffs are at least partly compensated through the provision of government support to SEC. One such benefit is in the form of subsidised fuel provided by Saudi Aramco – another state company 94% owned by the Kingdom. In addition to cheap feedstock, SEC has also historically benefitted from significant government support in the forms of:

*"subsidised loans, higher tariffs for electricity supplied to Governmental customers, [...] the assumption by the Government of certain payables due to Saudi Aramco in respect of supplied fuel, the granting of certain rights of way to SEC, the ability to defer significant payments to Saudi Aramco, Saline Water Conversion Corporation ("SWCC") and certain Government-related entities and the waiver of certain dividends."<sup>89</sup>*

Subsidies such as these are likely helping state utilities to lower their costs and help them achieve better returns. They may also partly explain why it is possible for some state electricity providers to continue operating despite selling their products at prices below cost recovery.

<sup>86</sup> This is the example of Saudi Aramco, which noted in a 2019 bond prospectus that the regulated prices mandated by the Saudi Government "have been lower than the prices at which the Company could otherwise have sold such refined product." As a result, "as at 1 January 2017, the Government implemented an equalisation mechanism to compensate the Company for revenue directly foregone as a result of compliance with the mandates related to crude oil, kerosene, diesel, heavy fuel oil and gasoline, with equalisation compensation recorded as other income related to sales."

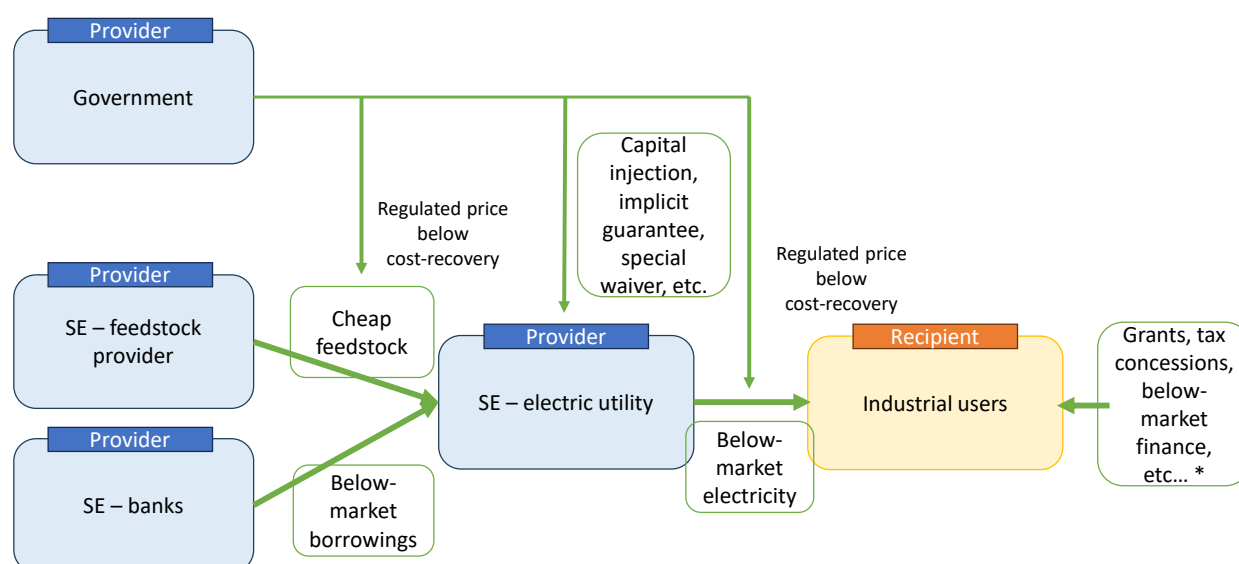
<sup>87</sup> This would be especially the case in the context of long lead times for the construction of power plants, which can lead to accumulating capital costs.

<sup>88</sup> See SEC's 2020 sukuk (Islamic bond) prospectus. The prospectus details the different electricity tariffs set by the government, which for industrial users were a flat rate tariff of SAR 0.18 (USD 0.05) per kWh.

<sup>89</sup> See SEC's sukuk prospectus, available at [www.se.com.sa/-/media/sec/Investors/Debt-Investors/Sukuk-Issuances/Project-Light---Base-Prospectus---Final.ashx](http://www.se.com.sa/-/media/sec/Investors/Debt-Investors/Sukuk-Issuances/Project-Light---Base-Prospectus---Final.ashx) (accessed on 16 February 2024).

In summary, state power companies can at times act as providers of below-market energy, thereby playing the role of intermediary between the government and industrial companies. They do so by bearing the financial burden of generating and selling electricity at below-market (or below-cost) tariffs while also receiving government support themselves from upstream state actors (Figure 19).

**Figure 19. Une usine à gaz!: Providers of below-market energy can also be recipients in a complex subsidy chain**



Note: \* For simplicity this diagram does not fully illustrate other types of government support received by industrial manufacturers.  
Source: Authors' elaboration.

## 4. Implications for trade policy and broader considerations

This report has presented evidence that SEs in industrial sectors receive relatively more subsidies than their private competitors. It has also shown that these subsidies come at times from other SEs – be they state banks, government investment funds, or state energy providers – acting as intermediaries between governments and industrial producers. The question is now what these findings imply for policy, and for trade policy in particular.

### 4.1. Can trade rules help address the support provided to and by state enterprises?

SEs in manufacturing sectors are relatively large recipients of government support, but also providers of this support, which raises a number of trade concerns. Yet the WTO Agreements do not contain a definition of SE, nor do they have a specific agreement or provision in place which would address both the distortive conduct of SEs in the marketplace and the provision of support and other non-pecuniary advantages by governments to SEs. The WTO deals with some of these issues in the context of a range of specific disciplines, notably the Agreement on Subsidies and Countervailing Measures – which regulates subsidies bestowed by a government or ‘public body’ to specific undertakings manufacturing goods causing adverse trade effects – and the plurilateral Agreement on Government Procurement. The WTO also allows WTO Members to raise issues pertaining to SEs on an *ad hoc* basis during the accession negotiations with acceding countries [TAD/TC(2022)9/FINAL]. Many of the problems raised by the support SEs receive and provide remain, however, currently unaddressed in the WTO Agreements.

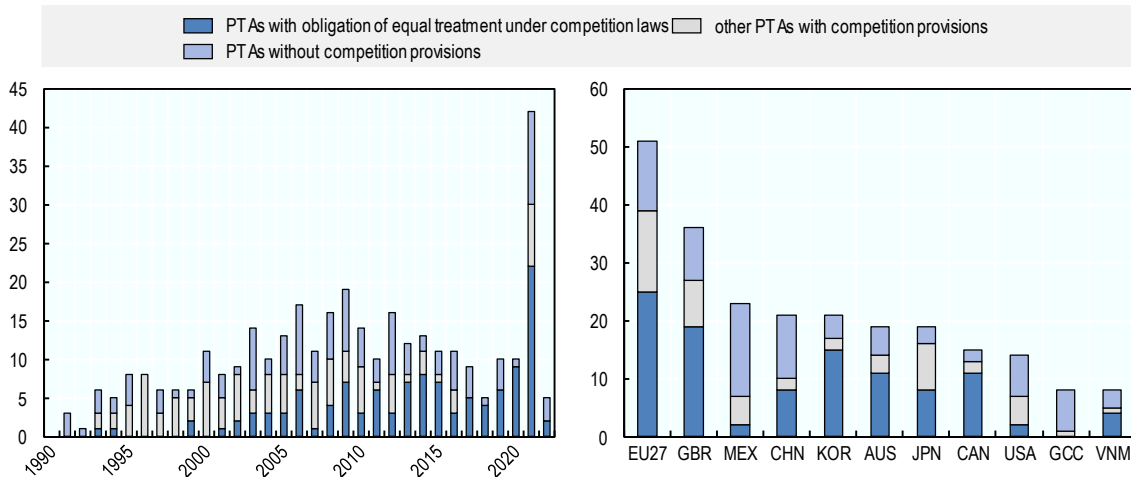
By contrast, various Preferential Trade Agreements (PTAs) contain disciplines on SEs aimed at addressing distortions caused by SEs receiving or providing government support and other regulatory advantages. Although there are important differences across these agreements, the OECD has found that more than



70 of the 367 agreements in force in December 2022<sup>90</sup>, i.e. around 20%, contain some form of disciplines on SEs (Figure 20 and [TAD/TC(2022)9/FINAL]). Approximately 50 of these 70 agreements include provisions that not only provide a definition of SEs, but also impose substantial obligations on SEs when acting in the marketplace, as well as on governments in relation with their SEs.

