

The background of the entire page is a photograph of a modern industrial manufacturing facility. Several white robotic arms are visible, positioned over large metal trays that contain numerous small, cylindrical components, likely batteries or electronic parts. The scene is brightly lit, showing the intricate details of the machinery and the organized layout of the production line.

OECD MAGIC Database of Industrial Subsidies

June 2026

OECD MAGIC Database of Industrial Subsidies

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Table of contents

Key messages	5
1 Bringing new evidence on industrial subsidies	6
2 Key trends in industrial subsidies	7
Subsidies have reached their highest levels since the global financial crisis of 2008-09	7
Subsidy levels and types vary across economies	8
Renewable energy equipment, semiconductors, and heavy industries receive relatively more subsidies	9
State enterprises play a large role as recipients and providers of subsidies	11
Subsidy transparency is crucial for trust in global markets, but declining	13
3 How do subsidies shape global markets?	15
Annex A. Sector annexes	18
References	43
Notes	44

FIGURES

Figure 1. Industrial subsidies reached in 2023-24 their highest level since the global financial crisis	7
Figure 2. The geography of industrial subsidies	8
Figure 3. Many corporate loans in China are issued at rates below the country's one-year lending benchmark	9
Figure 4. Solar panels, semiconductors, and heavy industries received relatively more subsidies	10
Figure 5. Governments retain large equity stakes in many of the companies covered in the OECD MAGIC database	11
Figure 6. State enterprises have been relatively larger recipients of industrial subsidies	12
Figure 7. Some MAGIC sectors became more concentrated geographically between 2005 and 2024	16
Figure A A.1. Aerospace and defence – Subsidies by firms' headquarters location	18
Figure A A.2. Aerospace and defence – Subsidies by instrument	19
Figure A A.3. Aluminium – Subsidies by firms' headquarters location	20
Figure A A.4. Aluminium – Subsidies by instrument	21
Figure A A.5. Automobile – Subsidies by firms' headquarters location	22
Figure A A.6. Automobiles – Subsidies by instrument	22
Figure A A.7. Cement – Subsidies by firms' headquarters location	23
Figure A A.8. Cement – Subsidies by instrument	24

Figure A A.9. Chemicals – Subsidies by firms' headquarters location	25
Figure A A.10. Chemicals – Subsidies by instrument	26
Figure A A.11. Fertilisers – Subsidies by firms' headquarters location	27
Figure A A.12. Fertilisers – Subsidies by instrument	27
Figure A A.13. Glass, ceramics, and refractories – Subsidies by firms' headquarters location	28
Figure A A.14. Glass, ceramics, and refractories – Subsidies by instrument	29
Figure A A.15. Heavy machinery – Subsidies by firms' headquarters location	30
Figure A A.16. Heavy machinery – Subsidies by instrument	31
Figure A A.17. Semiconductors – Subsidies by firms' headquarters location	32
Figure A A.18. Semiconductors – Subsidies by instrument	33
Figure A A.19. Shipbuilding – Subsidies by firms' headquarters location	33
Figure A A.20. Shipbuilding – Subsidies by instrument	34
Figure A A.21. Solar photovoltaic cells and modules – Subsidies by firms' headquarters location	35
Figure A A.22. Solar photovoltaic cells and modules – Subsidies by instrument	36
Figure A A.23. Steel – Subsidies by firms' headquarters location	37
Figure A A.24. Steel – Subsidies by instrument	37
Figure A A.25. Telecommunications network equipment – Subsidies by firms' headquarters location	38
Figure A A.26. Telecommunications network equipment – Subsidies by instrument	39
Figure A A.27. Rolling stock and signalling – Subsidies by firms' headquarters location	40
Figure A A.28. Rolling stock and signalling – Subsidies by instrument	40
Figure A A.29. Wind turbines – Subsidies by firms' headquarters location	41
Figure A A.30. Wind turbines – Subsidies by instrument	42

Key messages

- **Industrial subsidies have reached their highest levels since the global financial crisis.** As a percentage of firms' sales revenue, industrial subsidies amounted to 1.3% in 2024, which was the second highest level on record after the previous peak in 2009 during the global financial crisis. Subsidies for the 15 industrial sectors covered by the OECD Manufacturing Groups and Industrial Corporations (MAGIC) database reached USD 108 billion (nominal) in 2024.
- **Industrial firms based in China receive more subsidies than their competitors based everywhere else.** Between 2005 and 2024, Chinese firms received on average three to eight times more government support than firms based in the OECD, a conservative estimate. These subsidies were also considerably higher than the support received by firms based in non-OECD economies such as Brazil, India, and Indonesia.
- **Renewable energy equipment, semiconductors, and heavy industries receive relatively more subsidies than other industrial sectors.** Between 2005 and 2024, the production of solar photovoltaic panels, semiconductors, aluminium, steel, and shipbuilding were – as a percentage of firms' sales revenue – the top five recipients of subsidies across the 15 sectors covered in the OECD MAGIC database.
- **State enterprises play a large role as recipients and providers of subsidies.** On average, state enterprises with state ownership above 25% are significantly larger recipients of industrial subsidies than their private competitors, especially for grants and below-market-borrowings. This stems partly from the fact that these companies are often found in heavy industries characterised by more debt financing and below-market-borrowings, and in China.
- **Industrial subsidies are shaping global markets.** OECD research shows that around 22% of the global market share gains of firms that grew between 2005 and 2023 can be explained by the subsidies they received. For Chinese firms, almost 60% of their global market share gains can be explained by the subsidies received.
- **The OECD MAGIC database provides an unprecedented view of industrial subsidies at the level of individual firms,** allowing for novel insights into the potential of industrial subsidies to influence global trade flows. The [public MAGIC dashboard](#) provides aggregate information on subsidies received by the largest firms across 15 industrial sectors from 2005-24, tracking the evolution of grants, tax concessions, and below-market finance to firms over time and across regions.

1 Bringing new evidence on industrial subsidies

In open economies, government support in the form of subsidies to economic activities has the potential to distort international markets. As a result, companies are no longer competing on a level playing field. This can result in less productive firms winning global market share at the expense of more innovative and efficient ones with implications over time for innovation, fair competition, and support for global trade. For these reasons, the use of subsidies has been disciplined in the multilateral trading system.

Reliable data on industrial subsidies is necessary to monitor what governments are doing worldwide and analyse how subsidies are shaping global markets. This can help countries build a shared understanding of the challenge, paving the way for co-operative efforts to find solutions.

Building on its longstanding work measuring subsidies across agriculture (OECD, 2025^[1]), fisheries (OECD, 2023^[2]), and fossil fuels (OECD, 2025^[3]), the OECD has spent nearly a decade investing in measuring industrial subsidies. For the first time, the OECD is now releasing a public version of the OECD MAGIC (Manufacturing Groups and Industrial Corporations) database. The database includes subsidy estimates and financial information for 525 of the largest manufacturing groups globally over the period 2005-24 across 15 key industrial sectors, which together make up the bulk of global manufacturing. The [public version of the database](#) provides downloadable data on the value of subsidies across years, sectors, subsidy instruments, and geographical groupings.

The OECD MAGIC database takes a unique approach; it is not based on the subsidies governments disclose, but on the amounts that firms actually receive. This firm-level approach allows MAGIC to measure subsidies provided globally – even where governments are not transparent about the subsidies they provide – and to identify subsidies given at the subnational (city, county, state) level. Looking at what firms receive makes it possible to identify new forms of support, including subsidies provided in the form of below-market finance (cheap loans offered by state-owned banks), and to shed new light on the role of state enterprises as both important recipients and providers of subsidies. Finally, the firm-level approach demonstrates how subsidies are associated with companies' sales revenue, providing direct evidence of their potential to confer a competitive advantage on recipients ([detailed information on the methodology behind MAGIC available here](#)).

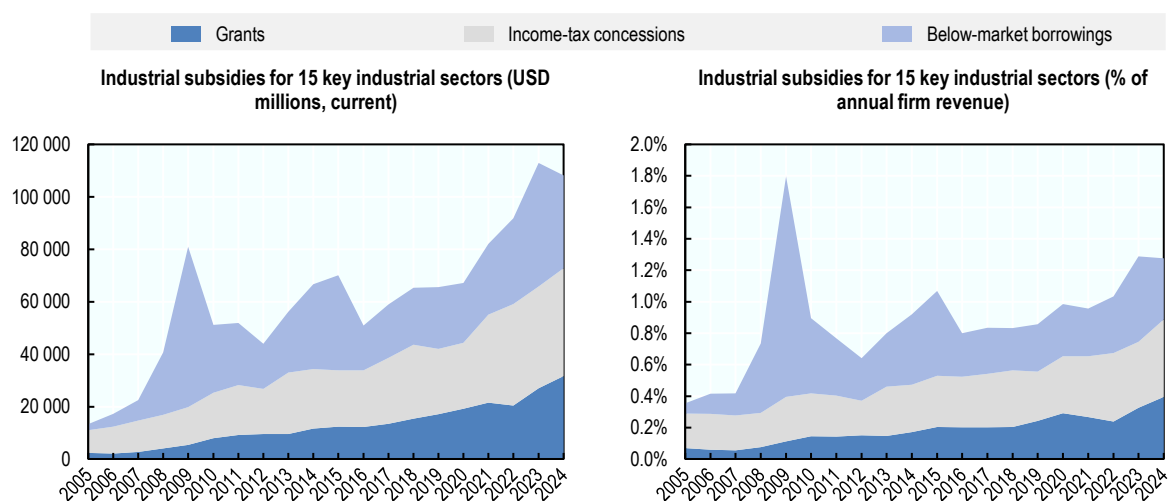
This report accompanies the public release of the OECD MAGIC database and highlights the key findings based on the latest (2024) data. It outlines key trends across subsidy types, sectors, and regions and presents the results of OECD analysis on what these subsidies mean for global markets. Snapshots of the situation in the 15 sectors covered by MAGIC are provided in Annex A. Future editions of this report will provide annual updates based on MAGIC data. Separate deep dives into individual sectors will also continue to be produced periodically. The results presented do not prejudice the outcome of any assessments that may be undertaken by investigating authorities or under the World Trade Organization (WTO) dispute settlement procedures on subsidies and countervailing measures.

2 Key trends in industrial subsidies

Subsidies have reached their highest levels since the global financial crisis of 2008-09

Industrial subsidies peaked in absolute terms in 2023 before declining slightly in 2024. As a share of firms' sales revenue, subsidies reached 1.3% in 2024 — the second highest level on record after 2009 (Figure 1, right). The 2009 peak, however, coincided with a severe global recession, when a 15% year-over-year collapse in sales mechanically inflated the subsidy-to-revenue ratio. This was not the case in 2023-24, which indicates the recent increase in industrial subsidies to be more structural. In nominal terms, subsidies across the 15 industrial sectors covered by the OECD MAGIC database totalled USD 108 billion in 2024 (Figure 1, left), or USD 94 billion at constant 2015 prices. Both figures represent the second-highest levels observed to date, following the record high in 2023.

Figure 1. Industrial subsidies reached in 2023-24 their highest level since the global financial crisis



Source: OECD MAGIC database.

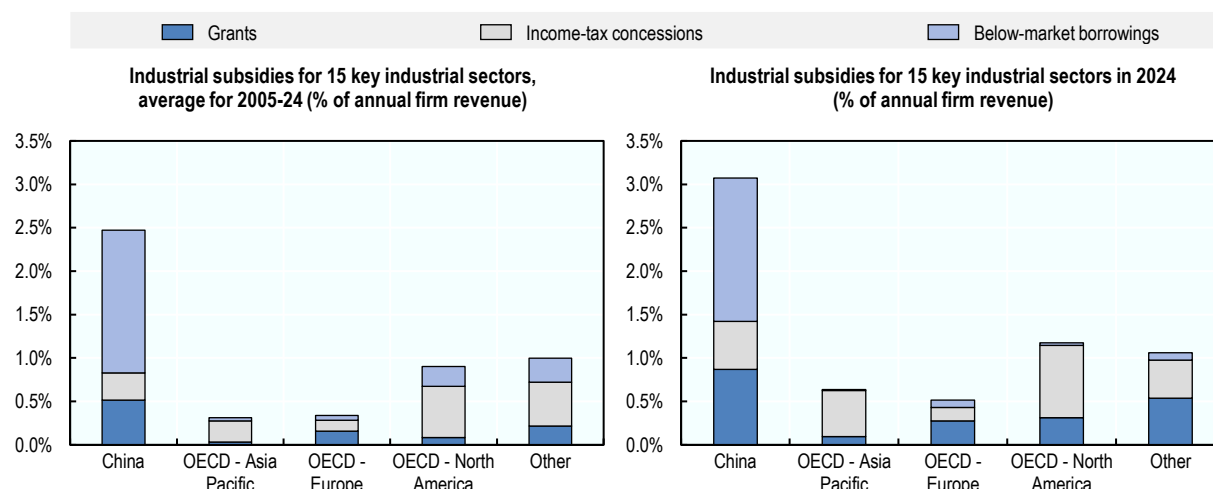
All three subsidy instruments covered by the OECD MAGIC database matter, with government grants, corporate income tax concessions, and below-market-borrowings (BMB) having each contributed a sizable amount to the total industrial subsidies measured over the period 2005-24. Of these three instruments, BMB appear to play a more countercyclical role, having increased in times of crisis or to rescue firms in distress (e.g. the rescue of U.S. carmakers in 2009 or the People's Republic of China's (hereafter "China") support for its heavy industries in 2015-16). This may be due to firms experiencing worsening financing conditions and tighter access to credit during crisis times or to the relative speed and ease with which BMB can be deployed in emergency situations compared with grants and tax concessions (OECD, 2025^[4]).¹

Many tax concessions also require firms to be earning a profit for them to be effective and are therefore of limited help in rescuing loss-making companies.

Subsidy levels and types vary across economies

From a geographical standpoint, industrial firms based in China tend to receive more subsidies relative to their revenues than their competitors based everywhere else. Between 2005 and 2024, Chinese firms received on average three to eight times more government support than firms based in the OECD (Figure 2, left). These subsidies were also considerably higher than the support received by firms based in non-OECD economies such as Brazil, India, and Indonesia, which were comparable in relative terms to the subsidies received by companies based in North America. The right-hand side of Figure 2 reveals that in almost all regions industrial subsidies were higher in 2024 than in average over the period covered by the database (Figure 2, right). That said, the difference between subsidies received by Chinese firms and firms elsewhere remained higher in 2024.²

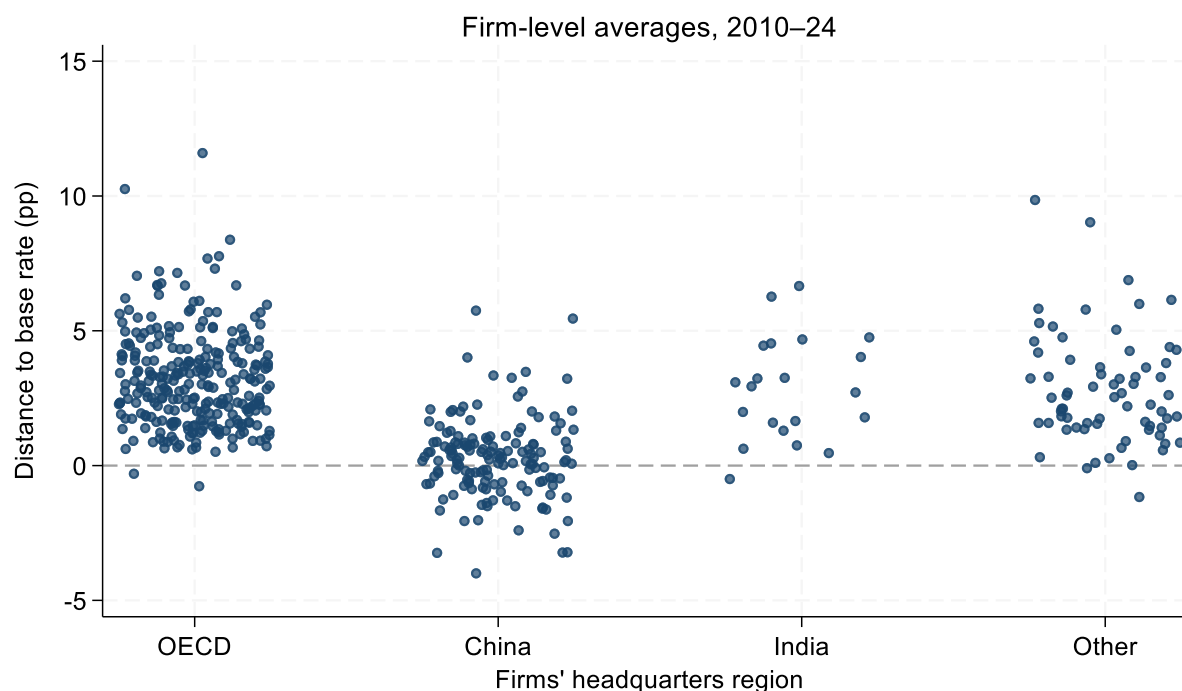
Figure 2. The geography of industrial subsidies



Note: The values above are averaged by geographical grouping using firms' revenue as weights. Geographical groupings are based on the location of firms' headquarters or main place of production, which does not always correspond to where companies receive their subsidies. Source: OECD MAGIC database.

The types of subsidy instruments used to support industrial companies vary across countries, which reflects institutional differences in how jurisdictions channel government support. Companies based in Japan, Korea, and the United States tend, for example, to benefit mainly from tax concessions, generally in relation to R&D and investment in fixed tangible assets. By contrast, companies based in Europe receive more of their support in the form of government grants and, to a lesser extent, BMB.³ Firms based in China tend to receive a large proportion of their support in the form of grants and BMB, with the latter proving especially large. China's greater use of BMB is made possible by the structure of the country's financial system, notably the fact that most corporate loans are issued by state banks and policy banks at rates close to China's one-year lending benchmark (OECD, 2021^[5]; OECD, 2024^[6]) (Figure 3).

