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Unpacking China's industrial policy tools and why they matter for Europe

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Abstract

China's industrial policy has attracted significant attention, not only in emerging economies but also in developed ones, including the European Union. However, the debate often focuses excessively on the Chinese government's provision of subsidies to companies. In this first brief of a two-part series on China's industrial policy, we review the general economic rationale behind industrial policy and its application to China. We also analyze the various instruments China uses to conduct its industrial policy. Given the complexities and opacity of these instruments, it can be concluded that subsidies are just the tip of the iceberg, with relevant conclusions for the EU to draw.

Key findings

- China's industrial policy needs to be framed in the context of its institutional particularities. While private entrepreneurship has driven productivity growth for much of China's rise, the state economy has an advantage in access to finance due to implicit government guarantees. Industrial policy seeks to draw resources toward certain key sectors, benefiting the private economy under the conditions set by the government's strategic agenda.
- The ultimate goal of China's industrial policy is to boost the innovative capacity of the economy by supporting companies in key future-oriented sectors. Enhancing China's innovation capacity is crucial for two reasons. Firstly, innovation is likely the most important lever China has to mitigate the structural deceleration of its economy. Secondly, China needs to move up the technological ladder to reduce its dependence on foreign technology and, thereby, avoid potential chokepoints stemming from the West's technological dominance.
- To this end, a comprehensive web of government directives has been designed for decades and strengthened further since Xi Jinping came to power with the help of local governments.
- Regarding the instruments to carry out industrial policy, subsidies are only one part of the equation (equivalent to some 2% of GDP). Furthermore, the state injects capital through government guidance funds and sovereign wealth funds. Additionally, preferential bank loans and tax incentives are offered to targeted companies operating in sectors chosen by the central and local governments. Moreover, there are many implicit ways in which the government can provide selective support, such as preferential land allocation and selective integration of firms into business networks.
- To gain an objective picture of the degree of state involvement in industrial support, the EU's investigations need to go well beyond subsidies, even in their broadest definition. Unfortunately, China's transparency regarding sectoral and company information is very limited, making any estimate of government support challenging to carry out.

Contents

1. Objective

The academic literature contains several definitions of industrial policy, but reducing it to its essence, one might follow Juhász et al (2023) who defined it as "those government policies that explicitly target the transformation of the structure of economic activity in pursuit of some public goal." Frequently, this public goal is associated with innovation and productivity, industrialisation and security-related matters such as supply-chain resilience or the advancement of dual-use technology.

One the one hand, China's re-emergence, in which extensive use has been made of industrial policy, has triggered industrial-policy re-awakenings elsewhere. Germany's National Industrial Strategy 2030, for example, called China a "particular successful country in terms of industrial policy" (BMWi, 2019). One the other hand, the European Commission has itself updated its report of distortive practices in the People's Republic of China (European Commission, 2024). In this first brief of a two-piece series on China's industrial policy we review the economic rationale of industrial policy, how it applies to China and what instruments the Chinese government uses to conduct industrial policy. This is particularly relevant at a time when the EU has launched several anti-subsidy investigations into imports from China, in particular solar panels and EVs.

2. The economic rationale for industrial policy

Industrial policy has been justified traditionally through the infant-industry argument. To industrialise, underdeveloped countries must shield domestic firms from foreign competition. This is done either by erecting barriers to trade, such as tariffs, or by preferential treatment of domestic firms that compete with foreign incumbents on the home market (Hamilton, 1791; List, 1844; Rosenstein-Rodan, 1943; Melitz, 2005). Industrial policy can also be justified by innovation-related externalities. Research and development ventures usually require high upfront investment, while success is often uncertain.

Since inventions, once discovered, are a public good, other firms can free ride on the efforts of the inventor, reducing the private benefits of a socially desirable outcome. Hence, the government can support R&D efforts financially, therefore increasing private incentives to innovate and accelerating technological progress (Nelson, 1959; Arrow, 1962). This rationale seems particularly relevant to technologies characterised by strong intra-sectoral spillovers, such as artificial intelligence, semiconductors and aerospace.