### Figure 20. PTAs with SE disciplines have increased over time, but remain geographically concentrated

Left: Number of PTAs, by year of entry into force; right: by jurisdiction



Note: Only PTAs that entered into force after 1990 and before 2023 are shown in the left graph. See Annex H for more information on the OECD methodology for identifying SEs disciplines in PTAs.

Source: OECD research.

Among the differences observed across PTAs with disciplines on SEs, an important difference concerns the lack of a harmonised definition of SEs. This matters since the definition of SEs determines the reach of the obligations imposed on both SEs and governments in their relationships, as well as the reach of the provisions placing obligations of transparency on governments. Some definitions envisage, for example, rather broad coverage by capturing as SEs entities directly and indirectly owned or controlled by the government, including through voting rights or the presence of government representatives within the entity's management bodies.

Meanwhile, only a handful of PTAs with disciplines on SEs have specific provisions that regulate the direct or indirect provision of government support limited to SOEs,<sup>91</sup> hence addressing the issue posed by SEs as recipients of government support.<sup>92</sup> These agreements prohibit the provision of so-called 'non-commercial assistance' (NCA), that is, assistance bestowed directly or indirectly by governments to specific SOEs causing 'adverse effects to the interests of another Party'.<sup>93</sup> The United States-Mexico-

<sup>90</sup> For details on the methodology, see Annex H.

<sup>91</sup> The term SOEs is used as the disciplines distinguish between SOEs and SEs: the agreements prohibit non-commercial assistance to SOEs provided by governments or SEs causing adverse effects. Different definitions are attached to these two terms.

<sup>92</sup> Note that the current WTO subsidy disciplines apply to subsidies received by all enterprises, irrespective of their ownership status.

<sup>93</sup> The first PTA to include such provisions was the Comprehensive and Progressive Agreement for Trans-Pacific Partnership. Since then, three other agreements, namely the Australia-Peru FTA, the United States-Mexico-Canada Agreement, and the United Kingdom-Australia FTA have integrated disciplines on NCA. Note that the United Kingdom-Australia FTA entered into force in May 2023 and thus was not included in the earlier OECD study [TAD/TC(2022)9/FINAL].

Canada Agreement (USMCA) also prohibits outright, without the need to show adverse effects, three different types of subsidies when provided to financially unsustainable SOEs.<sup>94</sup>

Some PTAs deal with the issue of SEs as providers of support and other undue advantages by including obligations on SEs disciplining their conduct in relation to downstream or upstream companies. The obligation prohibiting SEs to provide NCA to other SOEs causing adverse effects regulates subsidisation occurring between SEs at different levels of production or in different markets. Moreover, the obligations to act 'in accordance with commercial considerations', as well as obligations in relation to non-discrimination, which are more commonly found in PTAs, apply to SEs in their relationships with both state and private enterprises, although they are not specifically geared towards the provision of government support by or through SEs.<sup>95</sup>

In sum, various PTAs already include – although with some limitations [TAD/TC(2022)9/FINAL] – advanced disciplines on SEs, which could help to address the trade and competition distortions arising from government support and regulatory advantages provided to and by SEs discussed in this report. Notably, the obligations that certain PTAs impose on SEs to regulate their conduct vis-à-vis downstream and upstream firms could serve to complement multilateral subsidy rules. Disciplines focusing on the provider rather than the recipient could better capture, for example, the systematic provision of below-market finance and below-market energy inputs by, respectively, state financial institutions and state utilities.

The geographical coverage of those PTAs remains, however, a key challenge if countries want to address meaningfully distortions stemming from government support and regulatory advantages to and through SEs. Given the geographical concentration of manufacturing SEs, the relevance and effectiveness of future disciplines on SEs may depend upon whether adhering countries include those jurisdictions where trade and competition issues in relation to industrial SEs have been significant (Figure 20).<sup>96</sup>

While a multilateral discipline on SEs covering all WTO Members would constitute a first-best outcome, increasing the number of WTO Members having PTAs with disciplines on SEs could constitute a first avenue. Yet, garnering consensus on even basic common rules across the WTO membership or among a broader number of WTO Members may prove very difficult. In this context, knowledge and experience acquired at the bilateral or plurilateral level are key to informing multilateral efforts, as is a solid evidence base on the scope and scale of government support provided to and by SEs. OECD work such as this report offers an important contribution, but more is needed, including on identifying potential gaps within the different PTAs containing disciplines on SEs.

OECD instruments such as the revised *OECD Guidelines of Corporate Governance on State-Owned Enterprises* could enable a convergence of views among countries on the various approaches, as well as on how trade and competition distortions may better be addressed. Encouraging more countries, notably outside the OECD area, to adhere to these Guidelines would be an important step in building greater awareness of issues related to the support provided to and through SEs and the actions necessary to address them.

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<sup>94</sup> Article 22.6(1) USMCA. These subsidies are (i) loans or loan guarantees to uncreditworthy SOEs; (ii) non-commercial assistance to an SOE that is insolvent or on the brink of insolvency without a credible restructuring plan designed to return the SOE within a reasonable period of time to long-term viability; and (iii) conversion of the outstanding debt to equity when inconsistent with the usual investment practice of a private investor. Note that other PTAs, such as the agreements which the European Union concluded with Korea in 2010, as well as with Japan and Singapore in 2018, include a prohibited subsidy category for subsidies to non-financially sustainable enterprises, although these do not specifically target SEs.

<sup>95</sup> Only the Comprehensive and Progressive Agreement for Trans-Pacific Partnership, the Australia-Peru FTA, the USMCA, and the United Kingdom-Australia FTA combine provisions related to both the first obligation prohibiting NCA and the second cluster of obligations. Note that the obligation to act 'in accordance with commercial considerations' and the 'non-discrimination' obligation are also contained in the Comprehensive Agreement on Investment concluded between China and the European Union. See Article 3bis(3) of the Agreement.

<sup>96</sup> Note, however, that the Comprehensive Agreement on Investment concluded between China and the European Union in December 2020, and whose ratification has been suspended, contains a comprehensive definition of SEs, as well as substantive and transparency obligations in relation to SEs.

## 4.2. Support to and through state enterprises has broader implications for trade policy but also the environment

### 4.2.1. *The involvement of SEs as providers of support requires a rethink of subsidy rules*

Perhaps the most significant implications from a policy standpoint originate in the finding that SEs can be providers of support. The fact that SEs are providers of support means that subsidies may not directly come from the government but are instead provided through a set of companies acting on behalf of the government. The use of SEs as a vehicle for government support has far-reaching consequences in that it can give the appearance of severing the link between policy and funding. The distance created between policy measures and their translation into actual flows of money can be wide. It can span multiple companies, such as where chains of entities beneficially owned by the state are involved in the provision of equity funding to industrial firms. It can span multiple stages of a value chain, such as where a SE provides subsidised natural gas to a state-owned power provider, who goes on to provide subsidised electricity to a primary manufacturer, who then supplies intermediate inputs downstream. It can even span multiple jurisdictions, such as where the overseas activities of a SE result in subsidised production in third countries (Beck et al., 2023<sup>[55]</sup>). In many such cases, the involvement of SEs is a necessary condition for the provision of government support, as the presence of profit-seeking actors within these subsidy chains would likely have the effect of stopping the flow of below-market inputs.<sup>97</sup>

The length of the chain between the initial government policy actor and the actual flows of support can make it very challenging to identify individual measures underpinning government support. There is often no publicly available paper trail showing how decisions by governments are influencing the actions of individual SEs. Demonstrating this influence is especially difficult in the context of trade disputes, where the level of proof required may be high. In that sense, the involvement of SEs as providers of support currently poses a significant challenge for trade rules.