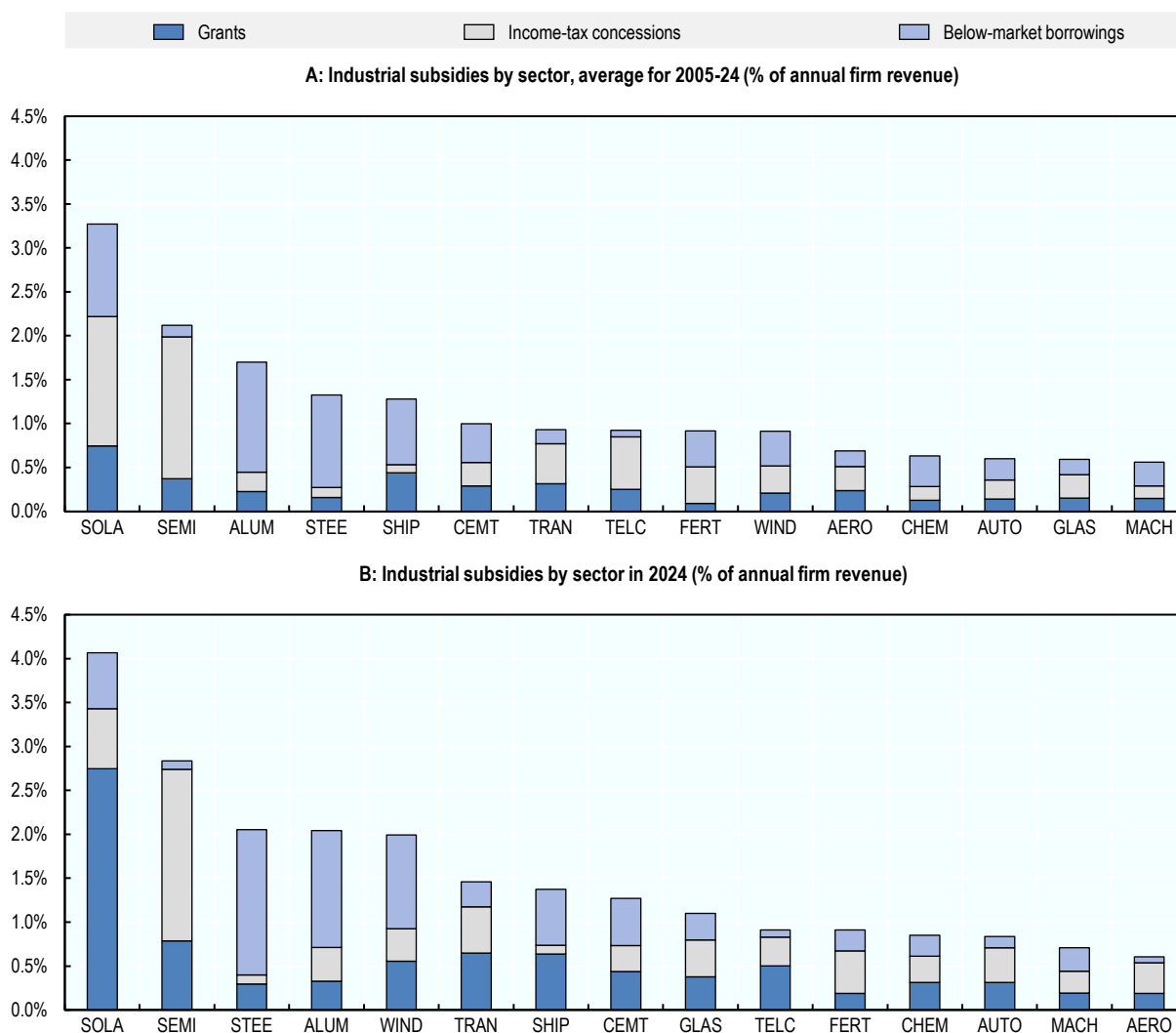
Figure 3. Many corporate loans in China are issued at rates below the country's one-year lending benchmark



Note: The zero line denotes companies' base rates applicable to their borrowings (e.g. a weighted average of Secured Overnight Financing Rate and Euribor). Actual interest rates incurred by companies are based on their average effective rates of interest used in the calculation of BMB in the OECD MAGIC database. A positive (negative) number implies an average effective interest rate above (below) the base rate.
Source: based on the OECD MAGIC database.

Renewable energy equipment, semiconductors, and heavy industries receive relatively more subsidies

Between 2005 and 2024, the production of solar photovoltaic panels, semiconductors, aluminium, steel, and shipbuilding were the top five recipient of subsidies across the 15 sectors covered in the OECD MAGIC database (Figure 4, panel A). The year 2024 (Figure 4, panel B) saw large increases in the average subsidy-to-revenue ratio in the production of steel, solar panels, wind turbines, heavy machinery, and rolling stock and signalling. Some of these sectors, however, faced a decrease in global sales in 2024, which had the effect of increasing the subsidy-to-revenue ratio independently of the subsidies received. This was especially the case in steel, where firms in the sector incurred a considerable fall in their sales and profitability, which, combined with higher subsidies, resulted in a large increase in their subsidy-to-revenue ratio. The fall in revenue and profits was even more marked in solar panels, which led to an increase in the subsidy-to-revenue ratio despite an overall reduction in the subsidies received by solar panel manufacturers. Conversely, even though semiconductor companies received larger subsidies in 2024, the value of their sales increased to such an extent (+30% year-over-year) that the sector's subsidy-to-revenue ratio declined marginally in 2024.

Figure 4. Solar panels, semiconductors, and heavy industries received relatively more subsidies

Note: AERO: Aerospace and defence; ALUM: Aluminium; AUTO: Automobile; CEMENT: Cement and other building materials; CHEM: Chemicals; FERT: Fertilisers; GLAS: Glass, ceramics and refractories; MACH: Heavy machinery; SEMI: Semiconductors; SHIP: Shipbuilding; SOLA: Solar photovoltaic cells and modules; STEE: Steel; TELC: Telecommunications network equipment; TRAN: Rolling stock and signalling; WIND: Wind turbines.

Source: OECD MAGIC database.

At the sector level, global average subsidies as a percentage of firms' revenue mask significant differences across countries (Annex A). While the average level of support globally to the production of wind turbines over the 2005-24 period is around 1%, subsidies to firms based in China have been consistently above 2% of firm revenue over the past 15 years, and above 5% in multiple years over that period. Similarly, while global average subsidies for semiconductors are just over 2% of firm revenue, for firms based in China, subsidies reached nearly 10% of firm revenue in 2021 and 2022.

Sectors differ considerably in terms of the types of subsidies they attract. Heavy industries typically receive large amounts of BMB as companies in these sectors tend to rely relatively more on debt financing than on equity. Many large producers of steel, aluminium, cement, and chemicals thus have large amounts of debt on their balance sheets and relatively weak credit ratings in many cases. Debt-asset ratios in 2024 were, on average, 0.32 in chemicals, 0.31 in steel, and 0.26 in aluminium while being closer to 0.21 in all other sectors.

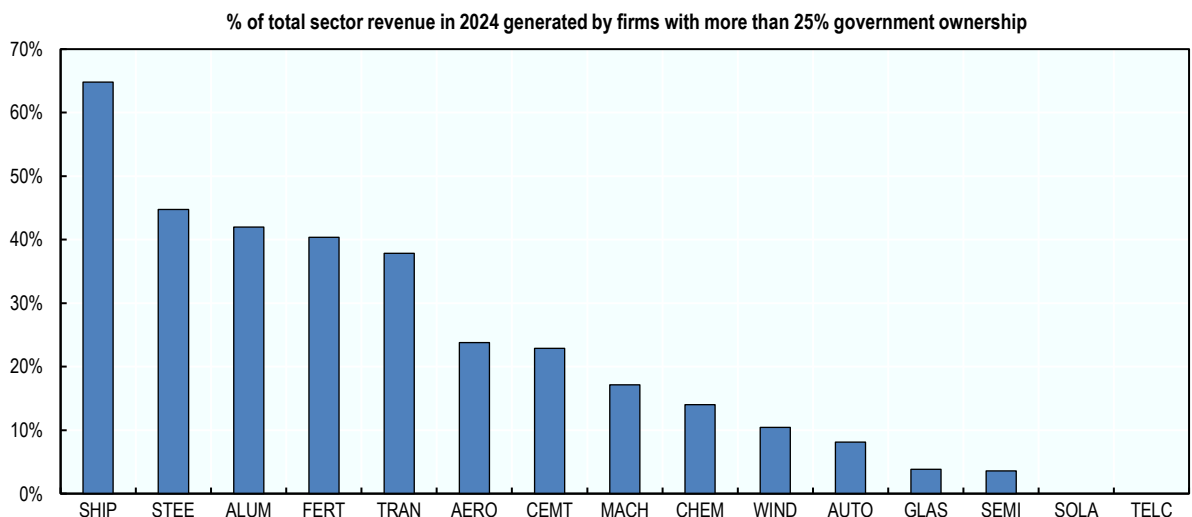
Technology-oriented sectors (e.g. semiconductors and telecommunications network equipment) typically attract a greater proportion of tax concessions. This larger contribution of tax concessions reflects, among other things, tech companies' larger R&D spending, which governments often support through dedicated tax provisions. It also reflects governments' inclination toward offering tech companies investment tax incentives in the hope of encouraging domestic investment and technology spillovers in sectors deemed strategic. Besides the subsidy packages recently introduced in OECD Member countries for supporting investment in semiconductors and renewable energy, several emerging economies typically offer tax holidays or special reduced tax rates aiming to encourage foreign tech firms to invest locally.

Unlike tax concessions, BMB do not appear to be very large in technology-oriented sectors due to the fact that these sectors rely relatively more on equity financing than debt. Indeed, some governments have relied on injections of government equity into semiconductor companies as a means of supporting domestic chip champions (OECD, 2019^[7]). While the OECD MAGIC database does not yet account for government support provided through the equity channel, work is underway to add below-market equity as one other subsidy type in the database.

State enterprises play a large role as recipients and providers of subsidies

Governments retain large equity stakes in many of the companies covered in the OECD MAGIC database. This ranges from full government ownership of companies to minority stakes held by government investment funds. Government ownership of industrial companies was, in 2024, the largest in shipbuilding, followed by steel, aluminium, fertilisers, rolling stock and signalling equipment, and aerospace and defence (Figure 5). While government ownership may not be problematic in and of itself, it can serve as a conduit for government support wherever governments do not manage their state enterprises (SEs) as regular shareholders would but instead exercise their control of companies in the service of their industrial policies.⁴

Figure 5. Governments retain large equity stakes in many of the companies covered in the OECD MAGIC database

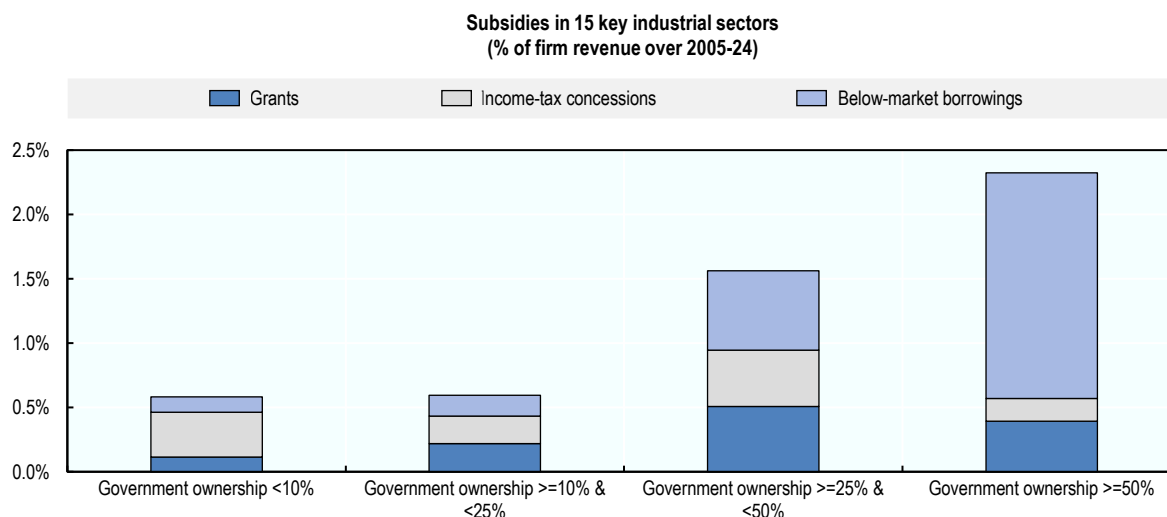


Note: AERO: Aerospace and defence; ALUM: Aluminium; AUTO: Automobile; CEMENT: Cement and other building materials; CHEM: Chemicals; FERT: Fertilisers; GLAS: Glass, ceramics and refractories; MACH: Heavy machinery; SEMI: Semiconductors; SHIP: Shipbuilding; SOLA: Solar photovoltaic cells and modules; STEE: Steel; TELC: Telecommunications network equipment; TRAN: Rolling stock and signalling; WIND: Wind turbines.

Source: OECD MAGIC database.

On average, SEs have been relatively larger recipients of industrial subsidies than their private competitors (Figure 6). The OECD MAGIC database collects detailed information on the ownership structure of the companies it covers, enabling it to classify firms according to the extent of their government ownership. These data show that companies with more than 25% of government ownership tended to receive relatively more government grants and BMB over the period 2005-24.

Figure 6. State enterprises have been relatively larger recipients of industrial subsidies



Note: The values above are averaged by government ownership category using firms' revenue as weights.

Source: OECD MAGIC database.

The finding that SEs are relatively larger recipients of grants and BMB stems partly from the fact that these companies are often found in heavy industries – characterised by more debt financing and BMB (Figure 4). Because SEs are relatively uncommon in tech industries and in renewable energy (Figure 5) – and since these sectors receive relatively large amounts of tax concessions – it is unsurprising to find that SEs receive on average fewer tax concessions than private companies (Figure 6). Not only are SEs less prone to invest in R&D – which lessens the scope for large R&D tax concessions – but they also have a considerably smaller international footprint as indicated by their percentage of domestic fixed tangible assets, which reduces the scope for SEs to benefit from foreign tax incentives. In contrast, SEs' very large BMB are evidence of their preferential access to debt financing at rates which do not fully reflect their credit risk and which may involve implicit government guarantees.

Not only are SEs relatively large recipients of industrial subsidies but they can also be important enablers or intermediaries of government support. In particular, the provision of BMB generally involves state banks in the position of loan issuers, who thus act as subsidy providers on behalf of their government shareholders. Government equity injections can also at times involve government investment funds serving as conduits for government support. Government ownership of companies thus forms an important component of the subsidy landscape, with SEs potentially operating on both sides of a subsidised transaction. Along with the lack of transparency about which firms are SEs, this can generate additional opacity around the true scope and scale of industrial subsidies (OECD, 2024^[6]).⁵

Subsidy transparency is crucial for trust in global markets, but declining

Lack of transparency remains a key challenge for understanding the scope and scale of industrial subsidies and many governments' poor track record in this area has been a key motivation behind the firm-level methodology of the OECD MAGIC database.

Article 25.1 of the WTO's Subsidies and Countervailing Measures (SCM) Agreement requires Members to notify their subsidies annually, yet compliance has remained low. While the number of Members complying with the notification obligation remained fairly stable over the 1995-2025 period, the number of Members not making any notification rose sharply from 26 (in 1995) to 117 (in 2025).⁶ While this may partly reflect the technical difficulties and capacity limitations that some WTO Members face, the percentage of Members that did not make any notification rose from 23% (in 1995) to 70% (in 2025) which implies a systemic issue.⁷

Although a number of WTO Members do notify their subsidies, their notifications may be incomplete. As the obligation to notify is built around the definition of subsidy in Articles 1 and 2 of the SCM Agreement, disagreement about the scope of the definition have led to different expectations about the completeness of notifications, which have in cases not included subsidies granted by subnational levels of government. As those subsidies can be considerable, the lack of completeness erodes the usefulness of these notifications. In this context, the use of firm-level data offers a complementary lens, which helps improve clarity on the global scope and scale of industrial subsidies despite the lack of sufficient government transparency.

Rules on corporate disclosures normally remain within the purview of private actors and accounting standard-setting bodies but governments have nevertheless a useful role to play. In one example, in 2017, Italy published legislation requiring all companies receiving subsidies to publish the amounts they obtained from Italian authorities in their financial statements (OECD, 2023^[2]). There are also encouraging signs that accounting standard-setting bodies are themselves expanding their rules on subsidy disclosure by companies. For instance, in 2021, the U.S. Financial Accounting Standards Board introduced a rule requiring all business entities following the Generally Accepted Accounting Principles (GAAP) to report the government assistance they obtained in the notes to their financial statements. The U.S. Securities and Exchange Commission has responsibility for enforcing the GAAP, which effectively makes subsidy disclosure a mandatory requirement for US-based companies. Sustainability reporting by firms has also evolved to better account for government financial assistance, with the Global Reporting Initiative's 2016 standard on "Economic Performance" requiring companies to report the value of the financial assistance they received from any government over a given period. These different initiatives have visibly improved the quality of subsidy disclosures by companies in a context where governments are increasing the level of support they provide to their manufacturers.

However, improvements in firm-level subsidy disclosures have not been universal. Notably, there has been a trend toward less granular subsidy disclosures and a lesser availability of financial statements for firms based in China. Where companies previously disclosed detailed lists of their government grants, many are now only disclosing one aggregate heading under the "other income" category in their financial statements. Meanwhile, the financial statements of large unlisted SEs are becoming increasingly difficult to access. Examples include large state-owned actors in China's aerospace and defence industry – namely the Commercial Aircraft Corporation of China (COMAC), the Aviation Industry Corporation of China (AVIC), and the China Aerospace Science and Industry Corporation (CASIC) – for which financial statements are no longer available online as of the early 2020s. For this reason, the OECD MAGIC database is unable to provide estimates of subsidies for aerospace companies based in China for the year 2024.

China is, however, not alone in having recently reduced the availability of corporate disclosures. In the case of the Russian Federation (hereafter "Russia"), several large manufacturing firms have stopped releasing their financial statements since the country's large-scale invasion of Ukraine, citing in particular

the country's new Federal Law No. 1102 of 4 July 2023 “[o]n the specifics of Disclosure and (or) Provision of Information Subject to Disclosure and (or) Provision in Accordance with the Requirements of the Federal Law ‘On Joint-Stock Companies’ and the Federal Law ‘On the Securities Market’.”

While firms’ financial disclosures are primarily meant for investors and to enable the sound functioning of capital markets, they nonetheless serve a broader purpose. Imperfect or unavailable financial disclosures from firms hamper the public’s ability to monitor the economic performance of key actors in the global economy generating uncertainty as to whether firms are competing on a level playing field.

3

How do subsidies shape global markets?