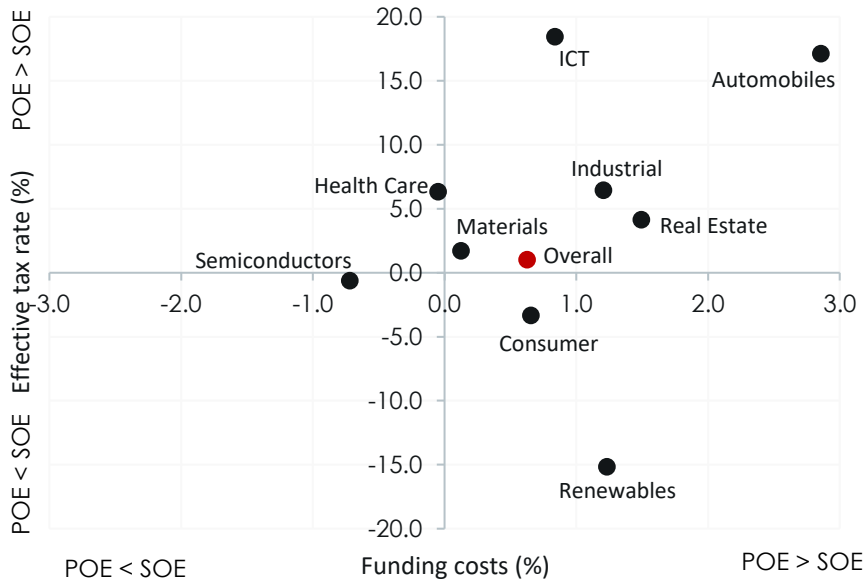
The economic literature also points to many drawbacks related to industrial policy. Informational asymmetries between the government and the market make it hard for bureaucrats to choose the most desirable investment. Government officials are seldom sector-specific practitioners and have themselves blurred views on the dynamics of the market. Furthermore, industrial policy might induce firms to switch a substantial amount of resources

away from productive activities towards seeking rents from the government, creating a breeding ground for corruption and distorted competition (Tullock, 1967; Krueger 1990).

China is a good laboratory for the study of industrial policy since active state guidance of the economy is explicitly promoted. Nevertheless, any analysis of Chinese industrial policy must take into account China's institutional particularities. China already has a millennium-long tradition of a relatively unchallenged state, not easily comparable with the nation states that formed in Europe. While private cultivation of farmland was the backbone of material prosperity in imperial China, the country was ruled by a cohesive fabric of gentry-like economic elites, Confucian officials and wealthy merchants in state-backed resource monopolies (Brandt et al, 2014). Some of these dynamics reemerged when the People's Republic legalised private entrepreneurship in 1992. Private entrepreneurs became the drivers of productivity growth but found themselves at a disadvantage when seeking access to finance (Song et al, 2011). Privately-owned companies (POEs) were often subjected to the so-called 'three types of arbitrariness': arbitrary fees, arbitrary fines and arbitrary extortion, which they could only smooth out through connections with local government officials.

The situation of POEs improved when China's acceded to the World Trade Organisation, but has deteriorated since President Xi Jinping came to power in 2013 and, in particular, since 2015. When credit growth slowed during China's deregulation campaign from 2016 onwards, private firms were squeezed, while state-owned enterprises could rely on government guarantees to receive loans (Wright, 2023). Since then, the state also reasserted control over some previously POE-dominated sectors, including IT services, online education and real estate. More generally, in China's corporate world, SOEs receive better fiscal and financial treatment than POEs as, documented by García-Herrero and Ng (2021).

Figure 1: SOEs, POEs, divergence in effective tax rates and interest rates (values of POE - SOE, 2019)



Source: Bruegel based on Wind.

China's industrial policy therefore can be seen in the context of a dominant state sector in the production of goods and services. Financing private firms through industrial policy aims to

alleviate the disadvantage the private economy faces relative to the state economy, although importantly, under the conditions set by the government. Private-sector activity is channeled into strategic industries through government support, eventually blurring the line between state capital and private capital.

3. How does China conduct industrial policy?

3.1. Industrial policy and technological upgrading

The official objective of Chinese industrial policy is to upgrade China's domestic industrial base, especially in the context of two recent developments. First, the Chinese economy has been decelerating for over 10 years and this deceleration is expected to continue (García-Herrero, 2023). Innovation is the most obvious way to mitigate this. Second, China is now in strategic competition with the United States, with the outcome very much depending on the technological progress China can make. China's aim in this respect is not only to foster growth but also to eliminate the technological chokepoints that the US still counts on to contain China's rise.

Beyond this, China's striving for technological excellence has deep historical roots. China has been, with few interruptions, the cultural and economic centre of East Asia over the last 2,500 years. The eventual downfall of imperial China at the hands of technologically advanced powers in the nineteenth century was a deep collective trauma effecting its self-perception. Chinese intellectuals and later statesmen thus recognised the importance of science and technology both for economic development and for national security1. It is not a coincidence that every leader since the reunification of China under the Communist Party in 1949 has emphasised the centrality of technological self-sufficiency in the rejuvenation of the Chinese nation. Seen through this lens, competitiveness and innovation are matters of national security, aimed at preventing the 'century of humiliation' – the period of China's decay between 1842 and 1949 – from repeating itself. The 'never again' mentality has been further strengthened under President Xi Jinping, and this rationale acts as the animating spirit of the kind of innovation-related industrial policy that China has conducted since the mid-2000s.

A milestone in this evolution came in 2006 when the central government issued the Medium to Long- term Science and Technology Plan (2006-2020)2. Industrial policy was officially merged into China's striving for technological self-sufficiency (Naughton and Chen, 2016). The concept of indigenous innovation became central to the narrative. Since 2006, several important industrial policy strategies and state initiatives have been published, of which the most essential are the Decision on Accelerating the Development of Strategic Emerging Industries3 in 2010, Made in China 20254 in 2015, the Plan for the Development of SMEs5 in 2016 and the 10,000 Little Giants in 2018.