More fundamentally, the legal and economic apparatus crafted over the years to analyse and discipline subsidies proceeds from the perspective that subsidies are specific policies that can be identified (and quantified in the best of cases). The involvement of SEs as providers of support challenges this, and may require an approach that views subsidies as a flow of money along a chain rather than as a specific policy measure. Subsidy work needs to start ‘following the money’, which implies the use of tools in relation to accounting and finance to track evidence of government funding across companies, sectors, and countries. Viewing government support as an ecosystem in which support flows in multiple directions and fundamentally reshapes markets poses challenges for approaches based on specific transfers, but may open the way for more comprehensive solutions to the multiple market distortions engendered by support to and through SEs.

This report has demonstrated one possible way of ‘following the money’ by approaching industrial subsidies in a pincer movement from the recipient side and the provider side. The fact that the evidence obtained from the provider side (state banks or utilities) is consistent with that obtained from the recipient side (industrial firms) forms overall a solid account of how chains of industrial subsidies work in practice.

As countries attempt to lower their CO<sub>2</sub> emissions and meet their climate commitments, government support is gradually shifting toward sectors deemed ‘green’ such as the production of solar photovoltaic modules, wind turbines, electric vehicles, batteries, and hydrogen electrolyzers. Much support is also going toward semiconductors and other digital technologies (for, e.g., national security or supply-chain resilience). One important feature of green and digital sectors, however, is that they are characterised by a relatively low presence of SEs. None of the top producers of solar modules or cells are state-owned. Top battery producers (e.g. BYD, CATL, LG Energy Solution, or Panasonic) are all private, as are major vendors of semiconductors and electric vehicles. This implies that the future could potentially see relatively less concerns over SEs as subsidy recipients but a persistence of concerns in relation to SEs as providers, and an enduring need to ‘follow the money’.

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<sup>97</sup> There could be cases where private firms are required by law to provide subsidies to their customers (e.g. private fertiliser producers in India) but in this situation the existence of a clear policy visible to everyone, namely the applicable law, is generally not in doubt.

#### 4.2.2. Government support to and from SEs may also have environmental implications

It is interesting to note that the industrial sectors where SEs have the largest presence tend to be heavy industries. This is the case, for example, in aluminium smelting, cement, chemicals, fertilisers, and steelmaking (Table A B.1). Besides having a large presence of SEs, these sectors also have something else in common: they are energy- and CO<sub>2</sub>-emissions-intensive. Collectively, they account for nearly 60% of all electricity and 70% of all energy used in manufacturing worldwide (OECD, 2023<sub>[3]</sub>). Cement alone reportedly accounts for about 8% of global anthropogenic emissions of CO<sub>2</sub>.<sup>98</sup> Steelmaking emissions are larger than those coming from global road freight, at around 4% of global emissions (a conservative estimate).<sup>99</sup> Chemicals add another 5% (Gabrielli et al., 2023<sub>[56]</sub>), aluminium 2% (WEF, 2023<sub>[57]</sub>), etc. All told, a plausible range for the share of anthropogenic global CO<sub>2</sub> emissions resulting from the heavy industries listed above would be 20% to 25%.

A large proportion of industrial subsidies thus flows to SEs which have a relatively large presence in carbon-intensive industries. Moreover, recent evidence for the steel and aluminium industries suggests these subsidies act to increase firm-level CO<sub>2</sub> emissions (Garsous, Smith and Bourny, 2023<sub>[58]</sub>). The logical consequence is that subsidies to SEs are possibly a significant contributor to CO<sub>2</sub> emissions. An aggravating factor is the finding in this report that SEs in the energy sector are themselves providers of support in the form of below-market energy inputs, most of which take the form of fossil-based electricity and natural gas (OECD, 2023<sub>[3]</sub>). While this report is concerned with the market distortions caused by government support to and from SEs, it has second-order environmental implications considering that a reduction of this support could make a genuine contribution to lowering global CO<sub>2</sub> emissions.

That said, SEs are also found in sectors other than heavy industries, and particularly in the production of transport equipment. Several top firms in aerospace and defence are state-owned, partly or fully. Shipbuilding and rolling stock are each dominated by a giant Chinese SE (CSSC and CRRC, respectively) while the production of internal combustion engine cars in China (the world's largest car market) has long involved joint ventures between foreign carmakers and local state-owned carmakers. Given that transport represents another large contributor to anthropogenic global CO<sub>2</sub> emissions, this suggests an additional environmental angle in relation to the support that SEs receive. At any rate, the support that SEs receive ought to be part of future discussions around climate-change mitigation and low-carbon pathways.

The discussion above is preliminary, but indicative of possible new approaches to the problems posed by industrial subsidies and SEs at the OECD and elsewhere. This suggests several interesting avenues for a work agenda at the intersection of trade, competition, and the environment. The presence of large SEs in CO<sub>2</sub>-intensive industries and the subsidies they receive have, for example, potentially large consequences for carbon leakage and measures seeking to combat it. This is especially the case where differences in the amount of subsidies that different countries provide largely outweigh differences in their carbon prices. This is an area for investigation in future work.

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<sup>98</sup> See Cheng et al. (2023<sub>[66]</sub>) and [www.chathamhouse.org/2018/06/making-concrete-change-innovation-low-carbon-cement-and-concrete](http://www.chathamhouse.org/2018/06/making-concrete-change-innovation-low-carbon-cement-and-concrete) (accessed on 27 February 2024).

<sup>99</sup> See [www.iea.org/reports/iron-and-steel-technology-roadmap](http://www.iea.org/reports/iron-and-steel-technology-roadmap) (accessed on 27 February 2024).

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## Annex A. The OECD's MAGIC database

The OECD MAGIC (MAnufacturing Groups and Industrial Corporations) database is a confidential firm-level database combining basic financial and economic data and estimates of government support at the level of each industrial group covered. It is meant to help improve understanding of the scope and scale of government support in manufacturing and to enable analysis of how this support affects firms' decisions and markets.

The database covers more than 450 firms of the world's largest manufacturing groups across 14 key industrial sectors and over the period 2005-22 (Table A A.1). For each sector, the firm sample is selected starting from the top firms by revenue or capacity such that the resulting coverage accounts for at least two-thirds of global sales or capacity. The geographical origin of firms in each sector is therefore largely determined by which jurisdictions occupy relatively large shares of global production. Additional efforts are also made to actively diversify the firm sample, e.g. in cases where entire economies are top producers in a given sector but do not necessarily have companies large enough individually to feature in the top 20 or 30 firms.

The OECD MAGIC database seeks to avoid overlap with other areas of existing OECD work such as government support for agriculture and fossil-fuel subsidies, thus excluding much of the mining and resources sectors. It focuses on those industrial sectors that produce either durable goods (e.g. capital goods) or industrial raw materials (e.g. aluminium, steel, and chemicals). Preference is given to products destined for other businesses (B2B), with the notable exception of automobiles, which are purchased by both businesses and final consumers. The resulting choice of sectors is as follows: aerospace & defence; aluminium; automobile; cement & building materials; chemicals; fertilisers; glass, ceramics & refractories; semiconductors; shipbuilding; solar photovoltaic panels; steel; telecommunications network equipment; rolling stock & signalling; and wind turbines.