Greater availability of data on industrial subsidies does not only matter for monitoring the global scope and scale of such subsidies, but it also enables analysis of what these subsidies mean for global markets. Recent OECD work has shown the subsidies captured in the OECD MAGIC database to have increased the global market share of recipient firms between 2005 and 2023 (OECD, 2025^[8]). The published estimates imply that around 22% of the global market share gains of firms that grew between 2005 and 2023 can be explained by the subsidies they received. For Chinese firms, almost 60% of their global market share gains can be explained by the subsidies they received (Box 1).

Box 1. Quantifying the market implications of industrial subsidies

OECD work (OECD, 2025^[8]) has shown that higher levels of subsidies lead to an increase in firms' global market share. The analyses revealed an economically sizeable impact relative to observed small annual changes in market shares, with an increase of one percentage point in subsidies relative to revenue corresponding to between the 27th and 51st percentile of the observed distribution of annual absolute market share changes, depending on the estimation method.

Another way to understand the magnitude of the effect is to assess what proportion of actual market share shifts can be explained by subsidies. The *expected* change in market share resulting from subsidies can be defined and calculated as the regression coefficient of interest multiplied by the firm's value for the subsidy intensity variable. Dividing this expected change by the *observed change* in market share gives a ratio capturing what share of the real-world market share shifts for a given firm can be explained by the subsidies it received.

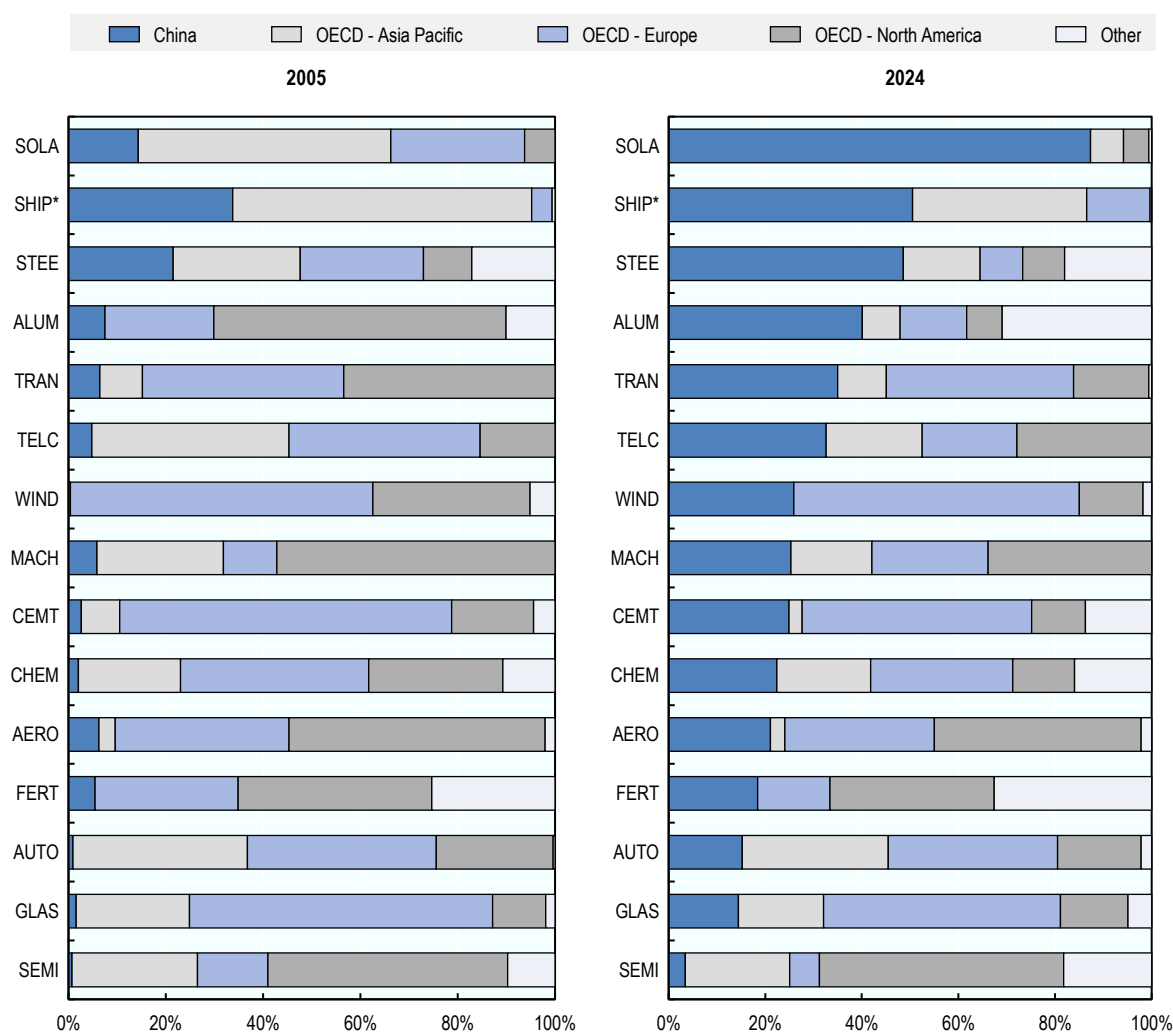
Two features of the econometric model used make this simple calculation possible. First, the treatment was defined as the difference between a firm's subsidies as a share of its revenue and the average subsidy intensity in its sector. Therefore, the average value of the independent variable is by construction zero. Second, the outcome variable of changes in market share must also average to zero across all firms in a sector, as one firm's gain will necessarily be another firm's loss. These two facts make it possible to focus only on the relative change induced by subsidies without incorporating absolute levels.

To account for, on the one hand, high levels of variability at the firm level and, on the other hand, the constraint that total market share changes must always sum to zero, the results of this exercise can be most meaningfully interpreted for subgroups of firms. For firms whose headquarters are located in China, the ratio between the hypothetical change predicted by their subsidy intensity relative to that of other firms is 59%. Looking at the subset of firms whose total change in market share between 2005 and 2023 (the period of analysis covered in the paper) was positive, the share of gains that can be explained is 22%.

While subsidies appear to have caused an increase in firms' market share, they did not lead to any significant increase in their productivity and profitability. Altogether, this suggests that the gains in market share may have stemmed from subsidised firms' ability to lower their prices, undercut their competitors, and deter them from making investments. Just like doping in sports, there is therefore a risk that subsidies result in less productive players winning unfairly at the expense of more innovative and efficient ones.⁸ This could eventually impose long-term costs on the global economy in the form of less innovation, product quality, and competition, even as consumers benefit in the short-term from the lower prices.

Figure 7. Some MAGIC sectors became more concentrated geographically between 2005 and 2024

Global revenue shares, by location of firms' headquarters or main place of business



Note: *Data for SHIP are from 2010 to 2024 due to large volumes of missing data before 2010. AERO: Aerospace and defence; ALUM: Aluminium; AUTO: Automobile; CEMENT: Cement and other building materials; CHEM: Chemicals; FERT: Fertilisers; GLAS: Glass, ceramics and refractories; MACH: Heavy machinery; SEMI: Semiconductors; SHIP: Shipbuilding; SOLA: Solar photovoltaic cells and modules; STEE: Steel; TELC: Telecommunications network equipment; TRAN: Rolling stock and signalling; WIND: Wind turbines. Geographical groupings are based on the location of firms' headquarters or main place of production, which does not always correspond to where production actually takes place. Source: OECD MAGIC database.

The link between subsidies and market shares suggests the possible emergence of concentration risks in global supply chains. Amongst the sectors covered by the OECD MAGIC database, a number became increasingly geographically concentrated between 2005 and 2024 (Figure 7). This is especially the case for the production of solar panels, shipbuilding, steel, and aluminium, where the share of global sales of Chinese firms grew significantly between 2005 and 2024.

The production of solar panels is a case in point, displaying both high levels of subsidies – as the most subsidised sector in MAGIC in relative terms (Figure 4) – and acute geographical concentration. Subsidies for the solar panel sector have notably translated into a build-up of production capacity significantly exceeding market demand, which caused a drop in solar module prices and led producers in 2024 to experience declining revenue, sizable losses, and job cuts (OECD, 2026^[9]). This underscores that subsidies are not only a problem for trade partners and global markets but also potentially a source of domestic imbalances, inefficiencies in the allocation of resources, and fiscal pressures.

Moreover, subsidised production in one economy can impact suppliers in other economies even in the absence of trade, where the scale of subsidised production is such that it impacts global prices and renders other producers non-viable.

Annex A. Sector annexes

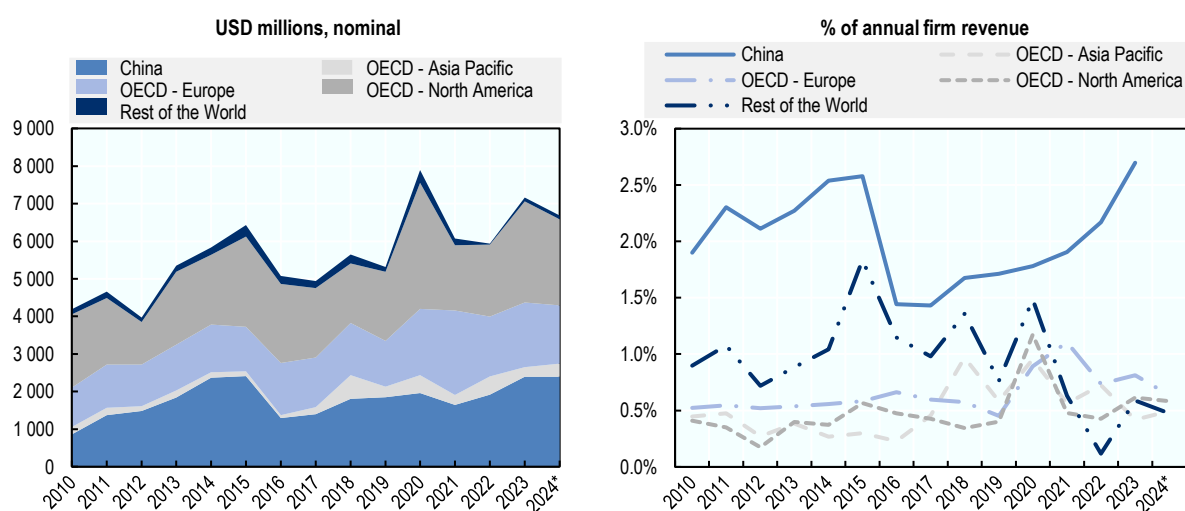
The following annexes present summary data for each of the 15 industrial sectors covered by the OECD MAGIC database. Sector-level data are presented only for the period 2010-24 due to some individual sectors having relatively fewer data for the period 2005-09 (e.g. shipbuilding and solar panels). This can occur, for instance, where companies which used to be top actors in a sector have either disappeared or exited the industry, making it difficult to locate the necessary raw data.

Please note that the geographical groupings used to compare firms based on the location of their headquarters can vary across sectors depending on the number of firms covered in each case. This was done with a view to maintaining confidentiality of the firm-level data.

Aerospace and defence (AERO)

In the context of the OECD MAGIC database, the aerospace and defence sector covers firms operating along the aircraft supply chain, including both original equipment manufacturers (OEMs) producing aerospace and defence platforms (e.g. commercial aircrafts and helicopters) and upstream suppliers of key aerospace components and system suppliers (e.g. aircraft engines). While the intended focus of the OECD MAGIC database is on civilian activities, it is generally difficult to separate the commercial and defence operations of aerospace firms as most operate as dual-use producers, serving both civilian and military markets. The database thus includes many firms whose defence operations overlap with civilian aerospace. Companies focussing solely on military activities such as ground military vehicles, firearms, or ammunition are excluded from the sample.

Figure A A.1. Aerospace and defence – Subsidies by firms' headquarters location



Note: Subsidies comprise government grants, income-tax concessions, and below-market borrowings. *Data are not available for China's aerospace sector in 2024 due to a deterioration in the availability of financial information for the largest producers. Values for China in 2023 were repeated for 2024 in the left hand-side graph.

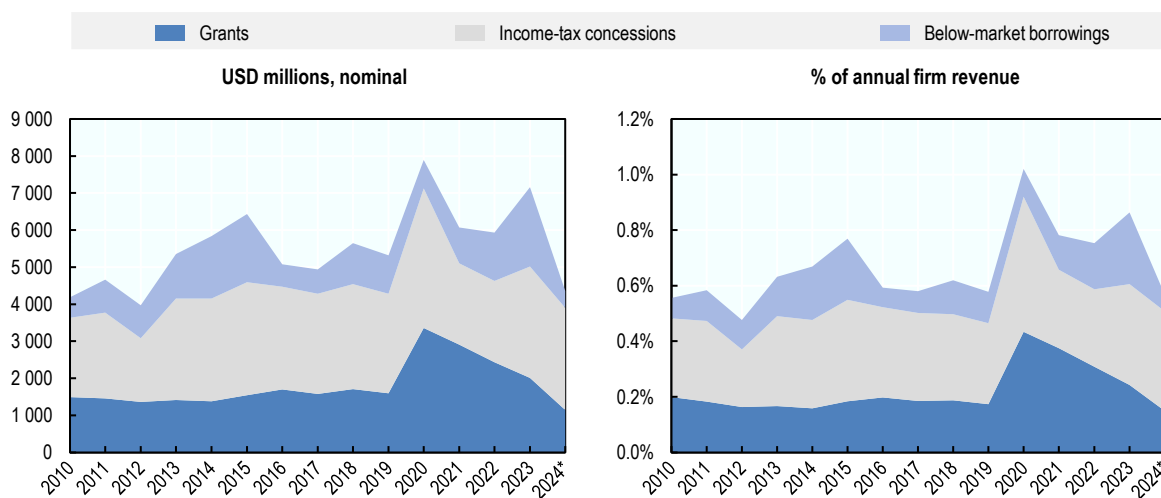
Source: OECD MAGIC database.

The aerospace and defence market has long been dominated by companies based in North America and Western Europe, but it is evolving into an increasingly diversified landscape. While Western-based companies remain market leaders, they have recently faced considerable backlogs and supply strain as global demand grows, driven mainly by the Asia-Pacific region and Gulf countries. China, India, Japan, and Korea have also taken on a more important role in the aerospace global supply chain, first as innovation-driven component suppliers but also increasingly as OEMs themselves. Bearing in mind that most industry publications mix aerospace and broader defence activities together, data from these sources suggest nevertheless that the aerospace and defence firms included in the OECD MAGIC database accounted for at least two-thirds of the global aerospace market as of 2024.

Between 2010 and 2024, aerospace subsidies evolved unevenly across the different regions. In nominal terms, subsidies expanded throughout the period but saw pronounced surges in 2020 and 2023, driven primarily by increases in the support received by firms based in China and in North America. The 2020 peak corresponded partly to the COVID-19 pandemic, which severely disrupted the air transport sector globally and led governments to offer some aerospace companies temporary tax relief and wage subsidies. When viewed relative to firm revenue, Chinese producers exhibited persistently higher subsidy levels throughout the period, often two to five times greater than those received by OECD-based companies. While companies based in North America and Europe had larger subsidies in nominal terms – mainly owing to their larger size –, their subsidy-to-revenue ratio remained relatively low and stable, except in 2020-21.

Grants and tax concessions were the largest forms of subsidies used in the aerospace industry over the whole period covered. The important role played by these types of subsidies results in part from the sector's heavy investments in R&D, which are often supported through dedicated grants, tax credits, and additional tax deductions. By contrast, below-market borrowings (BMB) appear to have been relatively less important, due partly to aerospace companies' capital structure, which generally favours equity financing over debt financing. BMB notably saw a significant decrease in 2016, due to a combination of lower bond spreads and higher revenue in China's aerospace sector. While the OECD MAGIC database does not yet cover support provided in the form of government equity offered on non-market terms, efforts are underway to study this subsidy channel and assess its contribution to the aerospace sector.

Figure A A.2. Aerospace and defence – Subsidies by instrument



Note: *Data are not available for China's aerospace sector in 2024 due to a deterioration in the availability of financial information for the largest producers.

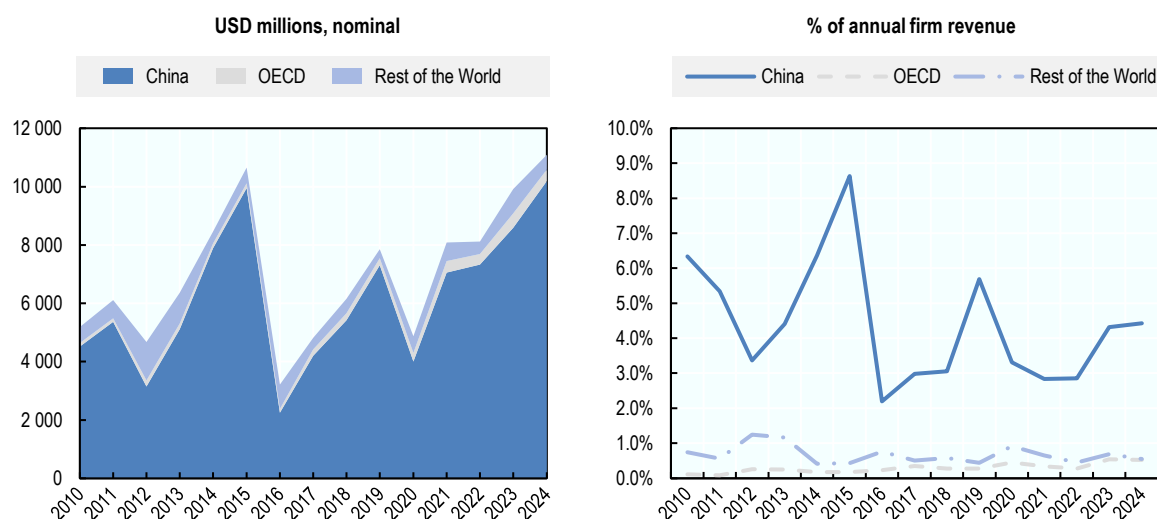
Source: OECD MAGIC database.

Aluminium (ALUM)

Aluminium is a non-ferrous metal valued for its durability, lightness, and conductivity. It is a critical upstream product used in several key manufacturing sectors, including aerospace and defence, automobiles, and solar panels, as well as an essential building material. Because many aluminium producers are vertically integrated, the OECD MAGIC database covers under the aluminium sector several stages of the value chain, including the refining of alumina (i.e. aluminium oxide), the smelting of primary aluminium, and the production of semi-fabricated products of aluminium downstream (e.g. rolled products and extrusions). To the extent possible, the data seek to avoid bauxite mining, though this is not always possible where companies cover all stages of the aluminium value chain.