To understand how these plans are connected, one can map them into the hierarchy of China's overall policy planning framework. In China, the high-level management of policy planning is communicated through five-year plans. Targets are often vague in order to later accommodate local conditions in sub-national policy implementation. Particular aspects of

the five-year plans are further detailed in sector- and industry-specific policy plans. For instance, MiC2025 is one of these sector-specific (the manufacturing sector) complements to the 13th five-year plan, which covered 2015-2020. Since then, MiC2025 has itself been complemented by industry-specific plans, including the New Generation AI Development Plan (2017) and the New Energy Vehicle Industry Development Plan (2021-2035) in 2020. In addition, the SME Development Plan can be linked directly to MiC2025. This web of national planning is then complemented by policy planning all the way down the administrative hierarchy. Provincial plans adopt the narratives of the national plans, but tailor their industry focus to local conditions (García-Herrero and Krystyanczuk, 2024, showed the differences between central five-year plans and local five-year plans in terms of sectoral policy objectives).

Beyond the sectoral choice of companies, it seems important to understand whether the choice of companies follows the criteria laid out in the 10,000 Little Giants official documentation. In an empirical investigation, García-Herrero and Krystyanczuk (2024) analysed the extent to which the firms selected as Little Giants comply with the formal requirements laid out in the application procedure. They found that companies generally do not comply with the main criteria, which is sectoral specialisation: 70 percent of business revenue should come from the company's main business activities. The chosen firms are almost consistently below the 70 percent threshold required for programme participation. However, relative to other listed firms, the companies selected as Little Giants tend to invest more in R&D. In line with the goal of mitigating asymmetries in access to finance between the state and the private economy, Little Giant firms also tend to be relatively more private.

Institutionally, China's push for industrial policy has been made possible by the weakness of the WTO's enforcement mechanisms. China's accession to the WTO in 2001 implied that a very large non-market economy could remain so and, thereby, could use industrial policy instruments to support its industry while retaining a very large share of state-owned companies. WTO provisions have proved ineffective. Member states often ignore the deadlines for the notification of subsidy schemes, and litigation cases drag on for several years (Hillman and Manak, 2023). This has facilitated China's determined application of infant-industry arguments to its industrial development, including the requiring of technology transfer from foreign direct investors in exchange for access to the Chinese market.

3.2. Instruments of China's industrial policy

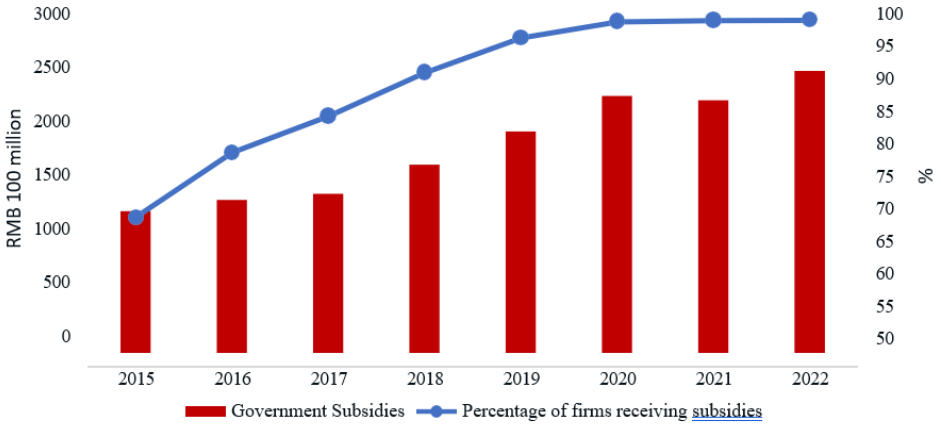
Beyond the rationale, the question is how China's industrial policy is implemented, in terms of the instruments used to support selected companies. This is one of the areas in which the differences between China and market-economies are greatest. In fact, given the institutional dominance of the Chinese state in the allocation of financial resources, the government has a wide variety of instruments at its disposal. We review the most essential channels of quantifiable support, some of which have equally been estimated by DiPippo et al (2022). We then draw on academic literature to highlight more subtle ways in which governments can selectively favour some firms over others.

3.2.1. Direct government subsidies

Measurable (direct) subsidies in China have increased substantially since the mid-2000s, both in volume and in terms of the share of firms receiving them (Figure 2). In 2015, firms listed on China's stock markets received a total amount RMB 125.5 billion in subsidies, which climbed to RMB 249.7 billion in 2022 ($34.47 billion). The overall share of listed firms receiving subsidies increased from around 70 percent in 2015 to 99 percent in 2022. Hence, close to all listed firms

now receive one or the other kind of subsidy. This also means that the focus should not be on whether a company receives subsidies, as virtually all publicly listed firms do, but rather the relative size of the subsidy received by a company compared to its competitors, or the average subsidies received by the companies in a specific sector compared to other sectors.