**Table A A.1. Overview of the OECD MAGIC database's firm sample**

Sector	Number of firms	%	Home base of firms	Number of firms	%
AERO	40	9%	China	129	28%
ALUM	38	8%	EU-27	79	17%
AUTO	37	8%	United States	74	16%
CEMT	38	8%	Other OECD	40	9%
CHEM	69	15%	Japan	38	8%
FERT	32	7%	India	21	5%
GLAS	32	7%	Korea	17	4%
SEMI	36	8%	Russia	15	3%
SHIP	21	5%	ASEAN	12	3%
SOLA	23	5%	GCC	12	3%
STEE	47	10%	Rest of the world	11	2%
TELC	10	2%	Chinese Taipei	8	2%
TRAN	26	6%	Brazil	6	1%
WIND	13	3%	<b>Total</b>	<b>462</b>	<b>100%</b>
<b>Total</b>	<b>462</b>	<b>100%</b>			

Source: OECD MAGIC database, as of May 2024.

As of May 2024, the OECD MAGIC database includes estimates of government support taking the form of governments grants, corporate income-tax concessions, and below-market borrowings. Estimates for government grants are generally obtained directly from corporate disclosures (or more rarely government sources) and not subject to assumptions or adjustments. Estimates for tax concessions are normally based on corporate disclosures but can at times involve judgment and interpretation on the part of the OECD when quantifying the amount of tax savings that companies enjoy as a result of particular tax provisions

(e.g. a preferential rate of tax for certain subsidiaries of a company). Estimates for below-market borrowings, on the other hand, involve complex calculations and assumptions by the OECD given the lack of government and corporate disclosure on the subsidy component of firms' borrowings.

To calculate below-market borrowings, the OECD first seeks to assess the terms and conditions that would normally prevail in credit markets given a borrower's financial profile. This involves replicating the interest rate that non-state investors could have charged to a given corporate borrower in credit markets using information obtained from corporate disclosures and corporate bond markets. Benchmark interest rates for debt transactions are thus constructed by incrementally adding: a risk-free base rate; spreads that reflect the credit risk of borrowers; and, where applicable, the additional spreads that borrowers would have incurred absent a government guarantee (OECD, 2021<sup>[2]</sup>).<sup>100</sup> This follows established financial principles commonly practiced by commercial lenders.

The OECD MAGIC database does not yet cover the support conferred to companies in the form of below-market equity, which could be included in future updates. Other forms of support not covered in the OECD MAGIC database include the provision of land and energy inputs at below-market prices.

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<sup>100</sup> In the latter case, for companies whose credit ratings are raised due to the expectation of government support by rating agencies, markets usually price their risk spreads based on all-in credit ratings, taking into account any notch uplift resulting from expected government support. Put differently, the resulting market spreads may not convey companies' original standalone ratings and thus their true financial health. It is, however, important, especially in the context of subsidy discussions, to take into consideration such effect of implicit government support due to its potential trade implications. In this respect, the WTO Agreement of Subsidies and Countervailing Measures provides that a firm receives a 'benefit' within the meaning of the Agreement corresponding to the difference between the amount that the firm pays on a loan guaranteed by the government and the amount that the firm would pay on a comparable commercial loan absent the government guarantee.

## Annex B. Additional figures and tables

**Table A B.1. Top 10 sampled companies by revenue (2022) in each key industrial sector covered**

Aerospace & defence			Aluminium			Automobile		
Sector ranking	Firm name	Govt ownership	Sector ranking	Firm name	Govt ownership	Sector ranking	Firm name	Govt ownership
1	AVIC	100.0%	1	Chalco	31.9%	1	VW	11.8%
2	Boeing	0.0%	2	Hindalco	9.6%	2	Toyota	0.0%
3	Airbus	25.9%	3	Hydro	40.7%	3	Stellantis	6.3%
4	RTX	0.0%	4	China Hongqiao	12.7%	4	Ford	0.0%
5	Lockheed-Martin	0.0%	5	Rio Tinto	0.0%	5	Daimler-Benz	0.0%
6	GE	0.0%	6	Rusal	0.0%	6	BMW	0.0%
7	Safran	11.2%	7	Alcoa	0.0%	7	General Motors	0.0%
8	Rolls Royce	0.0%	8	Emirates Global Aluminium	100.0%	8	Honda	0.0%
9	Leonardo	30.2%	9	Constellium	11.4%	9	Hyundai	7.1%
10	Honeywell	0.0%	10	SPIC	100.0%	10	SAIC	80.5%
Cement & building materials			Chemicals			Fertilisers		
Sector ranking	Firm name	Govt ownership	Sector ranking	Firm name	Govt ownership	Sector ranking	Firm name	Govt ownership
1	CNBM	39.2%	1	BASF	0.0%	1	Nutrien	0.0%
2	CRH	0.0%	2	Reliance	6.6%	2	Mosaic	0.0%
3	LafargeHolcim	0.0%	3	ChemChina	100.0%	3	OCP	94.1%
4	HeidelbergCement	0.0%	4	Dow Chemical	0.0%	4	CF Industries	0.0%
5	Anhui Conch	40.7%	5	Bayer	0.0%	5	Yunnan Yuntianhua	38.1%
6	SCG	33.6%	6	SABIC	70.0%	6	ICL	1.0%
7	Cemex	0.0%	7	LyondellBasell	0.0%	7	OCI	0.0%
8	UltraTech Cement	3.9%	8	Rongsheng Petrochemical	0.0%	8	PhosAgro	0.0%
9	Martin Marietta	0.0%	9	LG Chem	7.5%	9	IFFCO	0.0%
10	Taiheiyu	0.0%	10	3M	0.0%	10	Ma'aden	65.4%

Glass and ceramics			Semiconductors			Shipbuilding		
Sector ranking	Firm name	Govt ownership	Sector ranking	Firm name	Govt ownership	Sector ranking	Firm name	Govt ownership
1	Saint Gobain	4.3%	1	Samsung Electronics	7.7%	1	CSSC	100.0%
2	AGC	0.0%	2	TSMC	6.4%	2	KSOE	5.0%
3	Corning	0.0%	3	Intel	0.0%	3	Fincantieri	71.3%
4	NSG	0.0%	4	Qualcomm	0.0%	4	Samsung Heavy Industries	9.2%
5	Sisecam	0.0%	5	SK Hynix	7.2%	5	DSME	62.1%
6	Kyocera	0.0%	6	Broadcom	0.0%	6	Yangzijiang	0.0%
7	Imerys	0.0%	7	Micron	0.0%	7	Imabari	0.0%
8	Mohawk Industries	0.0%	8	Nvidia	0.0%	8	JMU	0.0%
9	Fuyao	2.2%	9	AMD	0.0%	9	Oshima	0.0%
10	RHI Magnesita	0.0%	10	ASE	0.0%	10	Namura	0.0%
Solar photovoltaic panels			Steel			Telecommunications network equipment		
Sector ranking	Firm name	Govt ownership	Sector ranking	Firm name	Govt ownership	Sector ranking	Firm name	Govt ownership
1	LONGi	10.2%	1	China Baowu Steel	100.0%	1	Huawei	0.0%
2	Trina Solar	19.0%	2	ArcelorMittal	0.0%	2	Cisco	0.0%
3	JinkoSolar	0.0%	3	POSCO	9.1%	3	Ericsson	0.0%
4	JA Solar	0.0%	4	Nippon Steel	0.0%	4	Nokia	5.3%
5	Hanwha Solutions	9.9%	5	HBIS	100.0%	5	NEC	0.0%
6	Canadian Solar	0.0%	6	Ansteel Group	100.0%	6	Fujitsu	0.0%
7	Chint Electrics	0.0%	7	Nucor	0.0%	7	ZTE	25.4%
8	Risen	6.8%	8	Shougang Group	100.0%	8	Juniper	0.0%
9	First Solar	0.0%	9	JFE Steel	0.0%	9	Ciena	0.0%
10	GCL System	13.3%	10	Shandong Steel Group	100.0%			