China accounted for nearly 60% of the global production of primary aluminium in 2024 (up from about 24% in 2005), so the sample of firms covered in the OECD MAGIC database understandably includes many companies based in China.⁹ Meanwhile, OECD Members have seen their share of global primary output fall from 38% in 2005 to 12% in 2024 while Gulf Cooperation Council countries grew their share from 0% in 2005 (no production then) to 9% in 2024. To the extent possible, the sample of aluminium companies used in the database aims to reflect these changes.

Figure A A.3. Aluminium – Subsidies by firms’ headquarters location



Note: Subsidies comprise government grants, income-tax concessions, and below-market borrowings.

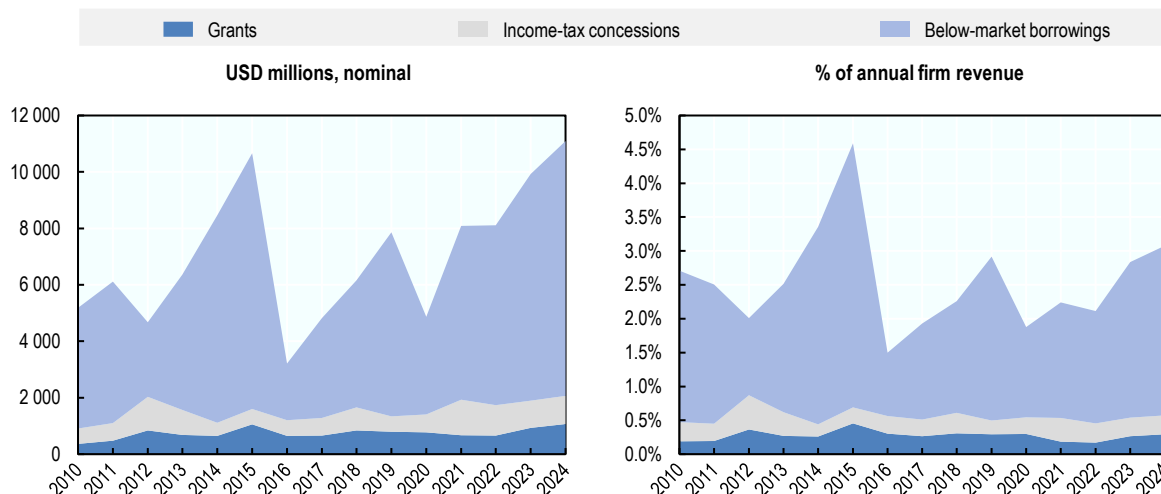
Source: OECD MAGIC database.

Aluminium firms based in China were by far the largest recipients of subsidies in the sector between 2010 and 2024. This was true both in value and relative to the revenue of companies. Many of these subsidies appear countercyclical in that support has tended to increase when aluminium prices on the London Metals Exchange were decreasing, which suggests that governments may have attempted to provide relief to aluminium producers or to prevent the decommissioning of uneconomic production capacity. As a percentage of firms’ sales revenue, subsidies reached their peak in 2015 when China experienced stock market turbulence and metal producers faced the lowest prices seen over the period covered, at around USD 1 600 a tonne for aluminium. Subsidies in value also increased noticeably starting in 2021 around the time China entered a severe real estate crisis.

Below-market borrowings (BMB) make up most of the subsidies measured for the aluminium sector in the OECD MAGIC database. This is partly due to aluminium producers having relatively large volumes of debt

relative to their assets and some having also relatively weak credit ratings. While they appear more modest on average, government grants and tax concessions are not insignificant, with grants having notably peaked in 2015, similar to BMB. Although the OECD MAGIC database is the first to provide granular, comprehensive, and comparable estimates of subsidies benefitting the aluminium industry, it does not exhaust all the possible ways in which governments are able to support the sector. Of particular importance for the aluminium industry is the provision of energy to producers at subsidised prices since the smelting of primary aluminium forms one of the most electricity-intensive production processes.¹⁰ More information on energy subsidies benefitting the aluminium industry can be found in OECD (2019_[10]; 2023_[11]).

Figure A A.4. Aluminium – Subsidies by instrument

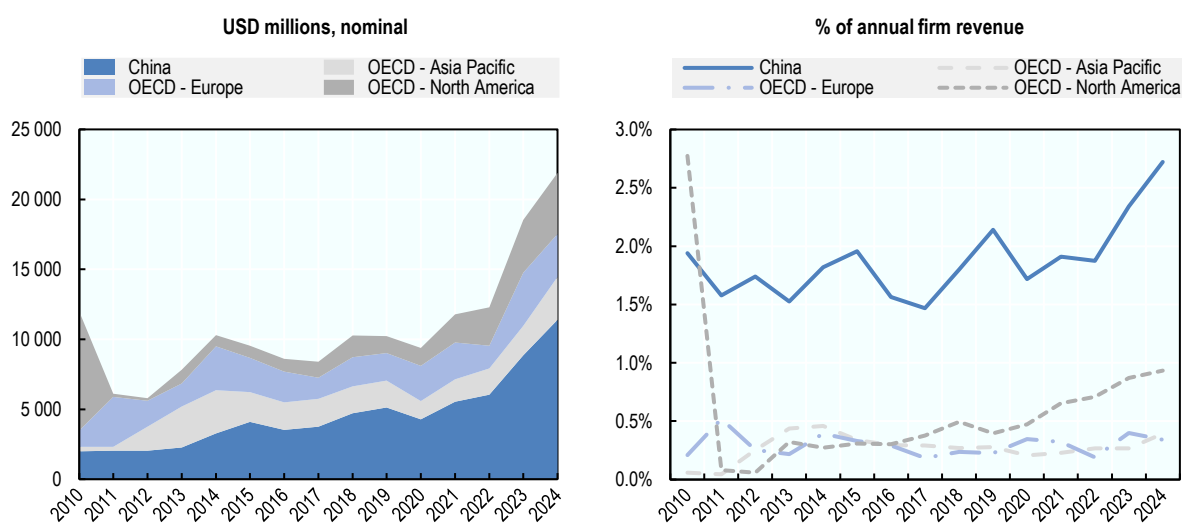


Source: OECD MAGIC database.

Automobile (AUTO)

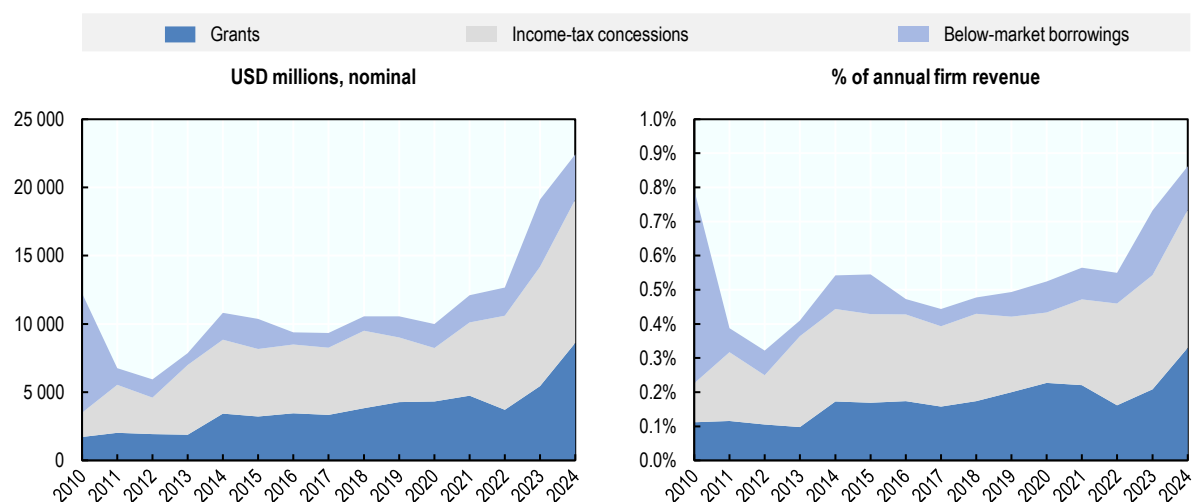
The car industry makes up the largest of all the industrial sectors covered by the OECD MAGIC database, with global sales nearing USD 3 trillion and sustaining millions of jobs in OECD countries. The automotive sector in the database focuses on carmakers themselves, i.e. the final producers of commercial and passenger motor vehicles. This includes both vehicles equipped with internal combustion engines and battery electric vehicles (BEVs). It does not cover the production of automotive parts and components, including batteries destined for electric vehicles. The automotive sector is thus downstream of other industries covered in the database such as steel, aluminium, semiconductors, and glass, which all provide key inputs into the production of cars.

While major carmakers have traditionally been based in OECD countries – even as they operate across multiple continents and countries –, recent years have seen Chinese carmakers grow their market share significantly, particularly in the production of BEVs and plug-in hybrid vehicles (PHEVs). The sample of carmakers covered in the OECD MAGIC database aims to reflect these changing realities by including new entrants as well as legacy carmakers. The sample accounts for about 80% of global sales by value according to Factset data.

Figure A A.5. Automobile – Subsidies by firms' headquarters location

Note: Subsidies comprise government grants, income-tax concessions, and below-market borrowings.

Source: OECD MAGIC database.

Figure A A.6. Automobiles – Subsidies by instrument

Source: OECD MAGIC database.

Carmakers based in China have continuously received larger subsidies – both in absolute and relative terms – than OECD-based firms, with the exception of the one-off rescue of several large OECD carmakers during the global financial crisis of 2008-09. Chinese carmakers received twice as much support in absolute terms and four times more support in relative terms compared with OECD-based firms. These larger subsidies for Chinese carmakers reflect both longstanding support to the country's state-owned legacy carmakers as well as the more recent introduction of support for new BEV entrants, which are predominately privately owned. It should also be noted that some of the support obtained by OECD-based carmakers was in several cases received by their Chinese subsidiaries from Chinese authorities.

Between 2010 and 2024, income-tax concessions were the largest form of subsidy in the sector, followed by grants. While relatively modest over the period, below-market borrowings (BMB) saw a sudden spike

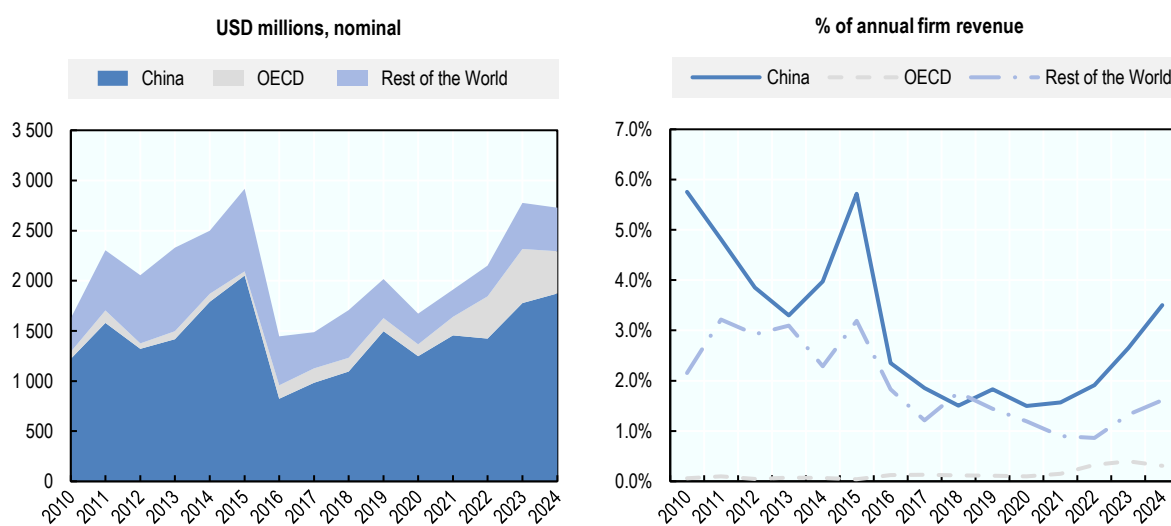
during the global financial crisis as governments responded to the financial distress of large carmakers using direct government lending and equity injections. This still shows in the data for 2010 although support was quickly wound down in 2011. More recently, from about 2019, there has been a noticeable increase in the grants and BMB received by carmakers based in China, reflecting a sustained push by Chinese authorities to support their “new energy vehicle” industry.

Cement and other building materials (CEMT)

Cement is one of the most widely used materials globally due to its central role in the construction of buildings and infrastructure. Its production process in horizontal rotating kilns is highly energy intensive and emits large amounts of CO₂. In the OECD MAGIC database, the sector covers firms predominantly engaged in the manufacture of Portland cement and other clinker-based products, though it can also include aggregates such as sand, gravel, and crushed stone. Coverage excludes building materials such as architectural glass and ceramic tiles, which are covered under “glass, ceramics and refractories” in the database. The sector comprises a heterogeneous set of firms ranging from privately owned multinationals to regional producers and state-owned enterprises.

Global demand for cement is fundamentally driven by population growth, rapid urbanisation in emerging and developing economies, and significant government investments in infrastructure projects worldwide. Because cement is mainly traded regionally due to its unfavourable weight-to-value ratio, global production patterns tend to follow demand drivers, with China and India, followed by Viet Nam and the United States being the largest producers. China stands out, however, with the country alone still accounting for nearly half of global output in volume even after the onset of its real estate crisis. According to the U.S. Geological Survey, China produced more cement in three years than the United States did throughout the entire twentieth century.¹¹ The sample of cement-producing firms covered by the OECD MAGIC database reflects these trends as it includes a significant number of companies based in China, as well as large multinationals based in the OECD and a sizable number of firms based in other emerging and developing markets (e.g. Brazil, Egypt, India, Indonesia, Nigeria, Thailand, and South Africa). Many of these companies are state enterprises or have at least government entities as large shareholders.

Figure A A.7. Cement – Subsidies by firms’ headquarters location



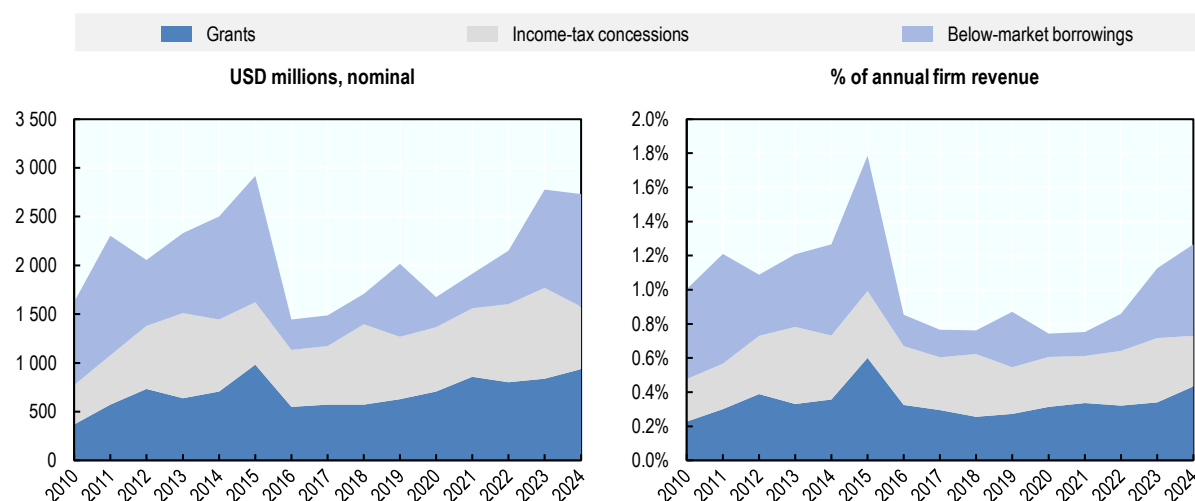
Note: Subsidies comprise government grants, income-tax concessions, and below-market borrowings.

Source: OECD MAGIC database.

Subsidies for cement producers are generally larger for firms based in China in both absolute and relative terms, although firms based in other non-OECD jurisdictions have also received substantial amounts of support relative to OECD firms. Subsidies for cement production appear to have peaked in 2015 before increasing again in recent years. Both increases correspond to periods of slowdown in China's heavy industries, with the more recent episode directly tied to the country's real estate crisis, which began in 2021. This suggests that cement subsidies are partly countercyclical, similar to aluminium subsidies. While relatively small, subsidies for OECD-based cement producers saw an increase around 2022-23 in the form of support schemes to help energy-intensive businesses cope with the higher energy prices resulting from Russia's large-scale invasion of Ukraine.

All three forms of government support played a role in the sector, although below-market borrowings have grown in importance in recent years, particularly in China. There has also been a notable rise in government grants and tax concessions, especially for OECD-based companies, which include support to offset the high energy prices caused by Russia's large-scale invasion of Ukraine. While the OECD MAGIC database does not cover the direct provision of energy inputs at below-market prices, evidence for an illustrative sample of cement producers has shown these to be important as well (OECD, 2023^[11]).

Figure A A.8. Cement – Subsidies by instrument



Source: OECD MAGIC database.

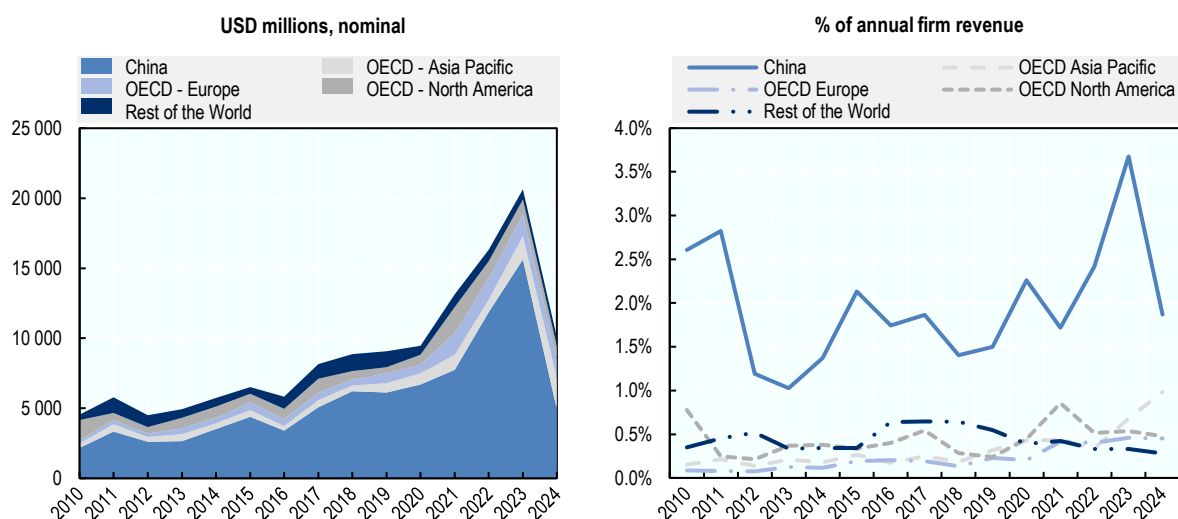
Chemicals (CHEM)

Due to their upstream nature and widespread usage, chemicals are essential inputs for virtually all downstream manufacturing sectors, such as automotive and electronics. The scope of products manufactured by chemical producers is broad, encompassing both the production of basic chemicals (e.g. petrochemicals and sulfuric acid) and specialty chemicals. Coverage of the industry in the OECD MAGIC database is therefore understandably diversified as it includes the refining of hydrocarbons into petrochemicals, advanced polymers, industrial gases, and the processing of mineral ores into chemical precursors used in the manufacture of batteries (e.g. lithium, graphite, and cobalt).