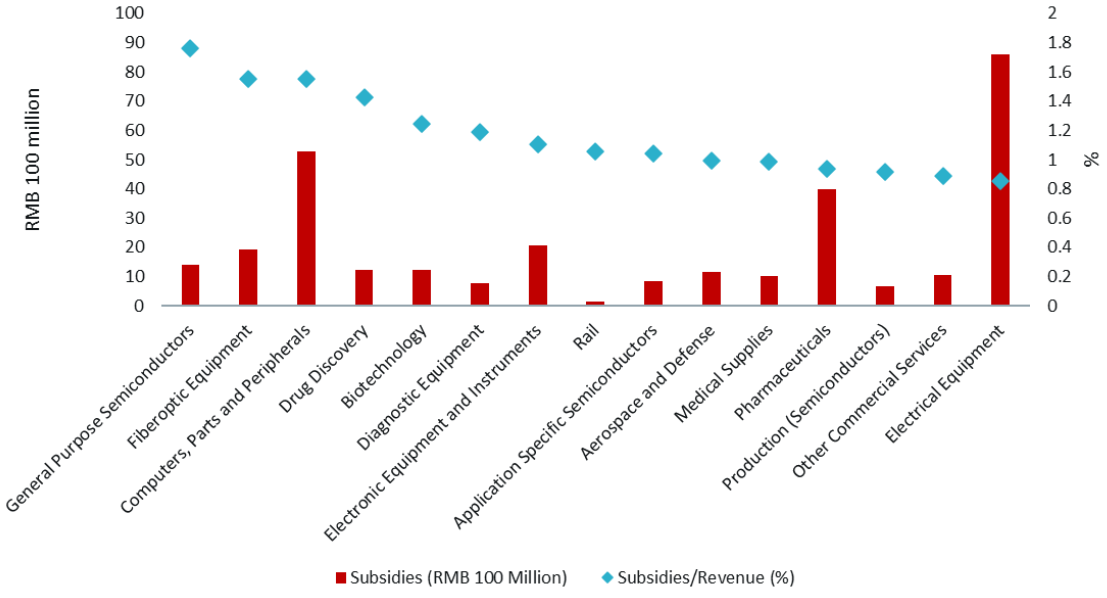
Figure 2: Direct government subsidies to listed firms in China



Source: Bruegel based on PitchBook, Wind, data on publicly listed firms in China's onshore stock markets.

Figure 3 shows the distribution of subsidies across manufacturing sectors averaged from 2015 to 2022. In absolute terms, the largest volume of subsidies went to electrical equipment makers. Since listed firms tend to be biased towards large firms (including state-owned energy conglomerates), we also calculate subsidies as a share of total revenue. This changes the picture substantially, as shown by the blue dots in Figure 3. Consistent with the government's overall industrial policy plan, subsidy intensity is high among listed firms in equipment manufacturing, semiconductors, biotechnology, rail and aerospace. Finally, it is also important to note that direct government subsidies account for less than 2 percent of total revenue. This is significant in absolute terms but indicates that direct subsidies to Chinese firms are themselves not decisive relative to the size of the firms under observation.

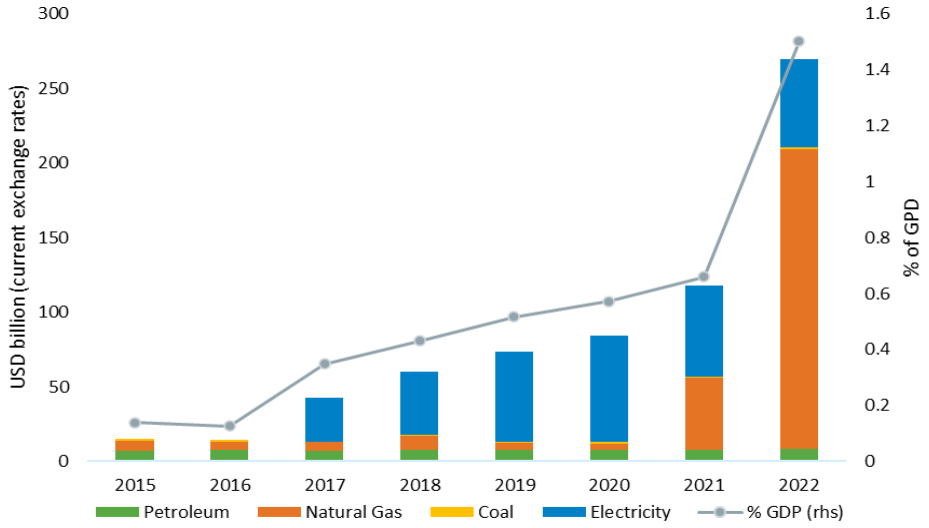
Figure 3: Sectoral classification of direct subsidies in China (2015 - 2022)



Source: Bruegel based on PitchBook, Wind, data on publicly listed firms in China's onshore stock markets.