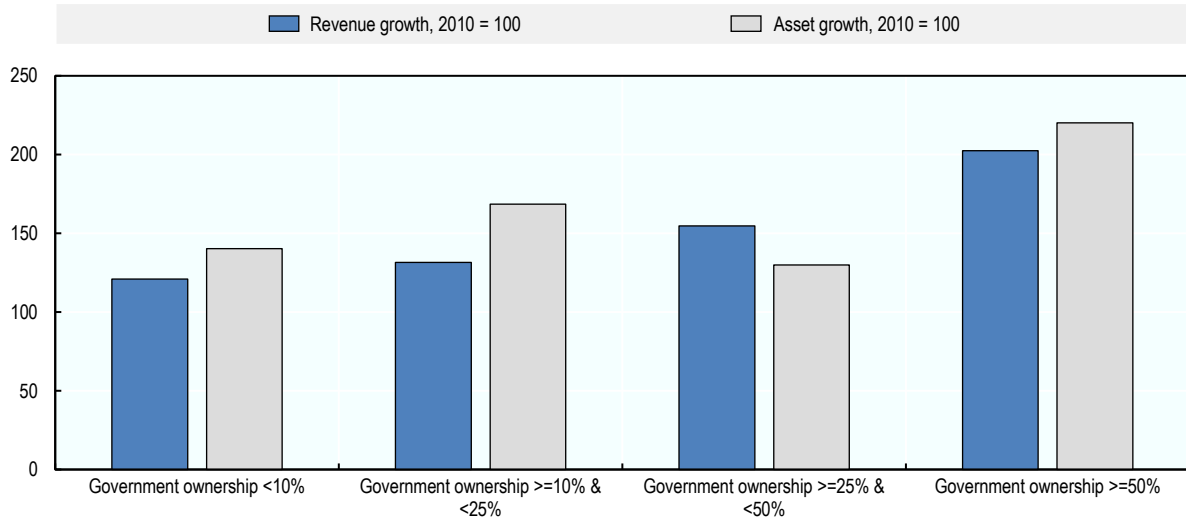
Rolling stock & signalling			Wind turbines		
Sector ranking	Firm name	Govt ownership	Sector ranking	Firm name	Govt ownership
1	CRRC	55.5%	1	Vestas	0.0%
2	Alstom	0.0%	2	GE	0.0%
3	Siemens	0.0%	3	Siemens Gamesa	0.0%
4	Wabtec	0.0%	4	Goldwind	25.9%
5	CRSC	64.3%	5	Nordex	0.0%
6	Transmashholding	0.0%			
7	Stadler	0.0%			
8	Knorr Bremse	0.0%			
9	CAF	0.0%			
10	Greenbrier	0.0%			

Note: Government ownership comprises ownership by public pension funds and public investment banks as of 2022. For conglomerates, the ranking only considers segment-specific revenue (e.g. semiconductor-related revenue for Samsung Electronics). The ranking is missing certain large companies based in Russia, which have stopped disclosing their financials to the public following Russia's large-scale invasion of Ukraine. This notably affects the fertiliser sector. A few large shipyards and other firms based in China could not be covered either due to lack of data and information.

Source: OECD MAGIC database.

### Figure A B.1. State enterprises in the sample have grown faster than private peers

Growth in firms' assets and revenue over 2010-21, 2010 = 100



Note: Growth rates are calculated for the period 2010-21 since several state enterprises were not active in the sectors covered prior to 2010. Data are also at times missing between 2005-07. The finding that state enterprises have grown faster than private peers holds, however, irrespective of the reference year.

Source: OECD MAGIC database.

### Table A B.2. Cement and automobiles are two sectors where government ownership seemingly correlates positively with financial performance

Average return on assets by sector and ownership category, segment specific

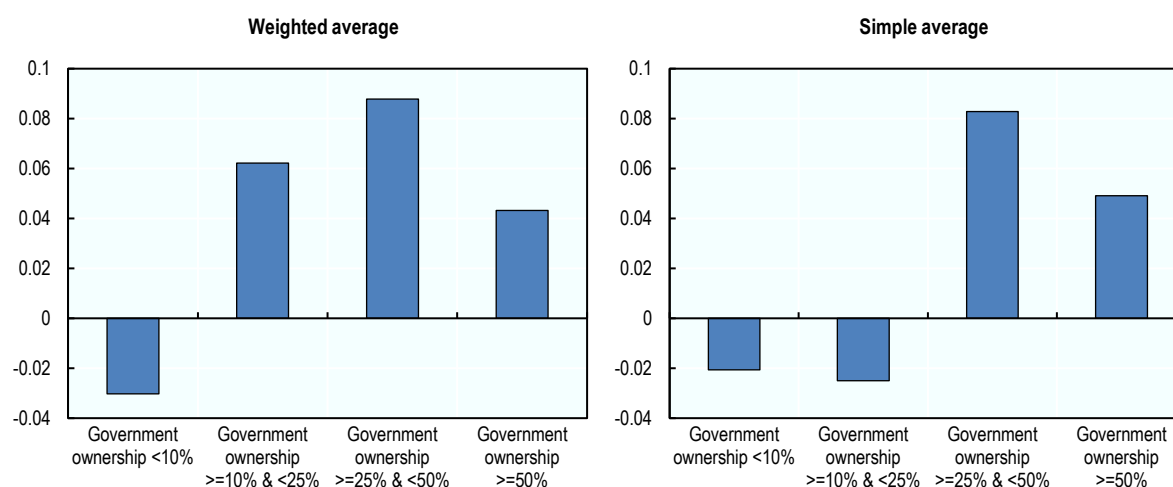
	Government ownership <33%	Government ownership >=33%
Aerospace & defence	15.8%	3.1%
Aluminium	4.8%	3.2%
<b>Automobile</b>	<b>2.7%</b>	<b>7.9%</b>
<b>Cement &amp; building materials</b>	<b>5.9%</b>	<b>9.9%</b>
Chemicals	7.9%	6.7%
Fertilisers	12.0%	8.3%
Glass & ceramics	5.0%	1.1%
Semiconductors	12.0%	3.2%
Shipbuilding	2.4%	2.4%
Solar PV panels	3.5%	n.a.
Steel	6.4%	3.0%
Telecom network equipment	7.6%	n.a.
Rolling stock & signalling	7.8%	4.8%
Wind turbines	4.1%	1.2%

Note: Because not all sectors feature firms falling within each of the four government-ownership categories investigated in this report, this table uses a simpler 33% ownership threshold. Using 25% instead does not invalidate the findings.

Source: OECD MAGIC database.