Historically, large integrated chemical firms tended to be based in OECD countries, with extensive networks of subsidiaries located globally near important feedstock and energy sources. Proximity to feedstock likewise explains the relatively large role played in the industry by companies based in the Gulf region and other resource-endowed regions (e.g. Russia). The past two decades have also seen large

companies based in emerging economies take on a more prominent role, and in particular China, which has achieved considerable scale by merging large state actors. Given the scope of products, companies, and countries involved, coverage of the chemicals sector in the OECD MAGIC database is characterised by a relatively large number of firms based in many different jurisdictions.

Figure A A.9. Chemicals – Subsidies by firms’ headquarters location

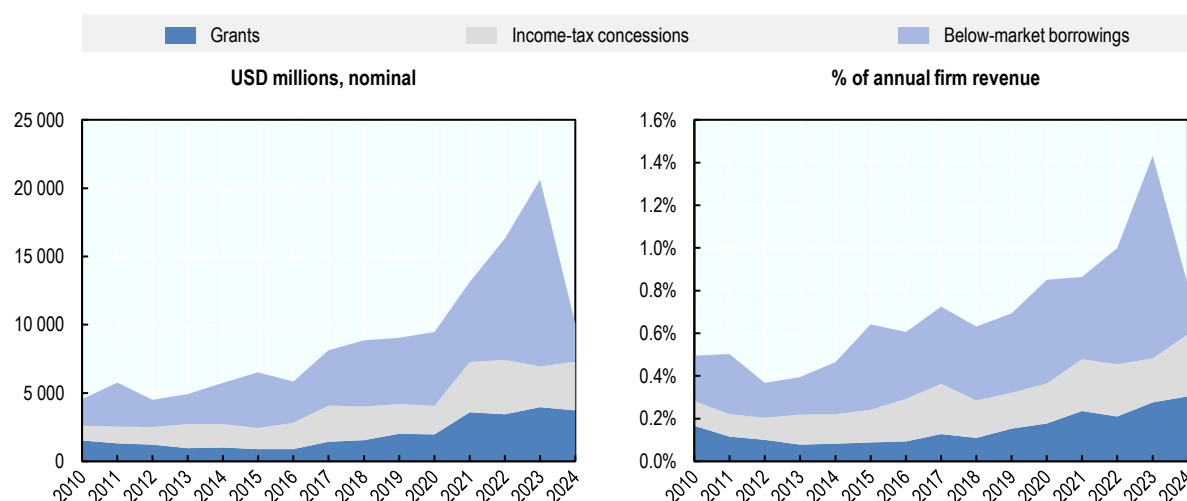


Note: Subsidies comprise government grants, income-tax concessions, and below-market borrowings.

Source: OECD MAGIC database.

Chemical producers based in China were by far the largest recipients of subsidies between 2010 and 2024, both in absolute and in relative terms. While changes in sales revenue explain some of the variation seen in the subsidy-to-revenue ratio, the increase in the subsidies received by China-based firms between 2021 and 2023 stemmed mainly from a more rapid increase in subsidies. This increase was then reversed in 2024 in a context of state-led consolidation of China’s chemical sector, which affected firms’ revenue and subsidy numbers. The subsidies received by firms based outside China were, meanwhile, considerably lower, although recent subsidy programmes did at times cause sporadic increases in support (including during the COVID-19 pandemic).

Tax concessions and below-market borrowings (BMB) played a comparatively larger role in the chemicals sector, with BMB having grown in importance since the mid-2010s. This is largely explained by chemicals producers having relatively large debt-asset ratios (the second largest on average after solar panels) and by the presence of large state enterprises in the sector with both poor standalone credit ratings and large implicit guarantees from their government shareholders. These factors together resulted in a large volume of BMB for the industry, notwithstanding the recent decrease seen in 2024, which was amplified by the state-led consolidation noted above and the resulting absorption of weaker state enterprises – rated well below investment-grade – by more financially robust ones.

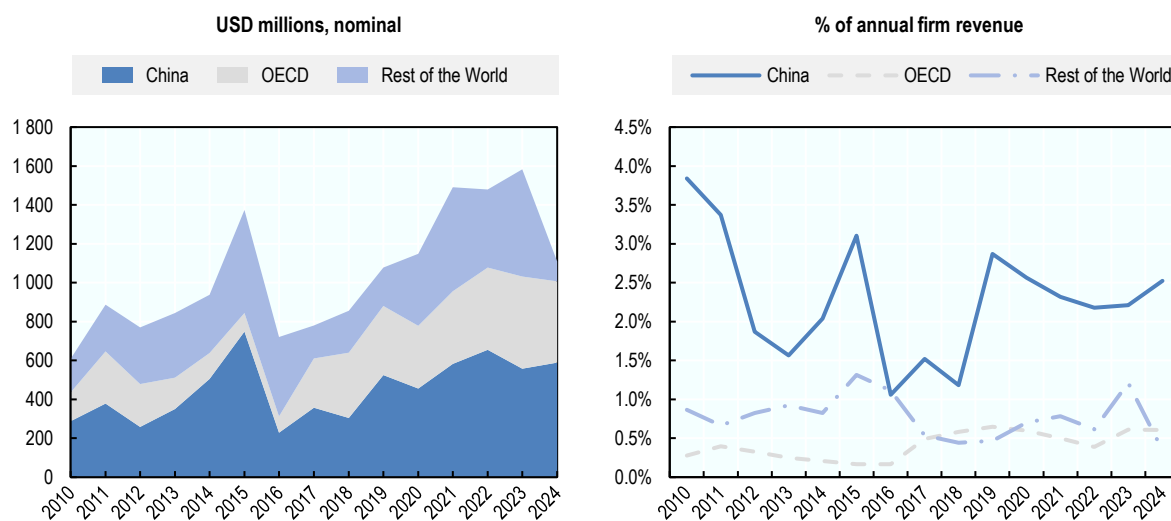
Figure A A.10. Chemicals – Subsidies by instrument

Source: OECD MAGIC database.

Fertilisers (FERT)

Fertilisers are a major input into global agricultural production. The fertiliser industry spans the extraction and processing of primary nutrients (nitrogen, phosphorus, and potassium) as well as the production of compound and specialty fertilisers downstream. The nature of actors involved in the sector varies based on geography, resource endowments, and industrial expertise. Coverage of fertiliser firms in the OECD MAGIC database spans globally integrated firms operating across multiple nutrient segments, as well as regional players benefiting from access to specific resource deposits (e.g. phosphates) and low-cost natural gas. As a result, the fertiliser industry tends to be geographically concentrated. This can give rise to critical trade choke points, which in the event of trade tensions or supply chain disruptions, can undermine access to fertilisers, including by significantly increasing prices, and ultimately impacting the stability of global agricultural markets.

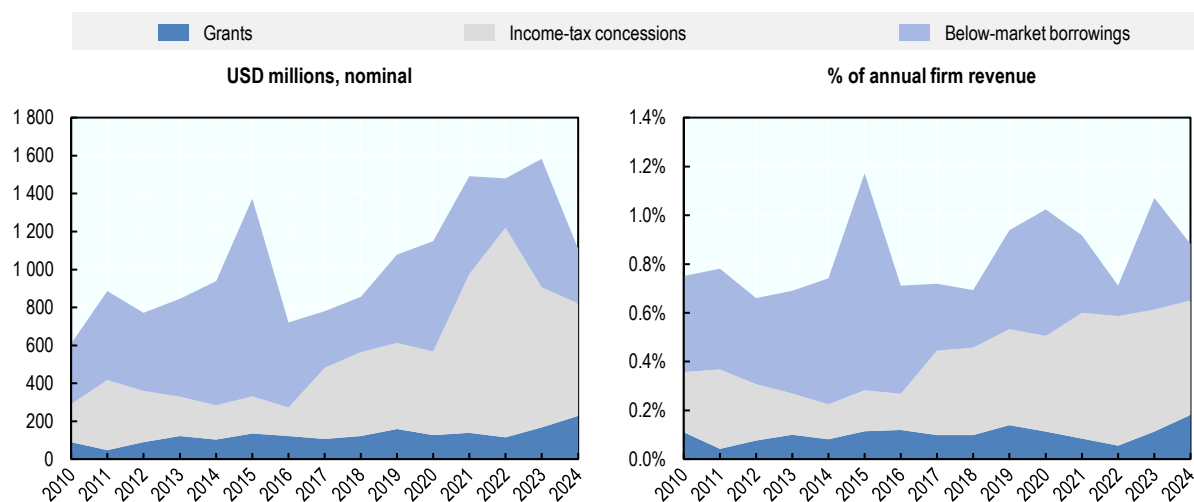
Coverage of the fertiliser industry in the OECD MAGIC database includes a relatively large proportion of firms based in China, India, and Russia, reflecting the structure of the industry globally. The OECD-based companies covered are often vertically integrated multinationals engaged in the processing of nutrients and manufacturing fertilisers for global distribution. Most of their sales are derived from the export of higher value-added fertiliser products. Firms based outside China and the OECD are often more specialised in the initial processing and refining of key inputs and are principally located in Eastern Europe (e.g. Belarus and Russia), the Middle East, and North Africa (e.g. Morocco). They leverage their abundant resources and access to lower-cost energy to serve as primary global exporters of feedstock, such as potash, urea, ammonia, and phosphate. While some of these firms possess the capacity to produce finished fertiliser products for domestic supply, many are primarily engaged in supplying essential feedstocks to global producers. Firms based in China have become pivotal actors in the global industry, although they continue to derive much of their revenue domestically.

Figure A A.11. Fertilisers – Subsidies by firms' headquarters location

Note: Subsidies comprise government grants, income-tax concessions, and below-market borrowings.

Source: OECD MAGIC database.

Subsidies for fertiliser production grew in value starting in the mid-2010s, reaching a peak in 2021-23 at a time when energy prices (and natural gas in particular) were especially high. Their evolution was, on the other hand, relatively flat relative to revenue, with occasional peaks seen in recent years. From a geographical standpoint, fertiliser firms based in China were larger recipients of subsidies between 2010 and 2024, both in absolute terms and relative to their sales revenue. Companies based in the OECD and elsewhere received, meanwhile, lower levels of support relative to their sales.

Figure A A.12. Fertilisers – Subsidies by instrument

Source: OECD MAGIC database.

Below-market borrowings (BMB) have been used relatively more in the sector, including as a form of counter-cyclical support during periods of elevated feedstock prices. Income tax concessions also played a significant role for most firms, albeit for different underlying reasons. Some tax concessions have involved

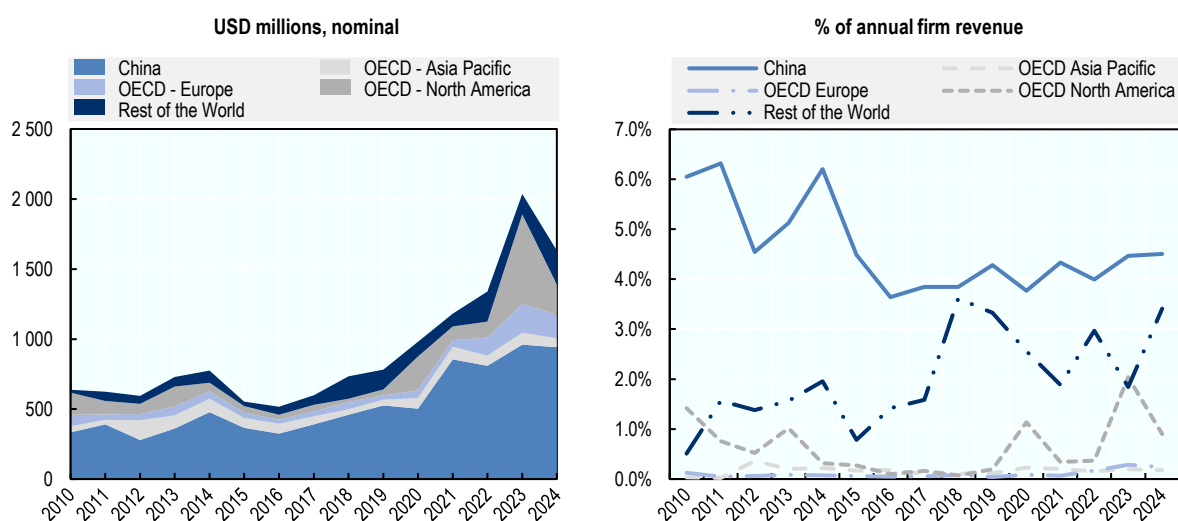
investment incentives for specific projects while others have provided for company-wide preferential rates of tax. Grants were also offered in 2023-24 to offset the impact of higher energy prices on fertiliser production. While the OECD MAGIC database does not cover the direct provision of energy inputs at below-market prices, evidence for an illustrative sample of fertiliser producers has shown these to be important as well (OECD, 2023^[11]).

Glass, ceramics and refractories (GLAS)

Glass, ceramics, and refractories encompass the production of inorganic, non-metallic materials formed by high-temperature processes and used across construction, transportation, electronics, energy, and industrial manufacturing. The products covered by the OECD MAGIC database are therefore heterogeneous in nature as companies in the sector are often horizontally integrated across the different subsectors. Glass products include architectural glass, automotive glass, photovoltaic glass, and fibreglass. Ceramics range from specialty products used in the electronics industry (e.g. high-performance ceramics), to refractory materials, and ceramic tiles used in construction. The firms covered in the sector are therefore wide-ranging and occupy different tiers along the value chain and the sophistication ladder. They are also upstream of several other sectors covered in the OECD MAGIC database, including the production of cars and solar panels.

Traditionally, companies based in Europe, Japan, and the United States constituted the major players for glassmaking, advanced ceramics, and high-performance refractories thanks to their technological leadership and capital-intensive production. However, since the 2000s, Asia, and more specifically China and India, have taken the lead as both global producers and consumers across many of the subsegments. Besides the policy environment, this shift was driven by a variety of structural factors, chief among them a boom in construction, lower production costs, and OECD-based companies opting to focus on high-tech, low-volume segments. Although the heterogeneity of the sector makes it difficult to judge the proportion of the global market covered by the firms included in the OECD MAGIC database for this sector, the database covers most major manufacturers of glass, ceramics, and refractories.

Figure A A.13. Glass, ceramics, and refractories – Subsidies by firms' headquarters location

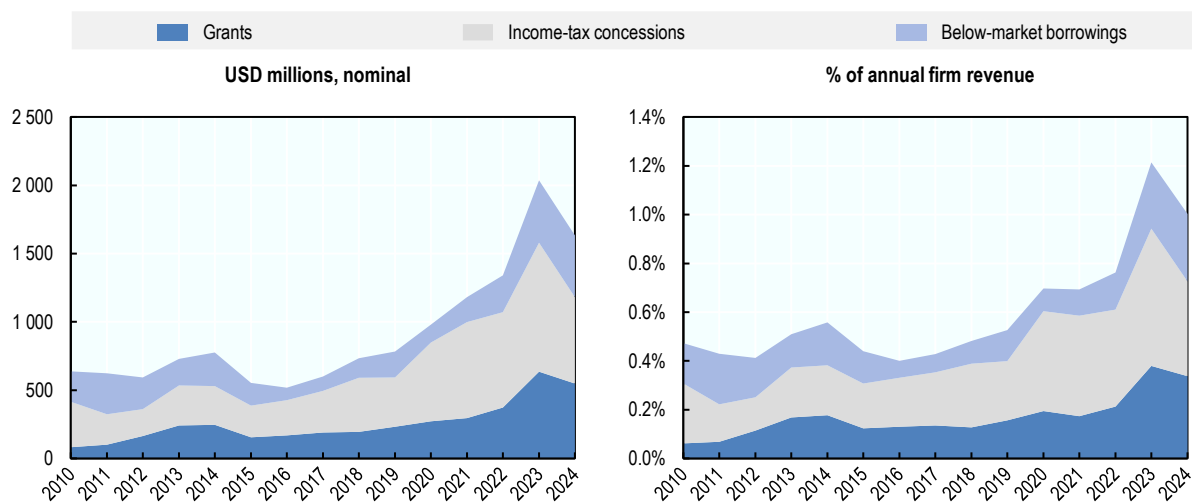


Note: Subsidies comprise government grants, income-tax concessions, and below-market borrowings.
Source: OECD MAGIC database.

Subsidies for the production of glass, ceramics, and refractories have risen sharply in absolute terms across all regions, particularly after 2020. Firms based in China were the largest recipients throughout the period, typically accounting for half or more of global subsidy outlays in the sector each year. OECD-based firms also experienced an increase after 2020, contributing to the overall rise in support seen between 2021 and 2023. As a share of their annual revenue, Chinese producers remained the largest subsidy recipients throughout the period, followed by producers based in other emerging and developing economies. While having a much lower subsidy intensity – typically below 1% of sales revenue – firms based in the OECD experienced occasional spikes in support. This was the especially the case for firms based in North America in 2020 and 2023.

Although the production of glass, ceramics, and refractories is generally considered a heavy industry, the structure of its subsidies involves relatively more grants and tax concessions than below-market borrowings (BMB). This makes the sector somewhat different from other heavy industries, such as aluminium, steel, and shipbuilding. Tax concessions and grants saw notable spikes in 2020 and 2023 in both nominal and relative terms, some of which were tied to support for the production of advanced pharmaceutical glass products following the COVID-19 pandemic. In addition to the subsidies covered by the OECD MAGIC database, the sector may have also benefitted from subsidised energy inputs given how energy-intensive the production of glass, ceramics, and refractories can be. To the OECD's knowledge, there are no estimates available for this type of support in this sector specifically.