Yet, independent of subsidies to listed firms, China employs a range of energy subsidies to consumers, both households and firms. International Monetary Fund estimates show that explicit fossil-fuel subsidies in China are used widely (Black et al, 2023). While some of the utility firms' subsidiaries are listed on the stock exchanges and thus also appear in the subsidy calculations for listed firms, the IMF estimates far exceed that. In 2021, the Chinese government spent $116.9 billion in energy subsidies, mainly on electricity and natural gas. This number climbed to $266 billion in 2022, equivalent to 1.5 percent of China's GDP that year. However, we must also clarify that by calculating the difference between retail price and supply cost, it is not possible to tell through which channels the subsidies are distributed. We are thus ignorant of whether subsidies are applied independent of sectors or specific firms, and hence, fit our definition of industrial policy.

Figure 4: Fossil fuel subsidies in China, by type



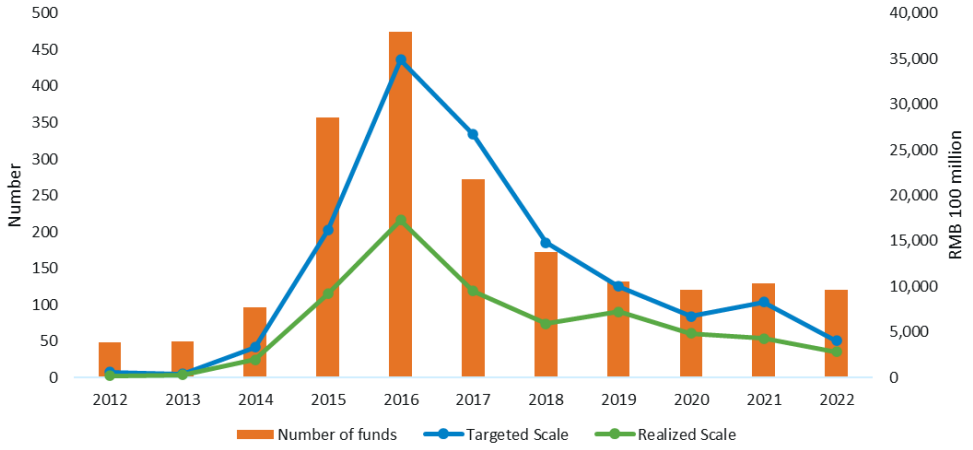
Source: IMF

3.2.2. Government equity investment

Another essential instrument for achieving China's industrial policy goals is government-guided equity financing, mostly through so-called Industrial Guidance Funds (产业引导基金), or more loosely called Government Guidance Funds (**政府引**导基金) (henceforth GGFs). Usually, GGFs are set up by government agencies, which fix a fundraising target. The aim is to pool money from other government agencies, state-run banks, SOEs and, equally, private investors. GGFs typically have a sectoral focus and use different investment strategies. Some GGFs invest in other funds, and some invest directly in businesses and assets (Luong et al, 2021).

Such funding schemes have been successful in other countries, such as Singapore and Israel, but China's scale is much bigger. Figure 5 displays the increase in the number of newly established GGFs after 2015. While in 2014 only 96 new funds were set up, with a realised scale of RMB 197.79 billion, this number rose to 474 and RMB 1729.35 billion ($240.27 billion) in 2016 – a 10-fold increase – before slowly decreasing thereafter. One striking feature has been the failure of many funds to achieve the targeted scale, which means that the government ambitions in terms of raising funds were even greater than what was achieved, especially from 2016 to 2017. One of the reasons for the excessively ambitious targets lies in in the competition between local governments for funds to support their own companies (Wei et al, 2023).

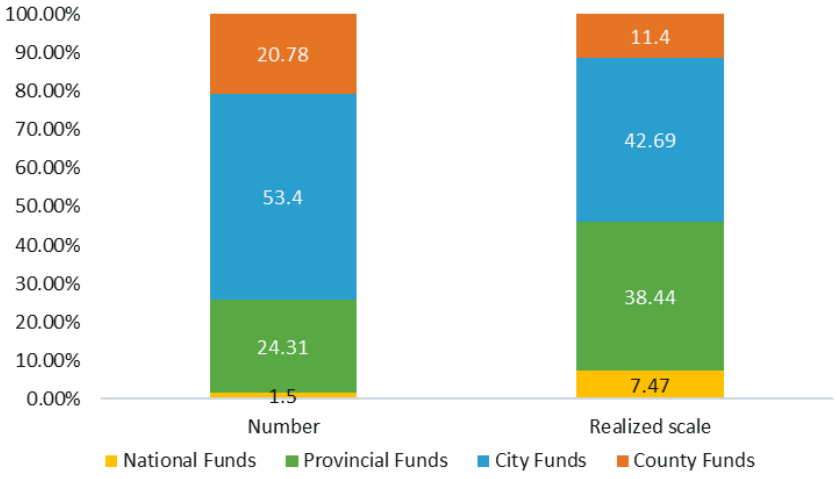
Figure 5: Number and scale of newly established Government Guidance Funds



Source: Zero2IPO

The heightened competition for funding across different local governments becomes evident when looking at the number of funds throughout China's administrative hierarchy. While some of the large national funds, such as the China Integrated Circuit Industry Investment Fund (also called the Big Fund) have received much attention in the media[1], most GGFs are established locally. As of 2022, only 1.5 percent of all established funds were national funds, despite taking a disproportionate share of the funding reached – 7.5 percent of the total (Figure 6).