**Figure A B.2. State enterprises tend to be more leveraged than their private peers**

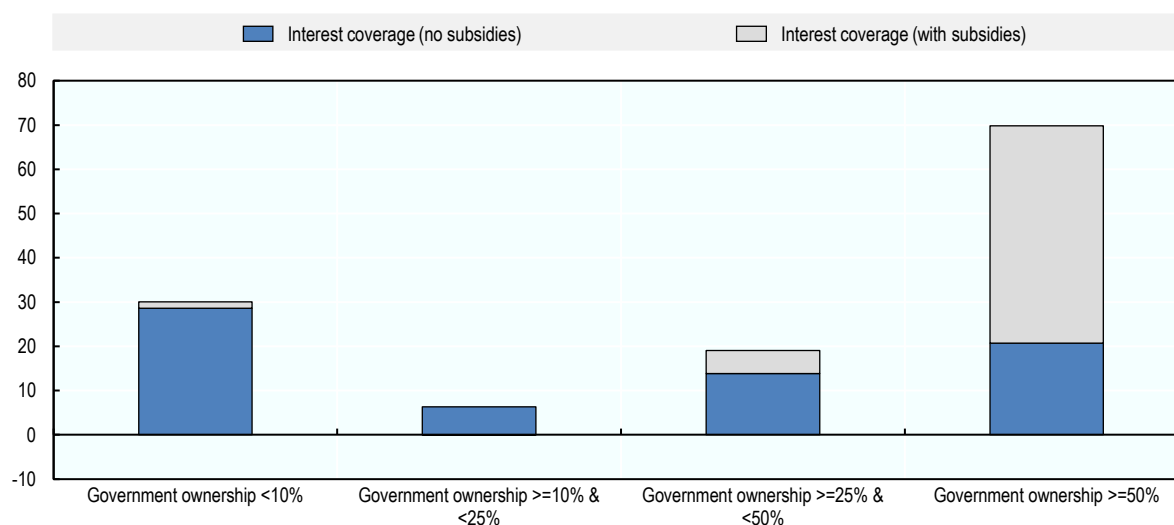
Standardised debt-equity ratios



Note: Debt-equity ratios are here standardised for each sector so they have a mean of zero and a standard deviation of one.  
Source: OECD MAGIC database.

**Figure A B.3. Interest coverage appears worse once accounting for subsidies**

Ratio of firms' interest expenses over their EBIT



Note: This graph only considers government grants and below-market borrowings, thus omitting below-market inputs for which only few data points exist. Readers are advised that the counterfactual of no subsidies shown here is purely hypothetical and does not represent what would actually happen were subsidies to be removed.  
Source: OECD MAGIC database.



## Annex C. State enterprises can fall outside the scope of competition rules in countries of the Gulf Cooperation Council

**Bahrain:** The Bahrain competition law (Law No. 31 of 2018 Concerning Promotion and Protection of Competition) exempts facilities and projects owned or controlled by the state from the application of competition rules [Article 2(b)].

**Kuwait:** The Kuwait competition law [Protection of Competition Law (Law No. 72 of 2020)] exempts from the application of competition rules activities of public utilities and state-owned companies that provide basic goods and services to the public and which are determined by a decision of the Council of Ministers (Article 3).

**Oman:** The Oman competition law [Competition Protection and Monopoly Prevention Law promulgated under the Royal Decree No. 67 of 2014 (as amended by Royal Decree 22 of 2018)] exempts from the application of competition rules activities relevant to the public facilities fully owned or controlled by Oman (Article 6).

**Qatar:** The Qatar competition law (Law No. 19 of 2006 Concerning the Protection of Competition and the Prevention of Monopoly Practices) exempts from the application of competition rules state ventures and institutions, groups, companies, or entities subject to State direction and supervision (Article 6).

**Saudi Arabia:** The Saudi Arabia competition law [Cabinet Resolution No. 372 of 1440H Promulgating the Competition Law of the Kingdom of Saudi Arabia (Royal Decree No. (M/75) of 1440H) and Implementing Regulations issued by Resolution No. (337) of 25/1/1441H] exempts from the application of competition rules Public establishments and State-owned entities where they grant exclusive rights by the government to provide goods or services in a certain field [Article 3(2) and Article 4(1) of the Implementing Regulations]. Such public establishments and state-owned entities are also exempt from reporting economic concentration transactions to Committee for Adjudication of Competition Law Violations [Article 4(3) of the Implementing Regulations].

Prior to the 2019 competition law, the legal framework in place (Competition Regulation of 2014) envisaged a broad exemption from the application of competition rules for public establishments and companies wholly owned by the government. Under the new legislation, such exemption must be granted by a royal decree or a resolution of the Council of Ministers authorising the relevant public establishment or state-owned company to be the sole provider of goods or services in a particular field. By contrast, competition law applies in Saudi Arabia to non-wholly SOE, as well as to SOEs in fields other than the one in which it is solely authorised by the Saudi Government to provide goods or services [Article 4(1) of the Implementing Regulations].

**United Arab Emirates:** The competition law of the United Arab Emirates (Federal Law No. 4 of 2012 concerning the Regulation of Competition as amended by Federal Decree-Law No. 36 of 2023 Regulating Competition) exempts from the application of competition rules actions of undertakings owned by the Federal Government based on a Cabinet resolution upon the Minister of Economy's proposal and after coordination with the relevant authority, as well as undertakings owned by a government of an emirate, which carry out their activities in such emirate, as determined by a local government's resolution.

Prior to the 2023 amendment, the legal framework in place envisaged a broad exemption from the application of competition rules for public establishments and enterprises owned by the federal government or emirate government (Article 2 of Federal Law No. 4 of 2012).

## Annex D. Large central state enterprises have emerged in China since 2012 following a consolidation wave initiated by the SASAC

The following table summarises M&As in China involving at least one central SE<sup>101</sup> in the manufacturing sector, which have taken place since 2012. Among these M&As, seven led to the emergence of a new central SE:

**Table A D.1. Manufacturing M&As in China involving at least one central SE since 2012**

Year	Sector	Acquired company or merging entities	Acquiring company or newly created entity
2013	Heavy Machinery	China National Erzhong Group	China National Machinery Industry Corporation (Sinomach)
2014	Aircraft	Shenyang Aircraft Industry Group Co. (military branch of Aviation Industry Corporation of China (AVIC))	Sichuan Chengfei Integration Technology Corp.
2015	Rolling stock	CNR Corporation CSR Corporation	China Railway Rolling Stock Corporation (CRRC)
2015	Metals	China Metallurgical Group Corporation	China Minmetals Corporation
2016	Steel	Baoshan Iron and Steel Group (Baosteel) Wuhan Iron and Steel Corporation	Baowu Steel Group (Baowu)
2016	Cement	China National Building Materials Group Corporation China National Materials Group Corporation (Sinoma)	China National Building Materials
2017	Heavy Machinery and Textiles	China High-Tech Group	China National Machinery Industry (Sinomach)
2018	Shipbuilding	China State Shipbuilding Corporation (CSSC) China Shipbuilding Industry Group Corporation Ltd (CSIC)	China Shipbuilding Group
2018	Telecommunication equipment and networking provider a	FiberHome Technologies Group Datang Telecom Technology and Industry Group	China Information and Communication Technologies Group Corporation
2018	Aluminium	Yunnan Metallurgical Group controlling Yunnan Aluminium Co. Ltd. Yunnan Aluminium Co. Ltd	China Copper Co., a joint venture between Chinalco and the Yunnan provincial government
2019	Steel	Maashan Iron & Steel Group	Baowu Group
2019	Aluminium	Yunnan Aluminium	Chalco Aluminium Corp of China Ltd
2020	Steel	Taiyuan Iron & Steel Group (TISCO)	Baowu Group
2020	Steel	Sinosteel	Baowu Group
2020	Steel	Chongqing Changshou Iron and Steel Co. Ltd.	Baowu Group
2021	Steel	Kunming Iron & Steel Holding Co. Ltd.	Baowu Steel Group Corp. Ltd.
2021	Steel	Benxi Steel	Ansteel
2021	IT equipment	China Putian Information Industry Group (Potevio)	China Electronics Technology Group (CETG)
2021	Rare earths	Aluminium Corporation of China (CHALCO) (rare earth units) China Minmetals Corporation (rare earth units) Ganzhou Rare Earth Group Co. Ltd (rare earth units)	China Rare Earth Group Co. Ltd.
2021	Oils and Chemicals	ChemChina Sinochem	Sinochem Holdings Corp.
2022	Steel	Xinyu Iron and Steel (Xingang Group)	Baowu Group
2022	Aluminium	Yunnan Aluminium	Chalco Aluminium Corp. of China Ltd
2023	Steel	Shandong Iron and Steel Group (Shangang Group)	Baowu Group

Source: OECD research.