Figure A A.14. Glass, ceramics, and refractories – Subsidies by instrument



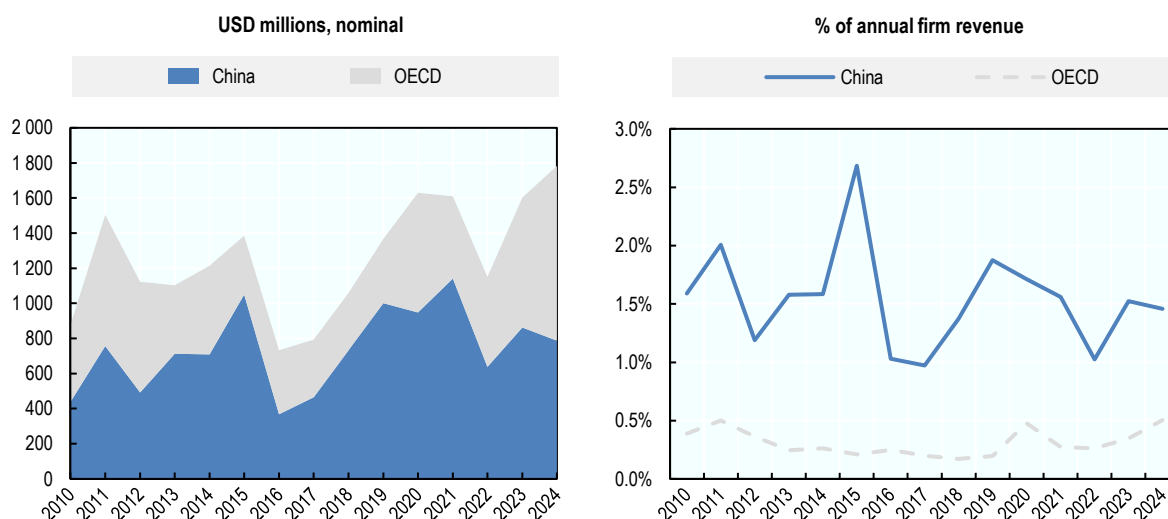
Source: OECD MAGIC database.

Heavy machinery (MACH)

The heavy machinery sector in the OECD MAGIC database covers machinery and equipment used in construction, agriculture, and mining. This sector is diverse, with companies producing a wide range of products, including tractors, excavators, wheel loaders, backhoes, as well as different types of cranes (e.g. all-terrain cranes, truck cranes, crawler cranes, or port cranes). The industry has experienced significant growth in recent decades, underpinned by large-scale infrastructure drives associated with rapidly rising urbanisation and China's real estate boom. Recent decades have also seen sizeable growth in demand for mining-related equipment emanating from countries' growing needs for critical raw materials.

Major heavy machinery manufacturers have historically been based in OECD countries, mainly in the United States, Western Europe, Japan, and Korea. Several Chinese companies have, however, gained sizeable market shares in recent decades aided by growth in their domestic market. While not major exporters globally, there are also significant producers based in other emerging and developing economies such as India. Coverage of heavy machinery manufacturers in the OECD MAGIC database is estimated to cover at least half of global sales, although the OECD is not aware of a comprehensive, publicly available estimate of the size of the global market. Because the heavy machinery sector is the most recent addition to the database, work is ongoing to improve coverage further in future versions of the data.

Figure A A.15. Heavy machinery – Subsidies by firms' headquarters location



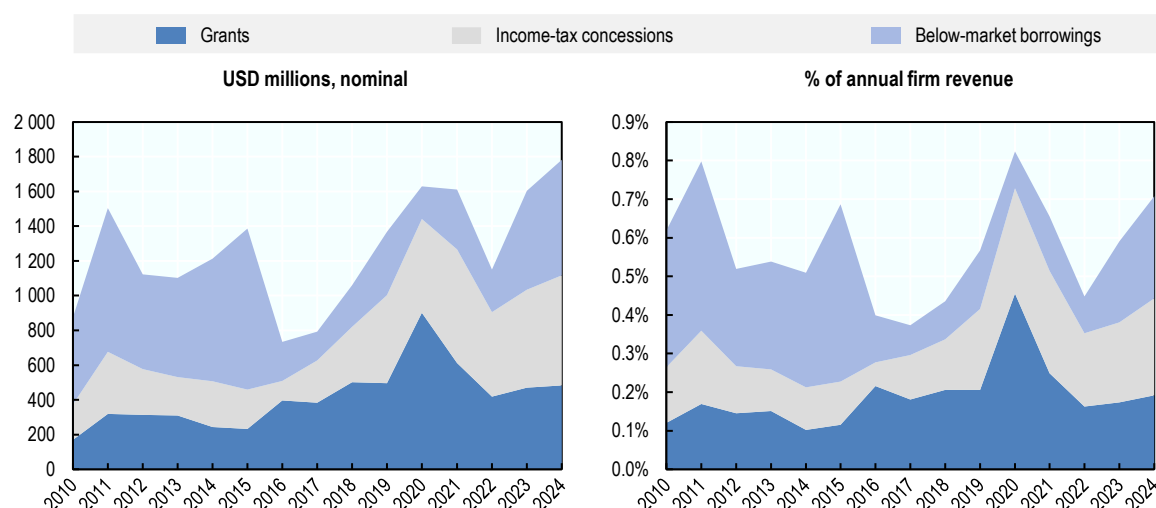
Note: Subsidies comprise government grants, income-tax concessions, and below-market borrowings.

Source: OECD MAGIC database.

Chinese manufacturers of heavy machinery have generally received larger subsidies than their OECD-based competitors, both in absolute and relative terms. This gap has been growing wider over time, but recently narrowed beginning with the onset of China's real estate crisis in 2021. Meanwhile, subsidies for OECD-based producers jumped in 2020 due to support schemes tied to the COVID-19 pandemic and falling sales, which together caused an increase in the subsidy-to-revenue ratio.

The three types of subsidies covered by the OECD MAGIC database – namely, grants, income tax concessions, and below-market borrowings (BMB) – have all played an important role in supporting the heavy machinery sector between 2010 and 2024. While BMB seem to have been particularly prevalent in the early 2010s, they have since become more modest, leaving grants and tax concessions subsequently to account for most of the subsidies to the sector.

Figure A A.16. Heavy machinery – Subsidies by instrument



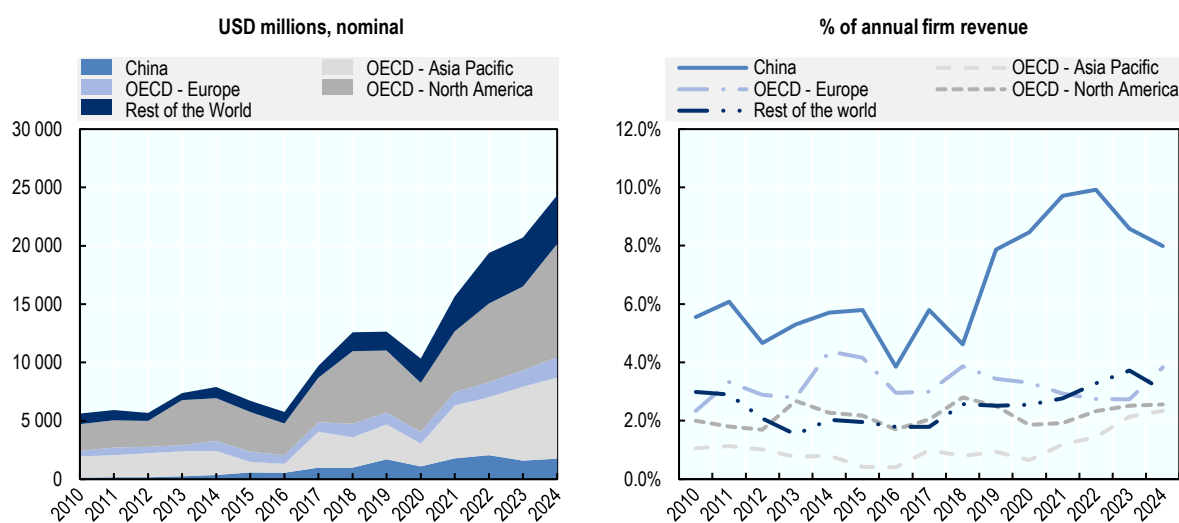
Source: OECD MAGIC database.

Semiconductors (SEMI)

The semiconductor industry plays a pivotal role in the modern economy, producing vital, enabling components for electronic devices ranging from smartphones and computers to cars, medical devices, and aerospace and defence systems. The global semiconductor market, which amounted in 2024 to USD 631 billion (World Semiconductor Trade Statistics, 2026^[12]), is projected to grow further on the back of growth in data centres, artificial intelligence, and autonomous driving. The semiconductor sector typically covers three stages of the semiconductor value chain, namely: chip design; chip manufacturing in foundries; and semiconductor testing and packaging. Firms involved along the chain are either specialised in one of these steps or vertically integrated. Coverage of semiconductor firms in the OECD MAGIC database reflects this diversity but does not include more upstream companies such as those producing semiconductor manufacturing equipment (e.g. photolithography machines).

Firms based in the United States and Asia (e.g. Japan, Korea, and Chinese Taipei) have long been the key players in the semiconductor sector, with Asia's role growing in importance as part of the supply chain was relocated there. Asia has, over the last two decades, become a global centre for chip manufacturing and trade, although the United States maintains an important role in high-value segments of the supply chain, including in chip design. The sample of firms covered by the OECD MAGIC database thus includes a relatively large number of firms based in Asia and the United States, as well as large actors based in Europe, which largely serve the automotive industry. The sample is estimated to cover between 64% to 83% of global sales, depending on the year and how the sector's scope is defined.

Figure A A.17. Semiconductors – Subsidies by firms' headquarters location

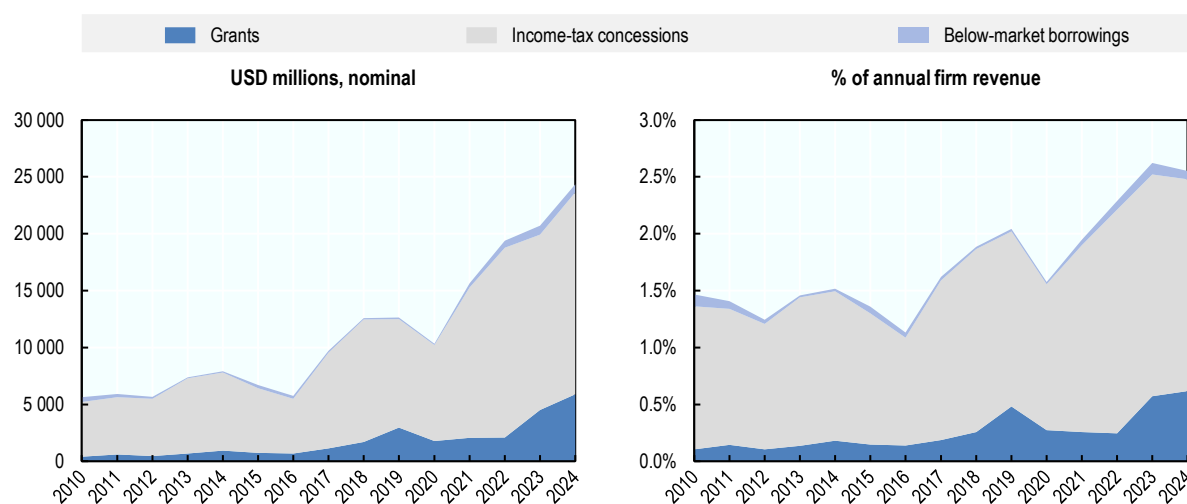


Note: Subsidies comprise government grants, income-tax concessions, and below-market borrowings.

Source: OECD MAGIC database.

The semiconductor sector has seen substantial increases in subsidies since 2016, with the steepest growth occurring after 2020. In absolute terms, firms based in the United States were the largest beneficiaries of government support, which notably includes the support these firms received in other jurisdictions in which they operate (e.g. in Asia), as well as the introduction of new subsidy programmes in the United States. Subsidies to firms based in the OECD Asia-Pacific region also expanded steadily throughout the period for similar reasons. While subsidies to semiconductor manufacturers based in China have been modest in absolute terms, they represented a significant amount relative to their sales, reaching close to 10% of revenue in the early 2020s. This reflects China's longstanding support for its semiconductor industry, which received new impetus following the adoption by the State Council in 2014 of the *Guideline for the Promotion of the Development of the National Integrated Circuit Industry* and growing restrictions imposed on exports of semiconductor technology by trading partners beginning in 2018.

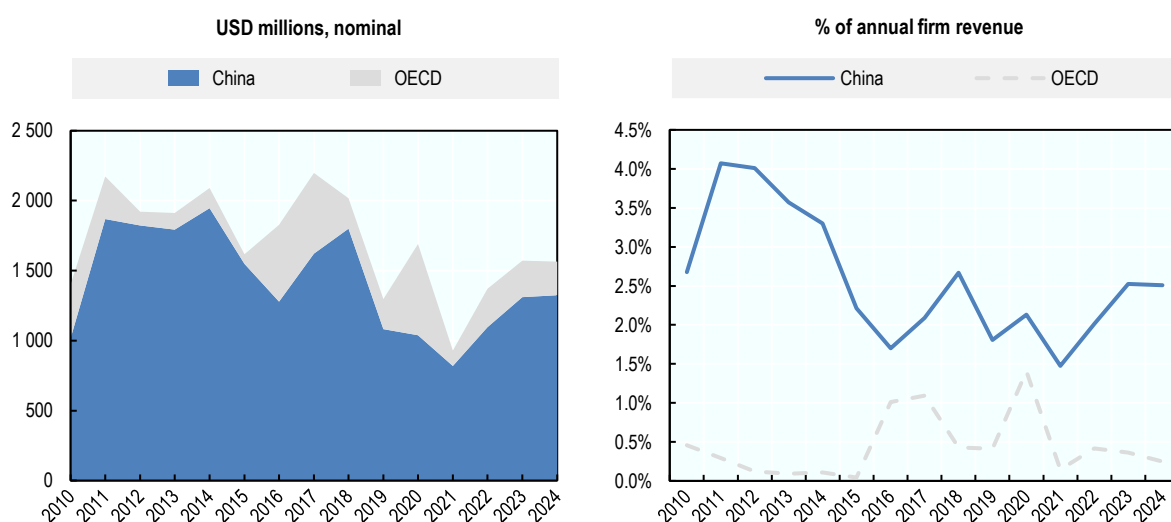
Tax concessions are the largest instrument supporting the sector and have seen a noticeable rise since 2020. This reflects a mixture of longstanding tax support for R&D spending and investment incentives taking the form of tax holidays, preferential rates of tax, and investment tax credits for promoting new semiconductor manufacturing capacity. Grants have increased as well, but continue to represent a smaller portion of all subsidies. The presence of below-market borrowings (BMB) in the sector is, however, marginal as the semiconductor industry tends to rely relatively more on equity financing and bonds than bank loans. That said, BMB were relatively more meaningful in the specific case of Chinese firms, which have benefitted from preferential lending from policy banks and state banks. Although the OECD MAGIC database does not yet cover support to semiconductor firms taking the form of government equity provided on non-market terms, such support has been important in the semiconductor industry (OECD, 2019^[7]; OECD, 2021^[5]).

Figure A A.18. Semiconductors – Subsidies by instrument

Source: OECD MAGIC database.

Shipbuilding (SHIP)

Although it is generally considered a heavy industry, shipbuilding sits downstream in industrial supply chains, with global maritime shipping companies being the main clients for the commercial vessels produced by shipyards. The sector notably relies heavily on steel, the production of which is also covered in the OECD MAGIC database. Shipbuilding in the database concentrates predominantly on the construction of large civilian vessels, thus excluding naval (military) shipbuilding where possible.¹² This primarily includes container ships, tankers (e.g. for oil), LNG carriers (for liquefied natural gas), bulkers (e.g. for iron ore, steel, and grain), and large passenger ships (e.g. cruise ships).

Figure A A.19. Shipbuilding – Subsidies by firms' headquarters location

Note: Subsidies comprise government grants, income-tax concessions, and below-market borrowings.

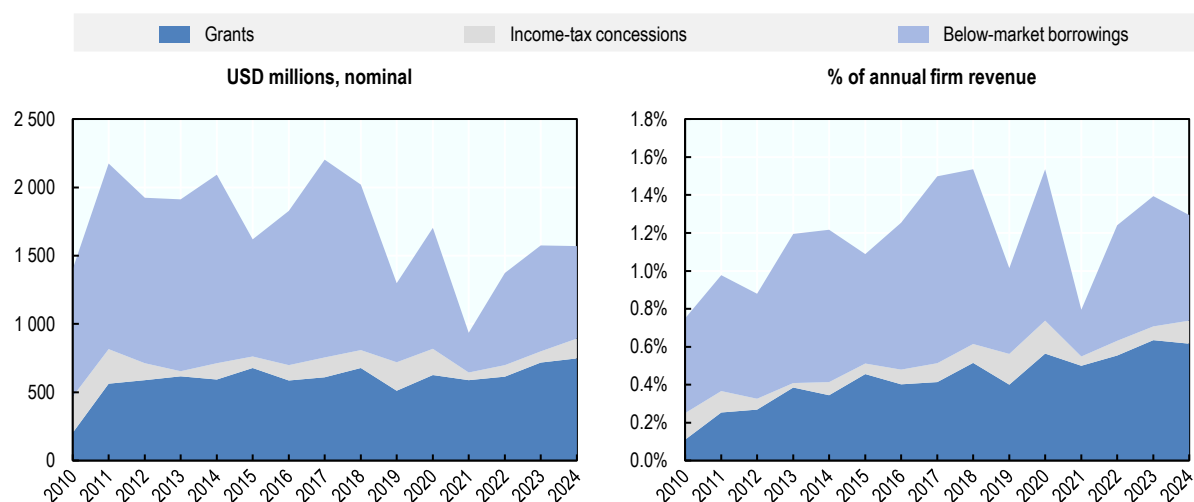
Source: OECD MAGIC database.

The shipbuilding sector has seen major changes in market shares over the period 2005-24, with China having become the largest supplier by far, measured by global commercial ship deliveries in compensated gross tonnage. China's share of global commercial ship deliveries thus grew from 19% in 2005 to 51% in 2024 while the combined share of Japan and Korea decreased from 59% to 38% and Europe's fell from 15% to 5%.¹³ As many shipbuilders are part of broader industrial conglomerates spanning multiple sectors, there are limits to the entities the OECD MAGIC database can cover, particularly where reported business segments do not single out shipbuilding. That said, the firms covered in the OECD MAGIC database represented about 60% of the global shipbuilding capacity estimated by shipping consultancy Clarksons in 2023-24.