Figure 6: Administrative distribution of GGFs



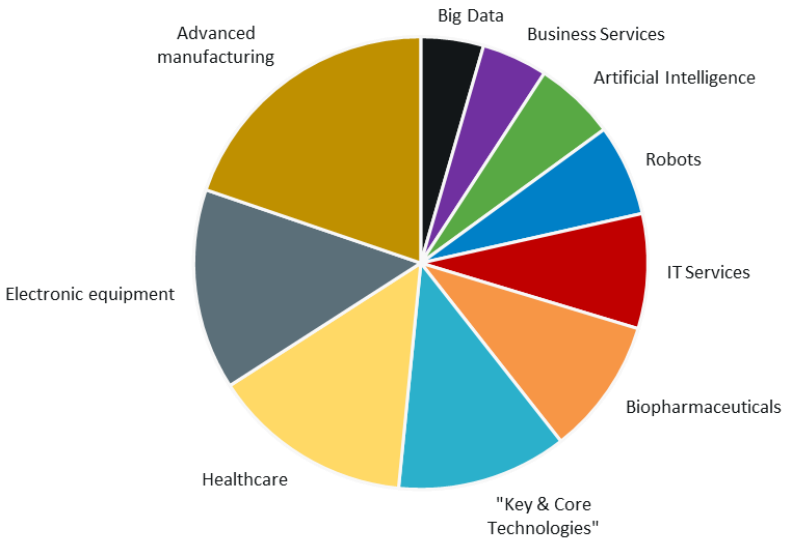
Source: Zero2IPO

Finally, as one would expect, these funds are highly focused on priority industries, essentially following the MiC25 guidance. According to China Venture, a private research company focusing on China's innovation economy, 19.8 percent of total GGF investment went to advanced manufacturing during 2017-2019, followed by electronic equipment,

[1] Li Tao, 'How China's 'Big Fund' is helping the country catch up in the global semiconductor race', South China Morning Post, 10 May 2018, https://www.scmp.com/tech/enterprises/article/2145422/how-chinas-big-fund-helping-country-catch- global-semiconductor-race.

biopharmaceuticals, robots, AI and big data. Healthcare also received a large share of 14.3 percent during the same period (Figure 7).

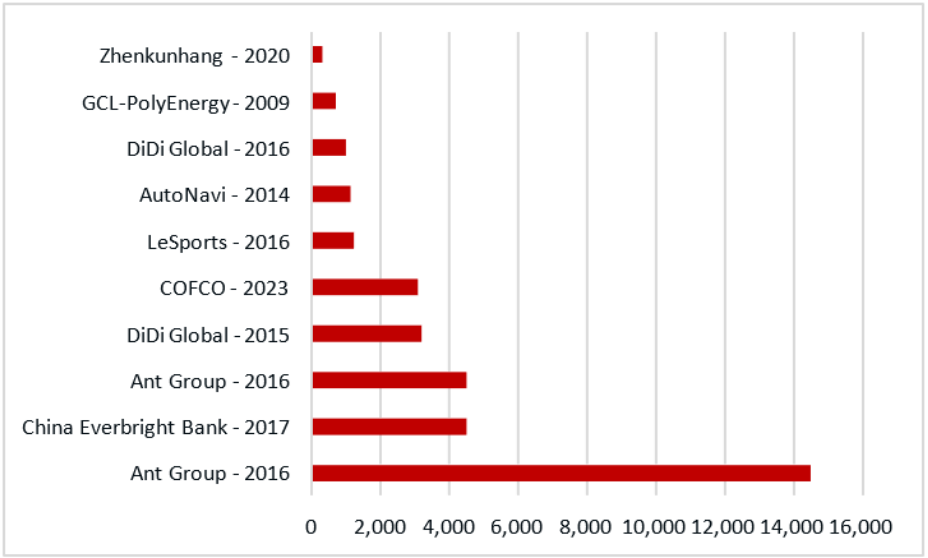
Figure 7: GGF investment across industries (2017 - 2019)



Source: China Venture

Although GGFs stand out for their scale and number, the Chinese government has other ways to use equity investment to achieve its goals. For instance, China's major sovereign wealth fund, the China Investment Corporation (CIC), has channelled significant amounts of funds into China's digital platform industry (Figure 8). In 2016, Ant Group, China's largest mobile payment provider and a subsidiary of Alibaba, received the equivalent of $4.5 billion in equity investment from CIC. In 2018, this was followed by another injection of $14 billion. Mobility service platform DiDi Global, the Chinese counterpart of Uber, received an investment of $3.2 billion in 2015 and another $1 billion in 2016. AutoNavi, the provider of Gao De Di Tu, China's Google Maps, received an investment of $1.13 billion in 2014.