<sup>101</sup> Central SEs refer in China to enterprises owned and administered by the SASAC at the national level.

## Annex E. Mergers conditionally approved in China by the SAMR since 2021

The table below lists the mergers conditionally approved in China by the SAMR since 2021 and how they have been assessed by the competition authorities in other major jurisdictions (i.e. the EU, Japan, Korea, the United States, and the United Kingdom). It shows that out of the nine transactions examined by both the SAMR and at least one other competition authority, only three were also approved conditionally by at least one other competition authority.

**Table A E.1. Mergers conditionally approved in China by the SAMR since 2021**

Year	Case	Industry	Country of origin of the parties involved	SAMR Assessment	Assessment by other competition authorities (if filed)
2023	<i>Broadcom/VMware</i>	Semiconductors	United States	Conditionally approved	Conditionally approved in the European Union, Korea, unconditionally approved in the United Kingdom
2023	<i>Sincere Pharmaceutical Group/Beijing Tobishi Pharmaceutical</i>	Pharmaceuticals	China	Conditionally approved	N.A. (the transaction was not filed in another jurisdiction)
2023	<i>MaxLinear/Silicon Motion</i>	Semiconductors	United States; United States/Chinese Taipei	Conditionally approved	Unconditionally approved in the United States
2023	<i>Wanhua Chemical/Yantai Juli</i>	Chemicals	China (local SEs)	Conditionally approved	N.A. (the transaction was not filed in another jurisdiction)
2022	<i>Korean Air/Asiana Airlines</i>	Transportation (aviation)	Korea	Conditionally approved	Conditionally approved in the European Union, Japan, Korea, and in the United Kingdom
2022	<i>Shanghai Airport/Eastern Air Logistics JV</i>	Transportation (aviation)	China (local SE with the subsidiary of a central SE)	Conditionally approved	N.A. (the transaction was not filed in another jurisdiction)
2022	<i>II-VI/Coherent</i>	Semiconductors	United States	Conditionally approved	Unconditionally approved in the United States, and Korea
2022	<i>AMD/Xilinx</i>	Semiconductors	United States	Conditionally approved	Unconditionally approved in the European Union, Korea, the United Kingdom, and the United States
2022	<i>GlobalWafers/Siltronic</i>	Semiconductors	Chinese Taipei; Germany	Conditionally approved	Unconditionally approved in Japan, Korea, the United States; no investigation by the United Kingdom
2021	<i>SK Hynix/Intel</i>	Semiconductors	Korea; United States	Conditionally approved	Unconditionally approved in the European Union Korea, the United Kingdom, and the United States
2021	<i>Illinois Tool Works/MTS</i>	Industrials	United States	Conditionally approved	N.A. (the transaction was not filed in another jurisdiction)
2021	<i>Danfoss/Eaton</i>	Industrials	Denmark; Ireland	Conditionally approved	Conditionally approved in Brazil, the European Union and the United States
2021	<i>Cisco/Acacia</i>	Semiconductors	United States	Conditionally approved	Unconditionally approved in the United States

Source: Authors' elaboration based on the SAMR website, [www.samr.gov.cn/flides/tzgg/fj/index.html](http://www.samr.gov.cn/flides/tzgg/fj/index.html) (accessed on 16 February 2024), as well as <https://globalcompetitionreview.com/guide/the-guide-merger-remedies/fifth-edition/article/china-recent-remedy-cases-showcase-impact-of-amended-anti-monopoly-law#footnote-017> (accessed on 16 February 2024).

## Annex F. List of sampled banks covered in Section 3.1.2 of this report

### Policy banks, China

- China Development bank
- The Export-Import Bank of China

### State-owned large commercial banks, China

- Industrial and Commercial Bank of China Limited
- Agricultural Bank of China Limited
- Bank of China Limited
- China Construction Bank Corporation
- Bank of Communications Co., Ltd.
- Postal Savings Bank of China Co., Ltd.

### Joint-stock commercial banks, China

- China Bohai Bank Co., Ltd.
- China CITIC Bank Corporation Limited
- Shanghai Pudong Development Bank Co., Ltd.
- Huaxia Bank Co., Limited
- China Merchants Bank Co., Ltd.
- Industrial Bank Co., Ltd.
- China Minsheng Banking Corp., Ltd.
- China Everbright Bank Company Limited
- Ping An Bank Co. Ltd.
- China Zheshang Bank Co., Ltd.
- China Guangfa bank Co., Ltd.

### City commercial and rural banks, China

- Bank of Beijing Co., Ltd
- Bank of Jiangsu
- Bank of Shanghai Co., Ltd
- Bank of Ningbo Co. Ltd.
- Chongqing Rural Commercial Bank Co., Ltd.

### Other Top 10 globally largest banks

- JP Morgan Chase & Co.
- Bank of America Corporation
- Mitsubishi UFJ Financial Group Inc.
- HSBC Holdings PLC
- BNP Paribas SA
- Crédit Agricole Group

## Annex G. The lack of a harmonised definition of NPLs across countries limits meaningful cross-country comparisons

There is no uniform definition of NPLs nor harmonised criteria across countries for classifying a loan as non-performing (The World Bank, 2020<sup>(40)</sup>).<sup>102</sup> National competent regulatory authorities typically differ in how they define NPLs, thus making this concept a regulatory rather than an accounting one.<sup>103</sup> As a result, a comparative exercise that does not account for jurisdiction-specific definitions may lead to inaccurate cross-country comparisons of credit quality in each economy's banking sector.

Despite the absence of an international standard definition, some commonalities may be found across jurisdictions. Such commonalities are notably reflected in the guidelines of the Basel Committee on Banking Supervision (BCBS) published in 2017. National regulatory authorities frequently use the 90-day overdue threshold to classify a loan as non-performing, although this threshold is not universal. In the United States, for instance, NPLs are defined as loans past due for more than 90 days and non-accrual loans (i.e. loans on which a bank has ceased to accrue interest). Similarly, the European Banking Authority (EBA), which issued guidelines in 2014 on the definitions and management of non-performing exposures and forbearance within the European Union,<sup>104</sup> refers to the quantitative criterion of 90 days overdue to consider a loan and other exposures as non-performing. In addition, prior to the Asian financial crisis of the late 1990s, various Asian economies considered loans as non-performing only when they had exceeded a 180-day past due threshold. Since then, however, most regulators in Asia (e.g. in Hong-Kong, China and Chinese Taipei) have tightened their definitions of NPLs: by adopting a 90-day threshold, they have aligned themselves with other jurisdictions, ensuring a more adequate disclosure of their credit quality.<sup>105</sup>

Moreover, a loan that is past due for less than 90 days is nevertheless commonly identified as non-performing where it is likely that the borrower will not be able to repay the loan in full. According to the EBA guidelines, for instance, overdue loans that have not yet attained the 90-day threshold may still be classified as non-performing if there is evidence that full repayment of principal and interest is unlikely without resorting to collateral, irrespective of whether a loan is in arrears.<sup>106</sup>

By contrast, in mainland China, although the CBRC adopted in 2004 a standard five-category loan classification system, which was also in use in some Latin American and Asian countries<sup>107</sup>, the Chinese regulator did not seemingly set a mandatory 90-day threshold, hence leaving discretion to banks as to when a loan should be classified as non-performing. In fact, none of the 'Big six' banks refer to such a threshold when defining NPLs in their annual reports. The five-category system classifies bank loans according to their inherent risks as 'pass', 'special-mention', 'substandard', 'doubtful', and 'loss'. Loans belonging to the last three categories are all considered as non-performing. Table A G.1 below

<sup>102</sup> See also [www.imf.org/external/pubs/ft/bop/2005/05-29.pdf](http://www.imf.org/external/pubs/ft/bop/2005/05-29.pdf) (accessed on 23 August 2023).