Chinese shipyards generally received larger subsidies than their OECD competitors over the period 2010-24 covered in the OECD MAGIC database. There were, however, two noticeable spikes in the subsidies received by OECD-based shipyards around 2016-17 and in 2020. The former instance was in relation to the rescue of Korean shipyards facing financial distress in 2016 and the latter was due to emergency loans provided to some European shipyards during the COVID-19 pandemic. Support for Chinese shipyards has been relatively more sustained, albeit at a reduced rate starting around 2016.

Grants and below-market borrowings (BMB) have been the main two instruments that governments have used to support the shipbuilding industry between 2010 and 2024. Corporate tax concessions were, for their part, relatively minor, accounting for a much smaller proportion of the total support. While the amount of grants provided has been relatively stable over the years, BMB appear to have responded partly to shipyards' financial distress, consistent with governments' more frequent use of BMB in emergency situations. Besides these three types of subsidies, shipbuilding is also characterised by large government ownership of shipyards, with as much as 65% of sales revenue in the sector coming from firms which are at least 25% owned by governments in China and OECD Member countries. Widespread government ownership in shipbuilding creates not only the potential for support provided through the equity channel, but also alludes to the possible existence of an ecosystem of government support along the value chain given the presence of subsidised state-owned steelmakers upstream and the involvement downstream of state-owned shipping companies ordering commercial vessels.

Figure A A.20. Shipbuilding – Subsidies by instrument



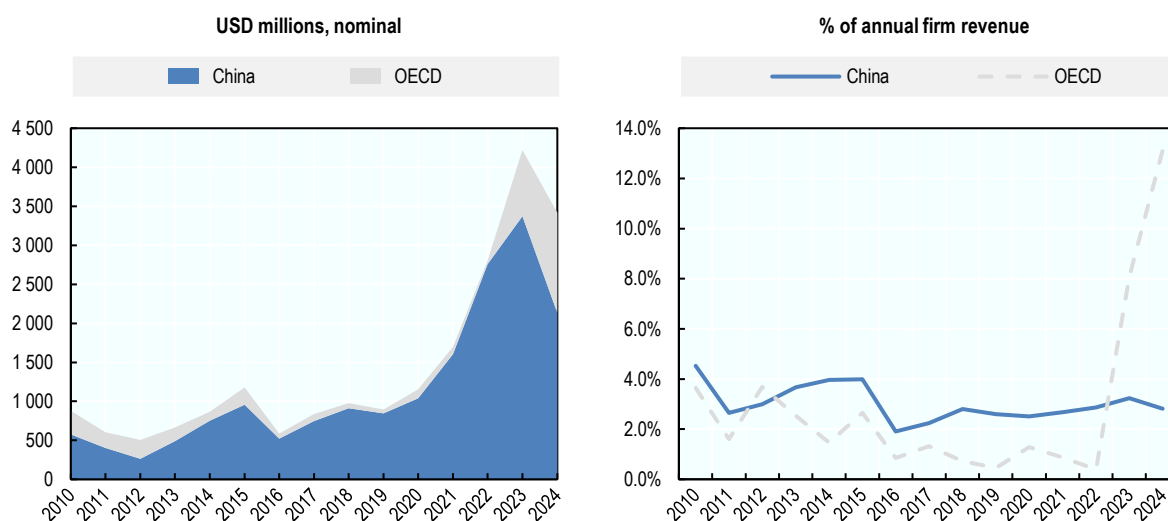
Source: OECD MAGIC database.

Solar photovoltaic cells and modules (SOLA)

Solar photovoltaic energy has been the fastest growing source of renewable energy in recent times, enabled by the rapid scaling of manufacturing capacity for producing solar cells and modules. The sector has received widespread support from governments over the years for reasons ranging from countries' desire to decarbonise power generation to energy security, job creation, and innovation. While the sector in the OECD MAGIC database largely concentrates on the production of downstream solar cells and modules, it also covers the production of upstream solar-grade polysilicon and wafers where companies are vertically integrated.

The solar panel industry has undergone massive shifts in the location of production over the past two decades. In 2024, Chinese module producers accounted for more than 90% of global shipments by volume, while OECD-based producers (e.g. based in Germany, Japan, and the United States) saw their combined global share fall below 10%, down from 80% in 2005. This shift has been accompanied by an unprecedented increase in global production capacity, which in 2024 represented more than twice the level of global demand. The OECD MAGIC database aims to reflect these changes, with its firm sample accounting for an estimated 67% of global solar module shipments in 2024 according to industry sources.

Figure A A.21. Solar photovoltaic cells and modules – Subsidies by firms' headquarters location



Note: Subsidies comprise government grants, income-tax concessions, and below-market borrowings.

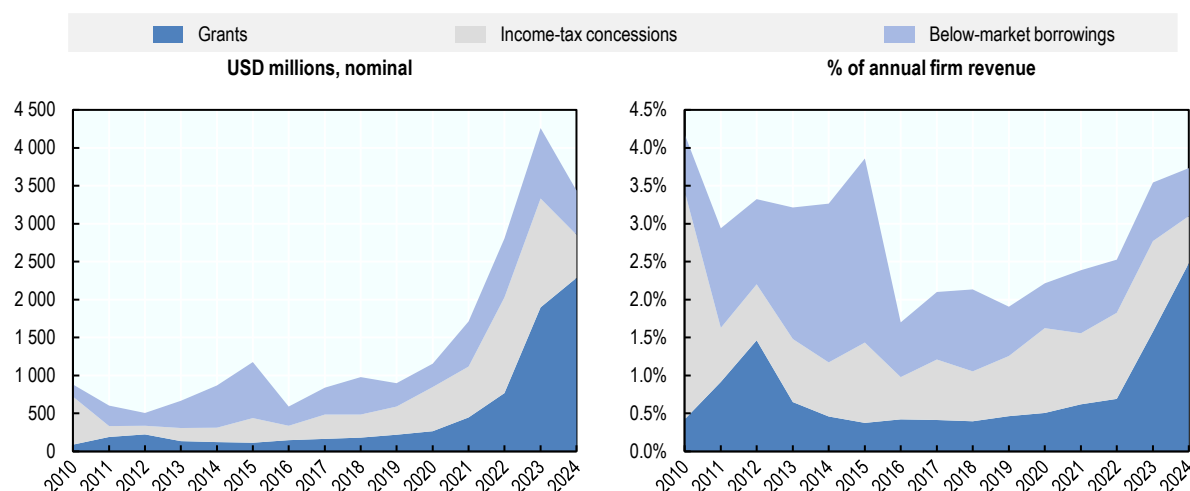
Source: OECD MAGIC database.

While Chinese producers of solar cells and modules have traditionally received larger subsidies than their OECD-based competitors, the years 2023-24 saw government support increase dramatically in the OECD on the back of new government policies, including measures aimed at supporting reshoring of the solar value chain. In absolute value, Chinese producers continue, however, to receive larger subsidies due to their considerably larger size and scale of production. That said, Chinese producers did experience, in 2024, a marked decrease in support as persistent supply-demand imbalances in the solar panel industry led to falling revenue, sizable losses, and job cuts.

Grants, tax concessions, and below-market borrowings (BMB) have all been used by governments aiming to support solar panel producers, including in the form of investment tax credits, preferential rates of tax, and subsidised loans from policy banks and state banks. Grants notably saw a large increase in 2023-24 following the introduction of specific schemes in OECD Member countries awarding producers refundable

and exchangeable tax credits counted as grants by companies in their accounting reports. Grants were also higher in China over the course of 2023-24 even as the losses incurred by Chinese producers resulted in lower levels of tax concessions and BMB.¹⁴ There are also potentially other forms of subsidies benefitting the sector, which are not captured in the OECD MAGIC database. These might include, for example, injections of government equity into lossmaking companies, preferential electricity tariffs for producers of energy-intensive polysilicon, and availability of land at below-market prices.

Figure A A.22. Solar photovoltaic cells and modules – Subsidies by instrument

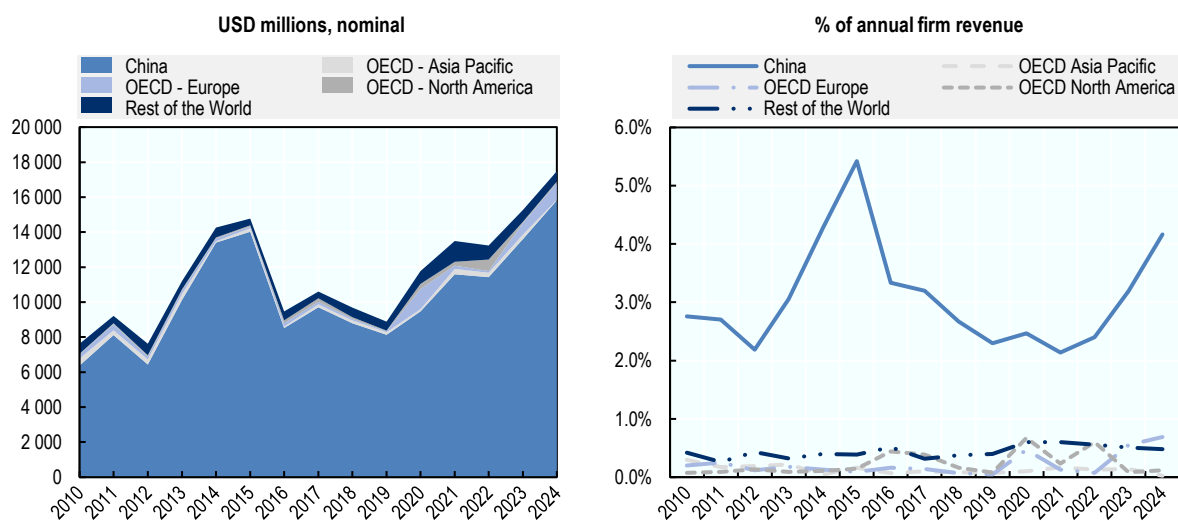


Source: OECD MAGIC database.

Steel (STEE)

Steel plays an important role in the production of capital goods, buildings, infrastructure projects, consumer goods (e.g. appliances), and transportation equipment (e.g. automobiles and shipbuilding). In the OECD MAGIC database, the sector covers steel produced in integrated plants, which use blast furnaces for ironmaking and basic oxygen furnaces for steel, and that produced in electric arc furnaces. It does not include iron-ore mining, unless the companies included in the database are vertically integrated. Coverage includes the value chain downstream of mining, namely: the smelting and processing of iron ore into steel; semi-finished steel such as ingots, billets, blooms and slabs, hot-rolled products such as coils and plates; and products that are processed further into cold-finished products, such as cold-rolled coils, plates, tubes, wires, and unworked castings and forgings.

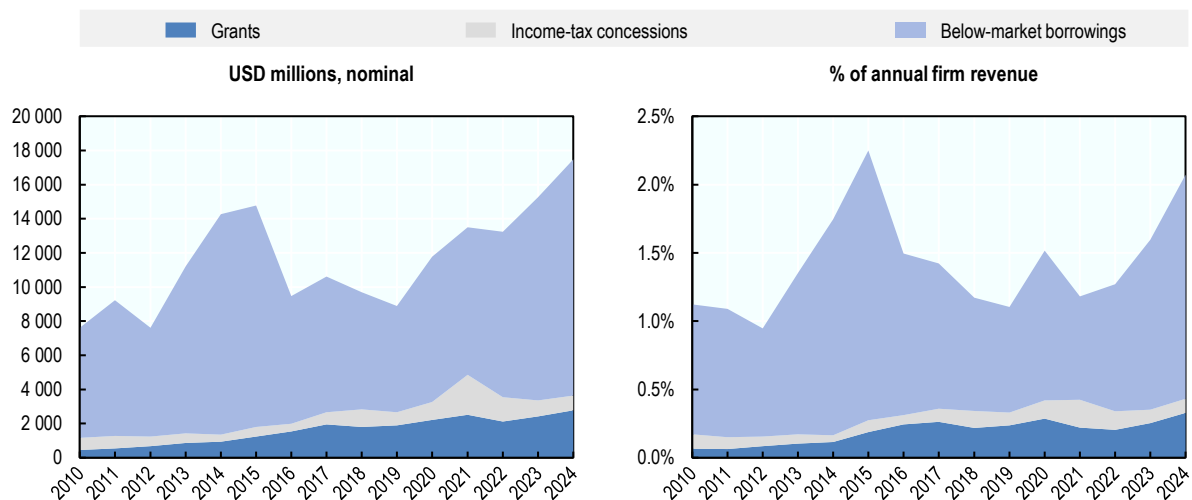
Steelmakers covered in the OECD MAGIC database represent about 60% of global steel revenue according to Factset data. The largest players in the sector are based in China, India, and the OECD, though there are several key companies based in other emerging and developing economies (e.g. Russia and Viet Nam). Collectively, Chinese firms have gained significant market shares in the last two decades, accounting in 2024 for 47% of global steelmaking capacity and 49% of the total steel revenue covered in the OECD MAGIC database. Many of these companies are state-owned, including some of the largest ones.

Figure A A.23. Steel – Subsidies by firms' headquarters location

Note: Subsidies comprise government grants, income-tax concessions, and below-market borrowings.

Source: OECD MAGIC database.

Steelmakers based in China received considerably larger subsidies than steelmakers based elsewhere throughout the period 2010-24, both in absolute and relative terms. Subsidies peaked in 2015 when China experienced stock market turbulence and metal producers faced the lowest prices seen over the period covered. Subsidies subsequently increased again with the onset of China's real estate crisis in 2021, which triggered a fall in profitability and revenue for steelmakers globally. Lower revenue and larger amounts of subsidies together resulted in a significantly higher subsidy-to-revenue ratio in 2024, at around 4% for China.

Figure A A.24. Steel – Subsidies by instrument

Source: OECD MAGIC database.

Below-market borrowings (BMB) accounted for most of the subsidies in the sector. This partly reflects the greater reliance of steelmakers on debt financing – given the capital-intensive nature of steel mills – as

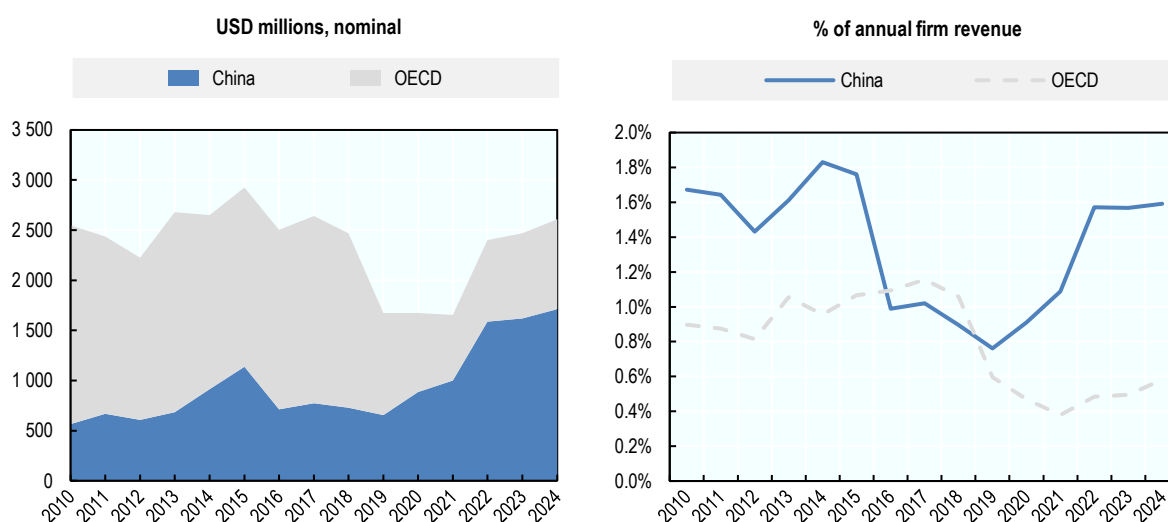
well as these companies' weaker financial standing. Support in the form of BMB has tended to ramp up in time of crises suggesting that these subsidies often act in a countercyclical fashion, helping distressed companies to stay afloat. While they appear more modest, government grants and income tax concessions are not insignificant either. Grants have notably increased in absolute terms since 2015, with the amount doubling over the period 2015-24. While the OECD MAGIC database does not cover the direct provision of subsidised energy inputs to companies, evidence for an illustrative sample of steelmakers has shown these to be important as well (OECD, 2023^[11]).

Telecommunications network equipment (TELC)

The telecommunications network equipment sector plays a crucial role in the modern global economy, connecting people, businesses, and governments and enabling the flow of information in real-time. The sector encompasses global companies producing the devices and software behind network infrastructure, which utilise various technologies such as wired, wireless, fibre, and satellite systems (including 5G technology). It is one of the most technologically sophisticated industrial sectors in the OECD MAGIC database, with change occurring at a rapid pace, underpinned by sizable investments in R&D.

The global telecommunications network equipment sector is highly concentrated, with a small number of firms accounting for the vast majority of economic activity. Coverage in the OECD MAGIC database is near-universal, capturing an estimated 80% of global sector revenue according to industry sources. The leading firms are headquartered primarily in China and OECD Member countries. Since 2005, Chinese companies have significantly expanded their global market share, increasingly competing with—and in some segments displacing—OECD-based firms. Compared with other sectors covered in the database, telecommunications network equipment is characterised by a higher prevalence of privately-owned firms.

Figure A A.25. Telecommunications network equipment – Subsidies by firms' headquarters location



Note: Subsidies comprise government grants, income-tax concessions, and below-market borrowings.