Figure 8: Top 10 CIC equity investment deals ($ millions)



Source: PitchBook

3.2.3. Bank loans

Beyond subsidies and GGFs, the most obvious channel for industrial policy is bank lending, which accounted for 77 percent of corporate finance in December 2023 (PBoC, 2023). Preferential bank lending to selected firms or sectors can come from various sources with different degrees of policy orientation. First are the three policy banks: the Export-Import Bank of China, China Development Bank and the Agricultural Development Bank. While they mostly concentrate their operations in infrastructure investment, at home and abroad, the Export-Import Bank has been active in the promotion of domestic companies' foreign outreach. Of its RMB 5.94 trillion of assets, RMB 2.64 trillion is held in foreign trade loans, encouraging export and imports of goods and the development of foreign trade enterprises (EXIM Bank, Annual Report 2022). Indeed, support through lending-centred industrial policy mitigates risk for Chinese firms in their overseas operations. This has been shown to lead to an increase in cross-border mergers and acquisitions of firms in targeted sectors relative to non-targeted sectors (Shen et al, 2023). Policy banks, however, only account for 9 percent of all lending in China. Another 27.04 percent of China's corporate lending comes from the big four state-owned commercial banks (marked in red in Figure 9), which have a share of loans into manufacturing equating to between 15 percent and 20 percent of total corporate loans, depending on the bank. All four banks are in turn backed by capital from China's Central Huijin (Figure 10), a wholly owned subsidiary of CIC. The Central Huijin itself is tasked with the strategic investment of China's foreign exchanges reserves in China's domestic market (Liu, 2023).

Figure 9: Percentage of shares held by Central Huijin (%)

Source: Central Huijin Annual Report 2022, major banks are marked in red

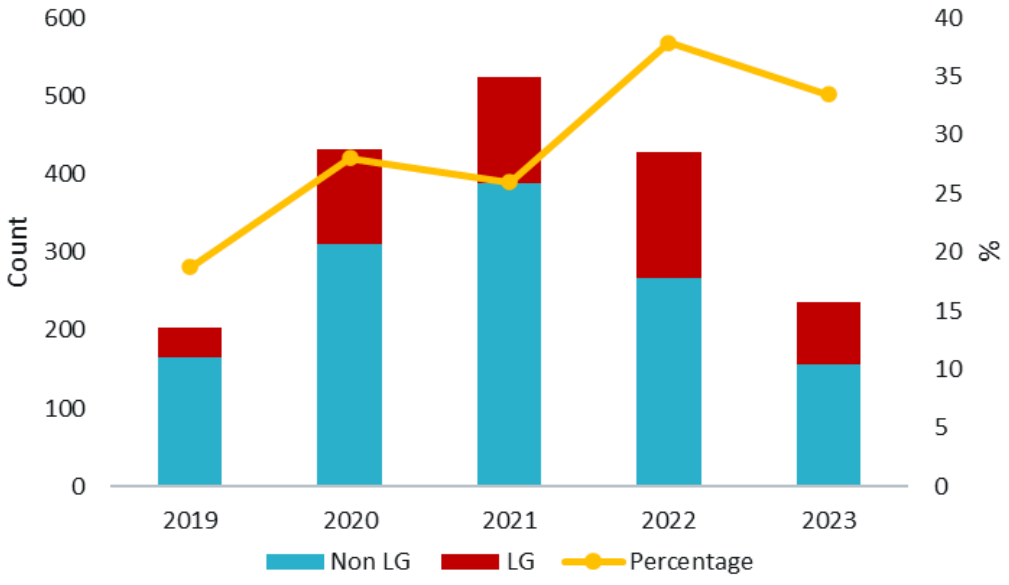
Beyond the central government's means, much of China's corporate lending occurs at the sub-national level through the jungle of China's numerous local commercial banks. The term 'commercial' bank is misleading as these banks are generally owned by the respective local government. Banks' CEOs are also hand-picked or approved by the local organisational

department of the Chinese Communist Party. The degree to which these banks act in line with central policy goals is more difficult to assess. While there is no reliable data on the direction of local bank's financing activities, local governments often do not internalise the strategic concerns of the central government. To make matters worse, when the central government allowed the establishment of local banks in return for reduced local revenue retention in 1994, it rescinded its oversight over local banking activities as part of the bargain. As a consequence, over time these banks became "the wildest animals in the Chinese economy", lending on behalf of local governments' addiction for investment (Liu, 2023). Since the great financial crisis these funds have increasingly been directed into real estate and infrastructure projects with decreased economic value – hence, China's current local government debt crisis. With Beijing's renewed push for banking oversight since 2016, this might soon change.