<sup>103</sup> See [www.frbsf.org/banking/asia-program/pacific-exchange-blog/nonperforming-loan-ratio-asset-quality-measures-in-asia/](http://www.frbsf.org/banking/asia-program/pacific-exchange-blog/nonperforming-loan-ratio-asset-quality-measures-in-asia/) (accessed on 10 August 2023).

<sup>104</sup> While the guidelines were issued in 2013, they were endorsed by the European Commission and published in 2014. The EBA revised the guidelines in 2022; see [www.eba.europa.eu/regulation-and-policy/credit-risk/guidelines-on-management-of-non-performing-and-forborne-exposures](http://www.eba.europa.eu/regulation-and-policy/credit-risk/guidelines-on-management-of-non-performing-and-forborne-exposures) (accessed on 20 August 2023). Note that the EBA, along with other regulatory authorities, has substituted the term 'non-performing exposures' for the concept of NPLs to cover a broader range of problem assets, beyond NPLs. The term includes not only NPLs but also non-performing debt securities and other amounts due (including interest and fees), as well as specific off-balance sheet items (e.g. loan commitments and financial guarantees).

<sup>105</sup> See [www.frbsf.org/banking/asia-program/pacific-exchange-blog/nonperforming-loan-ratio-asset-quality-measures-in-asia/](http://www.frbsf.org/banking/asia-program/pacific-exchange-blog/nonperforming-loan-ratio-asset-quality-measures-in-asia/) (accessed on 10 August 2023).

<sup>106</sup> Paragraph 213 of Part 2 of Annex V to Commission Implementing Regulation 680/2014/EU.

<sup>107</sup> See 'Guiding Principles on the Classification of Loan Risk' [http://en.people.cn/200309/06/eng20030906\\_123830.shtml](http://en.people.cn/200309/06/eng20030906_123830.shtml) (accessed on 20 August 2023).

summarises this five-category system. In February 2023, the PBOC tightened its financial-asset risk classification methods for commercial banks, which should bring it closer to the criteria laid down in the 2017 BCBS guidelines.

**Table A G.1. The five-category loan classification system in China**

Loan type	Classification criteria	Impairment loss
Pass	Borrowers are able to honor the terms of the contracts and there is no reason to doubt their ability to repay the principal and interest of loans in full and in a timely manner.	None
Special mention	Borrowers are able to serve their loans currently, although repayment may be adversely affected by specific factors.	2% provisioning required
Sub-standard	Borrowers' abilities to service their loans are in question. Borrowers cannot depend on their normal business revenues to pay back the principal and interest so losses may ensue, even when guarantees are invoked.	25% provisioning required
Doubtful	Borrowers cannot pay back the principal and interest in full and significant losses will be incurred, even when guarantees are invoked.	50% provisioning required
Loss	The principal and interest of loans cannot be recovered or only a small portion can be recovered after taking all possible measures and resorting to necessary legal procedures.	100% provisioning required

Note: Loans belonging to the last three categories are all considered as non-performing.

Source: Authors' elaboration based on [http://en.people.cn/200309/06/eng20030906\\_123830.shtml](http://en.people.cn/200309/06/eng20030906_123830.shtml) (accessed on 20 August 2023).

## Annex H. Overview of the OECD methodology for identifying SEs disciplines in PTAs

In earlier work [TAD/TC(2022)9/FINAL], the OECD has mapped and classified the provisions disciplining SEs included in PTAs signed between the 1950s and December 2022.<sup>108</sup> The analysis is based on information collected on all PTAs currently in force,<sup>109</sup> including their dates of signature and entry into force, and the Parties to the agreements. For this purpose, the OECD relied on the WTO database of regional trade agreements<sup>110</sup> although the information was cross-checked with certain national or supra-national websites, notably those of Australia, Canada, China, Japan, the United States, the European Union, and the United Kingdom. A total of 367 PTAs<sup>111</sup> were identified as being in force. Zooming in on SEs, information was compiled on whether and how SEs are defined across the various PTAs, the various provisions establishing a discipline on SEs, and where those provisions could be located within the PTAs.

The OECD considered that a PTA contains discipline on SEs when it establishes a specific framework regulating the conduct of SEs and, potentially, the relationship of governments with their SEs. It deems PTAs containing at least one of the following three provisions to have an SE discipline in place, namely (i) the obligation for SEs to act ‘in accordance with commercial considerations’; (ii) the obligation for SEs to accord non-differential treatment when purchasing and selling goods or services; (iii) the prohibition of non-commercial assistance provided by governments or SEs to SOEs when causing adverse effects.<sup>112</sup> On some occasions, the OECD regarded as including a discipline on SEs those PTAs that contain provisions regulating more broadly the relationship of governments with their SEs.<sup>113</sup> It should be noted that additional obligations and transparency requirements often accompany the three main obligations referred to above. These provisions for which the OECD also collected information, complement the main provisions regulating SEs and do not appear as stand-alone obligations.

By contrast, for the purpose of this study, a PTA is not considered to include disciplines on SEs when it only contains either of the two following obligation, namely: (i) a general obligation for Parties to the agreement to comply with the principle of non-discrimination when applying competition laws; or (ii) an obligation to treat all enterprises equally under competition laws, irrespective of their ownership status.<sup>114</sup>

<sup>108</sup> This OECD study complements the work of other international organisations, such as the World Bank, which has inventoried the provisions on SEs in 283 agreements signed between 1957 and early February 2016 to assess the vertical depth of PTAs (Rubini and Wang, 2020<sup>[68]</sup>). For further details on the different methodology between the two studies, see below.

<sup>109</sup> This includes PTAs that have preliminarily entered into force, such as the Comprehensive Economic and Trade Agreement between the European Union and Canada (CETA), as well as PTAs that have entered into force albeit not for all Parties to the agreement.

<sup>110</sup> See <http://rtais.wto.org/UI/PublicMaintainRTAHome.aspx> (accessed on 1 March 2024).

<sup>111</sup> This number covers PTAs, which have recently entered into force, although they have not yet been notified to the WTO. In addition, Protocols to a PTA adding a new chapter on ‘competition policy’ or ‘state-owned enterprises’ have been counted as separate agreements to reflect their date of entry into force. Four instances were found in this respect, namely the upgrade protocol to the China-Singapore FTA, the upgrade protocol to the China-New Zealand FTA, the protocol amending the China-Chile FTA, and the protocol amending the Singapore-New Zealand Closer Economic Partnership.

<sup>112</sup> Note, as explained above, that the CPTPP, the Australia-Peru FTA and the USMCA contain disciplines on non-commercial assistance to SOEs provided by governments or by SEs. These agreements thus distinguish between SOEs and SEs. Hence, although this report uses the term SEs, it refers to SOEs when the Agreements under discussion contain two separate definitions of SOEs and SEs.

<sup>113</sup> Details are provided in section 4.2 as to the number of PTAs containing a discipline on SEs, including in a broader language, and the number of PTAs containing only one or several of the obligations (i) to (iii).

<sup>114</sup> Notwithstanding this approach, relevant data on such provisions were collected. See [TAD/TC(2022)9/FINAL].

In that regard, the analysis has adopted a rather conservative approach by classifying as discipline on SEs only the inclusion of specific rules tailored to the issues to which SEs give rise. That is, although the application of general competition laws to SEs may contribute to addressing some of the distortions caused by the conduct and practices of SEs, such provisions do not lay down a framework specifically regulating SEs. The rationale for this conservative approach is that too broad a categorisation would not give sufficient weight to frameworks imposing substantial obligations on both SEs and governments in their relations with SEs.



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