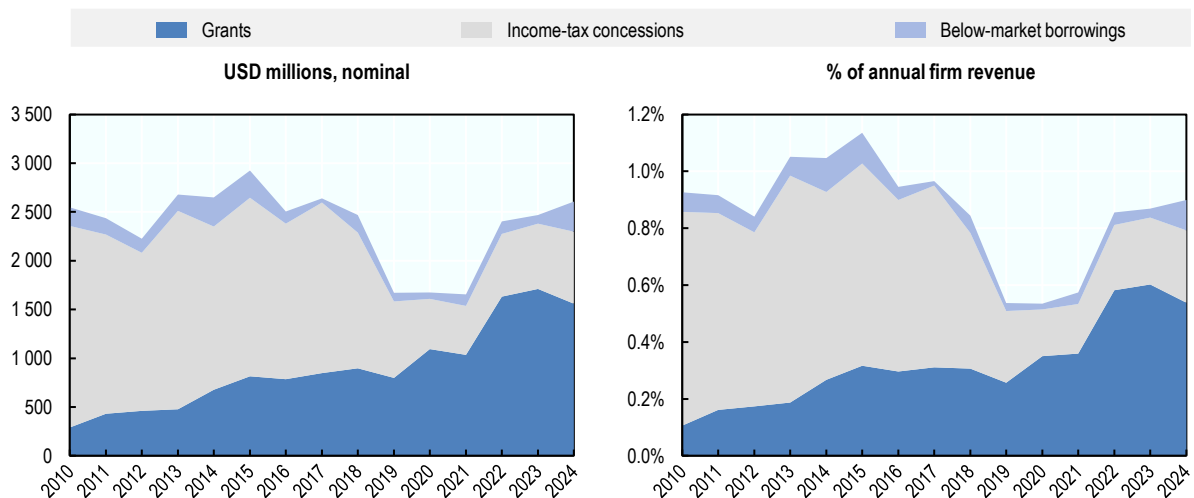
Source: OECD MAGIC database.

Telecommunications network equipment companies based in China generally received larger subsidies relative to their revenue than companies based in the OECD over the period 2010-24, although the difference is generally smaller compared with other industrial sectors covered in the OECD MAGIC

database. There was, nevertheless, a marked decrease in the relative value of the subsidies received by China-based firms in 2016. This decrease stemmed mainly from lower tax concessions and arose due to some companies earning lower taxable income amid a generally poor financial performance. Changes in these companies' indebtedness also affected their below-market borrowings (BMB). Subsidies were initially larger in absolute terms for OECD-based companies but have since fallen, both in absolute terms and relative to revenue. Subsidies benefitting China-based firms have been growing meanwhile since 2020.

As a technology- and intangibles-intensive activity, the production of telecommunications network equipment relies predominantly on equity as a source of financing, which leaves relatively little scope for subsidies taking the form of BMB. Instead, subsidies to the sector comprise chiefly grants and income tax concessions, many of which are directed at stimulating R&D and innovation. While income tax concessions were large in the early 2010s, they have since decreased both in absolute and relative terms, even as grants became considerably larger, accounting in recent years for most of the support to the sector. Beyond the subsidies covered in the OECD MAGIC database, the importance of public procurement for the sector may lead to other forms of government support such as market-access restrictions and discriminatory practices, which, like subsidies, can also distort markets and help firms gain market shares (OECD, 2024^[6]).

Figure A A.26. Telecommunications network equipment – Subsidies by instrument



Source: OECD MAGIC database.

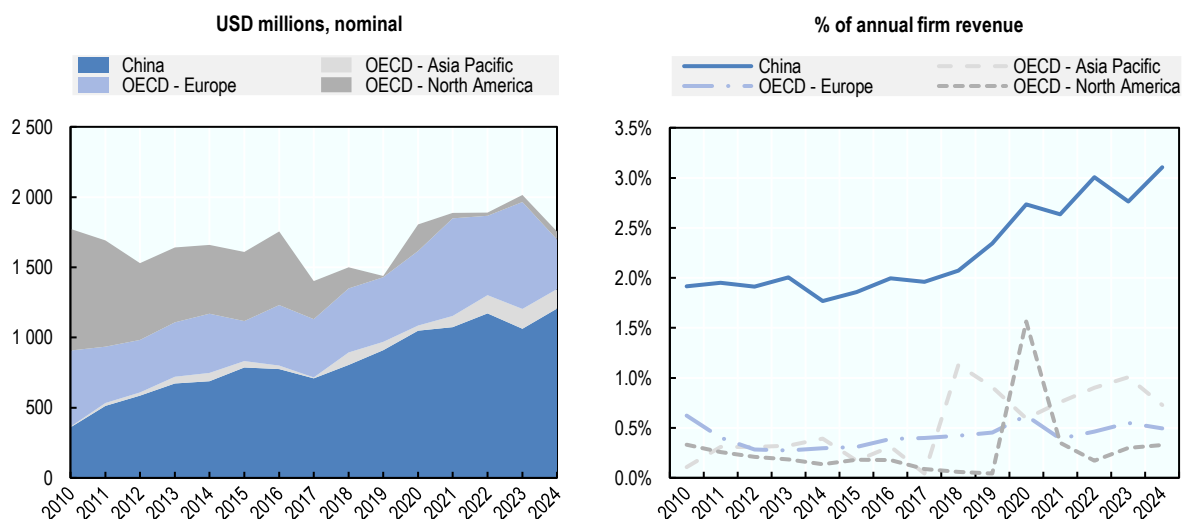
Rolling stock and signalling (TRAN)

Rolling stock refers to the range of vehicles used for the transportation of passengers and freight by rail. It includes all powered (e.g. locomotives) and unpowered vehicles (e.g. passenger carriages or coaches and freight wagons). The sector is broad and diverse as it includes the manufacture of passenger trains, freight trains, high-speed trains, light rail vehicles (e.g. trams), metro vehicles, and automated systems (e.g. monorails). The rolling stock and signalling sector is a subset of the broader rail supply industry, which also comprises the provision of rail infrastructure such as tracks and electrification and dedicated services such as the repair and maintenance of rolling stock.

Firms covered in the OECD MAGIC database account for about 75% of the global rolling stock and signalling market according to industry estimates (UNIFE, 2024^[13]). The sample includes more than

20 companies producing vehicles for the transportation of passengers and freight, as well as signalling and communication equipment. While some firms manufacture and sell vehicles in one product segment only, others are more diversified and can be involved at different stages of a rail project, including the provision of equipment (i.e. rolling stock), signalling and communication systems, and services (e.g. reparation and maintenance services). Many of the largest firms are based in Europe, Japan, and Korea, although companies with the highest sales globally are based in China. Firms located in North America today produce vehicles mainly designed for freight transportation.

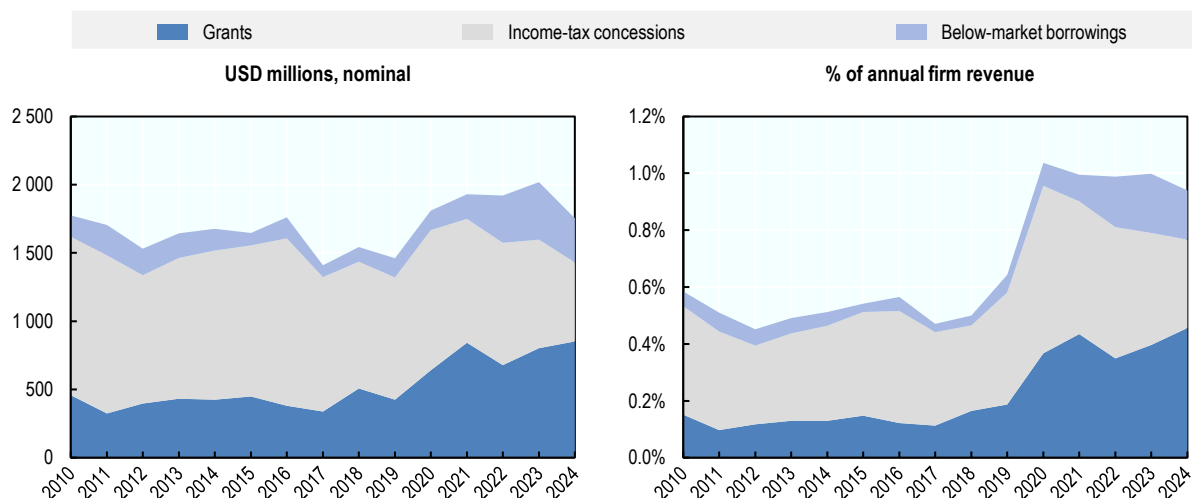
Figure A A.27. Rolling stock and signalling – Subsidies by firms' headquarters location



Note: Subsidies comprise government grants, income-tax concessions, and below-market borrowings.

Source: OECD MAGIC database.

Figure A A.28. Rolling stock and signalling – Subsidies by instrument



Source: OECD MAGIC database.

China-based producers of rolling stock and signalling equipment were by far the largest beneficiaries of subsidies – both in absolute and relative terms – compared with firms based in the OECD between 2010

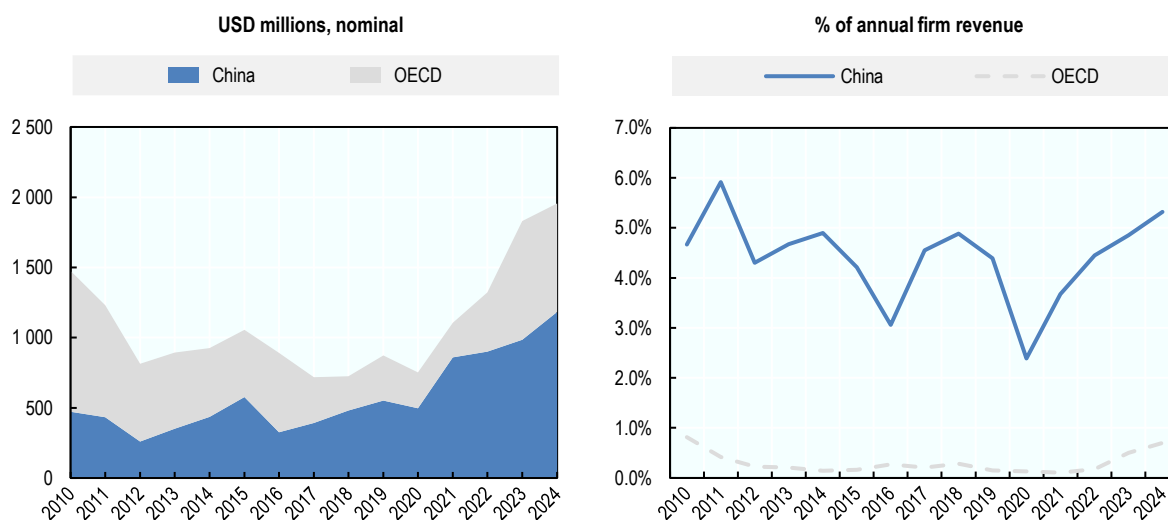
and 2024. These subsidies have also grown considerably beginning in the mid-2010s. Support for OECD-based firms was, meanwhile, much more modest despite occasional spikes in subsidies, notably following the introduction of one-off wage subsidies and tax relief during the COVID-19 pandemic.

Income-tax concessions (including support for R&D and preferential rates of tax) and grants were the largest subsidy instruments employed in the sector globally. Below-market borrowings (BMB) were, for their part, relatively modest for the overall sample of firms, although this form of support did feature prominently in the case of firms based in China. Beyond the subsidies covered in the OECD MAGIC database, the importance of public procurement for the sector may lead to other forms of government support such as market-access restrictions and discriminatory practices, which, like subsidies, can also distort markets and help firms gain market shares (OECD, 2024^[6]).

Wind turbines (WIND)

Wind energy was the second fastest growing form of renewable energy in 2024, behind solar photovoltaic energy. The wind turbine manufacturing sector has enabled this growth by designing, manufacturing, erecting, and maintaining wind turbines and their associated equipment. While wind turbines are composed of approximately 25 000 individual parts, the final product is made up of five major components, namely, the blades, the tower, the nacelle, the rotor, and the turbine foundations. Most of the largest wind turbine manufacturers are vertically integrated, producing in-house some of these components, such as the nacelles and, to a lesser extent, the blades. While specific raw materials such as certain rare-earth elements (e.g. neodymium, dysprosium and – albeit in relatively smaller amounts – praseodymium) can form critical upstream inputs into the production of turbine components (e.g. permanent magnets for offshore turbines), the sample covered by the OECD MAGIC database does not include the production of these upstream materials.

Figure A A.29. Wind turbines – Subsidies by firms' headquarters location



Note: Subsidies comprise government grants, income-tax concessions, and below-market borrowings.

Source: OECD MAGIC database.

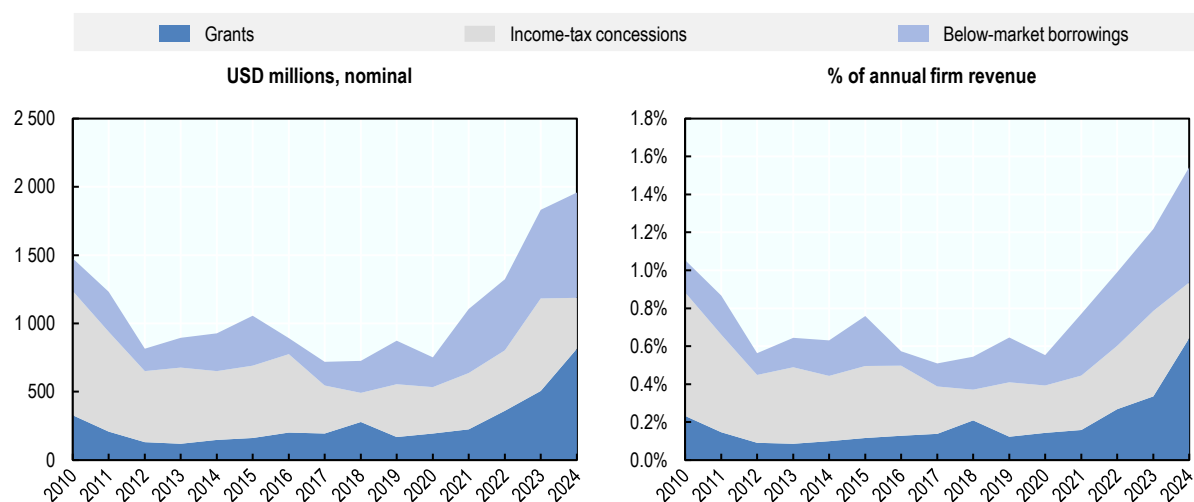
Firms covered in the OECD MAGIC database represent about 75% of global sales of wind turbines. The largest are headquartered in China, Europe, and the United States. In the last 15 years, the wind turbine sector has notably seen Chinese producers play a growing role both at home and abroad. As of 2025,

more than half of the top 15 wind turbines manufacturers in terms of capacity additions were Chinese according to BloombergNEF. On top of benefitting from a sizeable home market, Chinese exports of wind turbines have grown steadily since 2010 (OECD, 2025^[14]).

While firms based in China have generally received larger subsidies than OECD-based firms, the difference is more striking when expressing subsidies relative to firms' sales revenue. OECD-based firms have seen an uptick in the subsidies they received since 2023 on account of new subsidy schemes supporting the domestic production of wind turbines. This increase was, however, more modest compared with the recent increase in the subsidies received by manufacturers of solar panels. Despite the recent uptick in support for OECD-based producers of wind turbines, China-based manufacturers continued to be the largest recipients of subsidies in 2023 and 2024, both in nominal terms and as a percentage of their annual revenue.

All three types of subsidy instruments covered in the OECD MAGIC database – namely grants, tax concessions, and below-market borrowings (BMB) – featured prominently in the sector. Income-tax concessions and BMB were generally larger – both in nominal and relative terms – until 2023, when new grant programmes were introduced to support the production of renewable energy equipment in China and OECD Member countries.

Figure A A.30. Wind turbines – Subsidies by instrument



Source: OECD MAGIC database.

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Notes

¹ The provision of emergency loans to firms in distress can, however, increase firms' indebtedness. This has led governments at times to offer debt-equity swaps or equity infusions to improve distressed firms' balance sheets (OECD, 2021^[5]). Work to include estimates of below-market equity in future versions of the OECD MAGIC database is underway.

² As the OECD MAGIC database looks at individual firms rather than countries, data on subsidies can include support firms receive across the different jurisdictions in which they operate. The difference in where firms locate their productive assets implies that some of the subsidies for OECD-based firms come from China but that almost all the subsidies benefitting Chinese firms come from China ([detailed information on the methodology behind MAGIC available here](#)).

³ While companies based in North America received on average relatively more BMB over the entire period 2005-24, this was almost entirely due to the large loans the U.S. Treasury Department provided to Michigan-based carmakers during the global financial crisis of 2008-09. Absent these loans, subsidies in the form of BMB have been relatively small for firms based in North America (Figure 2, right).

⁴ The revised *OECD Guidelines on Corporate Governance of State-Owned Enterprises* (the [SOE Guidelines](#)) provide concrete guidance to help policymakers evaluate and improve the legal, regulatory, and institutional framework for the ownership and governance of SOEs (OECD, 2024^[15]).

⁵ While information on which companies are partly or fully owned by government entities is generally publicly available, there are cases where ownership through chains of entities can mask beneficial ownership of companies by governments.

⁶ WTO, Committee on Subsidies and Countervailing Measures, Notifications Provisions under the Agreement on Subsidies and Countervailing Measures, Background Note by the Secretariat, G/SCM/W/546/Rev.19, 3 October 2025.

⁷ A further issue concerns the lack of timeliness, as many annual notifications are submitted, if at all, after the deadline of the end of June.

⁸ See Box 1 in OECD (2023^[2]).

⁹ Historical data on primary aluminium production by region come from the International Aluminium Institute's website. See <https://international-aluminium.org/> (accessed on 13 April 2026).

¹⁰ It typically takes about 12-16 kWh of electricity to produce one kg of primary aluminium, with electricity alone accounting for 30%-40% of the costs of aluminium smelting.

¹¹ See, for example, <https://pubs.usgs.gov/periodicals/mcs2025/mcs2025-cement.pdf> (accessed on 21 April 2026).

¹² Many large companies combine commercial and naval shipyards, which makes it impossible to operate a clear separation.

¹³ Historical data on global commercial ship deliveries by geographical grouping are based on OECD calculations using Clarksons Research Services, *World Fleet Register* (2026).

¹⁴ This is likely because losses imply that companies have no taxable income against which to apply special deductions and reduced rates of tax. Financial losses similarly degrade the risk profile of companies, which can make banks less inclined to lend to them at low rates.

OECD MAGIC Database of Industrial Subsidies

Industrial subsidies have reached their highest levels since the global financial crisis, amounting to USD 108 billion in 2024 and reflecting governments' renewed interest for industrial policy in a challenging context for global trade and supply chains. Using detailed firm-level data from the 2026 release of the OECD MANufacturing Groups and Industrial Corporations (MAGIC) database, this report finds that the production of solar energy equipment, semiconductors, and heavy industries were the most subsidised industrial sectors over the period 2005-24. The database also finds manufacturers based in China to receive relatively more subsidies than their competitors based in other jurisdictions, mainly in the form of government grants and below-market borrowings. Available evidence suggests that these subsidies are contributing to shaping global markets by increasing the global market share of recipient firms.



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