3.2.4. Government certification

To complete the story, a goal of firm-specific state support is the signalling of a company's worth to outside private investors[2]. Here again, as the private sector has consistently been at a disadvantage when it comes to access to finance relative to the state sector, subsidies and programmes like the 10,000 Little Giant initiative serve as a perceived guarantee for the competitiveness of the firm in the eyes of outside investors. This is connected to the fact that in a country with still underdeveloped institutions, entrepreneurial firms often do not disclose their actual innovative performance out of fear that competitors will infringe their IP rights. Selective government support helps to 'reveal' those firms. It is therefore not surprising that in Chinese provinces with weaker IP protection, receiving R&D subsidies has been found to lead to better access to bank lending for an innovative firm (Li et al, 2019). Likewise, entrepreneurial firms that receive R&D-related subsidies perform better during their IPOs (Chen, 2017). Besides, government certification can help firms to get listing approval from the China Security and Regulatory Commission, broadening their access to finance through equity investment. In 2022

Figure 10: Little Giant firms in new stock market listings



[2] In conversations in 2023 and 2024 between the authors and relevant government officials and businesspeople, it became clear that this certification effect is well understood and integrated into the goals of China's industrial policy.

and 2023, more than one third of newly listed firms were Little Giant firms (Figure 10). Source: Bruegel based on Wind

3.2.5. Other types of government support

Apart from the channels discussed, government agencies use various more indirect forms of selective support to carry out industrial policy. These include preferential tax treatment and preferential land allocation. Land allocation is important since all land in China is owned by the government, in particular local governments. With the real-estate boom and rising levels of development in China's Eastern provinces, land became increasingly a scarce resource. For affordable access to land, firms were thus left at the mercy of local officials. As the government tightened regulations in the property sector from 2016, the oversupply of housing triggered severe debt distress for many property developers. The collapse of real estate giant Evergrande in mid-2021 and the ensuing real estate crisis eased the pressure on land prices and therefore access to land for commercial use. Thus, the importance of this channel in China's industrial policy might decrease in the future.

Yet, the example of land allocation fits into the general picture of more subtle ways of selective government support. A suitable way to illustrate local governments' relationship with businesses is to imagine the government as functioning like a chamber of commerce. Firms can expect numerous benefits if they keep good connections with local officials, beyond subsidies and land. For instance, politically connected firms can expect an edge in court cases over their opponents (Lu et al, 2015).

Equally, firms might benefit from their connections beyond the tenure of the current leaders. As city mayors are rotated every few years within a province, and provincial governors across provinces, they carry with them business contacts from their previous tenures. This in turn fosters inter-regional trade links for supported firms (Jiang, 2020).

4. Implications for the EU

To sum up, subsidies are only the tip of the iceberg. China has many more instruments at its disposal although the precise measurement of their scale remains a challenge. Nevertheless, the above analysis suggests that both scale and scope are significant. The analysis also highlights the challenges associated with cross-country comparisons. Evenett and Fritz (2021), drawing on data from the Global Trade Alert (GTA), estimated the number of subsidy awards in China since 2010 to be almost on par with the European Union. However, the GTA data draws on official announcements of subsidy schemes, which in China often omit the scope and the scale of state support. For instance, the Little Giants initiative does not disclose the associated benefits for selected firms. The setup of a GGF is equally not announced in policy documents. Thus, the numerous ways in which industrial policy can be implemented and the institutional context in which policies are applied imply that measuring industrial policy through official announcements has its limits.

On the more specific point of the EU response to China's industrial policy, a wealth of different investigations have been opened. An EU anti-subsidy investigation has been opened into

Chinese battery electric vehicles[3]. As of early 2024, the EU's trade defence instruments have been used to launch investigations into Chinese solar panel manufacturers[4] and a subsidiary of CRRC[5]. Our conclusions point to the difficulties in viewing the extent of China's industrial policy only through the size of direct subsidies. What is more concerning is that many of the other instruments the Chinese governments has at its disposal (from bank loans to state-guided funds) are both hard to measure and hard to classify as 'financial contributions conferring a benefit', which is at the core of the definition of actionable subsidies under the WTO's subsidies and countervailing measures regime.

These considerations highlight how much more the EU needs to know in terms of how China conducts industrial policy, as a basis for figuring out the consequences: from the positive, such as cheaper prices for the EU energy transition, to the negative, such as how the EU can protect itself from the consequences of China's industrial policy in terms of overcapacity reaching the EU single market.

[3] Alice Hancock, Henry Foy, Hudson Lockett and Peter Campbell, 'EU to launch anti-subsidy probe into Chinese electric vehicles', Financial Times, 13 September 2023, https://www.ft.com/content/55ec498d-0959-41ef-8ab9-af06cc45f8e7.
[4] Alice Hancock and Edward White, 'EU launches 2 probes into China solar manufacturers', Financial Times, 3 April 2024, https://www.ft.com/content/5e677032-82c6-4761-9053-a441ef1a71c4.
[5] Andy Bounds, 'EU launches anti-subsidy probe into Chinese train maker', Financial Times, 16 February 2024, https://www.ft.com/content/6dbc828f-03bc-4418-bbd0-4ff194d3f830

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